# The Waters of March: Environmental, Social, and Commercial Reactions to the Mahoning Valley Flood of 1913

by

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Submitted in Partial Fulfillment of the Requirements

for the Degree of

Master of Arts

in the

American Studies

Program

YOUNGSTOWN STATE UNIVERSITY

December, 2013

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ABSTRACT

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The flood that devastated much of the Midwestern United States during Easter weekend in 1913 affected areas as far west as Nebraska and southward into Tennessee. Despite an apparent contemporary cultural amnesia toward the specifics of the flood, the resulting actions taken in the immediate years following the event have had a lasting impact more than a century later. Although Dayton, Ohio has the historical distinction of being the city most often associated with the event, it was simply first to apply for federal aid, and thus garner the majority of headlines. Calling this multi-state event the "Great Dayton Flood" belies the devastating economic and social impact the rains had across the Midwest, including the Mahoning River Valley.

That region experienced its own loss of life, destruction of property, and subsequent recovery efforts. Curiously, many of the direct reactions to the flood also indirectly contributed to major increases in industrial capacity and quality of life improvements for both workers and residents. This thesis will use historical newspaper articles, archival photographs, county records and prior scholarly research to develop the argument that the construction of dams and reservoirs, as well as infrastructure redevelopment built during the aftermath of the flood, actually had a much more lasting impact on the area's productivity than simply future flood mitigation.

# ACKNOWLEDGEMENTS

There are several people and organizations I would like to thank for helping me during the process of developing my thesis.

First, I'd like to acknowledge the staff and faculty of the YSU American Studies Department for providing academic as well as moral support during the completion of this thesis. The insight into research methods, theme development, and interdisciplinary collaboration made the progression of this work an academic journey worth taking. I would especially like to thank Dr. Stephanie Tingley for her constant guidance and suggestions, and my readers Dr. Fred Viehe and Dr. Marcelle Wilson.

The modern landscape of Youngstown is a far cry from the industrial powerhouse it once was. The factories and industrial plants that withstood the devastating impact of the 1913 Flood proved incapable of weathering the economic storm which would wash over them later in the century. For the people of the region who not only remember the glory of the past, but look to the future with optimistic eyes; I acknowledge you, and I thank you for embodying the same spirit your fellow residents had, just a century ago.

I'd also like to thank the friends and family members who've stood by me and at times tolerated me during the last two years of graduate school. My parents, Pam and Gene have been a constant source of emotional and often financial support. My wonderful siblings Corey and Kara offered me encouragement throughout this journey and I'm truly grateful to have them in my corner.

Finally, I'd like to acknowledge my daughter Avery. Above all, she has been my motivation and biggest source of pride. Her resolve, tenacity, and joie de vivre teach me that academics are not about what we learn, but how we use our wisdom to enrich our loved ones.

CONTENTS

# Introduction

The days leading up to Easter weekend, 1913 in Youngstown, Ohio were not unlike previous years. Neighborhood churches prepared for holiday festivities. Local groups made announcements in the *Youngstown Vindicator* and the *Mahoning Dispatch* two of the major newspapers in the region. Local news gave little mention of the weather. The headlines of the day included stories of a string of tornados sweeping across the Great Plains region of the U.S., but otherwise local weather reports gave little indication that anything unusual was expected in the Midwest. In fact, nothing suggested that March 23rd would offer anything other than a chilly cold or even moderate rain in a region accustomed to the harsh Midwest winters and the Lake Erie winds that impacted their industrial, working-class lives.[1]

Weather forecasting during the 1910s relied more on reviewing historic conditions than scientific predictions. Meteorology was often reactionary and based on weather patterns, and most reports came from national weather centers rather than local or even state specific sources. In the days leading up to Easter, the only weather stories of significance were reports of a series of tornados striking areas of the northern Great Plains in the days just prior to Easter weekend. These tornados captured national headlines, culminating in a massive twister that hit Omaha, Nebraska.[2] The death toll from these twisters exceeded 200, with more than half of those located in Omaha.[3]

In the Mahoning Valley, natural disasters were rarely seen firsthand, especially the kind which garnered headlines across the country. The areas along the various rivers

[1] *The Vindicator*. March 23, 1916.
[2] Ibid.
[3] G.E. Condra and G.A. Loveland. "The Iowa-Nebraska Tornadoes of Easter Sunday, 1913". *Bulletin of the American Geographical Society*, Volume 46. University of Nebraska. 1914.

experienced occasional flooding during high rains, but nothing too severe. The highest the Mahoning River had ever risen above its normal water level was nine feet, well below the height of bridges and barely enough to spill over the banks. In the previous forty years, only the 1878 and 1904 floods had caused any serious disruption to daily functions in the city.[4] Even these events were viewed as little more than footnotes in the local history and left little impact on the city's landscape. More importantly, these prior floods failed to lead to any widespread preventative measures to avert future river overflow.

This became all too evident that Easter weekend in 1913. The rains started early that Sunday morning. They continued throughout the day and although the storm's intensity itself wasn't anything unusual, the downpour was consistent and unrelenting. By Sunday evening, the showers had done little other than cause an unfortunate nuisance on an otherwise normal holiday weekend. It continued raining throughout the night however, and by Monday morning the river had started to noticeably rise. Still, the banks of the Mahoning River sat high enough above the water level to prevent overflowing at levels up to this point. Despite its track record of infrequent flooding, the geography of the area possessed the potential for such an event. The Mahoning River created the hilly landscape which characterizes the region, forming a long valley which stretches for miles.

The Mahoning Valley covers an area which includes four counties[5] in northeast Ohio and two counties in northwest Pennsylvania. The city of Youngstown is the largest

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[4] Joseph Green Butler, *History of Youngstown and the Mahoning Valley, Ohio, Vol. 1* (New York: American Historical Society, 1921), 239.

[5] The Mahoning Valley includes Columbiana, Mahoning, Portage, and Trumbull counties in Ohio and Mercer and Lawrence counties in Pennsylvania. Mosquito Creek, West Branch, and Eagle Creek are the three main tributaries which feed into the Mahoning River.

municipality in the valley and sits directly on the Mahoning River, the primary waterway in the region. As a landlocked city, Youngstown depended heavily on the river for importation of raw materials to sustain manufacturing of steel and pig iron. The railroad lines which served as a primary means of industrial export often intersected portions of the river near commercial areas. During the 1913 flood, every town and city in the Mahoning Valley suffered damages; but as the manufacturing epicenter of the region, Youngstown experienced the greatest losses to its industrial infrastructure. For the purposes of this paper, the name Youngstown often represents the group of cities and townships in the surrounding area as well as the city proper, unless specifically stated otherwise.

The 76,000 residents in the city of Youngstown didn't notice any immediate threat from the Easter rain because most lived in neighborhoods situated at elevations higher than the river. Taking their names from their geographic attributes, neighborhoods such as Oak Hill, Briar Hill, and North Heights saw little threat from flooding. Over a total of four days and nights of unprecedented rainfall, the Mahoning River crested at twenty-three feet above normal water levels.[6] This was eighteen feet above the critical mark; more than double the highest level ever recorded. The city faced a catastrophic flood situation within the first days of rainfall.

In his notable 1921 book, "History of Youngstown and the Mahoning Valley, Ohio," Joseph G. Butler Jr. gave a firsthand account of how the unceasing rain had reached almost biblical proportions. His recollection of the event fills an entire chapter of the book, and anyone looking for a deeper historical perspective on the specific events

[6] Conrade C. Hinds, *Columbus and the Great Flood of 1913: The Disaster That Reshaped the Ohio Valley* (Charleston: History Press, 2013), 44.

during the Flood of 1913 will find his account one of the best. The book offers unique insight into the immediate recovery and reconstruction of the industrial infrastructure of the area, but doesn't allow for a long-term assessment of the impact of the event.

This thesis will take a more nuanced look at the flood, notably how city officials and industry leaders responded to it, and what impact those decisions had on the region. An argument will be laid out which shows how the immediate and permanent actions to prevent future flooding had an indirectly positive effect on the lives of people living and working in northeast Ohio. The consequences of flood mitigation projects actually led to unprecedented production capabilities in the steel industry, due to an increased ability to regulate water capacity in the Mahoning River. The years prior to the flood saw the river run dangerous low during summer months, seriously disrupting water supplies for domestic and industrial usage.

Attempts by both government officials and industrial interests to acquire land near the city to construct large water storage basins to offset the low flow periods had been unsuccessful. A project to purchase land for the development of artificial lakes as an additional water source had failed when speculators drove up real estate prices to unreasonable levels.[7] Additionally, federal land laws had prevented the outright seizure of privately held land solely for the purpose of economic development. Repeated efforts to secure tracts of land suitable for the construction of a reservoir through the process of eminent domain led to challenges in court and had made little progress prior to the 1913 flood.[8]

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[7] Butler, *History of Youngstown*, 233.
[8] Richard Allen Epstein. *Takings: Private Property and the Power of Eminent Domain.* (U.S. Harvard College, 1985), 221.

In the months following the flood, county leaders assembled emergency committees to mitigate future flooding on a small scale by analyzing watershed maps and areas along the river. They also coordinated construction of wooden flood control structures and minor dams along the river. While these actions were short-term, officials began forming permanent and long lasting plans almost immediately, utilizing modern engineering principles to construct a dam and reservoir upstream from Youngstown to control the flow of water into the city. While these municipal responses were typical of the reactions of other Ohio cities, the flood control committee in Mahoning County had a major advantage in that much of the preliminary planning for upstream reservoirs was already in place. The failed attempts to secure land for industrial-use water storage basins could now be reinitiated under the cause of "flood prevention."

Milton Dam was the first of these projects to reach completion. When it opened in 1917, it was the first large-scale reservoir of its kind in the Midwest. Although Dayton, Ohio suffered more damage than Youngstown, legal and bureaucratic hurdles delayed any construction in that part of the state. The Miami Conservancy District was organized in 1914, but attempts to secure privately owned farmland for dry dam construction experienced delays in court, leading to appeals up to the level of the Supreme Court. Dam projects along the Miami River did not begin until 1918, and it wasn't until 1922 before the last of these projects saw completion.[9] The industrial demands in the Mahoning Valley however, coupled with local support for the dam construction, hastened completion of the Milton Dam.

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[9] Judith Sealander, *Grand Plans: Business Progressivism and Social Change in Ohio's Miami Valley, 1890-1929* (Lexington: University Press of Kentucky, 1988), 81.

While the flood had minimal impact on residential areas in the city, the industrial areas located directly on the river's edge took the brunt of the damage. Floodwaters destroyed and washed away the rail lines which serviced these factories and milling plants, and most commercial activity in the city came to a halt. The construction of Milton Dam coincided with the rebuilding of many of these factories. The additional access to large, controllable quantities of water greatly improved the output capabilities of many of the steel mills and factories. Additionally, the success of the Milton Reservoir project provided evidence toward the viability and usefulness of future projects.

This thesis will explore how the industrial potential of the Mahoning Valley improved as a direct result of the construction of Milton Reservoir, which itself was a massive undertaking primarily completed in part as a response to the flood. Subsequent man-made lakes and reservoirs in the region also indirectly contributed to a massive increase in industrial production capacity due to the high demands for accessible water required in steel production. Other factors coinciding with the construction of Milton Dam included the onset of the First World War in 1914 as well as an increasing national demand for steel production to support growing automobile sales and steel-based construction. These issues contributed to the success of the steel industry in the Valley, but the Flood of 1913 was the catalyst that enabled the region to become an industry leader for decades to come.

As a transplant to the city of Youngstown, my knowledge of the area was based only on second-hand accounts of the once great steel town. I have no personal memories of the celebrated glory days of this area, famous for its manufacturing output along with

the subsequent hardships that followed the industrial downturn in the 1970s. Many of the empty buildings which once housed factories still dot the landscape, and although the mills are quiet, their presence still serves as a reminder of the bustling industrial potential this area was once known for. Not unlike the photographs that document the devastating aftermath of the 1913 flood, the landscape of Youngstown today stands ready for a major event which will allow it to reinvent itself and wash it clean of its tumultuous past.

