RECONNAISSANCE SURVEY

BROWNSVILLE / MONONGAHELA VALLEY PENNSYLVANIA / WEST VIRGINIA

The America's Industrial Heritage Project (AIHP) is an effort to preserve, protect, and interpret the remains of iron, steelmaking, coal, and transportation industries and the social and labor history of nine counties in southwestern Pennsylvania. The area and the related resources served an important role in America's industrial growth, and the resources should be preserved and interpreted for visitors. The AIHP focuses on protecting selected sites related to the region's industrial heritage and using the sites to help strengthen the local economic base through the promotion of tourism.

The AIHP is under the direction of the Southwestern Pennsylvania Heritage Preservation Commission (HPC). The HPC, established in the Department of the Interior and composed of regional representatives from industry, government, and area organizations, is responsible for overseeing the various programs and activities related to AIHP, for directing its future course, and for fostering communication and coordination between the various levels of government and the private sector. The HPC, seated in January 1990, was established to solicit input from area experts regarding the region's industrial heritage to further define, develop, and implement recommendations to preserve theme-related resources and promote tourism. The National Park Service serves as lead agency and staff to the commission and assists it in its public involvement activities. The HPC is under the chairmanship of John Bennett of Bedford, Pennsylvania.

Congressional legislation establishing the HPC required it to prepare a report to the secretary of the interior on resource values in the greater Allegheny and Washington counties/Monongahela Valley area. This Reconnaissance Survey, Brownsville/ Monongahela Valley was prepared for the HPC by a National Park Service study team to fulfill, in part, the requirements of the legislation. The survey serves as the initial inventory of theme-related resources in the greater Monongahela Valley region and identifies where opportunities exist for thematic and programmatic coordination between the HPC and efforts in the greater Pittsburgh/Monongahela Valley area.

Printed on recycled paper

OCTOBER 1991

RECONNAISSANCE SURVEY

BROWNSVILLE / MONONGAHELA VALLEY PENNSYLVANIA / WEST VIRGINIA

River, road, and rail transportation Brownsville, PA

UNITED STATES DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

DENVER SERVICE CENTER

PRELUDE

The seeds of a renewed working spirit have been planted in southwestern Pennsylvania. This spirit is manifested in the initiation of planning efforts that seek to prepare for the future through a respect for the region's natural, scenic, and cultural heritage. The region's heritage is an important chapter in the history of America's industrial development. The people of the region recognize the need to shift their focus from a heavy industrial-oriented economy to one of nurturing a more diversified economic structure. Resources that illustrate the story of the region's heritage are being recognized as a part of this broader vision. They are potential anchors for a tourism industry that can supplement a viable economy.

The Monongahela (Mon) River played an important role in the settlement and development of the region. Early water transportation facilitated settlement and westward migration. Later it was improved to support the development of heavy industry. The river in a sense drew the people it took to run the industrial machine. The river was an important part of their heritage and an important part of their future.

Much change is taking place in the Mon Valley/southwestern Pennsylvania region as new social and economic demands drive revitalization. The challenge before the region's inhabitants is to continue to improve the quality of life, promote growth and prosperity, and define the region's future in a way that acknowledges, conserves, and promotes the people's heritage. This challenge can be met in part through a collective effort of local, regional, state, and federal interests providing guidance and assistance to develop visitor-oriented programs, facilities, and access to resources of special interest.

This *Reconnaissance Survey* has its origins in congressional legislation (Public Law 100-698) establishing the Southwestern Pennsylvania Heritage Preservation Commission (HPC) in 1988). It required the preparation of a report to the secretary of the interior on the cultural and historic resources in the greater Allegheny and Washington counties/Mon Valley region. The National Park Service conducted this survey for the HPC to fulfill, in part, the requirements of this legislation.

This survey assesses a broad land area within a variety of historic themes to provide the basis for future cooperative planning. There is a complex geographic distribution of resources crossing many political boundaries that contribute to understanding the heritage of the region. Autonomous assessment, preservation, and promotion of these resources cannot be as effective as a unified strategy guided by a shared vision. Independent efforts currently underway in the region can benefit by sharing ideas to address common issues across state and county boundaries. A thematic or categoric framework is one possible way to address common threats to specific types of resources and to provide a context for prioritizing actions to protect the most significant resources first. It should be understood, however, that many of the stories characterized in the survey share one common resource – a river. The Mon, Allegheny, and Ohio rivers together form a structure with which to understand the historic relationship between the resources described. It only seems appropriate that the river should serve as a common platform for which shared interests plan for their future.

SUMMARY

The National Park Service conducted a reconnaissance survey of southwestern Pennsylvania and northern West Virginia, including the Monongahela River valley and a portion of the Ohio River (also known as the study area). As part of the survey, the NPS study team collected data on the area's cultural, natural, recreational, and scenic resources. The survey documented existing and potential nationally significant resources, focusing on those that related to the industrial activities of iron production, steelmaking, coal mining, and coke production, and transportation. The study team also uncovered resources related to other important topics in American history that appeared in sufficient concentration in the area to merit documentation.

The reconnaissance survey shows that there are a variety of cultural resources in the Mon and Ohio River valley corridors and into West Virginia west toward Wheeling and south toward Fairmont that further tell the story of industrialization in America. The Mon River valley is important because of its commercial and industrial development impact on the rest of the nation. Its prominence has been closely tied to its natural resources, western migration, transportation development (canal, river, rail, and road), and the rapidly expanding 19th century technology. The coal, coke, iron, steel, and aluminum industries of the Mon River valley contributed significantly to America's economic and industrial power during the first half of the 20th century.

There are 14 national historic landmarks in the study area. Approximately 110 sites are listed in the National Register of Historic Places, 18 of which are nationally significant. In addition, at least 182 potential sites relate to the topics identified above. These sites are dispersed throughout the greater southwestern Pennsylvania and northern West Virginia area. There are currently no sites in the immediate study area that are listed in the National Registry of Natural Landmarks. The nearest site is in the Youghiogheny River drainage. Two sites, the upper Youghiogheny River and the Cheat River Gorge/Coopers Rock, have been identified as potential natural landmarks.

The Mon and Ohio rivers were recommended by the commonwealth of Pennsylvania as potential priority three scenic rivers having local and regional significance. There are a few segments of the Youghiogheny River as well as a few tributaries within the Youghiogheny River drainage that have notable scenic qualities.

The potential for recreational opportunities in the area appears to be high in meeting regional and local needs. The study area currently offers 20 percent of the supply of flat-water boating recreational opportunities for the Pittsburgh metropolitan market area. The potential for increasing and improving boating and other water-related recreational opportunities is high. Factors that affect this potential include the shipping industry (a source of potential conflict on the lower Mon, Allegheny, and Ohio rivers), water quality, access to the Mon and Ohio rivers, and shoreline restoration. In addition, the region has the potential to offer recreation trails converted from abandoned rail corridors as railroads consolidate their lines.

During the reconnaissance survey, it became clear that a variety of historical industry-related resources needed further evaluation within a broader contextual framework. That framework is the Monongahela River navigation system.

The following topics and their associated resources found within the study area are of primary importance in illustrating the cultural, economic, and industrial development of southwestern Pennsylvania and the entire nation:

- Coal and coke industries
- Iron industry
- Steel industry (from 1870 to WW II)
- Labor/ethnic history
- Aluminum industry
- Transportation – river, rail, and road (e.g., National Road, Lincoln Highway, Pennsylvania Railroad, B&O Railroad trunk and feeder lines)
- Glass industry
- Pottery
- Secondary metals (machine shops)

An expanded effort should be undertaken to coordinate information and develop specific strategies for the protection, preservation, and interpretation of the cultural and historic resources and the recreational opportunities in the study area.

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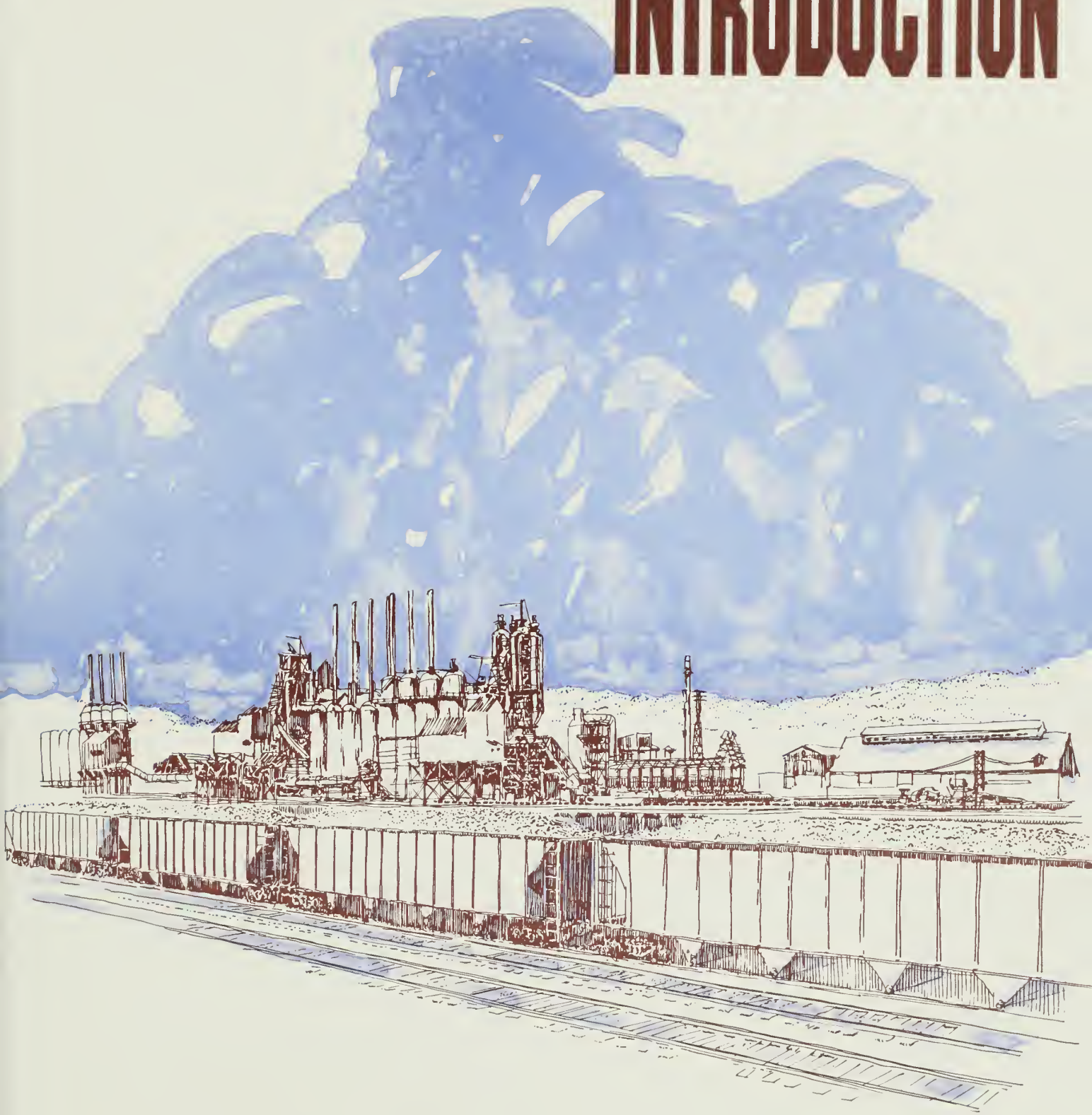

PURPOSE OF THE STUDY

As outlined in its 1988 *Management Policies*, the National Park Service conducts planning activities to identify nationally significant natural, cultural, and recreational resources and to assist in their preservation both inside and outside the national park system. These studies are initiated within the agency or are conducted in response to requests from Congress, other federal, state, or local agencies, or the private sector. The National Park Service has established criteria for evaluating natural, cultural, and recreational resources for national significance; this criteria is set forth in the *Management Policies*.