During my studies at Youngstown State University, I was exposed to a variety of interdisciplinary subjects within the American Studies program. These included urban history, working class studies, media literacy, historiography, geography, and American history. Drawing on each focus area allowed me to create this thesis with an objective view toward the significance of the various influences on the regional recovery of Youngstown following the 1913 flood. I relied on a variety of sources, including the archival newspaper articles published in the days and weeks following the flood. I examined U.S. Census data to evaluate population and demographic shifts in the years after the flood and how industry regained its foothold in the aftermath. I've included archival photographs to emphasize the level of destruction, and for more photos of the event readers are encouraged to contact the Mahoning Valley Historical Society.

Archival data collected by national organizations affiliated with the steel industry provided important insight into commercial output of the mills prior to and following the flood. These supported the argument that the construction of dams and reservoirs, as well as infrastructure redevelopment built in the aftermath of the flood, actually had a much more dramatic impact on the area's productivity than simply future flood mitigation. I analyzed Army Corps of Engineers' documents which outline specific water yield levels

of the Mahoning River before and after construction of their various reservoir projects, and compared these figures to increased output levels of the factories and mills located along the river's edge. These datasets support my hypothesis that the additional water resources made available as a byproduct of flood prevention efforts had a measurable impact on the production capabilities of the steel industry in the Mahoning Valley.

This thesis is the culminating result my past two years of American Studies research and study. With an emphasis on the Public Practice aspect of the degree, focusing primarily on classes in the Public History area, I've built on my interest in the American sense of place and identity, the evolution of urban planning, historical preservation, and the stories represented by people, places, and objects. In studying the meaning and significance of historic events, I've chosen to make my capstone project not just about the catastrophic flood that affected much of the Midwest over Easter weekend in 1913, but more specifically how the devastation contributed to the redevelopment and subsequent modernization of the Mahoning River Valley region.

Some notable classes that I've taken during my work in this program include Work in America (MGT5845) and Humanities in the Community (AMER6930), which both contributed to a broader understanding of working class studies, especially in the local area. *Steeltown USA*: *Work and Memory in* Youngstown, by Sherry Lee Linkon and John Russo played an especially important role in shaping my interest in the history of Youngstown and its surrounding areas. The book provides an historical reflection on the area with an emphasis on the stories of the people and places connected to the steel industry. The book was a valuable resource in the Work in America class and it's maintained a cherished place in my personal library.

I also took part in two internships during my graduate studies. First, I worked at the Autism Society of Ohio – Mahoning Valley office during Spring Semester 2013. This internship allowed me to work and interact with various nonprofit organizations in the tri-county area, all while coordinating the setup of the newly sanctioned regional office. Interacting with nonprofit leaders introduced me to the sense of pride felt by many residents toward this area. Known affectionately as the "Valley", the local area provided hope for the future as much as it struggled to honor its past. For those who had spent their entire lives in and around Youngstown, the city represented both the frustrations and potential of an economy based on blue collar industry.

My second internship was obtained through the Summer Honors Nonprofit Leadership Internship program sponsored by the YSU Business School. I was selected from a pool of more than fifty applicants to be a part of the program, which allowed me to work at the Mahoning County Land Reutilization Corporation. Along with learning the day-to-day operations of a county-level organization, I also became acquainted with all the neighborhoods within Youngstown city limits as well as the numerous townships and villages throughout the county. Many buildings and homes which stood during the 1913 flood are left largely unchanged on their exteriors, and in many ways it is not difficult to imagine how they looked a century ago. Others have not aged well.

The historical districts which once housed the executives of the mills in stately homes are now largely distressed, with urban blight and abandonment causing many of the structures to sit empty and in disrepair. The diversity of the neighborhoods also offers a glimpse into the history of urban planning and how cities were developed around an industrial epicenter. It's a rare chance to view contemporary urban issues with the

knowledge their historic origins, and Youngstown provides an excellent location for this type of study. The I skills learned from these internships, combined with my field of study within the American Studies graduate program encouraged me to take on this thesis project for both its local and personal significance.

The first chapter describes the immediate effects of the flood and examines the short term reactions to the devastation brought upon the region. While the loss of life was minimal, the manufacturing abilities of the county were brought to a standstill. The flood waters washed entire sections of rail lines, factory machinery, smelting pots, river barges, and train cars downstream into a mass of debris and wreckage. Downtown roads were inaccessible and mobility within the limits of Youngstown was nearly impossible. Joseph Butler's firsthand account summed up the travel conditions in the city:

*Rowboats plied their way blissfully up and down the lower end of East Federal Street from the junction of Himrod Avenue to a point well above Basin Street. The B. & O. and the old Pennsylvania passenger stations were submerged and the territory about the junction of Oak Hill and Mahoning Avenues, which has always been a favorite target for floods, witnessed an inundation that made previous ones appear trivial.*[10]

In the days, weeks, and years following the flood, focus was first on recovery, then on prevention. Getting the city and its manufacturing base up and running again was the top priority. While some efforts were underway to fortify the banks of the Mahoning River, most of these projects were minor and temporary at best. These short term plans led to the planning, construction, and use of the Lake Milton Reservoir and Dam, finished in 1917. It was only after the completion of this project that factories and mills along the river could dramatically escalate their production levels thanks, in large part, to the millions of additional gallons of newly available water.

[10] Butler, *History of Youngstown*, 240,241.

In the second chapter I examine additional factors which drove the global demand for steel production. These include the First World War and the domestic consumption of metal products in the first two decades of the twentieth century. I looked at specific local companies including major producers such as the Brier Hill Steel Company, Republic Steel, and Youngstown Sheet and Tube. Profiles include corporate origins, how they rebuilt their facilities after the flood, and also how they increased production capabilities to meet additional demands. This chapter also discusses smaller companies and how they adapted to the post-1913 flood environment.

To understand the business climate in the Mahoning Valley in 1913 requires an appreciation for the major industrial consolidations going on at the time. The increased demand for refined iron and steel products had seen the area's factories shift from small scale limited business models into the integrated mill system. These large facilities combined many of the processing steps involved in production into centralized locations. Individual corporations controlled both the supply and distribution of their materials, and this led to several powerful business entities dominating the industry. Some even developed employee specific neighborhoods to house their workers and segregate residents based on their status at the mill.

The third chapter covers the time period from 1920-1963. This timeframe includes construction of several additional water supplies as well as the development of a more scientific approach to water conservancy and flood plain research. This chapter also analyzes the state of the region on the fifty-year anniversary of the flood, and takes a broad perspective on conditions in the area half a century later. These include environmental, social, and commercial changes in the area, along with the maturation of

the industrial foundation of the city. This period includes the Second World War, which also played a major role in steel production in the valley and led to the construction of several more reservoirs to support the growing population as well as the industrial demands of the region.

## CHAPTER ONE

## THE IMMEDIATE RESPONSE (1913-1917)

There had been few clues in the days preceding the Great Storm to suggest it would be anything but a seasonal rain, typical for the region. Spring flooding was an almost annual occurrence, and even the previous major floods that befell Youngstown in 1904 and 1878 hardly registered as little more than historical anomalies which caused temporary disruptions to daily life.[1] In fact, previous prevention efforts and responses to these events focused primarily on sandbag retention walls and earthen barricades hastily built immediately before and during the inclement weather. Once the rains stopped, the waters receded and crews began the cleanup ritual that had become a yearly routine. It was a normal reaction to what was otherwise viewed as a predictable act of nature. Easter Weekend, 1913 was not normal, routine, or expected. In less than a week, enough rain fell to cause the region's greatest flood in recorded history. The response was immediate and unprecedented, and forever changed the physical and cultural landscape of the region. The national reaction to the flood contributed to changes in the legal system while the local response led to a system of water resource management responsible for the Mahoning Valley becoming a global leader in steel production.

When the rain stopped falling just after three PM on Wednesday, March 26, the Mahoning River Valley was unrecognizable. In just the previous three days, enough water flowed over the landscape to remove all but the largest structures and bridges in areas along the river's edge. Telephone and telegraph poles, electrical wires, signs, and

[1] Joseph Green Butler, *History of Youngstown and the Mahoning Valley*, *Ohio, Vol. 1* (New York: American Historical Society, 1921), 239.

even small buildings had simply vanished downstream.[2] What had once been pastures and farmland had turned into acres-wide lakes with chimneys and rooftops rising from the water's surface. The city was without electricity and all but the most primitive forms of mass communication had been eliminated. Rescue crews used megaphones and hand-delivered messages to spread news. Emergency recovery teams relied on boats to navigate the streets or districts with shallow water to travel by foot. Sirens wailed through the night as relief efforts struggled to meet the needs of the water-logged city.[3]

**Figure 1-1:** In this view eastward from the Market St. Bridge, Republic Steel's Youngstown Plant can be seen in the days immediately following the flood. Fully submerged rail lines on the left side of the picture ran parallel to telephone poles like what can be seen on the opposite side of the Mahoning River. This photo was taken on March 27, 1913 when the flood waters had already begun to recede.

*Courtesy of Ohio Historical Society: Youngstown Historical Center of Industry and Labor*

[2] "Three Bridges Torn From Their Abuttments," [sic] *The Vindicator*. March 26, 1913.
[3] "Fearful Floods," *The Vindicator*. March 28, 1913.

To add to the devastation, as electrical transistors exploded and short-circuited, they caused files which added to the devastation. In spite of the rain, flames had burned many of the wooden structures located along the roads and corridors followed by power lines. With access blocked by debris-filled floodwaters, the blazes were left to burn themselves out. Severed gas lines and spilled chemicals inside industrial buildings literally added fuel to the fires.[4] With no electricity throughout the city, residents at higher elevations huddled in their candlelit homes, looking down toward the blackened downtown area lit only by random fire which burned throughout the night.

In an ironic twist, the rising floodwater rendered the new water treatment facility useless. Opened less than a decade before in 1905, the water filtration plant was capable of treating 10 million gallons of water per day and led to a dramatic decrease in communicable diseases such as typhoid and malaria.[5] Prior to the construction of this facility, the city acquired its water supply directly from the Mahoning River, but as population and industrial production grew, the river water became dangerously unsafe to consume. The filtration plant resolved this problem, but once the flood knocked out its capabilities, residents were forced to conserve their rations of potable fluids, despite an inundation of water throughout the city.

The amount of rain that fell during this four day period was exceptional and difficult to fathom. The storm system covered a multi-state region and an estimated 12 *trillion* gallons of water fell across the Midwest. For perspective, this has been compared to the same amount of amount of water flowing over Niagara Falls in a four month

[4] "Work of Rescuing People From Flooded Sections," *The Vindicator*. March 26, 1913.
[5] John S. Lewis and N.E. Hawkins, *Historic American Engineering Record – Youngstown City Waterworks,* No. OH-118, 1950, 9.

period.[6] The devastation experienced in the Mahoning River Valley was shared by cities across Ohio and impacted a large swath of the country, with severe property damage and loss of life recorded in no less than fifteen states. The rain storms stretched across an area from Michigan to Vermont and as far south as Louisiana, but Ohio received the most damage nationwide.[7]

**Figure 1-2:** The water filtration plant located along the Mahoning River's edge at the intersection of Mahoning Ave. and Summit St. in Warren, OH was completely inundated when the floodwaters crested at more than ten feet above critical levels. Located approximately 20 miles NW of downtown Youngstown, the scene in Warren was typical of cities located near rivers in the Midwest.

*Courtesy Trumbull County Historical Society*

[6] Trudy E. Bell, *The Great Dayton Flood of 1913* (Chicago: Arcadia Publishing, 2008), 9.
[7] Ibid.