Public Law 100-698, dated November 19, 1988, established the Southwestern Pennsylvania Heritage Preservation Commission (hereafter referred to as the HPC). This legislation requires the HPC to prepare a report to the secretary of the interior, in consultation with the Pittsburgh Area Steel Heritage Task Force (Mon Valley Steel Heritage Task Force), on the cultural and historic resource values of the Greater Allegheny and Washington counties/Mon Valley area (see legislation in appendix A). The HPC asked the National Park Service for assistance in the preparation of this report.

The Fiscal Year 1990 appropriations legislation provided further direction to conduct a reconnaissance survey of the Brownsville/Mon Valley area.

This document is a special study conducted by the National Park Service to collect basic information. It provides a broad overview of the area, it documents the significance of the area's resources, and it identifies general threats to the resources. In addition, it makes recommendations as to whether or not the area has significant resources that merit further study. If recommended for further study, a study of alternatives may follow that would identify and evaluate alternatives for use, protection, and management of those resources.

This *Reconnaissance Survey* provides the HPC, Mon Valley Steel Heritage Task Force, and other interested parties with a foundation upon which to coordinate the identification, management, and interpretation of significant resources in southwestern Pennsylvania and northern West Virginia.

STUDY AREA OVERVIEW

Definition of the study area was a result of coordinated discussions between the AIHP director's office and the National Park Service's Mid-Atlantic Regional Office and Denver Service Center. While the title *Reconnaissance Survey, Brownsville/ Monongahela Valley*, implies a specific geographic area around Brownsville, Pennsylvania, the study area actually covers the broader region of southwestern Pennsylvania and northern West Virginia (see Location map).

The study team began its cultural resource survey based on the significant historical values identified by AIHP for southwestern Pennsylvania. The study area expanded because of similarities in the development of industrial resources in southwestern Pennsylvania and northern West Virginia. Wheeling, West Virginia, has also been closely linked to the Brownsville/Mon Valley area because of the National Road and the Monongahela and Ohio river navigation systems. It was also acknowledged that the story of the development of the aluminum industry in Allegheny County, Pennsylvania, would complement this project and thus was included. This approach took advantage of planning efforts currently underway by the Mid-Atlantic Regional Office in the Mon Valley and Wheeling, West Virginia, area where coordination of data collection was possible. Information from these specific areas was incorporated into the broader-focused reconnaissance survey.

The Monongahela River is formed by the confluence of the West Fork and Tygart Valley rivers at Fairmont, West Virginia. It flows northerly from Fairmont for about 129 miles where it joins the Allegheny River at Pittsburgh, Pennsylvania, to form the Ohio River. The Mon River basin drains an area of 7,386 square miles in northern West Virginia, western Maryland, and southwestern Pennsylvania. Major tributaries that enter the Mon River below Fairmont include the Youghiogheny and Cheat rivers. The study area covers only a portion of this drainage basin stemming from Fairmont, West Virginia, to Pittsburgh, Pennsylvania, and includes portions of Allegheny, Westmoreland, Fayette, Washington, and Greene counties in Pennsylvania and Marion and Monongalia counties in West Virginia. Other portions of the study area fall within the Ohio River basin below the Mon River.

The physiography of the area is of a maturely dissected plateau of the Appalachian Plateaus province. The area is characterized by gently rolling uplands and deep, narrow valleys with steep slopes. The geologic heritage is one of mild structural folding of bedrock that has had limited influence on the course of the main stem of the river. The relief typically ranges from 200 to 300 feet along the tributaries and 400 to 500 feet along major streams.

Major cities and towns in the study area include the Pittsburgh metropolitan area, Washington and Uniontown, Pennsylvania, and Wheeling, Morgantown, and Fairmont, West Virginia. Much of the immediate Mon Valley area developed into industrial land uses, including coal mining, steel production, heavy manufacturing, and river transportation. The principal mineral resources in the area are mineral fuels, including coal, oil, and gas. Iron ore was mined from small local deposits. The most abundant mineral resource in the basin is bituminous coal, with existing reserves estimated at 23 billion tons. Oil and gas wells and pipelines are common throughout the main stem of the Mon River, where most of the production is gas.

The transportation system in the region includes three interstate highways, three U.S. highways, and an extensive network of state and local highways. However, riverfront development between roads and the river limits access to the river in the northern, developed portions of the Mon Valley. Few roads parallel the southern portions of the

LOCATION

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Mon Valley. Two rail corridors parallel one or both sides of the river along its entire length from Pittsburgh to Fairmont. The river developed into a major shipping artery of the Ohio/Mississippi River navigation system. Of the 69 docks and launch ramps along the Mon River, only a few are available to the public.

Within the study area boundaries, the Pittsburgh metropolitan area is experiencing the highest rate of growth. This includes the lower 40 miles of the river between Charleroi and Pittsburgh that historically have been the scene of intensive industrialization. The prime level land currently occupied by several steel mills is being sought for development to fill the economic void left by the decline of the steel industry during the 1970s and by the recession of 1980-84. The region's job base shrunk as many industries closed or scaled back operations. Since that period the region has experienced slight to moderate growth.

Land use in the study area generally reflects increasing urbanization, particularly in Pittsburgh and Allegheny County. Here more emphasis is placed on residential, commercial, and industrial development and less on agriculture. The population density is highest along the Ohio, Allegheny, and Mon rivers because the rivers were historically the main transportation corridor and therefore a logical location for industrial centers. Much of the development along the rivers has been governed by the floodplain patterns and steep topography of the river valley walls. As a result, industrial development tends to concentrate in several clusters.

The southwestern portion of Pennsylvania is currently undergoing a change from heavy industry to high technology and light industrial development. The Allegheny and Washington County (Pennsylvania) portions of the Mon River are undergoing redevelopment that focuses on revitalizing older industrial sites, such as steel plants, and replacing an aging infrastructure. The Greene and Fayette County portions of the Mon River serve a lower density of industrial, residential, and commercial land uses between larger areas of deciduous forest. In West Virginia, the area along the river is limited industrial land use mixed with commercial uses in predominantly deciduous forest.

Possibly the only exception to the trend towards light industry is coal mining. While the demand for coal is high as an energy source, current air quality standards prohibit extensive use of coal with a high sulfur content. Greene and Washington counties hold the highest reserves of high sulfur, bituminous coal in Pennsylvania.

For the most part, counties within the study area do not have comprehensive plans, and land use is controlled at the local level. For example, there is no control exerted over the unincorporated area in Monongalia County, West Virginia, and Morgantown's city plan is 30 years old. The Pennsylvania municipal planning code was revised extensively by the legislature in 1988, after six years of effort. The new code requires that all counties adopt a comprehensive plan within three years. At a minimum, municipalities are encouraged to give serious consideration to recommendations of the county plan.

Some municipalities and organizations are developing riverfront plans. The Twin Rivers Council of Governments, in the Pittsburgh metropolitan area, has developed a riverfront recreation plan for the Youghiogheny and Monongahela rivers, although the developments are primarily designed for active recreation. The Mon Valley Tri-State Network, Inc., is an independent leadership organization working on a riverfront development project between Fredericktown, Pennsylvania, and Morgantown, West Virginia, and centering on Friendship Hill National Historic Site and surrounding localities.

Because the Mon River has already been altered from its natural state, threats posed by demolition and construction activities are primarily to cultural resources, specifically historically significant steel complexes that are not yet protected by a comprehensive management plan.

Development activities in the region are expected to increase with the revitalization of the coal mining and shipping industries. Vast coal reserves in Greene, Washington, and Fayette counties in Pennsylvania and Marion and Monongalia counties in West Virginia are vital to the economic future of this region. Maintenance and improvement of the Mon River and its banks for commercial shipping purposes threaten archeological resources relating to glass and pottery production and other early industries that have not yet been included in long-range planning efforts to conserve, interpret, and manage significant cultural resources associated with the Mon River valley.

RESOURCE DESCRIPTION

HISTORICAL CONTEXT

PREHISTORIC PERIOD

The Monongahela River valley has provided a home for man for more than 10,000 years. Prehistory in the study area is divided into several traditions from early Paleo-Indian through the Historic period. The earliest people known to have occupied western Pennsylvania were the Mound Builders. A few mounds have been found in the Mon River valley.

During the Late Prehistoric period, the region was occupied by many different, agriculturally dependent Indian societies. Archeological surveys suggest that the Mon River valley was one of the most intensely populated areas in Pennsylvania during this time. In southwestern Pennsylvania and north-central and northern panhandle areas of West Virginia, a series of occupational sites of this period have been located on hilltops, on the saddles between hills, on hillside benches, and on the floodplain terraces and high bottomlands of major rivers and their drainages. Subsistence economy consisted of corn agriculture and hunting, fishing, and gathering activities. Some village sites were permanent, while others were occupied for only a short time. In addition, these people occupied rock shelters and small farmsteads with storage structures. Most of the sites recorded in the *Archeological Record Survey* (Corps of Engineers 1980) represent village or campsite occupation by Late Prehistoric people.

HISTORIC PERIOD

Indian and Early White Settlement

Within historic time, western Pennsylvania has experienced two distinct periods of Indian occupation separated by an interval of nearly 75 years during which time this area was uninhabited. The first historic occupation involved the Erie Indians in the mid-1600s. They occupied the region south of Lake Erie, extending east from Ohio to New York and ranging south of the Allegheny River in Pennsylvania, where they probably had many villages. Indian settlement began again in the first quarter of the 18th century. Many villages were actually temporary camps established for use during migrations west.

Early white history in this section of southwestern Pennsylvania began with incursions by European and colonial forces ca. 1754. Both the French and British laid claim to this region, which became the backdrop for numerous events of the French and Indian War. After the most intensive warfare in this area had ceased, ca. 1758, settlers began arriving from eastern Pennsylvania. They found that the Mon River's narrow, confined corridor and the presence of dense hardwood forests severely restricted settlement patterns. Initial development began in the more level stream and river valleys where limited agricultural activity was possible.

Early Industry

Western Pennsylvania's geographic isolation from the East Coast forced it to become self-sufficient in many areas. One of the most important industries it had to develop in the late 18th and early 19th centuries was iron smelting. Blacksmiths were ultimately able to locally produce all types of goods needed by farmers, craftsmen, and settlers, including horseshoes, nails, tools, bolts, axes, weapons, and other implements. As the industry expanded, blast furnaces and forges were constructed along small streams in wooded, rural locations that provided ore, charcoal, and water power.

From earliest times, the Mon River comprised an important resource for early settlers. Prior to construction of the National Road, the lack of roads or improved trails into the region made the river an important communication artery and transportation route into Ohio, Kentucky, and points west. Several towns on the upper reaches of the Ohio Valley waters

became boat-building centers in the late 18th century, including Pittsburgh, Elizabeth, Belle Vernon, Allenport, and Brownsville. This area produced hundreds of flatboats, keelboats, and other vessels used to transport goods and to carry emigrants to the West.

Steamboat transportation opened the Ohio River and lower Mississippi River markets to Pittsburgh and Mon River ports. The launching of the *New Orleans*, the first steamboat on western waters, took place at Pittsburgh in 1811. Both Brownsville and Elizabeth became leaders in developing steamboat transportation in the West. The *Enterprise*, the first steamboat to travel from Pittsburgh to New Orleans and back was built in Bridgeport, near Brownsville, in 1814. Steamboat building reached its height along the Mon River after 1846, but the trade gradually declined around the mid-1850s due to a financial depression, the diversion of river traffic to railroads, and the impending Civil War.

Between 1790 and 1815 southwestern Pennsylvania began to shift from its agricultural base to an economy based on industrial development, primarily the manufacture of goods for outside consumption. Glassmaking and pottery making became major commercial activities in the 18th and 19th centuries. Construction of brickyards, sawmills, and gristmills also flourished because of the abundance of fuel and water power, good transportation, and skilled labor. The distilling and brewing industry began as a response to the high cost of transporting even small amounts of perishable grains to market. If the rye was distilled into whiskey, however, a larger amount could be carried, and it could easily be exchanged for needed products such as corn, salt, and tobacco. The towns supporting those businesses, which sprang up along the floodplains on the inside bends of the Mon River and near the mouths of creeks and runs feeding it, are among the earliest in southwestern Pennsylvania.

The Growth of Industry

After the Civil War, several factors helped make Allegheny County, Pennsylvania, the center of the American iron and steel industry. First, the post-war period initiated a heavy demand for large quantities of cheap iron for manufacturing uses. In addition, by mid-century iron furnaces were starting to use coke as a fuel source almost exclusively. Because coke could be transported easily and cheaply, the continuing growth of the industry enabled iron and steel manufacturers to locate in or near urban transportation and shipping centers rather than having to be near the source of raw materials. In the Ohio River valley dozens of furnace complexes, rolling mills, and fabrication and coking plants began lining the banks of the Mon, Allegheny, and Ohio rivers. The county's access to the superior Connellsville coke fields of Fayette and Westmoreland counties and to high-grade iron ore from the Lake Superior region ensured it an unrivaled position in the industry.

By the 1880s, two major factors were contributing to the commercial development of the region: (1) accessibility to national markets provided by the Mon River, enabling riverside towns to become important commercial distribution centers as the new country expanded west, and (2) abundant natural resources in this particular geographical area, including coal, gas, limestone, and iron ore, which provided the basics for turning the area into a primary metals production center. Improved roads and a new system of waterways helped foster the growth of heavy industry and enabled Allegheny County to assume its front-runner position in America's industrial revolution.

The massive demand in the Pittsburgh area for industrial laborers attracted thousands of workers from Great Britain, eastern and southern Europe, and the rural South. The ethnic cultures transplanted to this region have played an important role in the area's

social, economic, and political history. Today abundant remains exist, such as stores, social clubs, churches, and workers' housing, as well as legacies in the form of social institutions and settlement patterns. Labor relations have always been an important factor in the social and economic life of this area. In 1892, for instance, the Homestead steel mill was the site of one of the most significant and violent confrontations in the labor/management struggle. Pinkerton guards hired by steel magnate Andrew Carnegie succeeded in defeating striking members of the Amalgamated Association of Iron and Steel Workers, which ultimately led to the demise of the union.

New steel mills and towns to the south of Homestead were developed, including Monessen, Clairton, and Donora. At the same time, coal-related industries were restructured into larger corporations. After WW II, the Pittsburgh district began a decline in national output. The slacking of production by steel-related industries has not only hurt the regional economy but also has resulted in the demolition of many historic industrial sites in the Mon River valley.

A very significant nonferrous metal industry also had its beginnings in the Pittsburgh area. Aluminum, the most abundant metallic element in our environment, is valuable because of its high thermal and electrical conductivity, its resistance to corrosion, and its light weight, which makes it ideal for use in household utensils, skyscraper construction, and various forms of transportation. In 1886 American scientist Charles Martin Hall discovered an electrolytic process that successfully produced aluminum in its metallic form. Hall's Pittsburgh Reduction Company was renamed the Aluminum Company of America in 1907 (its common name, Alcoa, was coined in 1910). Alcoa was the sole American producer of primary aluminum up to 1940 and a giant in the world's aluminum industry. Even with the introduction of domestic competition, Alcoa has been able to remain at the top of the industry through development of new alloys, new processes, and new applications.

In the 19th century, Pennsylvania was a leader in the invention and production of electrical machinery. Westinghouse Electric Corporation of Pittsburgh was one of the first major electrical-machinery companies and is one of the largest electrical manufacturing companies in the United States. It continues to play a major role in this industry today.

The industrial history of southwestern Pennsylvania has been varied and closely tied to many natural resources, western migration, the expansion of communication networks, and the rapidly expanding technology of the 19th century. Despite the decline of manufacturing and mining, the history of these industries remains a significant part of the heritage of southwestern Pennsylvania.

CULTURAL VALUES

INTRODUCTION

Almost 300 cultural sites have been identified in the study area. There are approximately 110 sites listed on the National Register of Historic Places (18 of these are nationally significant) and approximately 180 sites potentially eligible for the National Register. Appendix B lists those resources included on the National Register as well as those resources that should be evaluated against National Register criteria.

The National Park Service uses themes to classify its resources and properties. This allows the comparison of resources to others within the national park system, or to similar resources that are being protected within the national historic landmarks program. The thematic framework is found in the publication entitled *History and Prehistory in the National Park System and the National Historic Landmarks Program* (NPS 1987). Cultural resources identified in the study area relate to the following themes and subthemes specifically identified in the above-mentioned document:

Cultural Developments: Indigenous American Populations (all subthemes)

European Colonial Exploration and Settlement (subthemes: French exploration and settlement, English exploration and settlement)

Development of the English Colonies, 1688-1763 (subthemes: physical development, military affairs)

Business (subthemes: extractive or mining industries, manufacturing organizations, power and lighting)

Transportation

Architecture (subthemes: colonial, commercial, historic district)

Technology – Engineering and Invention (subthemes: transportation, tools and machines, extraction and conversion of industrial raw materials, industrial production processes)

American Ways of Life (subthemes: industrial towns, ethnic communities, industrial wealth of the last half of 19th century, occupational and economic classes)

Social and Humanitarian Movements (subtheme: labor organizations)

The distribution of themes and existing and potential National Register sites within the study area is shown on the Cultural and Historical Values map.

In this study the historical topics related to the above themes have been divided into two categories: major topics and other topics. Major topics are those that have been identified by AIHP; other topics are those that surfaced as being significant in the southwestern Pennsylvania and northern West Virginia region but that are not being addressed by AIHP at this time. While iron and steel making are acknowledged to be separate industries, for purposes of this document their interrelationship is emphasized.

A number of historic sites, structures, and districts exist in many of the early towns along the Mon River that are connected with the topics addressed in this study and that should be included in planning efforts because of their relationship to people, events, or architectural styles that are locally or regionally significant (see appendix B). Many of these are important to interpretation of the commercial and social development of this area of Pennsylvania.

CULTURAL & HISTORICAL VALUES

BROWNSVILLE/MON VALLEY RECONNAISSANCE SURVEY

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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OHIO

PA

BEAVER CO
2 NATIONAL REGISTER SITES
4 POTENTIAL NAT REG SITES
THEMES ELECTRICAL GENERATION, REFRACTORY, TRANSPORTATION

ALLEGHENY CO.
16 NATIONAL REGISTER SITES
7 POTENTIAL NAT REG SITES
THEMES FRENCH & INDIAN WAR, TRANSPORTATION, STEELMAKING, COKE, ELECTRICAL EQUIP, AMERICAN WAYS OF LIFE, SOCIAL MOVEMENTS

River

NEW KENSINGTON

Allegheny

HANCOCK CO
1 NATIONAL REGISTER SITE
2 POTENTIAL NAT REG SITES
THEMES · IRONMAKING, TRANSPORTATION

WV

PITTSBURGH

WEIRTON

BRADDOCK

HOMESTEAD

McKEESPORT

WESTMORELAND CO
8 NATIONAL REGISTER SITES
31 POTENTIAL NAT REG SITES
THEMES ALUMINUM DEVELOPMENT, FRENCH & INDIAN WAR, COAL MINING, COKE PRODUCTION, STEELMAKING, IRONMAKING, GLASSMAKING

STEUBENVILLE

BROOKE CO
2 NATIONAL REGISTER SITES
THEME TRANSPORTATION

River

CLAIRTON

River

Ohio

WASHINGTON

MONONGAHELA

Youghiogheny

CHARLEROI

MONESSEN

NATIONAL ROAD

WASHINGTON CO.
31 NATIONAL REGISTER SITES
6 POTENTIAL NAT REG SITES
THEMES TRANSPORTATION, CONSERVATION OF NATURAL RESOURCES

WHEELING

Monongahela

CONNELLSVILLE

BROWNSVILLE

River

OHIO CO
9 NATIONAL REGISTER SITES
24 POTENTIAL NAT REG SITES
THEMES TRANSPORTATION, GLASSMAKING, IRONMAKING, STEELMAKING

UNIONTOWN

GREENE CO
12 NATIONAL REGISTER SITES
THEMES TRANSPORTATION, GLASSMAKING, COAL MINING

FAYETTE CO
19 NATIONAL REGISTER SITES
110 POTENTIAL NAT. REG. SITES
THEMES · FRENCH & INDIAN WAR, TRANSPORTATION, ARCHITECTURE, COAL MINING, COKE PRODUCTION, IRONMAKING, STEELMAKING, GLASSMAKING, DISTILLING & BREWING

0 5 10 15 MI

N

PA

WV

MD

NATIONAL ROAD

CUMBERLAND

MONONGALIA CO
3 NATIONAL REGISTER SITES
THEMES TRANSPORTATION, GLASSMAKING, IRONMAKING

MORGANTOWN

River

MARION CO
2 NATIONAL REGISTER SITES
THEME TRANSPORTATION

Monongahela

Great River

FAIRMONT

CULTURAL & HISTORICAL VALUES

BROWNSVILLE/MON VALLEY RECONNAISSANCE SURVEY

UNITED STATES DEPARTMENT OF THE INTERIOR
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MAJOR TOPICS

Coal and Coke Industries

Description. Anthracite and bituminous coal from Pennsylvania deposits were first used for local needs beginning in the 1760s. Canal systems completed in the early 19th century enabled large-scale commercial exploitation of the coalfields and the shipping of anthracite coal to the East Coast for home heating use. The construction of dams and locks in the 1840s made the Mon River suitable for slack-water navigation to Brownsville and stimulated the coal trade. Numerous small mines in the hills near the Mon River during the 1830s and 1840s delivered coal to the riverbank by tramway.

Iron was produced using charcoal for fuel until the 1830s and 1840s. In the 1840s, a few enterprising individuals began making coke from the Pittsburgh bituminous coal seams in the Connellsville region of Fayette and Westmoreland counties. This coal produced superior coke, and the development of the region as a center of the coal and coke industry began in earnest in the 1850s. The lower Connellsville region (referred to as the Klondike), bounded on the west by the Mon River, also became significant in the later years of the beehive-coke era. The coke ovens of Fayette and Westmoreland counties supplied almost all the coke burned in southwestern Pennsylvania furnaces.

Coal mining, especially bituminous extraction, grew enormously between 1861 and 1919, primarily because the western Pennsylvania; Wheeling, West Virginia; and Cleveland, Ohio, iron and steel industries began consuming immense quantities of coke during the 1870s with the improvement of the coking process. By the late 1880s coke works were strung throughout the coalfields from Latrobe, Pennsylvania, to Morgantown, West Virginia.

Large corporations dominated the coal industry between 1861 and 1919. Anthracite coal production increased as the demand for home heating fuel grew in the burgeoning Northeast. While railroads and independent mining companies controlled the anthracite industry, Henry Clay Frick is due most of the credit for the successful development of the coke industry after 1880. He joined with Andrew Carnegie to create the Carnegie Steel Company. Other giant firms dominated the rest of the bituminous industry.

Initially coal was reduced to coke at the mines because it was cheaper to transport to the iron and steel furnaces. Pittsburgh had long been established as the chief foundry and mill center in the United States when coke smelting began, so its rolling mill firms chose to build ironworks near that town rather than on the coke fields. Coke making remained a coalfield activity until 1890, when coal from mines near the Monongahela River was barged to ovens on the north side of the river near Pittsburgh. Carnegie began building coke ovens at its new Aliquippa Works 26 miles down the Ohio River from Pittsburgh in the early 1900s.

The coke industry in the Connellsville region declined after 1915 because of changes in processing, declining coal reserves, the use of coal mined elsewhere, and the growth of the midwestern steel industry. After 1919, Pennsylvania's production of anthracite also dwindled with the disappearance of the home heating market. Although coal mines had begun closing as early as the 1880s, this process occurred more rapidly in the Connellsville coke region during the 1920s due, to some degree, from exhaustion of resources and flooding of tunnels, but primarily because of the rise of the by-product coke oven. The by-product coke oven proved to be extremely efficient; it was able to not only use lower quality coal from other than the Connellsville region but also it required less of it.