Another large city in the Valley, Warren, Ohio had also witnessed its downtown area decimated by the flood. Without the elevation advantage many neighborhoods in Youngstown had, many of the houses near the river in Warren were destroyed. Without accessible roads, many of the remaining homes burned when fire crews were unable to reach them. Other cities nearby including Niles, Girard, Leavittsburg, and Howland also suffered severe damage. Many of the bridges in the area were either destroyed outright from the rising waters or were intentionally demolished to stop debris from accumulating.

As reports of the storm came across the wires in Columbus, it became evident by the third day of continuous rain that this was not just a localized event. Early on the morning of Tuesday, March 25th the first cable hinting at the severity of the disaster came into a wire station north of the state capital from an unidentified sender with a chilling, one line message. "We must have help or we'll be wiped out!"[8] Despite the unknown source of the communication, it hardly mattered. The cable could have been sent from any of the towns or cities across the state, as all were experiencing similar difficulties. Over the course of the morning, more calls filtered into the state capitol pleading for assistance.

Ohio Governor James M. Cox was woken early that morning and informed of the situation. The banks of the Scioto River in Columbus were already spilling over their normal levels, but Cox was unaware of the scope of the storm system. As emergency crews in the capital attempted communication with communities across the state, news from Dayton was eerily quiet.[9] When a solitary connection was made out of the city, the news that came across the wire revealed a catastrophe of historic magnitude. John Bell

[8] O.K. Shimansky, "Ohio's Fight With a Flood," *Bell Telephone News, Vol. 2, No. 10* (May, 1913): 7.
[9] James Middleton Cox, *Journey Through My Years,* (New York: Simon & Schuster, Inc., 1946), 166.

was the District Plant Chief of the Central-Union Telephone Company in Dayton, and operated the last remaining telephone line out of the city. Even as he struggled to maintain the connection, the rising water forced him to retreat to the upper floors of his office to continue sending out updates.[10]

This situation caused accurate and current reports from the city to be scare, despite demands from newspapers across the country for information about flood damage. Columbus news agencies acted as a conduit for reports sent out on a national scale, and Governor Cox himself communicated directly with cities across the state.[11] The lack of communication with Dayton, coupled with that city's Mayor, E.T. Phillips, sending out an alarming and exaggerated message over their one remaining telephone line late Tuesday morning focused national attention on that region of Ohio. This message would ultimately overshadow all other pleas for assistance, despite comparable adversities across the state. Mayor Phillips informed Governor Cox that he feared no less than 5,000 people were dead in his city, prompting the governor to dispatch the Ohio National Guard to Dayton.[12]

Mayor Phillips' casualty appraisal may have been inaccurate, but as news of the flood spread throughout the country along with countless stories of tragedy and heroism, the city of Dayton consistently came to represent the face of the statewide storm. The flood itself has come to be known in some references as "The Great Dayton Flood", but this title does a disservice to the hundreds of other communities in Ohio also impacted by their own flood-related misfortune. *The Ohio Almanac and Handbook of Information*,

[10] Shimansky, *Bell Telephone News,* 8.
[11] Cox, *Journey*, 167.
[12] "5,000 May Be Dead in Dayton." *Cleveland Plain Dealer*, March, 26, 1913.

published in 1913 estimated the total loss of life across the state at around 500, far less than Mayor Phillips had reported, but still notable. The true impact of the flood can more accurately be measured in property damage and loss of industry. The almanac summarized the statewide loss to property and life as follows:

> Belpre—16 houses destroyed, 30 families homeless.
> Chesapeake—200 persons destitute.
> Chillicothe—17 dead, 500 homeless, 200 houses destroyed.
> Columbus—89 lives lost, 4,474 families containing 20,000 homeless, 245 houses destroyed.
> Dayton—160 dead, 22,500 homeless.
> Defiance—400 homeless, 268 houses damaged.
> Delaware—18 dead, 21 missing, 115 families homeless; totaling 883 persons.
> Franklin—7 dead, 75 families homeless.
> Fremont—1 dead, 60 houses destroyed; 1,000 people need aid in rehabilitation.
> Hamilton—72 dead, 2,600 houses destroyed or wrecked; 1,000 families need continuous help; 12,500 need aid in rehabilitation.
> Ironton—5,000 homeless.
> Marietta—115 houses destroyed, 600 families homeless.
> Miamisburg—2 dead, 2,000 homeless.
> Middletown—8 dead, 160 homeless; 1,000 need aid.
> Middleport—1,600 homeless.
> Piqua—45 dead, 1,100 homeless; 1,400 need help in rehabilitation.
> Portsmouth—2 dead; 3,500 homeless.
> Tiffin—30 dead, 46 houses destroyed, 600 families homeless; 2,000 need help in getting rehabilitated.
> Troy—6 dead, 8 or 4 missing, 1,000 homeless.
> Zanesville—2 dead, 450 houses destroyed, 8,150 homeless.
> Coshocton—3 dead, 15 houses destroyed: 36 families homeless.[13]

It's important to note the Red Cross compiled these figures in Columbus in the days following the flood based on reports filed from individual cities across the state. In areas where communication lines were still inoperable, information about the flood's toll was often scarce. A later report by the U.S. Geological Survey estimated flood damage in Ohio was in excess of $200 million, which translates to nearly $3.3 billion in today's

[13] *The Ohio Almanac and Handbook of Information,* (Columbus: United Press Association, 1913), 181.

dollars. The USGS listed the total loss of life in Ohio at 367, although an accurate number is difficult to determine due to the massive scale of the disaster and weeks of disrupted communications.[14]


**Figure 1-3:** Situated just blocks from downtown Youngstown, the flood devastated the William Tod plant. After water breached the banks of the Mahoning River, it continued over the railroad tracks which serviced the integrated mill and eventually rose to levels which covered the floors of the mill and damaged machinery. Photo taken March 26 or 27, 1913.

*Courtesy Mahoning Valley Historical Society*

By nightfall on Tuesday, Governor Cox had authorized an emergency relief fund allocating $250,000 ($11 million in today's dollars) of state funds toward recovery and relief efforts. He also called for a ten-day bank holiday, preventing fear-based

[14] *Ohio Almanac*, 182.

withdrawals from depositors anxious over the safety of their accounts.[15] Elected governor just two months before the flood, Cox owned and published the *Dayton Daily News*.[16] When he called on U.S. President Woodrow Wilson for federal assistance, his former connection to Dayton most likely played a role in that city's name being permanently connected to the Great Flood. In the days during and immediately following the flood, Governor Cox gave daily press briefings about the disaster, using updates from Dayton to highlight the need for donations and financial support from across the nation.[17]

Prior to the 1913 flood, Ohio had a complex network of canals that served as the primary means of transporting goods throughout the state until railroads took over in the late 19th century. At their peak, more than 1,000 miles of canals connected nearly all major communities from the Ohio River to Lake Erie.[18] By the beginning of the 20th century however, the canals' greatest value came from the water they provided to businesses such as those in the steel industry. Their use as avenues of transportation had long passed, but they still played an important role in water distribution and drainage. When the Easter week flood caused rivers and lakes to overflow, the excess water filled the canals. In response, workers destroyed most of the levees and locks which held back the water to increase the flow in the manmade aqueducts, alleviating the flooding in some areas, but effectively ending the canal system in Ohio.[19]

In the days following the flood, stories appeared in newspapers across the U.S. and in Ohio retelling tales of desperation and bravery. *Washed Away: How the Great*

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[15] Lewis E. Stein, "Administering a Relief Fund at the Top," *The Survey: Social, Charitable, Civic: a Journal of Constructive Philanthropy, Vol. 32*, (1914), 139.
[16] Cox, *Journey*, 315.
[17] Cox, *Journey*, 169.
[18] *History of Ohio's Canals*, Ohio Department of Natural Resources.
[19] Ibid.

*Flood of 1913, America's Most Widespread Natural Disaster, Terrorized a Nation and Changed It Forever*, by Geoff Williams[20] offers compelling insight into many of these accounts of personal adversity experienced across the Midwest. There are many other books and articles focusing on the events surrounding the flood as it happened, but limited analysis has been done to quantify the long term consequences of the disaster, outside of preventative measures which minimized future flooding.

One of the most important flood mitigation responses to the 1913 flood was the creation of conservancy districts. Before the Easter Flood, the extent of flood prevention came from a series of levees and floodwalls located along the course of waterways along population centers. When these measures failed, as they often did in periods of heavy rain, the only other options were sandbagging or evacuation. The most common response to heavy rainfall was simply to wait for the excess water to filter back into the earth. The damage caused by the 1913 flood however, was proof that more permanent and substantial construction was necessary in areas near major cities. Communities across Ohio formed Flood Prevention Committees in the months following the flood, but no regional system was in place to allow widespread flood prevention projects.

One of the largest obstacles to the development of the conservancy districts and their subsequent public works projects was the concern over costs. In the immediate aftermath of the flood, many industries saw their infrastructure destroyed, and concerns were focused more on providing short term relief to the thousands of displaced and homeless citizens across the state. Additionally, with many roads and railroad systems still in states of disrepair, there were many vocal opponents to publicly funded future

[20] (New York: Pegasus Books, 2013).

flood prevention projects. In Dayton, a Citizen's Relief Committee was established, and thanks in part to a large media campaign, raised more than $2 million in donations to be used for surveying, engineering research and planning, and construction contracts.[21] In their initial plea to the citizens for donations, the committee called for "prompt and definite action to determine the cause of the inundation of the city of Dayton on March 25, 1913, and to apply the maximum of human knowledge and scientific skill with the necessary measure of financial resources to prevent the recurrence of a similar calamity."[22]

Governor Cox signed a Conservancy Bill (the Vonderheide Act), on February 17, 1914 which allowed the creation of conservancy districts.[23] The first of these districts was near the state's capital along the Upper Scioto River. The second was formed in the Miami River Valley region, an area covering roughly ten percent of the state and especially damaged from the flood. The districts would be funded through a supplemental addition to property taxes, with flood prone areas in the state carrying the heaviest financial burdens. State legislatures included measures in the act which gave authorization to city mayors to appoint local committees to oversee the distribution of funds.[24] The Conservancy Bill was not without controversy however, and the rollout of the new legislation was supplemented by a statewide educational campaign touting the benefits and necessity of flood mitigation projects.

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[21] Judith Sealander, *Grand Plans: Business Progressivism and Social Change in Ohio's Miami Valley, 1890-1929* (Lexington: University Press of Kentucky, 1988): 55.
[22] Arthur Ernest Morgan, *The Miami Conservancy District* (New York: McGraw-Hill, 1951), 135.
[23] Ibid. 200.
[24] Ibid. 134.

In took a year for the Miami and Upper Scioto Conservancy Districts to finally achieve legal standing as subdivisions of the state.[25] This was primarily due to court cases which delayed their final approval by the legislature. The law granted the Miami Conservancy District (MCD) the power to impose taxes on any areas benefiting from anti-flood structures and seize lands along rivers and watershed areas for the construction of improvements such as earthen dams or to reroute streams. Each respective region's geographical watershed area defined the district's area of concern. The State Conservancy Court appointed three-person boards of directors to supervise the planning and implementation of activities in the district. Some residents saw the limited taxation as arbitrary, and cases such as *Orr v. Allen* remain as sources of precedence in contemporary law.[26] When the United States Supreme Court declined to hear an appeal, the ruling in favor of the Conservancy Law by the highest court in Ohio became permanent.

The basis of this case held that the Ohio's Conservancy Law was unconstitutional, violated land rights of private citizens and imposed unfair financial burdens on residents living outside of flood prone areas. Also known as the Vonderheide Act, opponents of the legislation declared the law unconstitutional and attempted to stall its implementation in both courts of law and public opinion. Farmers living in rich agricultural areas feared their lands would become flooded by the addition of reservoirs and dams. The U.S. Supreme Court's refusal to hear the case effectively endorsed Ohio's courts, and the precedent set by the case had a long-lasting impact on eminent domain case laws in areas

[25] Chapter 6101, Ohio Revised Code (ORC).
[26] Conrade C. Hinds, *Columbus and the Great Flood of 1913: The Disaster That Reshaped the Ohio Valley* (Charleston: History Press, 2013): 119.

dealing with land use and a government's right to repurpose property for the advancement of public welfare.