Cokeburg, Pennsylvania

The Pittsburgh area was slow to build by-product ovens, primarily because it was difficult to find room for coal yards and ovens. Finally in 1918, U.S. Steel constructed the world's largest by-product coke plant just north of its Clairton Works. The use of Fayette County coal in by-product plants near Pittsburgh was made possible by a new coal-handling process that transported the coal by underground conveyor to the Mon River where it was shipped by barge upriver to Clairton. From there coke to be used for the production of molten iron was forwarded to Pittsburgh plants.

With the decline of the steel industry and competition from natural gas and oil, the mining of bituminous coal also slackened. After WW II, coal-mining technology changed. A revolution in underground mining began in the late 1940s with the introduction of new machinery that replaced conventional methods. By 1950 most of the Connellsville coke region was worked out, and the beehive-coke industry was obsolete.

To a great extent, smaller companies have replaced the large coal corporations. Ninety percent of Greene County coal is still deep mined. That county also contains the Bailey Mine – the largest underground coal mine in North America.

One of the most important aspects of the coal and coke industries is the human element. Coal mines were extremely dangerous places in which to work. Safety concerns were not a high priority for mine

owners, and accidents happened frequently. In addition to injuries, miners often succumbed to black lung disease or rheumatism.

Despite these conditions, unionization was slow to develop. Early attempts at local unionization being unsuccessful, the need was seen for a powerful national organization to promote miners' interests. The National Federation of Miners and Mine Laborers was organized in 1885. An earlier competing organization, the Knights of Labor, merged with the National Federation in 1890 to establish the United Mine Workers of America. Guided by strong, determined leaders and eventually amassing vast amounts of money, this powerful organization made outstanding progress in its fight for proper wages, better working conditions, an eight-hour workday, and child labor laws.

Labor/management relations in the Connellsville coke region, where working conditions were viewed as terrible, resulted in many bitter strikes in the 1880s and 1890s. In addition to low pay, immigration was also a source of friction. The immigrant coalfield workers from southern and eastern Europe were usually willing to work under worse conditions and for less pay than were the older, more experienced miners from Great Britain or northern and western Europe.

The early labor history of southwestern Pennsylvania's coal industry reflects the difficulty of achieving many fundamental human desires: to participate in the management of one's work environment; to control one's life and community; and to attain feelings of self-esteem and personal worth.

Significance. Bituminous coal is Pennsylvania's most important mineral resource. In the 19th and into the 20th centuries, its abundance made Pennsylvania the nation's leading coal-producing state. Coal mining and the coke manufacturing business were historically major industries in the study area. The Connellsville region of Fayette County was nationally renowned for the quality of this coal, which, with little preparation, produced extremely pure coke.

Coal mining and coke manufacturing had to expand greatly in the late 19th century to supply the needs of the growing iron and steel industries in the Pittsburgh and Mon Valley areas. This expansion helped make the industrial zone bordered by Youngstown, Ohio; Wheeling, West Virginia; and Johnstown, Pennsylvania, the greatest iron and steel region in the world.

Remains of coal and coke operations, such as mines with their associated buildings, extraction equipment, and coal-handling systems; coal patches (company towns built for duration of mining activity); and brick coke ovens, are found on both sides of the Mon River. These often deteriorating resources, if studied in the context of national patterns of industrialization, can add to our knowledge of

- technological and business developments within the coal and coke industry
- the rise of labor movements in the mining industry
- the impact of ethnically diverse cultures on settlement patterns and the social and political development of the region
- the physical effect of this type of industrial operation on the landscape and long-term environmental consequences

The Historic American Engineering Record (HAER), a division of the National Park Service, has identified many significant historical industrial resources related to coal mining and coke manufacture in the study

area that have potential for listing in the National Register (see appendix B).

Resource Threats. Excellent remains of historical coal and coke operations may be found in the form of mines, extractive equipment, conveyor systems, beehive ovens, and company settlements. Mines, ovens, and their associated equipment are susceptible to the ravages of time, neglect, and reclamation by nature. Towns related to these industries are deserted to a great extent. In some cases, slow decay is leading to the loss of resources representing residential and commercial architectural styles representative of this era and these industries. The integrity of individual houses is being changed by alteration and modernization efforts. The integrity of the historical spatial relationships between streets, residences, public facilities, and manufacturing sites is threatened by demolition, removal, or development. Many coal patches have been demolished for tax purposes or for strip mining while others were sold to real estate speculators.

Iron and Steel Industries

Description. Because it was physically difficult and cost-prohibitive to ship heavy iron products over the mountains from the East, and because western Pennsylvania had an abundance of iron ore, limestone, and forested land for charcoal production, the development of an early iron industry in this area was inevitable. Iron and steel production has been one of the largest and most important industries in the Mon River valley since the early 18th century. At that time ironworks settlements came into existence, consisting of "plantations" encompassing an owner's large house, workers' cabins, forges, orchards, stores, and blast furnaces that produced strips and bars for use by blacksmiths.

Along the Cheat River, a tributary of the Monongahela located mainly in West Virginia, an iron industry of national significance thrived from the 1790s to the 1850s. The Cheat area supplied much of the iron used by the nation's growing industrial areas as well as weapons and munitions for the War of 1812. Capitalists in Wheeling, West Virginia, supported several Cheat operations, and preliminary research has shown that Cheat iron was probably shipped to Pittsburgh and Wheeling via the Monongahela and Ohio rivers. This iron industry peaked during the 1840s but faded after the discovery of the Lake Superior ore beds.

The success sustained by Pennsylvania's early ironworks encouraged the growth of related business operations; the first nail factory in the area was constructed at Brownsville prior to 1800. In 1832 the Wheeling area, which was the terminus of the National Road and had access to local coal supplies and Mississippi River basin markets, developed a rolling mill business.

Iron was produced using charcoal for fuel until the 1830s and 1840s. The advent of railroads, which used miles and miles of iron and later steel rail, emphasized the need for a cheaper fuel source. By the 1850s, exploitation of the superior and seemingly inexhaustible coal deposits in the Connellsville region of Fayette and Westmoreland counties for the manufacture of coke had begun. From that time on, iron furnaces were built or refurbished exclusively for the manufacture of iron using coke.

Although steel activity was still limited in 1860 and the market for that product relatively small, after the Civil War demand arose for large quantities of cheap iron for use in manufacturing. Two temporary influences directed much of the steel development of the 19th century: the increased demand for rails and use of the Bessemer converter. The introduction of the Bessemer steel production process from England in the 1860s and the installation of Bessemer converters made the large-scale commercial production of steel possible and

resulted in the secure establishment of the American steel industry.

The continuing growth of the coke industry caused a shift to urban iron and steel production because coke traveled easily and allowed manufacturers to locate in transportation centers rather than near the source of raw materials. An integrated iron and steel industry grew, with manufacture concentrated in fewer, larger units and in major producing districts. This move resulted in construction of the rolling mills, foundries, machine shops, and engine shops of Pittsburgh, which became the dominant center of the Pennsylvania steel industry.

The southwestern Pennsylvania iron and steel mills concentrated along the Mon River, where water was easily available to meet production needs. Railways were laid along the riverbanks where lower grades allowed for the easy transport of raw materials and finished products. The rivers provided an even lower-cost transportation system, enabling industrialists to economically import coal, coke, and limestone from the mines and quarries and transport finished steel by barge to New Orleans and the Gulf Coast. This constant movement back and forth resulted in heavier traffic on the Mon than on any other river in the country.

Between 1860 and 1900, the iron and steel industries underwent tremendous growth facilitated by massive technological change motivated by the needs of seven principal iron- and steel-consuming industries: railroads, machinery, construction, shipbuilding, agriculture, oil and gas, and containers. By 1870, because of the dynamic growth of the iron and steel industry in southwestern Pennsylvania, local iron ore deposits had become too small to satisfy production needs. Manufacturers then turned to the abundant, high-quality ore deposits in Michigan. That state became the leading producer of iron ore, which was transported by water from the Lake Superior region to Pittsburgh and the Mon Valley for smelting and conversion into iron and steel.

Pittsburgh contained numerous iron and steel plants. The founding date of one of the earliest firms, which evolved into the Jones & Laughlin Steel Corporation, is not known, but the company purchased a tract of land in Pittsburgh in 1853 near the south bank of the Mon River on which it constructed an ironworks. Prospering in the production of small iron products, the plant, eventually called the American Iron Works, acquired property across the river on which it built the Eliza blast furnaces and beehive coke ovens. At first pig iron produced at the furnaces was carried by barge to the American Iron Works; after 1877 railroad cars transported it across a specially designed bridge.

As the demand for steel rails began increasing in 1879, several Pittsburgh steel manufacturers had trouble obtaining steel from the Bessemer steelmakers. Forming the Pittsburgh Bessemer Steel Company, they built a plant at Homestead to make Bessemer steel for their own use. Andrew Carnegie bought these works in 1883. The same men who built the Homestead plant attempted to again enter the Bessemer field by organizing the Allegheny Bessemer Steel Company and opening a new plant at Duquesne in 1889.

This plant competed with the Carnegie Steel Company's Edgar Thomson Works, which had opened at Braddock in 1875. Andrew Carnegie was the mainstay of the Pittsburgh area. His Carnegie Steel Company became the leader in the field of basic steel production with all its manufacturing properties concentrated in the Pittsburgh region. The Edgar Thomson plant was Carnegie's first successful venture into Bessemer steel production and Pittsburgh's first venture into the rolling of steel rails. In 1890 Carnegie also acquired the Duquesne plant, which provided him with three large plants in the Pittsburgh area.

Steel works were built upriver from Pittsburgh along both the Mon and Allegheny rivers, with the biggest works along the former due to the greater availability of large sites. Major new plants within the city boundary, such as Homestead and Duquesne, were placed on large river meanders. Success and ensuing growth extended them along the riverfront until residential buildings, railroad yards, or encroaching cliffs blocked the way. In the 1890s the process continued, from Duquesne upriver to McKeesport and then, in 1901, to the integrated works at Clairton, which were acquired by U.S. Steel in 1904.

From there construction extended beyond the Allegheny County line, the Pittsburgh Steel Company beginning development at Monessen in 1902 and the Donora works starting in 1905. Expansion and the later need to build open-hearth steel plants, which had greater space requirements than Bessemer shops, began to fill up the remaining flat areas. By 1906 the area bounded by Charleroi on the Mon River, by Kittanning on the Allegheny, and by Beaver Falls on the Ohio River contained 253 separate iron and steel plants.

Neighboring areas had also entered into iron and steel production. By 1862 Wheeling contained several large rolling mills, three nail works, and foundries. Antecedents of the Wheeling Steel Company go back to 1832, when the Wheeling Iron Works, known as the Top Mill, was established. It was followed by the Virginia Mill and the La Belle Iron Works. After the Civil War, the prominence of Wheeling's rolling mills in the nail trade gave the town the title of "Nail City." Wheeling lost its preeminence in this field during an 1885-86 labor dispute centering around the transition from iron to steel and also because of the decline in cut nail production. Wheeling's access to markets and its lack of raw materials made it logical to concentrate on specialized finished products, which by 1900 included sheets, tin plate, and pipe.

In the early 1900s, Weirton Steel on the Ohio River between Wheeling and Pittsburgh gained a foothold in the production of sheet and tinplate. By 1920 it had numerous mills, a blast furnace, a melting shop, and a blooming mill. In 1929 the M.A. Hanna Company of Cleveland, the Great Lakes Steel Corporation of Detroit, and the Weirton Steel Company merged as the National Steel Company.

Into the 1890s the iron and steel industry was comprised of many small firms that bought their raw materials in the open market and used independently owned mines and transportation facilities. New factors, including technology and business needs, changed that situation beginning at the turn of the century. The new integrated plants containing smelting, steelmaking, and rolling operations required larger quantities of coal, coke, and iron ore, which made control of those materials attractive. A different and more efficient type of corporate organization and industrial structure was required for such a huge commitment of capital. The organization of the U.S. Steel Corporation in 1901, an attempt to bring a large part of the industry under single management, was considered a daring venture for its time. Never had so many large companies been drawn into one unified operation, making U.S. Steel the largest corporation in America. It and later mergers became the models for large-scale integrated business organizations in the United States.

Steel manufacturing also became the focus of some of the nation's major labor/management battles, culminating in the Homestead Strike of 1892 in which Andrew Carnegie's forces defeated the Amalgamated Association of Iron and Steel Workers. The union withdrew from that plant, and the Carnegie Company proceeded to eliminate the union from all its plants, as did other companies in the Pittsburgh district. This outcome began a period of nonunion labor in the American steel industry that lasted until the 1930s.

From 1900 to 1920, many basic changes took place in steel production. During this time, the by-product coke oven replaced the beehive oven as the principal source of blast furnace coke in the United States. The Bessemer steel production process remained important until the 1890s. During the first two decades of the 20th century, however, rapid developments brought about a transition in steel making from the Bessemer converter to the open-hearth furnace as the principal means of melting steel.

The first 20 years of this century also witnessed the rise of electricity from a virtually unused form of energy to the dominant motor force in the manufacture of steel, replacing steam as the power source for mills. Carnegie Steel was the innovator in this last movement, installing electric arc lighting at the Edgar Thomson Works in 1882 and direct current motors at the same plant in 1891 and at Homestead a year later. Perhaps the biggest breakthrough was U.S. Steel Corporation's new Gary, Indiana, plant specifically built around the concept of electrification in 1908. Also during this 20-year period, a structural change in the industry occurred when new emphasis was placed on consumer goods such as automobiles and electric appliances, especially refrigerators, gas cooking stoves, and washing machines, that required steel sheets. At the same time a shift occurred in the geographic concentration of facilities as Chicago and the South became more significant in steel output.

Between 1920 and 1930, the Pittsburgh District continued to be a strong factor in the steel industry, mainly because both Carnegie Steel and Jones & Laughlin had started there and added to existing plants rather than moving elsewhere. (As defined by the American Iron and Steel Institute, this district includes Wheeling and other upper Ohio Valley operations.) During the 1920s, however, Carnegie Steel did dismantle or at least abandon some of its plants, including its Lower Union Works in Pittsburgh and its plant at Monessen.

In the 1930s, contraction and depression followed the stock market crash. In 1936 U.S. Steel built a new mill, the Irvin Works, at Dravosburg west of McKeesport. This is currently the world's major appliance steel mill. Because no suitable plant sites were available on the Mon River, the Irvin Works was built, after extensive leveling and filling activities, on the plateau top above the river. At the end of the decade, the steel industry began gearing up for WW II. During the war years, new plants commenced operation in western states due to the fear of invasion of the East Coast. These plants made plates for the West Coast shipbuilding industry and produced some structural steel.

The 25 years after WW II witnessed many changes in raw materials, technology, markets, and corporate organization. During that time more ore was obtained from foreign countries, while technological breakthroughs included adoption of the basic oxygen process for steel making. Growth expanded because of the postwar demand for autos, appliances, new railroad equipment, and construction materials. In addition to modernization of the steel industry in the Midwest in the postwar years, considerable activity in the western and southeastern sections of the country continued.

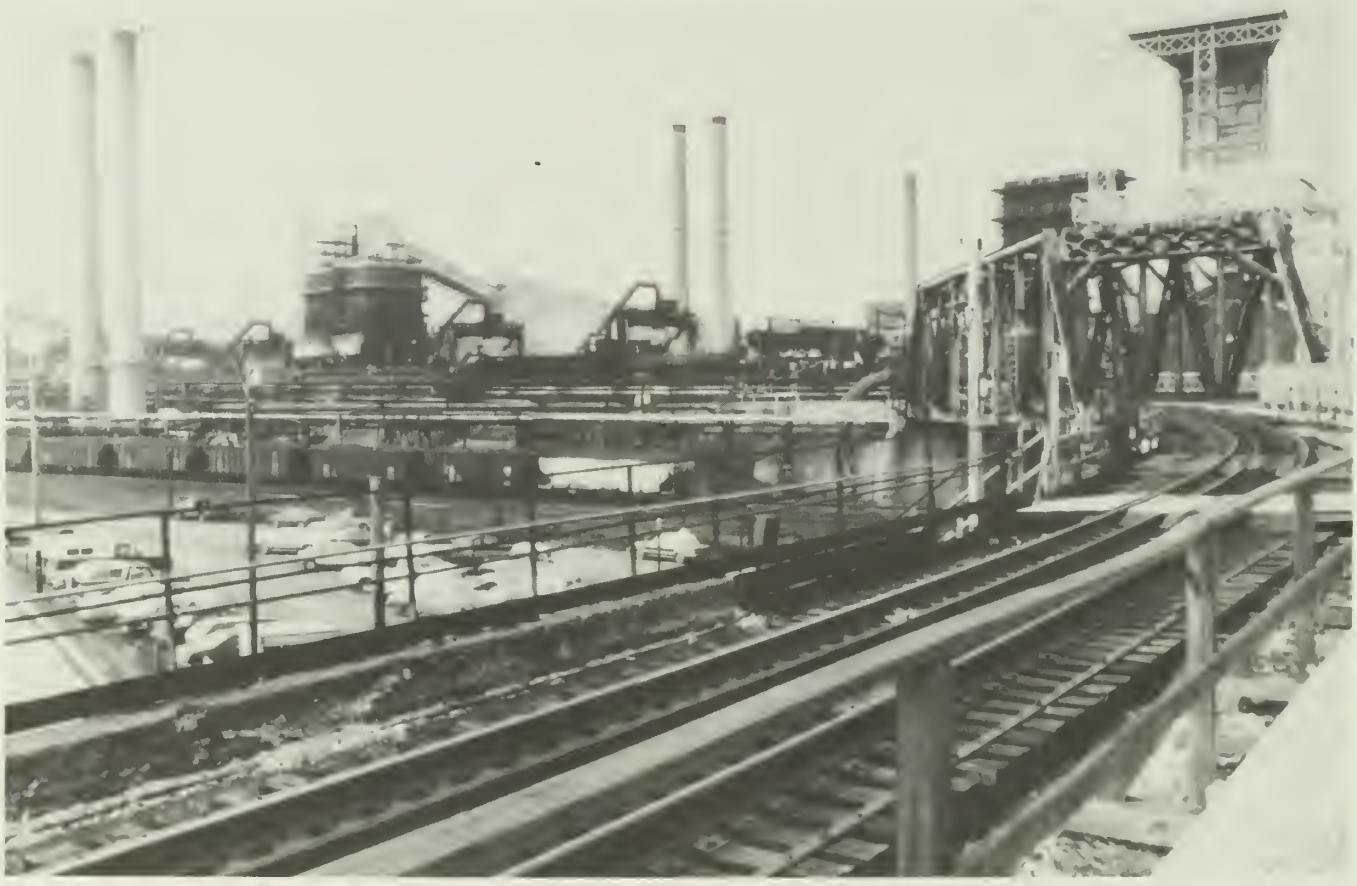
The iron and steel industry remained strong through the mid-20th century. A new generation of furnaces was born with the installation in 1943 of two defense plant corporation units at the Edgar Thomson Works of U.S. Steel. From 1946 to 1970, developments in blast furnaces were related to production, process, and equipment. Since WW II, however, there has been a marked decline of activity in the Pittsburgh District and the region due to technological changes and a decreased reliance on local fuels. This has resulted in the spread of steel mills to other sections of the country closer to

markets in the Midwest and on the West Coast. Continuing development of new sources of iron ore outside the United States has also hurt Pennsylvania's position.

In 1970 U.S. Steel operated the following plants in the Pittsburgh area. They are in various stages of operation today.

Clairton Works – Originally built during 1901-03 by the St. Clair Steel Company of the Crucible Steel Company of America, it was purchased by the U.S. Steel Corporation and leased to the Carnegie Steel Company in 1904. Portions of it still operate today. Adjacent to the north end of the steel works is the Clairton By-Product Coke Works, whose original plant was constructed in 1918. It converts about 8 million tons per year of high grade metallurgical coal into 5-1/2 million tons of furnace coke that is shipped to steel plants.

Edgar Thomson-Irvin Works – Edgar Thomson, Andrew Carnegie's first successful Bessemer steel venture, is probably the most historically significant of the steel plants along the Mon River. By introducing cheap, high-volume steel to the region, this plant marked the end of small-scale, craft-oriented iron and steel manufacture and the beginning of the Pittsburgh area's century-long dominance of high-tonnage steel production. Edgar Thomson produces steel slabs that are finished into sheet products at the Irvin plant. The latter is a finishing mill that has been gaining fame as the world's major appliance steel



Clairton Works, Coke Plant, Clairton, Pennsylvania

mill. Included in this operation is a specialty steel finishing facility for electrical sheet steels at Vandergrift.

Homestead Works – A fully integrated operation, it underwent the nation's largest wartime expansion of an existing steel plant during WW II. On the banks of the Mon River across from the Homestead plant is the Carrie Blast Furnace Division. Begun in 1883, the operation was purchased by the Carnegie interests in 1898. The new owners installed two more blast furnaces, ore storage yards, and three ore bridges. A "Hot Metal Bridge" was erected over the Mon River in 1900 to facilitate the movement of pig iron from the plant to the Homestead mill. U.S. Steel disposed of the Homestead Works and the Carrie Furnaces in 1987. The new owner, the Park Corporation of Cleveland, Ohio, has demolished many potentially nationally significant structures and steel-making equipment.

National-Duquesne Works – This complex comprised the National Tube plant at McKeesport and the Duquesne plant. The National plant had blast furnaces and pipe mills, while Duquesne contributed furnaces and steel-producing facilities. The Duquesne plant has been abandoned and is being torn down for scrap.

The LTV Steel Jones & Laughlin Southside Plant is being demolished for scrap metal, although the coke plant is still in use.

Since the 1970s, competition from foreign producers has been a contributing factor to the closure or consolidation of steel mills in the Mon River valley. The decline of the steel industry in the Pittsburgh area has, however, generated an interest in preserving the industrial and ethnic heritage of this activity in terms of both physical remains and the more elusive cultural aspects.

Significance. The history of the iron and steel industries nationwide is fascinating and complex, involving the creation and merger of numerous companies and a continuing evolution of equipment and production processes. Within this context, no other state achieved the dominance in iron and steel production that Pennsylvania enjoyed during the late 19th and early 20th centuries. The Pittsburgh area was a significant steel center from 1870 to WW II.

In Fayette and Westmoreland counties, HAER has inventoried and evaluated numerous ironworks and sites containing deteriorating stone iron furnaces and associated structures, forges, company housing, and occasionally an ironmaster's house or complex. Because of their role in the development of early iron production; their architectural qualities; and the information they can provide on iron furnace construction and its evolving styles and technological processes and on plantation layouts and settlement patterns, these structures are potentially eligible for listing in the National Register.

The Allegheny County steel mills undoubtedly have potential for National Register listing because of their connection with the growth and development of the American iron and steel industries and the American labor movement. Due to closures and abandonment, however, the integrity of these mills has been severely compromised through demolition and natural decay. The HAER, which has surveyed and evaluated some of these steel-making resources, reports that there appear to be extant individual components of these complexes that illustrate specific aspects of this nationally significant industry.

The HAER found historically significant pieces of equipment and buildings surviving at three of the four steel mills surveyed. At Homestead Works, the HAER team found the last known surviving steam-powered universal plate mill in the United States, installed in

1899. It also found a 1903 armor forging press, the only extant example of turn-of-the-century, heavy steel-forging technology. Carrie Furnaces 6 and 7, built in 1907, are examples of the more modern blast furnace layout design that paired furnaces. Although the activities at the Homestead Steel Works and Carrie Furnaces were considered historically significant on local, regional, and national levels – in connection with iron and steel technology; national defense; and labor, corporate, and social history – recent demolition efforts have seriously compromised the integrity of many of their physical components, detracting from their educational and interpretive value.

The National Works at McKeesport is notable for its large buildings and pipe-making machinery. The main pipe mill, erected in 1906, was considered the largest mill building in the world for 20 years. It also houses two of the few remaining production lines in the United States employing original seamless pipemaking technology. The complex also contains an excellent Bessemer blowing room, built in 1930. No definitive determinations of significance have been made for this site.