**Figure 1-4:** This editorial cartoon by Billy Ireland appeared in the *Columbus Dispatch* in 1915. It depicts the growing tension between opponents of the Vonderheide Conservancy Act (mostly farmers whose lands were located north of Dayton), and political leaders who supported the conservancy legislation.

*Courtesy Wright State University Library Collections*

Originally, the Conservancy District had responsibility only for flood control. One of the initial requirements of any plan put forward was that any completed project must be capable of withstanding any future flooding equal to 140 percent of the volume of water as experienced during the 1913 flood.[27] Additionally, the project must include the entire Miami Valley, an area covering no less than nine counties. To implement their strategic vision, the MCD hired preeminent hydraulic engineer Arthur E. Morgan to design a comprehensive plan using a system of dams, reservoirs, and levees. Morgan and a team of specialists presented a variety of concepts to the MCD and they eventually

[27] Hinds, *Columbus and the Great Flood*, 119.

chose an ambitious plan which called for the widening and deepening of the Miami River and the construction of a series of five large earthen dams covering an area of roughly 30,000 acres which had previously been farmland.[28]

Due to several factors including legal challenges, court proceedings, and the onset of World War I, serious construction on any of the permanent flood mitigation designs could not begin until 1918.[29] By then, memories of the flood were fading and the financial justification for the large scale engineering project was becoming harder to sell to the public. Provisions had been written into the original Conservancy Law allowing for the development of hydroelectric power stations at the dam sites, and powerful businessmen and special interest groups began to see alternative opportunities outside of simple flood control.[30] To his credit, Arthur Morgan remained fiercely opposed to any profit-based schemes and promoted the engineering benefits throughout the project.

When the project finally began, it employed thousands of workers and stretched across thousands of acres in the Miami River Valley. The massive project would go on to become the second largest engineering undertaking in the world at the time, surpassed in scale only by the Panama Canal, which opened just a few years earlier.[31] Due to World War I however, the thousands of laborers required for the project were scare and often demanded above average wages. To resolve these issues, the project managers often resorted to hiring foreign workers. Over the course of the project from 1918 to its completion in 1922, the conservancy construction only experienced one strike. The Conservancy District effectively eliminated all future wage-related work stoppages by

[28] Morgan, *The Miami Conservancy District*, 499.
[29] Bell, *The Great Dayton Flood of 1913*, 10.
[30] Sealander, *Grand Plans*, 55.
[31] Ibid. 75.

replacing all the strikers with nonunion labor.[32] When work finished in 1922, Morgan's network of dry dams became the model for flood relief.

The Mahoning River Valley also had a conservancy district, and although it wasn't the first or the largest, it had a key advantage over its counterparts throughout the state. Calls for damming the Mahoning River upstream from Youngstown had been made for years before the 1913 Flood.[33] As industry in the region expanded, the water necessary for pig iron and steel production was often inadequate. Population growth also contributed to an increased need for a reliable source of water for domestic use. The filtration plant that opened in 1905 provided a much needed source of treated drinking water, but the natural river runoff was capable of only so much. A larger source of water was required to meet the growing needs of Youngstown, and in 1906 city leaders began analyzing their options.[34]

That year, the city of Youngstown began quietly purchasing parcels of land in Berlin Township; a sparsely populated community located approximately twenty miles west of the industrial center of Youngstown. The plan was to acquire enough land to establish a reservoir in the Upper Mahoning River Watershed by damming the river and creating additional channels into the city. In a situation similar to the Miami Valley Conservancy's initial problems, speculators had driven up property prices in Berlin Township before the city could accumulate enough land to execute its reservoir project.[35] Before the Conservancy Act of 1914, cities in this situation had little recourse but to

[32] Ibid. 80.
[33] Butler, *History of Youngstown*, 367.
[34] Lewis, *Youngstown City Waterworks*, 12.
[35] Butler, *History of Youngstown*, 367.

either submit to the overinflated land prices or to scuttle the project altogether. Youngstown chose the latter, despite economic pressure from business leaders.

After the Berlin debacle, city leaders next chose a site just seven miles north of their original location. Milton Township was located in a heavily wooded area and had the fewest residents of any township in the county, but was close enough to the Mahoning River to allow for construction of a dam and subsequent lake. With less than a thousand permanent residents, there was little opposition or protest as city officials purchased large swaths of land. From 1911 to 1913, the city of Youngstown orchestrated the acquisition of 3,416 acres of land in Milton Township.[36] The purpose of the reservoir was to meet the increasing industrial and domestic demands of the growing population of Youngstown.

**Figure 1-5:** Milton Dam and the Upper Bridge as it appeared after its completion in 1917. The 2,800 ft. bridge crossed the Mahoning River at a relatively wide point, although after construction of the dam some points near the reservoir were more than a mile wide.

From Joseph Green Butler, *History of Youngstown and the Mahoning Valley*, *Ohio, Vol. 1* (New York: American Historical Society, 1921), 367.

[36] *The Vindicator*. November 26, 1916.

The flood of 1913 delayed the project, but also made it dramatically clear that a system of river control was urgently needed in the Valley, and engineers expedited plans to complete the project. Work on the Milton Dam began in the spring of 1914 and finished ahead of schedule in 1917.The completed lake covered almost 1,700 acres and became the primary source for consistent water flow into Youngstown.[37] During the summer months, industrial demands had taxed the river to a point of near drought. Milton Dam allowed for a controlled release of water throughout the year, supplying the industrial infrastructure located downstream. The reservoir holds nearly 10 billion gallons of water and is capable of discharging 90 million gallons into the river during dry periods.

Lake Milton began attracting visitors almost immediately, and its secondary impact as a recreational area lasts to this day. It opened just four years after the 1913 flood, having the advantage of years of planning already in place. It also preceded the completion of the first earthen dam in the Miami Conservancy District, bypassing much of the legal wrangling that tied up those projects with the Vonderheide Act. Milton Dam was the first large-scale dam project completed after the Great Flood, and its impact on industry in the Mahoning River Valley cannot be understated. As worldwide demand for manufactured iron and steel products increased, the Valley saw an unprecedented growth in industrial output thanks, in large part, to the fortunate timing of the new dam's construction.

[37] Butler, *History of Youngstown*, 368.

## CHAPTER TWO

## INDUSTRY FLOODS IN

Large scale industrial metal production in the Mahoning Valley can trace its beginnings to the mid nineteenth century, when farmhands discovered coal on David Tod's Brier Hill estate in 1844.[1] Smaller coal mines and furnaces had been established along the Mahoning River prior to this, but the higher quality of the coal on Tod's land coupled with the massive size of the underground vein led to an iron and steel manufacturing boom that would completely reshape the commercial landscape of the region in just a few decades. The blast furnaces which sprang up along the river stretched for miles, and depended on the waterway for its convenient access to other rivers and canals across Ohio and Pennsylvania. The Mahoning River also provided a much needed source of water for the blast process of refining metal in the furnace, as well as cooling the molten metals after production. Unfortunately, as the population of Youngstown grew, the competition for limited water resources between industrial and public use became a major issue.

By the turn on the century, iron and steel industrialization in Youngstown had transformed the Mahoning River near downtown into an endless row of factories, ore yards, rail lines, blast furnaces, and pump houses along the water's edge. Factories and integrated mills stretched uninterrupted for nearly twenty miles along the river. Water pollution and the spread of disease led to the construction of the city's first municipal water treatment plant in 1905, but its limits were already nearing capacity when it was

[1] Sherry Lee Linkon & John Russo, *SteelTown U.S.A. Work and Memory in Youngstown.* (Lawrence, KS, University Press of Kansas, 2002), 18.

destroyed in the flood of 1913. By 1918, Youngstown had grown into one of the nation's largest producers of steel, second only to Pittsburgh in terms of total output.[2] Less than a decade later, it was the largest.

In 1900 the city's population was 40,000. Just two decades later it was more than three times that amount. The steel industry in the valley attracted large numbers of European immigrants to fill the growing labor demands, and by 1920 Youngstown had the fiftieth largest population in the United States. Technological advancements modernized steel production and made the process more efficient, but the basics of refining still required millions of gallons of water each year. As worldwide demand for steel grew, so did the local consumption of water to sustain the industrial requirements for production. The blast furnaces depleted water resources from the river, while leftover fluids were heavily polluted and unfit for human consumption. Some of these remaining liquids made their way back into the river.

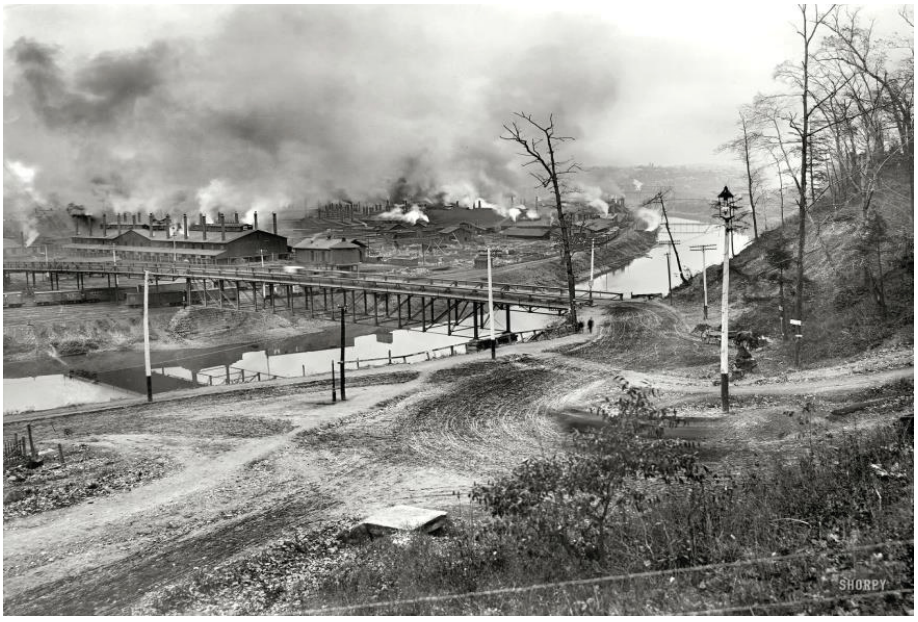


**Figure 2-1:** The Mahoning River as it appeared in 1902. The construction of the Youngstown Sheet and Tube Company's Campbell Works provided jobs for thousands of workers, but the smoke stacks became a standard fixture of the city's skyline.

*Courtesy Mahoning Valley Historical Society*

[2] *Ohio Steel Council.* Industry Report. 2013.

Prior to federal environmental protection laws enacted in the mid-twentieth century, there was little governmental oversight of industrial air and water pollution. During the height of the Mahoning Valley's production of iron and steel in the 1920s, the industry was largely self-regulated. Ashen gray skies were a common sight in Youngstown, and it was not uncommon for the city to be covered in soot from the mills. The smoke stacks along the river represented employment, but they also signaled a dangerous effect on the local environment. In addition to air pollutants, toxins present in the untreated wastewater and factory runoff included cyanide, fluoride, zinc, chromium, cadmium, oils and grease.[3] When these contaminants weren't fed directly back into the river downstream of the pump houses generating drinking water, they were simply left to gather in large sludge ponds and evaporation pools near the factories.

Water usage and disbursement became a growing issue as factories expanded and production requirements required substantially more fluid intake. National steel and iron demand also required larger capital input to sustain industrial growth, and contributed to a growing trend of consolidation within the industry. The first two decades of the twentieth century saw many of the smaller mills in the Valley merge into large corporations controlled by a small group of powerful business men. What had once been a collection of independently run companies scattered throughout the region had transformed into several immense industrial entities in and around the Mahoning Valley by the beginning of the twentieth century.