The Duquesne Works is the site of numerous technological innovations in the steel industry, several of which still stand. The Duquesne blast furnace plant, built in 1896, was the first iron and steel complex in the nation to employ an iron ore yard complete with ore bridges for transporting and storing iron ore. Labeled the "Duquesne Revolution," this was the earliest use of automatic raw material handling, storage, and delivery. This process was incorporated into the design of all subsequent blast furnaces in the Mon Valley and the nation, and comprised another significant Mon Valley development helping American manufacturers become world leaders in iron and steel production by the turn of the century. No definitive determinations of significance have been made for this site.

Resource Threats. Remains of the early iron industry exist in the form of furnaces, forges, and iron plantations. Many of these abandoned resources suffer from overgrowth, demolition, and neglect leading to the collapse of foundations, walls, and stacks. Abandoned steel plants are under immediate threat of extinction to make way for new development or at the minimum are susceptible to loss of both interior and exterior integrity as a result of conversion to uses incompatible with their historical use and features. Original equipment of historical and technological significance remaining in abandoned complexes will be sold for scrap. Such equipment in plants still in operation are periodically subject to modernization or removal as a result of changing technology. Industrial steel plant sites along the Mon River are subject to development for recreational or commercial uses.

Aluminum Industry

Description. In 1886 Charles Martin Hall discovered an electrolytic process for producing aluminum from its oxide, alumina. Coincidentally, Frenchman Paul T. Heroult identified the same process at the same time. Obtaining funding from a small group of investors led by Captain Alfred E. Hunt, Hall founded a pilot plant, the Pittsburgh Reduction Company, in 1888 to exploit the process. Initially the effort was difficult. The company not only had to raise large amounts of capital, solve technological problems, and train a work force to handle the new process, but also had to develop markets for what was considered a "novelty" product. As the business expanded, the company built a new plant along the Allegheny River in Westmoreland County with financial backing from the Thomas Mellon family. Aluminum was first smelted at this New Kensington plant in 1891.

In 1907 the Pittsburgh Reduction Company became the Aluminum Company of America. By 1909 Alcoa had achieved a position of

Alcoa Laboratory, Ca. 1930. Courtesy: Aluminum Company of America

Alcoa Aluminum, New Kensington, Pennsylvania. Courtesy: Aluminum Company of America

superiority in the production of primary aluminum. Corporate headquarters moved to Pittsburgh in 1912, although New Kensington remained the operational center. Up to about 1915, aluminum was used primarily in the manufacture of automobiles, kitchen utensils, and conductors, and in steel deoxidizing.

In 1917 Dr. Francis C. Frary took charge of a new Alcoa Research Bureau, which joined the ranks of refineries, smelters, and fabricating plants. This bureau, to be composed of world-class people involved in developing the fundamental knowledge of aluminum production, was joined to a Technical Direction Bureau in the Engineering Division, housed in the Clock House building of the New Kensington Works. This joint research and development organization made significant advances over the next decade in aluminum technology and brought Alcoa into the mainstream of industrial research and development. The research and development group was ultimately reorganized as the Aluminum Research Laboratories and housed in a new facility on a hill overlooking the New Kensington Works.

The military applications of this light and durable metal became apparent during WW I. After the war, consumption continued to rise due to the development of new alloys, new coatings, and new applications. By the 1920s, Alcoa was a member of the core group of large, complex operations at the center of the American economy.

A spectacular growth period in aluminum production and consumption began in the early 1940s when WW II stimulated an increase in the demand for aluminum for armaments and military equipment. Alcoa retained a monopoly on aluminum production until 1945, when its powerful monopoly status conflicted with U.S. antitrust laws. A landmark 1945 legal decision cleared the way for an oligopolistic marketplace in the aluminum industry through the sale of government aluminum-producing facilities after the war to other interested parties. The major competitors to Alcoa created by this action were Reynolds Metals, founded in 1928 by R.S. Reynolds, and Permanente Metals (predecessor to Kaiser Aluminum & Chemical Corp.), founded by Henry J. Kaiser in 1946. The postwar aluminum industry consisted of three vertically integrated primary producers, all of whom were listed among the largest firms in the American economy by the 1950s.

Aluminum's golden years spanned the period from WW II to the early 1970s, when producers became excited about "covering the world in aluminum." The rapid expansion of consumer goods helped create this surge in demand, as did the appearance of two new markets in the 1950s and 1960s – residential siding and aluminum cans. Definite progress in alloy technology has also occurred since 1950. In 1971 Alcoa's New Kensington Works was closed, with most work concentrating in the Alcoa Laboratories operating at the Alcoa Technical Center in Upper Burrell Township and at the Laboratory in New Kensington.

In the early 1980s, Alcoa was expanding its international resource base and cultivating new markets. One of the edges keeping Alcoa successful has been its ongoing research and development program that has paved the way for new products and processes. Today its personnel comprise the largest research and development organization in the metals industry, and the company is concentrating on being a high technology manufacturer of advanced materials such as high-strength aerospace alloys. It is also capitalizing on the sharing of information, hardware, and systems.

Originally a small entrepreneurial venture, Alcoa solved many of its problems and attained large-scale growth by (1) reinvesting its earnings; (2) enhancing its in-house research and engineering capabilities; (3) implementing technological innovations and economies that reduced costs, improved

efficiency, and made aluminum competitive with other materials; and (4) acquiring other components needed for its operations through backward integration into mining, refining, power generation, and transportation, and vertical integration into the production, marketing, and distribution of products.

By changing its organization as necessary to cope with increasing scale, Alcoa became a complex corporate bureaucracy, managing to sustain its North American monopoly in primary aluminum production long after its original patents expired in 1909. By 1920 the company was so large, well integrated, competent in its technology, and generally self-sufficient that it continued to maintain its dominant position until the political and economic events of WW II enabled competition to start.

Significance. Aluminum has become one of the world's most widely used industrial metals, an essential component of all major industrial sectors. The history of the rise and development of the American aluminum industry up to WW II centers in the Pittsburgh/New Kensington area, which was its birthplace. The Hall-Heroult process of aluminum smelting perfected by the Aluminum Company of America (Alcoa) remains the basis of the entire industry. Alcoa not only pioneered the processes of aluminum production but also researched and developed innovative techniques for refining, fabricating, and marketing the new product. Alcoa has played a dominant role in American economic history, dictated by the special nature of aluminum and its markets, technology, circumstances, and leadership. Alcoa has proven able to meet the challenges of its political and social environment, the vagaries of the marketplace, its responsibilities to labor occasioned by the rise of national industrial aluminum unions, and changing technology. It has evolved into one of the nation's largest and most successful business corporations. In his book entitled *From Monopoly to Competition: The Transformations of Alcoa, 1888-1986*, George Smith states that "aside from the telephone, there was no technology that had been as successfully parlayed into one firm's dominance of a business for so long a time" (Smith 1988).

Part of the aluminum story's significance in the study area lies in the fact that physical remains exist from the earliest company operations that have integrity and interpretive value. These include, in Pittsburgh, the site of the 1886 Pittsburgh Reduction Company smelter on Smallman Street, and in New Kensington ("Aluminum City"), the 1890-1971 plant along the Allegheny River (present industrial park), the old Wearever plant (present Kensington Arms Apartments), the Alcoa Center that served as a dormitory for bachelor workers (present School of Nursing), the 1929 Aluminum Research Laboratories complex in which the first aluminum research in the United States was performed, and the "Alcoa Row" of fine houses.

These remains of the early aluminum industry in Pittsburgh and New Kensington are of national significance because they are associated with a significant industrial activity and because they retain characteristics of factory architecture unique to a specific aspect of American industry – aluminum production.

Resource Threats. Remains of the early aluminum industry that illustrate its growth and development are fairly well protected because many of them have been converted to other uses. Although the interiors have been altered, their exterior appearances appear to retain integrity. The 1891 New Kensington manufacturing plant by the Allegheny River, which illustrates the old sawtooth roof style of the turn of the century, is now part of an industrial park and susceptible to alteration or demolition. The 1929 research laboratory, which contains

exciting interpretive items such as Charles Martin Hall's original office with some of its furnishings and beautiful examples of aluminum trim and architectural details, is for sale. This leaves its future in uncertainty and its significant historical features in jeopardy.

Roads and Trails

Description. Transportation across southwestern Pennsylvania was first provided by Indian paths, the most prominent of which were the Catawba Path, a major north-south route passing in Pennsylvania through Laurelville, Connellsville, Uniontown, and Smithfield; the Warrior's Path, which left the Catawba Path at Smithfield and passed through New Geneva and west into Greene County and West Virginia; Nemacolin's Trail, stretching from Cumberland, Maryland, to the forks of the Ohio; and the Redstone Path to Brownsville, which had two branches, one leading from Nemacolin's Path through Uniontown, the other leaving Nemacolin's at Mount Braddock and running through Bute to the Brier Hill area. During the French and Indian War, military roads replaced these trails. Some of the most significant of these early trails and roads are described below.

Nemacolin's Trail served as the first established route from Cumberland, Maryland, west. Blazed along existing Indian trails in 1751 by Delaware Indian Nemacolin for Capt. Thomas Cresap, an organizer of the Ohio Company (formed in 1748 by English and Virginia land speculators to encourage settlement in western Pennsylvania), the narrow path connected the Potomac River at Cumberland with the Ohio River near present Pittsburgh. The most important early passage to the Ohio Valley, it was the basic route of Braddock's Road and the predecessor, through the Allegheny Mountains, of the National Road. George Washington followed it to Fort Necessity in 1754 as did General Braddock en route to Fort Duquesne the next year.

Braddock's Road connected the Potomac River at Cumberland with the Mon River at Turtle Creek just south of present Pittsburgh. This route, built by troops under British Maj. Gen. Edward Braddock in 1755 to carry infantry and supply wagons en route to capture Fort Duquesne from the French, widened and extended Nemacolin's Trail. Braddock's army was ambushed and routed and the general killed. Present Braddock, Pennsylvania, near Pittsburgh, marks the end of this road, which was never more than a slash through the forest. It was used, however, as a main thoroughfare until 1818 when it was supplanted by the National Road. Few sections of the original road are visible.

Forbes Road was originally opened during the French and Indian War. In 1758 Gen. John Forbes, commander of British forces in America, completed a road west to Fort Duquesne in an attempt to attack the French, who avoided conflict by burning and abandoning the fort. This road partially followed an earlier wagon trail across central Pennsylvania opened about 1755 by James Burd in support of the Braddock campaign, but Forbes continued it farther west to the area of Fort Ligonier. In 1759 the English pushed the road through to the present site of Pittsburgh. Today this early military road's approximate right-of-way survives as US 30, or the Lincoln Highway. Traces of the old road remain in Westmoreland County.

The *National Road* was authorized by President Thomas Jefferson in 1806 to stretch from Cumberland, Maryland, to the state of Ohio. This "highway to the west" was the first government-sponsored road constructed in the United States. Originating at the headwaters of the Potomac River at Cumberland, Maryland, it climbed west through the Appalachian Mountains to Brownsville, long the embarkation point for pioneers heading on flatboats or steamboats for Ohio and Kentucky. Because of Wheeling's importance as a crossroads and

National Road marker near Centreville, Pennsylvania

Henry Clay's influence, Congress ultimately chose Wheeling, on the Ohio River, as the terminus of the National Road. The road was completed to Wheeling in 1818; from there, emigrants could embark on flatboats down the Ohio or cross the river by ferry and continue west.

The road immediately became a well-traveled highway with stagecoaches carrying passengers and mail and Conestoga wagons carrying freight to transfer to steamboats on the Ohio River. The road carried farm products to the East and transported manufactured and imported goods to the West, helping tie the Middle West to the East economically as well as politically. In 1831, in an effort to secure regular maintenance, the government turned jurisdiction of the road over to the individual states through which it passed. Pennsylvania then constructed six toll houses on the road and placed cast-iron markers along the route. Completion of the Pennsylvania Railroad to Pittsburgh in 1852 proved to be the National Road's undoing,

Wheeling Suspension Bridge. The National Road, US 40. Wheeling, West Virginia

and it fell into disuse and disrepair. In the 1920s it became part of the National Old Trails Road, and after WW II, it was absorbed into US 40, running coast to coast. Numerous small sections of this road deviate from US 40 because of efforts to streamline the highway. In some rural areas, abandoned sections of the old roadbed are buried beneath lawns and fields. In other places, road segments are traceable as cleared depressions.