Brier Hill Coal had become one of the primary resources for the production of pig iron and steel production due to its high quality, but it was limited in quantity and

[3] *Pollution Prevention and Abatement Handbook*, World Bank Group. July, 1998.

eventually additional ores had to be imported. As its business operations shifted primarily from coal sales into steel production, the corporation once known as the Brier Hill Coal and Iron Company became the Brier Hill Steel Company in 1912. Upon the creation of their new business charter, the company quickly began purchasing and acquiring many of its competitors. These included the Youngstown Steel Company, the Brier Hill Coke Company, the Empire Steel Company, as well as several small mines and foundries. It also acquired and rebuilt several independent furnaces, creating a network of self-sustaining components capable of immense production capacity.

The Youngstown Iron Sheet and Tube Company filed its articles of incorporation in 1900 as a response to increasing numbers of outside corporate interests taking control of locally owned manufacturers in the Valley. Industrial consolidations coincided with a transitional period at the beginning of the twentieth century that saw many of the pig and wrought iron producers refit their facilities into steel production. George D. Wick and James A. Campbell started the company by forming a coalition with other local investors who sought to maintain local ownership within Youngstown's manufacturing sector. The company would go on to become one of the area's major controllers of integrated mills and eventually one of the nation's leading producers of steel. In 1905 the company dropped the word "iron" from its title, and Youngstown Sheet and Tube would be a familiar name in the industry for the next seven decades. When YS&T took control of the Brier Hill Steel Company in 1923 it became the Mahoning Valley's largest employer.

One of the main manufacturing facilities of YS&T was the Campbell Works located due east of Youngstown, situated along either side of the Mahoning River. The Campbell Works was constructed as a new facility and contained what was then the

greatest output capacity of any mill in the area. The area where the mill was located had been called East Youngstown, but was later incorporated into the city of Campbell, named in honor of one of YS&T's founders. The integrated mill was so large it was measured in square miles rather than feet, and dominated the skyline in that part of the county. The Campbell Works contained four massive blast furnaces, several bar and tube mills, and twelve open hearth furnaces, running nonstop day and night.[4]


**Figure 2-2:** Youngstown Sheet & Tube's Campbell Works was an integrated mill capable of converting ore into liquid iron as well as converting pig iron into liquid steel. The casting process (transforming liquid steel into solid blocks) and blast furnaces on site required large amounts of water from the nearby Mahoning River. Circa late 1910s.

*Courtesy Ohio Historical Society: Youngstown Historical Center of Industry and Labor*

[4] *Directory to the Iron and Steel Works of the United States*. (Philadelphia: The American Iron and Steel Association, 1910), 27.

To accommodate the thousands of employees at the Campbell Works, Youngstown Sheet and Tube developed small neighborhoods with their own municipal infrastructures, including post offices, hospitals, fire and police stations, schools, and parks. The company incorporated The Buckeye Land Company in 1917 to facilitate the sale and rental of homes in the various employee neighborhoods.[5] Each district was defined by the quality of houses as well as the demographic to which the company marketed. Some areas catered to the large immigrant populations, and the quality of homes and neighborhood amenities reflected the status these workers held at the mill. African American employees were also segregated into their own respective areas, and other workers were subdivided into neighborhoods based on seniority at the company.[6]

Aside from the advantages of providing internal lending programs and mortgage options for its workers, YS&T's motivations for developing the Buckeye Land Company were also closely tied to efforts to control its employees. Increasingly poor and hazardous working conditions had contributed to a rising pattern of injuries and even deaths in the years since the Campbell Works opened for business. The dangerous work environment along with growing demands for fair wages culminated in a violent and bloody strike in 1916.[7] Although largely unorganized, large groups of disgruntled workers marched en masse to the main entrance of the plant in an attempt to prevent strike breakers from entering the facility. At least three workers died in skirmishes between police and private security forces guarding the entrance. Forced into retreat, the

[5] *Engineering and Contracting.* (Vol. 49, 1918), 414.
[6] Sherry Lee Linkon & John Russo, *SteelTown U.S.A. Work and Memory in Youngstown.* (Lawrence, KS, University Press of Kansas, 2002), 36.
[7] Joseph Green Butler, *History of Youngstown and the Mahoning Valley, Ohio, Vol. 1.* (New York: American Historical Society, 1921), 530.

crowd eventually focused their hostility on the business district. The strikers destroyed large portions of East Youngstown's downtown area and clashes persisted until Governor Frank B. Willis sent the National Guard to quell the uprising. As a result, factory owners eventually conceded to providing workers with a small raise in pay and the promise of better conditions.[8]

Some of the reports at the time of the strike placed a large part of the blame for the violence and destruction of public property on the striking workers. East Youngstown and the neighborhoods nearest the plant had gained a reputation as sources for drunken debauchery, violence, and crime. These behaviors were largely tolerated so long as they remained localized in their respective neighborhoods and did not spill into other areas of Youngstown. Joseph Butler's *History of Youngstown* provides a descriptive retelling of the strike, albeit from the perspective of an industrialist and former director of Youngstown Sheet & Tube.[9]

The area known as East Youngstown was renamed Campbell after the 1916 strike, and along with their increased wages the company offered several amenities to raise workers' morale. Managers organized sports teams in their respective departments, and the company began publishing its own newsletter, "The Youngstown Sheet and Tube Bulletin," to highlight interesting information involving employees. The internal publication contained information about ongoing production levels, wedding and birth announcements, lighthearted stories written by workers, and even cartoons, poetry, and photographs created by mill workers at all levels. The bulletin served the purpose of providing entertainment and information to YS&T workers, but it also provided a

[8] Ibid.
[9] "City's First Citizen Sleeps Peacefully Away." *The Vindicator*. December 20, 1927.

valuable tool for in-house marketing and advertising to promote the company's corporate agenda to the workforce.

THE YOUNGSTOWN SHEET AND TUBE BULLETIN

Vol. I AUGUST 15, 1919 No. 1

## SOME FACTS ABOUT THE PLANT

IN a plant so large as that of The Youngstown Sheet and Tube Company it is impossible for the average workman to learn, in the course of his work, very much about the plant as a whole. We know about our own departments, but perhaps do not know how large the works really are, the tremendous complexity of the organization, or even what becomes of the material which passes through our hands.

It is much more interesting to carry on work if we understand all that is possible about its purpose, the machinery used, the methods employed and the extent of the operations in which our labor is a part. A vision of the entire plant also helps us to understand how much we are all dependent on one another, and how entirely the quality of our product is dictated by the care each of us takes in the part we have in its manufacture.

For this reason a series of articles written by practical men well informed on the subject and describing all the operations in the manufacture of Youngstown Sheet & Tube products, from the mining of the ore to the packing for shipment of these products, will be published in The Bulletin. We hope these will be interesting, and in this issue give below a few facts and figures that will serve as an introduction to them.

The total area under roof in the Main, Rod and Wire and Hubbard plants is 6,925,000 square feet, considerably more than 150 acres.

The number of locomotives, standard and narrow gauge, used is 28.

The number of freight cars required each year to move inbound and outbound tonnage is almost 300,000.

The number of stationary steam engines in use is 130, and they develop 138,619 H. P.

The number of electric motors in the plant is slightly over 2,600.

More than 200,000,000 gallons of water are pumped into the plant daily.

About 6,000 tons of coal are used each day in the coke ovens and throughout the plant. Ten per cent. of this amount is now mined at Nemacolon.

More than 2,000,000 tons of ore are used each year in the blast furnaces.

### FIGURES ON MAXIMUM CAPACITY

Maximum capacities for the production of materials are estimated as follows:

**Coke and By-Products**

| | |
|---|---|
| By-product Coke | 1,260,000 tons |
| Coal Tar | 16,704,000 gals. |
| Ammonium Sulphate | 45,800,000 lbs. |
| Benzol | 3,600,000 gals. |
| Toluol | 540,000 gals. |
| Solvent Naphthas | 131,400 gals. |

**Iron and Steel**

| | |
|---|---|
| Pig Iron | 1,250,000 tons |
| Genuine Hand-puddled Iron | 50,000 tons |
| Bessemer and O. H. Steel Ingots | 1,477,380 tons |

**Semi-Finished Products**

| | |
|---|---|
| Blooms, Slabs, Billets, Sheet Bars | 1,250,000 tons |
| Skelp | 534,000 tons |

**Finished Products**

| | |
|---|---|
| Butt-welded and Lap-welded Pipe | 500,000 tons |
| Sheared Plates | 225,000 tons |
| Merchant Bars | 225,000 tons |
| Sheets (average sizes and gauges) | 88,400 tons |
| Wire Rods | 149,650 tons |
| Plain Wire | 136,875 tons |
| Wire Nails | 73,000 tons |
| Wire Hoops | 5,475 tons |
| Barbed Wire | 52,735 tons |
| Wire Fencing | 27,375 tons |
| Electrical Conduit (steel) | 30,000 tons |
| Flexible Steel Armored Cable | 36,000,000 feet |

These are impressive figures and will give some idea of the extent and nature of the operations carried on by The Youngstown Sheet & Tube Company. They do not, however, convey much information concerning the complexity of the organization necessary to carry on these operations successfully. Nor do they intimate the degree of care and constant watchfulness needed to produce materials for which there will be a market, and which may be sold in competition with those of other concerns.

Some light will be thrown upon all these matters in the course of time by the articles mentioned. The first of these will appear next month and will deal with the method of obtaining ore and bringing it to the blast furnaces.



### GOOD WISHES FROM OUR CHIEF

I am glad to see our employes begin the publication of a plant paper and feel that it will, if properly conducted, prove of great value in extending their acquaintance with one another and with the works, which is its only purpose.

At one time it was my privilege to know personally almost every man in our plant, but of course this is now impossible for anyone. The new paper should at least help everyone to understand better the big organization of which they are a part, as well as promote acquaintance among those connected with different departments. It ought to thus add to the interest and satisfaction of everyone connected with the company.

It is easy to start things, but not so easy to keep them going. The new paper will depend for its success on the hearty cooperation of every person who has anything to do with its publication. I wish it every success, and hope that it may prove to be something to which we will all look forward each month with growing interest.

J. A. CAMPBELL.

**Figure 2-3:** The first edition of the Youngstown Sheet and Tube Bulletin was published August 15, 1919 and contained sixteen B&W pages of company information, photographs, a sports section, and announcements for major employee events such as births and weddings.

*Courtesy Ohio Historical Society: Youngstown Historical Center of Industry and Labor*

The company newsletter billed itself as a bulletin "published by and for Sheet and Tube people exclusively." In the bulletin, articles about factory baseball team scores commonly appeared alongside announcements about the marriages of upper management. It was typical for executive photographs to appear on the same page as a comical editorial submitted by a machinist. The newsletter gave the appearance of a

socially integrated company, but outside the articles of the publication the company operated within a strict hierarchy of class and privilege.

The neighborhoods developed by the Buckeye Land Co. were a physical representation of the division between workers and management, cultural and ethnic backgrounds, and especially race and socioeconomic status.[10] The platted neighborhoods were located close enough to the mill so workers could walk or drive short distances to work, but still geographically separated enough to prevent intermixing between residents of different importance and standing at the plant. This corporate conduct was a reflection of the segregationist atmosphere at the time. These neighborhoods also represented an opportunity for some workers to reestablish themselves once again as homeowners after the 1913 Flood. Without homeowners' or flood insurance, many families were unable to rebuild homes which had been heavily damaged in the flood.[11]

The four main neighborhoods created by YS&T reflected their residents' social standing in society as much as their significance at their job. For example, the Loveland Farms neighborhood was marketed exclusively to mid-level management, foremen, and other high paying supervisory employees. It offered modern amenities in the houses and family-oriented features in the neighborhood such as playgrounds and parks. It also limited its residents only to white employees who had been born in America.[12] These policies exemplified a culture of elitism expressed by the company heads and demonstrated their attitudes toward the immigrant population who made up a majority percentage of the mill's workforce.