Significance. Early Indian paths and trails originated for purposes of overland travel, hunting, communication with other Indian groups, and intervillage trade. Any existing segments of these routes would be locally significant as rare remaining vestiges of the early Indian inhabitants of southwestern Pennsylvania and as examples of early transportation networks. Authentic sections are difficult to discern today because of inroads by modern highway construction and natural deterioration. The search for early trail scars and associated Indian artifacts remains a potential subject for archeological survey and evaluation.

Nemacolin's Trail and Braddock's and Forbes roads were all important early military routes of travel, facilitating the British and Colonial victory over the French for possession of the Ohio River valley. Identifiable remains of Nemacolin's Trail would be hard to authenticate. US 40 followed much of the Braddock Road route in the 20th century. Other portions of the original road are abandoned, with only a few section still visible. These also are locally significant remains associated with the development of early westward trails and American military affairs. The approximately right-of-way of Forbes Road survives as US 30, or the transcontinental Lincoln Highway.

The significance of the National Road lies in its conception as a road for a national purposes – to enable communication and contact with a potentially troublesome frontier area and to provide for more efficient transportation of goods to market. The road is considered to be of national significance in the areas of transportation, construction and engineering, and political and social events. Remains associated with that early route – stone and iron mile, bridges and other structural features, taverns, tollhouses, Madonna of the Trail statues, and the National Road-Zane Grey Museum east of Zanesville, Ohio – are part of this nationally significant corridor and of major importance in telling the story of westward migration and the initiation of overland commerce. The *Fort Necessity National Battlefield General Management Plan* recognized the National Road corridor as a potentially significant resource.

Brownsville, Pennsylvania, is significant as the point where historically travelers had changed from Conestoga wagons to flatboats to ride down the Mon and Ohio rivers. This activity made Brownsville Pittsburgh's major rival as the river gateway to the West.

Resource Threats. Many early Indian trails in the study area have disappeared as a result of highway construction, intensive cultivation, mining, and commercial and industrial development. Many sections of those trails that evolved into frontier roads have been incorporated into modern highway rights-of-way. Some early structural features that delineate old routes, such as bridges, culverts, and roadbed depressions, can still be found in isolated areas. Remnants of some early roads still function as spurs of major roads, but are not protected. Significant resources along the old National Road route are subject to neglect and decay, while the road (US 40) itself is undergoing improvements in some segments. Encroaching vegetation, construction, and subdivision development around major communities makes these early road sections difficult to locate.

Bridges

Description. A network of roads crisscrossed Pennsylvania by 1812, but most of them were impassable much of the time. Several wooden bridges had to be built over streams, and low places were filled with logs. Travel in winter or spring involved a never-ending battle with muddy, rutted roads. Pennsylvania served as a leader in the construction of artificial roads, with turnpike companies established to finance road construction. These roads have been improved over the years, but many covered bridges remain today. In addition, a large number of architecturally significant stone, cast-iron, and steel bridges may be found throughout the study area.

Significance. In several Pennsylvania counties, remaining covered bridges have become local monuments. They are found in Washington, Greene, and Westmoreland counties and are significant in the areas of architecture and transportation. Many are listed in the National Register. Several stone, cast-iron, and steel bridges are also listed in the National Register, some of which have been designated national historic landmarks (see appendix B).

Resource Threats. Although the significance of most of these structures has been recognized and has resulted in preservation efforts, this type of resource is always susceptible to floods, fire, and alteration. Early stone bridges on the National Road are threatened by neglect and natural deterioration.

Canals and Railroads

Description. Both canals and railroads were important parts of a transportation revolution that stimulated commercial growth and agricultural development and expanded mining and industrial activities in Pennsylvania in the pre-Civil War era.

Between the 1820s and 1840s, state and private interests created a system of canals, two of the most important being the Schuylkill Navigation Canal (1827) and the Main Line Canal (1834), which led to the Allegheny River. These waterways enabled the channeling of raw materials out of the interior to manufacturers in Pittsburgh and Philadelphia and the delivery of manufactured goods to markets in the interior and the Ohio River valley. Both canals were necessary to the economic survival of Philadelphia merchants fighting to remain competitive with their counterparts in New York and Baltimore. Pennsylvania also built more than a dozen other canals or slack-water systems across its various regions. Both canals and steamboats helped Philadelphia maintain its role as a leading East Coast port and established Pittsburgh as the most important port west of the Alleghenies and north of New Orleans during this period.

The canal system's usefulness diminished with the arrival of railroads, which developed from short lines motored by horse-drawn cars beginning in 1809 to longer systems powered by steam locomotives. By the late 1830s, tracks were being laid into Pennsylvania's anthracite coalfields, and other regional rail companies were hauling passengers and freight up the Allegheny and Youghiogheny rivers by 1860. Construction of railroad lines burgeoned after the Civil War, and by the early 20th century, almost every city and large town in Pennsylvania was linked by rail, enabling them to tap their natural resources more economically and ensuring their commercial growth.

The Pennsylvania Railroad completed a line from Philadelphia to Pittsburgh by 1852. With its several branches, it remained the principal rail line across the state, accessing many communities throughout southwestern Pennsylvania and stretching east to New York City and west to Chicago and St. Louis. In 1881 the trunk line of the Pennsylvania Railroad Company was brought to the west

River, road and rail transportation. Brownsville, Pennsylvania.

side of the Mon River at Brownsville. Other lines in southwestern Pennsylvania included the Baltimore & Ohio Railroad, this country's first trunk line railroad; the Pittsburgh and Lake Erie Railroad; the Pittsburgh & Connellsville Railroad; the Ligonier Valley Railroad; the Youghiogheny Railroad; the Allegheny Valley Railroad; the West Penn Railroad; the Pittsburgh, Westmoreland & Somerset Railroad; the Westmoreland Central Railroad; and the West Penn Railways electric road running through Scottdale, Mt. Pleasant, Latrobe, Greensburg, Jeannette, Irwin, and Trafford.

Railroads fostered the expansion of mining and manufacturing throughout Pennsylvania by ensuring inexpensive access to raw materials and markets. They also provided a connection between Pittsburgh and the iron ore range in the upper Great Lakes. Railroads were an important factor in the growth of the coal and coke industries, and were closely connected with iron and steel during the 19th century, supporting steel production through their need for durable rails.

Significance. Both its canal and railroad systems were significant aspects of early Pennsylvania transportation history. Canals offered a relatively rapid and inexpensive means of transporting freight and passengers compared to highway travel. Railroads made inroads into both highway and canal traffic. They were cheaper to construct than the latter and offered greater speed and efficiency. The development of Pennsylvania's railroad network between 1850 and 1900 was

fundamental to the industrial evolution of the state, particularly in the realms of coal mining and iron and steel production. Many canal and railroad resources exist that are significant in the history of transportation development in this country. Remnants of the canal system can be found outside the study area. Railroad systems were an extremely important part of the coal, iron, and steel industries; some resources connected with those systems have potential National Register significance.

Resource Threats. A few canal remnants remain in Pennsylvania, but not in the study area. Some railway lines are threatened through the trend of corporate merging, ultimately resulting in the abandonment of repetitive routes, some of which are historic. Railroad yards no longer needed to serve large industrial sites are recognized as valuable development sites. Continued or alternative uses of these routes as rights-of-way are subject to losing their uninterrupted connective aspect.

River Navigation

Description. The Allegheny, Mon, and the upper Ohio rivers served as the principal logistic lines for French, British, and later American military forces operating on the Ohio River basin frontier in the 18th century. During the late 18th and early 19th centuries, these waterways also served as the "gateway to the West" for pioneer immigration. As a result, the area became the birthplace of flatboat and keelboat commerce and the inland river shipbuilding industry.

Several major factors related to these uses generated an early interest in waterway improvements on the Ohio River system – the need for a more dependable military transport and supply procedure; the desire for an easier, more economical route west than those provided by overland trails and roads; and the potential for development of a prosperous inland river commercial and transport business.

The Mon River is referred to as the cradle of inland river navigation, the birthplace of numerous flatboats, keelboats, steamboats, towboats, and barges that not only transported settlers and their goods to western settlements but also pursued an active commercial trade, carrying cash products from farmers in the area to the growing markets of the West. The Mon, Allegheny, and Beaver rivers and their tributaries, and the upper Ohio River eventually carried the greatest waterborne commerce of any inland river system in the United States, promoting the growth of that region in the 19th century and ensuring its prosperity.

In 1811 the river steamboat *The New Orleans* left Pittsburgh and revolutionized use of the Ohio River. Steamboats became responsible for opening the markets of the Ohio River and lower Mississippi River valleys to Pittsburgh's business community. The creation of an efficient, long distance, bulk transport system was soon regarded as essential to the further development of the Pittsburgh area as the industrial center of the new nation. In 1824, therefore, Congress directed the U.S. Army Corps of Engineers to improve Ohio River navigation from its headwaters to its mouth. Improved navigation would not only contribute directly to national defense needs, but also ensure fewer interruptions of commercial activity along the river.

Because of its position in the Three Rivers area, where the Allegheny and Monongahela rivers converge to form the Ohio, and its growing status as an industrial center, it was natural that improvement of inland river navigation should begin at Pittsburgh. The corp's canalization of the Three Rivers area during the 19th century helped the Pittsburgh region market its manufactures and contributed to making Pittsburgh the

largest inland river port in the nation. The commercial interchange that arose between Pittsburgh and downriver markets created a community of interest within the Ohio River valley. It also built Pittsburgh's industrial might. Navigation improvements fostered the region's industrial specialization, enabling Pittsburgh to concentrate on iron and steel manufacturing because it could market its products in New Orleans and beyond and import raw materials by river and rail. This became the place where innovations in marine design and water resource engineering were devised and implemented, the Corps' experiments and experiences there serving as models for similar efforts on inland river systems throughout the country. Here in their headwaters district, army engineers undertook their first experiments with waterways improvement engineering, clearing snags and constructing dams in 1824 to open river channels for reliable commerce.

In 1832 the U.S. Congress passed a resolution to improve steamboat navigation on the Mon River from Pittsburgh to the Cumberland Road at Brownsville to ensure an outlet for emigrant travel and traffic moving west on the National Road. The Monongahela Navigation Company, incorporated in 1836, was authorized to improve the river from Pittsburgh to the present West Virginia state line with a system of locks and dams.

By 1844 the river was navigable to Brownsville. In 1874 Congress approved work on the Mon in West Virginia, authorizing lock and dam #9. In 1878 Congress authorized clearing the Allegheny's channel, and in 1885 the first river lock and movable dam on the Ohio were built at Davis Island near Pittsburgh. In 1897 the federal government acquired the Monongahela's locks and dams and placed the entire river under federal control. Navigation on the Mon was not complete to Fairmont, West Virginia, until construction of locks and dam #10-15 between 1892 and 1904. Reconstruction and enlargement of the system took place between 1902 and 1932.

Lock and Dam #7, Monongahela River

New Corps Lock and Dam #8, near Point Marion, Pennsylvania.

The Corps of Engineers built a total of 15 locks and dams on the Mon River, 9 on the Allegheny River, and 13 on the Ohio River. These structures had to be constantly

modified to serve the area's growing waterborne commerce. The 37 locks and dams had declined by 1986 to 23 as a result of replacement and modernization programs.

The Mon River navigation system currently consists of nine lock and dam structures, creating a 128.7-mile slack-water system on the river. Today barges on the Mon River carry great quantities of coal and other heavy material, affording a cheap means of moving coal from Fayette County mines to the important Pittsburgh industrial district. The Youghiogheny River has also been an important commercial waterway since Connellsville began building flatboats for transporting salt, pig iron, hollow ironware, whiskey, and flour.