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[10] Donna DeBlasio, "'A Splendid Place to Live': Housing and the Youngstown Sheet and Tube Company" (conference presentation, Great Lakes American Studies Association, March 1998), 21.
[11] Trudy E. Bell, *The Great Dayton Flood of 1913* (Chicago: Arcadia Publishing, 2008), 73.
[12] DeBlasio, "A Splendid Place to Live", 21.

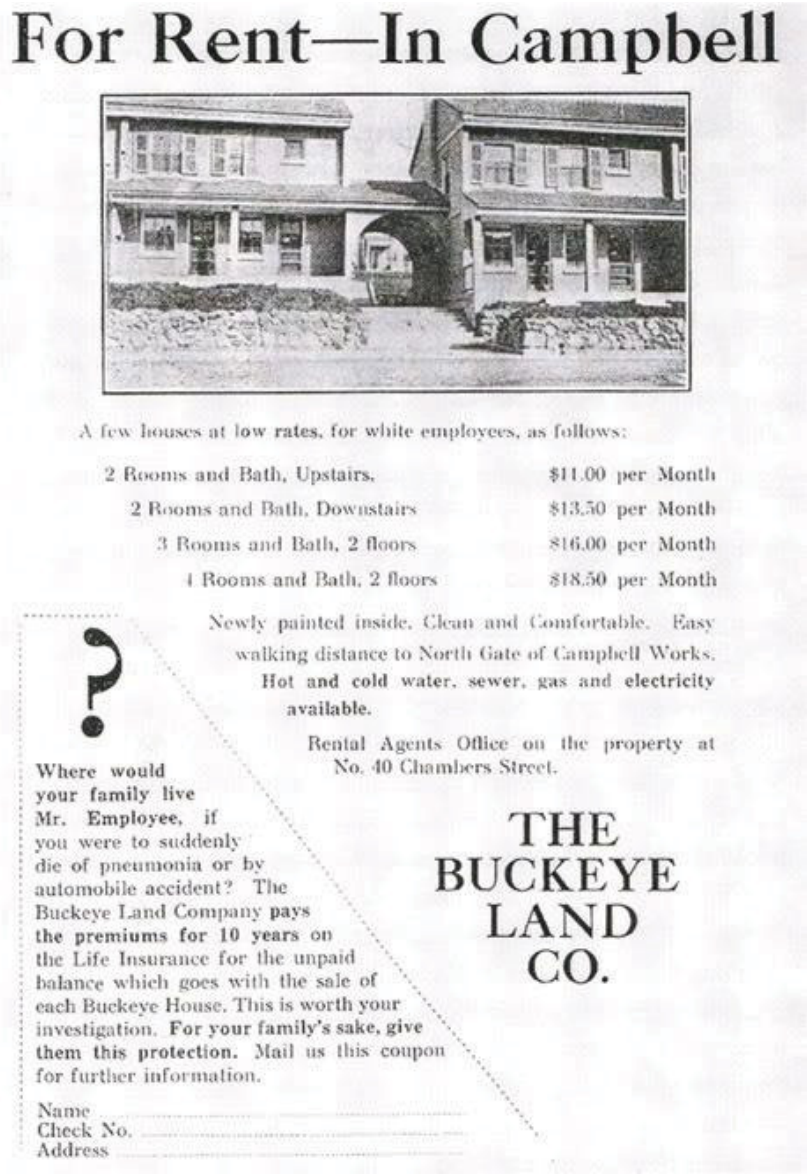


**Figure 2-4:** The Buckeye Land Co., a subsidiary of the Youngstown Sheet and Tube Company developed several neighborhoods near the Campbell Works. In this advertisement for the Highview neighborhood, several rental plans are posted. Note the race-specific requirement, "A few houses at low rates, for white employees…"

From The Youngstown Sheet & Tube Bulletin, Feb.15, 1930.

*Courtesy Ohio Historical Society: Youngstown Historical Center of Industry and Labor*

The other platted neighborhoods included Overlook, Highview, and Blackburn. The Blackburn neighborhood consisted largely of rental units for immigrants who had recently arrived and also housed many of the African American employees who worked at the mill.[13] This neighborhood had the disadvantage of being the only company-

[13] Sherry Lee Linkon & John Russo, *SteelTown U.S.A. Work and Memory in Youngstown.* (Lawrence, KS, University Press of Kansas, 2002), 36.

developed community downwind of the mill. Most of the structures were prefabricated concrete slab buildings consisting of just one or two bedrooms each. The Blackburn neighborhood sat on a hill overlooking the mill and provided close proximity to the plant for the lower income workers who didn't own automobiles.

An additional benefit of centralized employee housing was how it reflected favorably on the company when applying for government contracts.[14] Being able to show that a workforce was well cared for, both during the work day and in their home environment meant the company could bill itself as altruistic, whether true or not. Preventing another strike like the one in 1916 was important not just to productivity, but also in the publicity it garnered from federal regulators. Steel prices had increased dramatically in the years leading up to the war, and a history of price collusion amongst major industry leaders had led to severe anti-trust laws in the country.[15] When President Wilson's administration authorized price-fixing measures affecting commodities at the start of WWI, it prevented price gouging, but also ensured long term profits for steel producers in Mahoning Valley.

After months of legal negotiations industry leaders finally agreed to limit prices on steel produced for both domestic use and for the war effort.[16] The price-fixing came at a time when profits were already heavily inflated so, along with preventing future inflation, it also guaranteed the swollen steel prices would remain in effect for at least the

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[14] Anne Cipriano Venzon and Paul L. Miles, *The United States in the First World War: An Encyclopedia*. (New York: Garland Publishing, 1995), 204

[15] The Clayton Act and the Federal Trade Commission Act of 1914 were substantial additions to the Sherman Antitrust Act, which became law in 1890. These Acts restricted the formation of cartels and prohibited the creation of monopolies and the abuse of monopoly power.

[16] Robert D. Cuff. "The Steel Industry and Price-Fixing During World War I". *The Business History Review. Vol. 44, No. 3*, (1970), 1-4.

duration of the war. Also, once the price-fixing guidelines were in place corporations were able to use their existence as the basis for a variety of cost-saving measures. These included frozen wage increases for workers and reduced expenditures on safety and equipment maintenance. These policies led to higher numbers of employee injuries as well as a growing dissatisfaction amongst the workforce over fair compensation. For the corporation, however the price-fixing laws contributed to record profits. Youngstown Sheet and Tube saw it profits double from 1916 to 1917,[17] despite government mandated price limits. The increasing sales volume due to the war kept the factories running continuously as the mills adapted to fill contracts for the war.

The global demands of World War I came just a few years after the iron and steel industry in the Mahoning Valley had been brought to a standstill after the flood of 1913. Rising floodwaters had devastated the mills along the Mahoning River, washing away machinery, rail lines, and tons of raw materials. The loss of life had been minimal due to most residential areas being located at elevations higher than the flood crest, but the integrated mills along the river in the lowest parts of the Valley were heavily damaged. A river that ran nearly dry during summer months due to industrial water consumption had inundated the area to the point of threatening the primary economy of the region.[18]

[17] *The Iron Trade Review. Vol. 62.* (Cleveland: Penton Publishing, 1918), 419
[18] W.P. Cross. "Water Resources of the Mahoning River Basin, Ohio". *U.S. Geological Survey.* (Washington, D.C., 1952), 8.

**Figure 2-5:** View of the Mahoning River during the dry season. Note the shallow water barely covering the riverbed at several points. Even along the banks the water level was low. Industrial water usage from mills such as Republic Steel's Haselton Works (seen here) placed heavy demands on the river due to its usage in cooling and steam production in blast furnaces. (Circa 1910).

*Courtesy Ohio Historical Society: Youngstown Historical Center of Industry and Labor*

In the years leading up to WWI, companies in the Mahoning Valley such as Republic Steel, Youngstown Sheet and Tube, Carnegie Steel, and the Brier Hill Steel Company produced products largely for industrial consumption. These included steel bars, tubes for petroleum extraction, raw ore, and steel wires. In the months leading up to full scale involvement of the United States in the war, many of the mills had already increased production of specific goods for the country's European allies.[19] These included steel plates for armaments, structural components, rails, rolled steel for ship

[19] Kenneth Warren. *Big Steel: The First Century of the United States Steel Corporation 1901-2001*. (Pittsburgh: University of Pittsburgh Press, 2001), 45-48.

hulls, and ingots for future refinement into automotive parts. With backing from the federal War Industries Board, contracts calling for steel led to a boom in the industry. Refined steel saw uses in gun barrels, tanks, helmets, artillery, bayonets, and many more products.[20]

This period followed several advancements in the quality and production efficiencies of steel. The primary output of the mills had seen a gradual shift from wrought and pig iron into mass production of refined steel as technological advances proved the superiority of the latter product. Increased demands from the petroleum industry, automobile sales, a national railroad grid, and commercial steel buildings all drove the need for steel production. Youngstown's own supply distribution methods were an indirect result of its place on the forefront of the industry. The commercial rail lines connecting the city's manufacturing epicenter to areas outside the region were a key aspect of the industrial distribution center. As technology progressed, the mills adapted. The factories were literally producing the steel railroad tracks that their goods were transported on. With most mills being landlocked, the rails were vital to importing and delivering supplies and finished products.

Concurrent with their construction, the mills required their own extensive system of rail lines to support the tons of raw materials needed for production. These tracks connected the plants to iron ore deposits near Lake Erie to the north and eastward to the coalfields of Pennsylvania, West Virginia, and southern Ohio. In a report immediately following the 1913 Flood, an assessment by the Pennsylvania Railroad Company declared that nearly all rail lines between Youngstown and company headquarters in

[20] Cuff. *Business History Review*. 298.

Pittsburgh had been completely destroyed or damaged beyond repair.[21] While this may have been a short-term financial problem, it became an opportunity for the company to upgrade and restructure their rail routes. The flood proved to be a catalyst for the replacement and modernization of the rail network in the Mahoning Valley. Worn or damaged tracks were replaced with new rails made of stronger steel. The foundries and rail production facilities located nearby expedited reconstruction due to their convenient proximity. In the interim period between the flood and permanent renovations, a system of temporary trestles was used to facilitate transportation of materials and relief supplies.[22] During this recovery stage the Pennsylvania Railroad waived all transport fees and provided services for free to the municipalities along their routes.[23]

**Figure 2-6:** Completely submerged freight yard of the Pennsylvania Railroad Company's Youngstown facility following the 1913 Flood. This photo first appeared in *Railway World, Vol. 57* in March, 1914. Despite the dangerously flooded tracks, a steam locomotive can be seen on the left side of the photograph.

From C.W. Garrett, *Pennsylvania Lines West of Pittsburgh: A History of the Flood of March*, 1913.

[21] C.W. Garrett. *Pennsylvania Lines West of Pittsburgh: A History of the Flood of March, 1913.* (The Pennsylvania Company, 1913), 59.
[22] Ibid. 79.
[23] Ibid. 26.

## CHAPTER THREE

## LONG TERM EFFECTS (1920-1963)

Prior to the Great Flood of 1913, few comprehensive systems to mitigate large-scale flooding were in place in the Mahoning Valley or anywhere else in the Midwest. This all would change with the development of the Miami Conservancy District in 1915. As a response to the flood, residents of Dayton, Ohio raised funds through private donations and local tax initiatives to sponsor a commission and its subsequent flood control projects. With the help of several Citizens' Relief Committees, over 23,000 residents raised more than $2 million in just sixty days after the flood.[1] The committees used the funds to hire hydraulic engineer Arthur E. Morgan to oversee surveying and construction design of what would become the new conservancy district. What started as a modest plan to respond to the 1913 Flood would eventually become the model which future flood construction plans would look to for the next century. The legal and engineering design precedents which resulted from the flood created a legacy that is still relevant to this day.

The legal obstacles faced during the proposal led to legislation such as the Ohio Conservancy Act of 1914 which had an impact on flood planning in other cities and created the precedence which continues to influence the Miami Conservancy District. In Dayton, construction of the five large retaining dams in Morgan's plan started in 1918. Construction of the earthen dams ran concurrently and the last structure officially went into operation in 1922. What made this project unique was its independence from the

[1] Steve Carter. *Environmental Management and Local Government. Vol. 1.* Washington, D.C. U.S. Environmental Protection Agency. Feb. 1974.

U.S. Army Corps of Engineers, an organization traditionally tasked with national flood prevention. Morgan relied on federally funded water surveys and engineering reports, but maintained control over the project's planning due to its independent funding.

Milton Reservoir in Mahoning County was also built independently from the Army Corps of Engineers, although that organization would eventually assume responsibility for maintenance and management of the reservoir as well as other man-made bodies of water in the Mahoning Valley and throughout the Midwest. Following the completion of Milton Dam in 1917, other reservoir projects were developed as needed, especially as a response to growing industrial and population needs in the Valley. The city of Youngstown relied on the Mahoning River as a source of municipal water for several years after Milton Reservoir went into operation, but increased demands and industrial pollution began to threaten the water supply.

As a response, Youngstown and the nearby city of Niles collaborated to form the Mahoning Valley Sanitary District in 1926.[2] Its mission was to seek out and develop alternative sources of drinking water as well as a control plan to supplement the Mahoning River during periods of low flow. This was especially critical during summer months when the river was naturally diminished due to warm temperatures and less precipitation. Using the model of the Miami Conservancy District as well as lessons learned from the operation of the Milton Dam, the MVSD began planning a reservoir on Meander Creek, a tributary of the Mahoning River. The plans allowed for additional water to be indirectly supplied to neighboring areas such as Boardman, Austintown, Canfield, and Girard when needed.

[2] Charles Norman Durfor and Edith Becker. *Public Water Supplies of the 100 Largest Cities in the United States*. (U.S. Dept. of the Interior, 1962), 287.

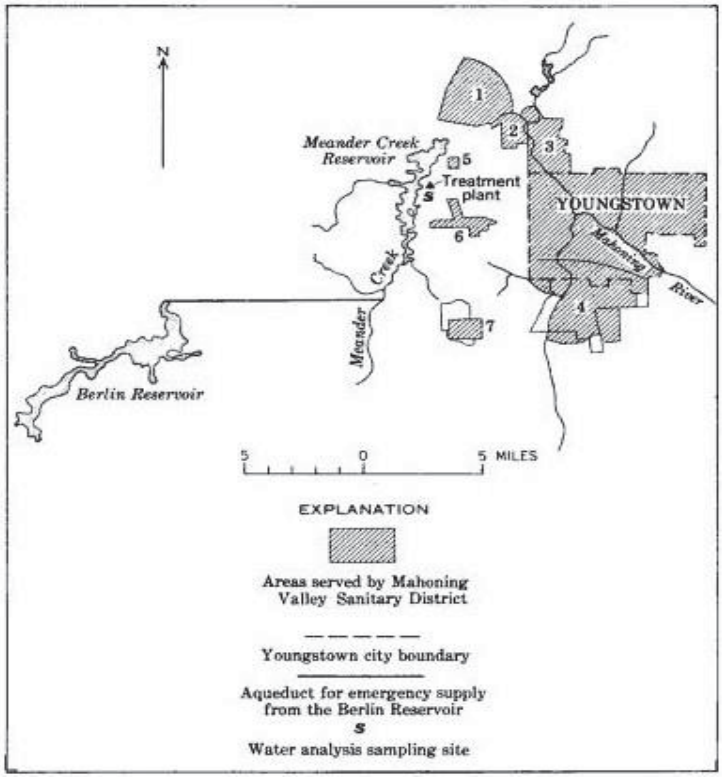


**Figure 3-1:** Map of the areas serviced by the Mahoning Valley Sanitary District. The MVSD's primary mission was to provide adequate drinking water to the residents of Youngstown and Niles, while regulating water flow from the Meander Reservoir to the Mahoning River.

From Charles Norman Durfor & Edith Becker, *Public Water Supplies of the 100 Largest Cities in the United States,* 1962

The Conservancy District Act following the 1913 flood eliminated many of the legal problems facing local municipalities when dealing with land requisition for purposes of flood control. It led to the foundation of the Mahoning Valley Conservancy District, although the organization became largely inactive once the MVSD began operations. The Mahoning Valley Sanitary District relied on Morgan's earthen dam concept with an addition of a concrete spillway to develop the Mineral Ridge Dam on Meander Creek in 1932.[3] The new Meander Reservoir became Youngstown's primary source for drinking water after the Ohio Department of Health declared Mahoning River water unfit for human consumption in 1926.[4] From that point on, Milton Reservoir's

[3] Joyce H. Pogany. *Austintown*. (Dover: Arcadia Publishing, 2007), 64.
[4] W.P. Cross. "Water Resources of the Mahoning River Basin, Ohio". U.S. Geological Survey.

main function was to provide an industrial water supply and promote flow control into the Mahoning River.

With the creation of Meander Reservoir as the area's principal potable water source, the area in and around Milton Reservoir was now opened up for recreational use. Fishing, boating, and swimming in Meander Reservoir was prohibited, but encouraged at Lake Milton, just ten miles to the west. This period saw the development of Craig Beach Village, a 1.7 square mile area that included Milton Dam and a recreational public beach area.[5] The dam continued to be under the management of the Army Corps of Engineers, and the area became an official state park in 1988.[6] The 1,700 acre lake continues to be a popular leisure destination for residents across northeast Ohio and western Pennsylvania.

Meander Reservoir covers 2,010 acres and was designed to provide a yield of nearly 30 million gallons of drinking water per day.[7] This was expected to meet Youngstown and Niles' needs until 1960, but this output proved inadequate. Even during the Great Depression the mills in Youngstown continued to manufacture steel and burden the available sources of water locally. By the late 1930s, conflicts in Europe had revitalized foreign steel exports, and indications toward the outbreak of another world war suggested that the current supply of water in the Mahoning Valley would need to be augmented by another reservoir. The city of Youngstown had failed once before when attempting to acquire land near Berlin Township, but the Conservancy Act of 1915 gave additional authority to municipal organizations in land acquisition.

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(Washington, D.C.: 1952), 7.
[5] Ibid.
[6] "A Boater's Delight", Lake Milton Association.
[7] Ibid. 15.

The Mahoning Valley Conservancy District coordinated the construction of the Berlin Reservoir just months after the United States entered World War II. Ohio Governor John W. Bricker attended the opening ceremony on October 26th, 1942. During the dedication, Gov. Bricker stated, "Ohio's artificial reservoirs are helping industry meet the needs of war and will serve in peace by answering the problem of the receding underground water table."[8] Unlike Milton Reservoir, the U.S. Army Corps of Engineers designed and built the Berlin Reservoir. The Conservancy District, whose origins traced back to strictly flood prevention following the 1913 Flood, openly included industrial water allocation in the plans of its Berlin Dam project. The onset of a world war may have little effect on future flooding, but it does indicate an immediate obligation for steel production, and thus additional water requirements. U.S. Senator Harold H. Burton was also in attendance at Berlin Reservoir's dedication ceremony, and he summed up the new reservoir's true purpose calling it, "an example of one good thing that has come out of this war."[9]

A second reservoir project was also completed during WWII. Mosquito Creek Reservoir was constructed approximately 15 miles north of the Meander Reservoir. It was originally planned both for flood control and to regulate flow levels into Youngstown. The Mahoning Valley Conservancy District was also involved in the development of this project and the Army Corps of Engineers authorized its construction during the war period to augment water flow in the Mahoning River for industrial water usage. Like the Berlin Reservoir, the original plan included provisions for flood control, but its primary advantage was as a storage reserve for low-water regulation. The

[8] *The Evening Independent*. Oct. 26, 1942. 13.
[9] Ibid.

allocation amounts were modified later in the project to allow for greater water supply and additional industrial capacity. When Mosquito Creek Reservoir opened in April, 1944 it covered an area of more than 7,850 acres, making it the largest flood control project coordinated by the Mahoning Valley Conservancy District, and one of the largest man-made bodies of water in Ohio.

**Figure 3-1:** View looking north toward Mosquito Creek Reservoir in Trumbull County, Ohio. The artificial lake created during WWII is one of the largest in Ohio. More than 2,400 acres of marshes and mature woodlands surround the reservoir, providing a sanctuary for wildlife and various recreational activities.

*Courtesy U.S. Army Corps of Engineers Digital Visual Library*

Authorization for Mosquito Creek Reservoir came in part due to the efforts of the MVCD and the legal model put in place by the Conservancy Act of 1914, but also had support from recent congressional legislation. The U.S. Congress passed the Flood Control Act in 1938 and President Franklin D. Roosevelt signed it into law.[10] This law gave authority to the Army Corps of Engineers to construct civil engineering projects

[10] *United States Code, Vol. 27* (House, Office of the Law Revision Counsel, 2000), 827.

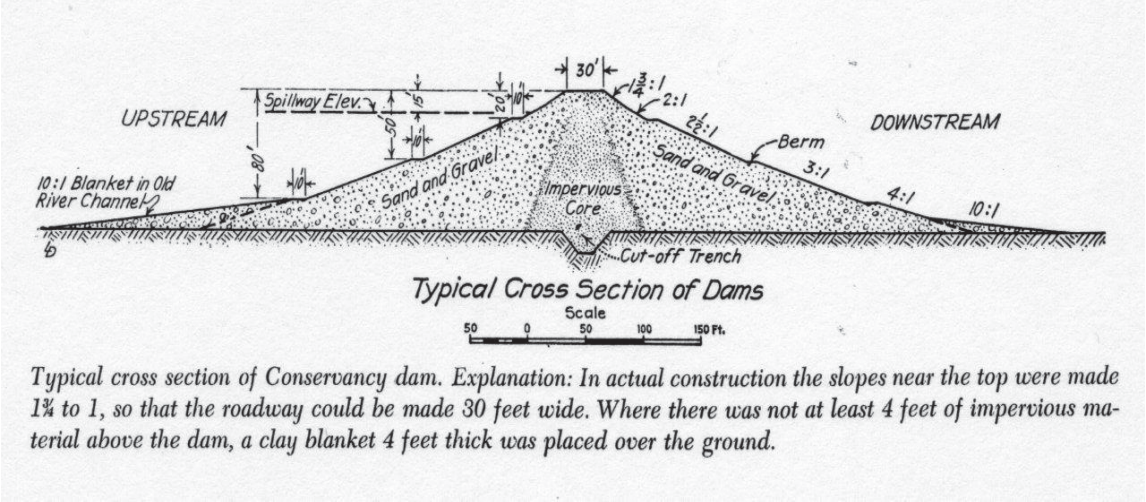
along waterways inside the United States. In total, the Corps has completed sixteen similar flood control reservoirs in the Pittsburgh District, a region which includes the Mahoning Valley. The Flood Control Act also ensured that all future flood damage reduction projects would require federal oversight.

Prior to federal legislation mandating coordination with U.S. government engineers on projects involving flood control, private companies had built small dams and reservoirs on tributaries feeding into the Mahoning River for industrial water usage. The first such dam was built on Yellow Creek in Struthers, creating Lake Hamilton in 1906.[11] Subsequent damming of the creek created other small lakes, including Evans, Beaver, and Pine. These lakes also provided additional functions in later years through recreational and municipal drinking supplies. Eventually these artificial bodies of water came under the control of the Ohio Water Service Company, a privately held company later incorporated under the name Aqua America.[12]

For reservoirs under the control of the U.S. Army Corps of Engineers, flood control remains the primary function. The chief engineer and designer of what would become the Miami Conservancy District, Arthur Morgan would go on to criticize the USACE for what he saw as bureaucratic ineptitude.[13] When his five earthen dams were completed in 1922 they were collectively one of the largest engineering projects ever completed in the world. Nevertheless, Morgan finished the project on time and with no

[11] John D. Love. *Preliminary Report on Uranium Deposits in the Pumpkin Buttes*. Geological Survey Circular 176. (U.S. Geological Survey, 1952), 8.
[12] Aqua America is based in Bryn Mawr, PA and has water utility interests in twelve states. It services more than 2.8 million residential customers, including approximately 450,000 in Ohio.
[13] Arthur E. Morgan. *Dams and Other Disasters: A Century of the Army Corps of Engineers*. (Boston: Porter Sargent, 1971), 1-5.

federal funding. The Englewood Dam was the largest of the five and was estimated to contain as much earth as the Great Pyramid of Giza.[14]




*Typical cross section of Conservancy dam. Explanation: In actual construction the slopes near the top were made 1¾ to 1, so that the roadway could be made 30 feet wide. Where there was not at least 4 feet of impervious material above the dam, a clay blanket 4 feet thick was placed over the ground.*

**Figure 3-1:** Arthur E. Morgan's concept for a large earthen dam for flood prevention. The dam would require no reservoir behind it and would allow for wide roads to cross over their surface. The bottom portion of the dam would contain permanently opened gates for specific amounts of water to pass through, regardless of rainfall. This model was the basis for all five of the dams built by the Miami Conservancy District after the 1913 flood.

From Arthur E. Morgan, *The Miami Conservancy District* (New York: McGraw-Hill, 1951.

Morgan himself referred to his earthen structures as "pyramids" both for their shape and simplicity. His response to critics who had never before seen such an approach to flood prevention was to compare their construction methods to those of a Pharaoh, "who built his pyramids on so broad a base that no matter what mistakes of judgment might be made, or how faulty the work might be done in the building, they would yet stand through the thousands of years."[15] Later projects such as the dams and reservoirs in the Mahoning Valley relied on a combination of Morgan's earthen dam concept and the reservoir system used by the U.S. Army Corps of Engineers. Regardless of their designs

[14] Trudy E. Bell, *The Great Dayton Flood of 1913* (Chicago: Arcadia Publishing, 2008), 10.
[15] Ohio Engineering Society. *Report of the Annual Meeting.* 1917.

however, the projects can look back at the epic flood of 1913 as an example of the potential dangers inherent in widespread flooding.

Construction projects to reduce floods in the Mahoning Valley also demonstrated the potential for secondary benefits such as water flow control in rivers which supplied industrial cities such as Youngstown. The earthen dam design by Morgan was unique in its simplicity, but it did not allow for future water discharge allocations to service growing consumption needs downstream. The steel industry in the Mahoning Valley was dependent on additional water resources to maintain production, and the requirements to fulfill the demands which came from two world wars necessitated more reservoirs. Whether the true motivation for the construction of Berlin and Mosquito Creek Reservoirs during World War II was for flood control or industrial water usage, their value to the region was unmistakable.

The first major test of the flood control measures in place since Milton Reservoir's completion in 1916 came during the storm of January 21st-24, 1959.[16] This flood was nearly on par with the 1913 Flood in terms of the volume of rain which fell, but due to the preventative systems in place damage was considerably limited. In some areas water discharge on minor rivers was higher than ever recorded.[17] Frozen ground water and melting snow added to the runoff. Northeast Ohio experienced the largest amount of property damage and the statewide loss of life was reported at sixteen. By all

[16] Richard W. Paulson. *Hydrologic Events and Floods and Droughts.* National Water Survey 1988-89. (Washington D.C.: U.S. Geological Survey, 1991), 447.
[17] Ibid.

accounts the destruction would have been much greater though, if not for the dams and reservoirs in place throughout the state.[18]

On the fifty year anniversary of the 1913 flood, newspapers across the state published reflective articles including interviews with residents who had witnessed the event and analyses of how the disaster may have been prevented. Positive appraisals were given to the Miami Conservancy District's progressive engineering project which had prevented any future floods as destructive as the one from half a century prior. In Youngstown, the Vindicator published a special two-page spread of photographs from the flood, as well as local statistics involving public and private property damage.[19] By 1963, few had firsthand memories of the worst natural disaster to affect the state, but the legacy of the 1913 Easter Flood persisted in the lessons learned by those who survived it.

[18] Ibid.
[19] Harold B. Harrison. "1913 Flood Ripped Ohio Valley". *The Vindicator*. March 23, 1916.

# Conclusion

2013 was the 100-year anniversary of the Great Easter Flood of 1913. The centennial event was marked with little fanfare. Modern cultural memory of the event has no contemporary reference points to relate to the devastation, fear, and sense of vulnerability experienced during and in the week following the flood from just a century prior. No blockbuster movie has been made that glorifies the heroics or chronicles the heartache felt by families separated in the night while floodwaters washed their homes away. Even in the pantheon of "great" disasters in American history, the 1913 Flood receives little to no press. Unlike the epic fires which swept through Chicago and San Francisco, the Great Flood was spread across several states and its total damage was difficult to estimate, both in terms of loss of property and life.

Without a specific cause other than incessant rains which lasted less than a week, it was also difficult to place blame or assign responsibility on any singular event. There was no anecdotal cow kicking over a bucket which caused the weather; it just rained. There were no failures in planning, engineering, or human error to justify the flood, only the defense that it had never happened before in the history of Ohio or other states. Unlike the Johnstown Flood of 1889, no dam had broken and there were no industrialists to take the blame. With no way of preventing another weather event like the one in March, 1913, the only appropriate reaction was to develop an improved response system to deal with future occurrences.

The systems that resulted from the flood changed the way the world handled flood prevention and dramatically affected the future of water resource management.

Organizations and policies which were born out of the great flood include the Miami Conservancy District and the Ohio Conservancy Act, which are both relevant to this day. Their original purposes may have changed over the years, but they laid a foundation of public and private cooperation which directly contributed to the growth of industry, especially in the Mahoning Valley. Without a sustainable water source, the integrated mills along the Mahoning River would never have achieved growth at the levels they did, especially during the national emergency periods seen during two world wars. The Conservancy Act of 1914 allowed public interests to take ownership and control of private lands in the name of flood prevention.

The dams and reservoirs which resulted from these flood mitigation projects also proved useful in other ways. They allowed water flow levels to be controlled during periods of drought or heavy consumption. Mahoning Valley mills such as Youngstown Sheet and Tube, Republic Steel, or U.S. Steel were able to fulfill the production requirements of World War I due largely to the completion of Milton Reservoir in 1916. The artificial lake also provided a much needed source of drinking water for Youngstown residents, especially during summer month when water levels ran low. The Conservancy Act gave municipal officials the legal support required to oppose any resistance to governmental ownership of formerly privately held land. So long as the reservoir and dam developments were conducted under the auspices of "flood control," little could be done to stop the projects.

Once the Miami Conservancy District prevailed at the highest national court, the precedent gave officials the power to legally take control over farmland and relocate neighborhoods. Water as a resource is vital to maintain commercial and domestic growth

in large industrial cities, and damming waterways is a convenient method of managing this commodity. Eminent domain is the legal authority granted to the government of a state or municipality to seize or condemn private property, so long as compensation is paid to the former owner of the property. It has a long and troubled history in the U.S. in situations where property transfers appear unjust or favorable to a corporate entity or government agencies.

Youngstown was spared much of the controversy surrounding the Miami Conservancy District's actions in Dayton. In the Miami River Valley, large populations of farmers were threatened with mandatory relocation for the sake of the District's engineering projects. This included thousands of acres of farmland near the river. In the Mahoning Valley, however, the majority of residents were either directly or indirectly employed through iron and steel manufacturing, and public support was often widespread to promote the survivability of this industry along with their jobs. In Dayton, some viewed the 1913 Flood as an anomaly not worthy of the large scale and costly engineering projects called for by the Miami Conservancy District. By co-opting reservoir projects under an aegis of flood prevention along with industrial and domestic water delivery, Youngstown administrators promoted the multiple benefits of these proposals.

When national demand for steel began to dissipate after World War II, there was little mandate or use for any future reservoir projects along the route of the Mahoning River. The years leading up to the war offered little indication that the flood control systems in place were less than sufficient, but as the war approached, the Mahoning Valley Conservancy District was able to use its authority to gain approval of two

additional reservoirs along the Mahoning River. Additionally, these reservoirs would be larger than any project built previously. Mosquito Creek Reservoir's completion in 1944 signaled an end to large flood control engineering projects in the Valley. The manmade lakes and reservoirs constructed since the 1913 Flood remain in operation however, under the control of the U.S. Army Corps of Engineers. The Mahoning Valley Conservancy District is no longer in existence, but other local government agencies such as the Mahoning Valley Sanitary District and Mahoning Valley Soil and Water Conservancy District have taken responsibility for natural resource management in the region. Like the Miami Conservancy District, these organizations have a range of duties in addition to flood mitigation.

Since 1913 there have been no floods on the same scale as the Easter Flood that led to so many changes in the Mahoning Valley. This can be seen as a testament to the success of the Conservancy Districts and their efforts to plan and prevent widespread flooding in their respective areas. With an established system of flood control measures in place, and the evident lack of any future projects on scale with the reservoirs in place, the question remains how to best utilize the dams and lakes currently in place? Lake Milton, Berlin Reservoir, Mosquito Creek Lake and the other artificial bodies of water in the valley provide an abundance of recreational activities. Fishing and boating are popular in the summer, and camping activities are available throughout the year. The undeveloped wooded areas surrounding the lakes also provide sanctuaries for large varieties of wildlife. The role of the U.S. Army Corps of Engineers over the years has shifted from design and development of new flood control projects into administrators of these leisure destinations. Some view this role as unnecessary.

The U.S. Army Corps of Engineers' involvement in flood control projects offers an advantage of federal financial support but also brings complications common in bureaucratic endeavors. Arthur Morgan became a vocal critic of the Corps, especially later in his life. In 1971, at the age of ninety-three he published a scathing historical look at the government agency and what he saw as a pervasive pattern of fraud, waste, and corruption. His book, *Dams and Other Disasters: A Century of the Army Corps of Engineers in Civil Works* detailed his experiences with the Corps. As the chief engineer of the Miami Conservancy District and former director of the Tennessee Valley Authority under FDR, Morgan's critique came from a voice of authority.

Morgan stated before his death, "There have been over the past 100 years consistent and disastrous failures by the Corps in public works areas, resulting in enormous and unnecessary costs to ecology and the taxpayer. The Army Corps of Engineers is generally known as a guardian of the public interest and facilitator of scientific progress. This carefully nurtured image has been the result of classification of documents relating to Corps failures and the selective re-writing of Corps history." Morgan's opinions on the USACE came largely in part due to the organization's history of deviating from its public mission – flood control.

It's important to note that despite Morgan's admonition of the agency, the USACE remains in control of the artificial lakes and reservoirs in the Mahoning Valley. The heritage of those bodies of water can be traced back to legislation resulting from the 1913 Flood. Arthur Morgan's legacy is also connected to the monumental engineering projects he managed on behalf of the Miami Conservancy District. The Great Easter Flood may be relegated to obscurity in regard to modern society's cultural memory, but

the legislation and engineering techniques it inspired played a fundamental role in the success of the steel industry in Youngstown.

It's been said that "one should never let a good crisis go to waste." On its surface this remark may seem flippant, but when viewed in the historical context of the Great Flood of 1913, it's evident that the legal powers granted through the Conservancy Act had a direct impact on the growth of Youngstown into one of the most important steel producers in the world. Senator Burton said as much at the dedication of the Berlin Reservoir, referring to it as an example of a "good thing" to come out of WWII. As devastating as it was at the time, the flood of a century ago may be largely forgotten but it has rightly earned its place in history for all the good things that came from it.

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