Significance. The Mon River navigation system is thought to have potential national significance because of its influence on the regional history of the Ohio River basin, its impact on American inland navigation systems, and its innovative design and construction techniques that served as prototypes in waterway engineering technology. There has, however, been reconstruction of locks and dams, replacement of structures at new sites, rehabilitation, and modernization of older locks, so that little of the original structures remains. Shipbuilding on the Mon was a very important industry. Resources connected to both passenger and freight transport by steamboat, flatboat, keelboat, and barge are potentially significant. Pittsburgh was one of the foremost early western construction areas for iron canal boats, ocean vessels, and river steamboats. Brownsville contains the 1814 construction and launching site of the steamboat *Enterprise*. This was the first steam-powered boat to run to New Orleans and return under its own power.

Resource Threats. The level of significance of individual components of the Mon River navigation system has not been assessed. Therefore, no comprehensive plan has been established to guide preservation/rehabilitation work. Locks and dams are therefore subject to further modernization and/or replacement.

OTHER TOPICS

Glass Industry

Description. Glassmaking has been an important western Pennsylvania industry since the late 18th century, with the area around Pittsburgh becoming the leading glassmaking district in the United States in the early 19th century. The industry began in response to the great demand in the rapidly growing settlements of the West for glass windows, bottles, and tableware. Again the Mon River played an important part in the area's industrial development. Because of the transportation advantages it offered, these early plants were located along the Ohio and its tributaries, which formed natural outlets for their products.

Isaac Craig and James O'Hara established the first glass manufacturing company (Pittsburgh Glassworks) in western Pennsylvania on the south side of the Mon River at Pittsburgh in 1795. Albert Gallatin established a second glass factory in western Pennsylvania, near New Geneva in Fayette County, about 1797. From there shipments could be sent west by way of the Mon to the Ohio River or overland to Wheeling. In 1810 Gallatin constructed a larger plant across the Mon River at Greensboro in Greene County. George Hogg started another glass company along the Mon River at Brownsville in 1828.

The industry grew steadily due to the increase in population in the West and to the advantages of water transportation systems to a growing market sheltered by the mountain barriers from eastern competition. Pittsburgh and its surrounding western counties became a national center of the glass industry. Other factories were built along the Mon River at Charleroi, Homestead, Braddock, Glassport,

Belle Vernon, and Albany, where they could take advantage of an abundance of resources needed for glass manufacture: inexpensive fuels such as coal and natural gas, high quality silica sand from the Brownsville region, and river and railroad transportation. Some unusual glass products were produced at these plants, such as lenses for seacoast lighthouses at Charleroi and eyepieces for WW I gas masks at Jeannette.

In the 19th century, developments that revolutionized the glass industry included mechanized production, perfection of a lime-soda formula, new fuel sources, a burgeoning kerosene lamp and chimney market, and the ability to transport products East by rail. By 1870 Pennsylvania had become the nation's leading glass producer. One of the most significant late 19th century developments was organization of the Pittsburgh Plate Glass Company in 1883. The first firm to make plate glass successfully, it became the world's largest producer of that product. The American Window Glass Company, which became the world's largest window glass company in the world by the 1930s, ran plants at Jeannette, Arnold, and Belle Vernon in Westmoreland County. Jeannette contained several large glass concerns producing a variety of products. On the strength of factories in Pittsburgh, Jeannette, and other western and southwestern cities, Pennsylvania dominated the American glass industry through the 20th century.

The further development of transportation had a revolutionary effect on the glass industry. In order to control markets, western Pennsylvania glassmakers needed improved transportation facilities to the West. The Mon River served to transport raw and finished products only when its water level was high. Although Pittsburgh initially served as the nucleus of western Pennsylvania commerce because of its key position on the river, after completion of the National Road to Wheeling, glassmakers in that district secured the advantage in transporting raw materials and glass manufactures because of the Ohio River's longer navigable season. Early on, therefore, glassmakers in western Pennsylvania took an active part in the movement for better transportation facilities, one of their priorities being improvement of the Mon River. Glassmakers not only worked toward the success of the Monongahela Navigation Company in 1836 but also became active in the movement for railroad construction.

Significance. Glassmaking was one of the earliest industries in western Pennsylvania, providing containers for the immediate area as well as for western migrating settlers. Pennsylvania was long preeminent in this industry, which was centered in Allegheny, Westmoreland, Washington, and Armstrong counties. Extant foundations of the first glass plant west of the Alleghenies, near New Geneva in Fayette County, is a particularly significant industrial site. Many remains of glassmaking operations along the Mon River in Charleroi, Homestead, Braddock, Glassport, Belle Vernon, and at Jeannette have possible significance in connection with American business history. Some also have potential information-yielding significance in the field of historical archeology.

Resource Threats. The significance of this industry in the commercial development of the study area is only now being assessed. Privately owned factories might be subject to demolition or rehabilitation, while any extant significant machinery and processes are always threatened by replacement or alteration. Unprotected glass manufacturing sites consisting only of foundations or subsurface remains are subject to destruction by new development activities or neglect.

Military Activities

Description. The *French and Indian War* was a decisive conflict between two major world powers – Great Britain and France – to

establish control and possession of North America. As a precursor to actual warfare, the French began building a line of forts in defense of their interests, specifically to defeat the purposes of the Ohio Company, which was making incursions into the disputed land. George Washington had recommended the strategic point at the confluence of the Allegheny and Mon rivers as a British fort site, and the Ohio Company began construction of Fort Saint George there early in 1754. The French, however, drove them off and rebuilt it as Fort Duquesne.

Preliminary skirmishes between French and British forces began after Washington had been rebuffed in his efforts to warn the French back from the Ohio country. Dispatched west again in 1754, Washington's men surprised troops from Fort Duquesne camped in a secluded rocky ravine near an open area known as Great Meadows. Washington's attack resulted in a French surrender and the death of their commander, Joseph Coulon de Villiers, Sieur de Jumonville. Preparing for retaliation from the French, Washington erected a hastily built fortification in the Great Meadows, calling it Fort Necessity. At the end of a clash there between the French, led by Jumonville's half brother, and British and colonial forces, Washington surrendered but was allowed to leave. The fort was burned. This battle was a prelude to the opening of the French and Indian War.

At news of this defeat at Fort Necessity, Great Britain placed Maj. Gen. Edward Braddock in command of all British troops in North America. Meeting the French and their Indian allies near Fort Duquesne, a three-hour battle ensued in which the British were routed and Braddock fatally wounded.

In 1757 Maj. Gen. John Forbes became commander of British forces in America. His army continued the Burd road west from Bedford, where a fort was established, to Ligonier where another fort was built. Although some of his advance troops attacking Fort Duquesne were killed, Forbes and the main body reached Fort Ligonier and advanced on Fort Duquesne, which was found deserted and burning. This enabled the British to finally control the Forks of the Ohio. Forbes named the area for William Pitt, British secretary of state, and ordered construction of a temporary fort and then of Fort Pitt itself, the largest British fortification in America, built in 1759-60. The French soon abandoned their other forts, and after several military campaigns and the fall of Quebec in 1759, the British took possession of North America.

Fort Ligonier served as an important outpost in the defense of the region. When in 1758 the British launched their major campaign under General Forbes aimed at Fort Duquesne, a series of fortifications were erected along the Forbes Road to ensure safety of the supply lines. Fort Ligonier was the last of these fortifications and was designed to serve as the springboard for the final assault. The fort withstood a major attack by a French and Indian force in October 1758. The failure of the French to take this fort contributed to their decision to abandon Fort Duquesne, giving control of the Forks of the Ohio and the Ohio River to the British. Although Forbes's expedition drove the French out of the immediate area, many of their Indian allies continued hostilities and harassed frontier settlements for several years thereafter. Ligonier was one of the forts garrisoned to keep an open line of communication to Fort Pitt. By the outbreak of the American Revolution, it had begun to fall into disrepair; Ligonier was finally abandoned in 1783.

The Battle of Bushy Run, fought in 1763 north of present Jeannette, Pennsylvania, was a British victory in an Indian attack on the colonial frontier in the 18th century referred to as "Pontiac's Conspiracy." Frontier outposts fell one by one until only Forts

Bedford, Ligonier, and Pitt held out in Pennsylvania. At Bushy Run, Col. Henry Boquet, on his way to relieve besieged Fort Pitt, confronted the Indians and won the battle by a strategic ruse.

The *Whiskey Rebellion* was a series of violent acts that occurred in southwestern Pennsylvania in 1794 in response to excise taxes passed on spirituous liquors. After the U.S. Constitution was adopted, it became necessary to support the new government and restore the nation's credit. Secretary of the Treasury Alexander Hamilton proposed an excise tax on alcohol, which was passed in 1791. This action greatly disturbed settlers in western Pennsylvania. During the Revolution, rum had become difficult to import. In response, many distilleries came into being, especially in western Pennsylvania, which became famous for the quantity and quality of its rye whiskey. After the war rye whiskey served as a form of exchange for needed goods and became the major source of cash income for the subsistence farmers of the Mon Valley. The new excise tax proposed by Hamilton would drain off the farmers' profits upon which they relied to buy farm implements and other items they could not grow or manufacture.

The farmers of western Pennsylvania regarded the law as unjust and were determined to resist the tax. Arrangements were made to organize armed resistance in Westmoreland, Fayette, Washington, and Allegheny counties. When attempts by the federal government to conciliate the dissenters failed, the Whiskey Rebellion, as this affair came to be known, threatened to become a civil war. In 1794 President George Washington called out the militia to march to Pennsylvania and enforce the law. This display of Federal force sobered the rebels and soon the rebellion was over. Washington's tough actions helped establish the prestige and authority of the government and strengthened its belief that the will of the majority should prevail.

Significance. The French and Indian War was a nationally significant aspect of the military and political history of the United States. Few resources from this event remain, which gives those extant resources a high level of interpretive value. The significance of these major sites has been recognized and appropriate preservation and interpretive activities undertaken. Fort Necessary National Battlefield, a unit of the national park system, commemorates the events surrounding the start of the French and Indian War. Reconstruction of Fort Ligonier, a major supply depot during the war, began in 1946. Sponsored by a nonprofit organization, it is located in Ligonier, Pennsylvania, and is a full-scale, on-site reconstruction of the original. Bushy Run Battlefield is preserved as a state park.

The Whiskey Rebellion was a significant test of the laws and institutions established by the U.S. Constitution and of the principle that grievances must be remedied by legal or political means (it was a contributing factor in the rise of a two-party political system). Brownsville, Pennsylvania, contains part of the original Black Horse Tavern, the site of a public meeting in 1791 that was considered to be the first public act in the Whiskey Rebellion. The last meeting of local insurgents was conducted here in 1794. Washington County contains the David Bradford House, a national historic landmark that was the home of a leading figure of the Whiskey Rebellion. Also located there is Whiskey Point, designated by a Pennsylvania Historical and Museum Commission marker. It was the scene of a 1794 Whiskey Rebellion meeting of more than 200 insurgents.

Resource Threats. The most significant sites in this study area related to the French and Indian War – Bushy Run Battlefield State Park, Fort Necessity National Battlefield, and Fort Ligonier – are currently under either private, state, or federal ownership and are being preserved and interpreted. No immediate threats are present.

The only remains of the Black Horse Tavern are incorporated within a private residence that has been completely altered and modernized. The remaining tavern stone wall is subject to removal or alteration. Any sites or structures related to the Whiskey Rebellion that are not part of a preservation plan and that are not a recognized federal or state historic property are subject to demolition or decay through neglect.

Electric Power Generation and Electrical Equipment Industries

Description. The practical generation and use of electrical power and the resultant machine industry did not begin until the late 19th century. One of the state's most significant pioneers in the electric power industry was George Westinghouse. Westinghouse was an inventor and manufacturer who, at the age of 19, invented a device for rerailing derailed freight cars. In 1869 he patented an air brake and organized the Westinghouse Air Brake Company. In 1872 he invented the automatic air brake, which was adopted by both American and European railways.

In 1886 Westinghouse developed a system of alternating current for electric power transmission in the U.S. and founded the Westinghouse Electric and Manufacturing Company in Pittsburgh. He brought the steam turbine to this country in 1895; its first successful commercial installation took place in 1899 at the Westinghouse Air Brake Company in Wilmerding, Pennsylvania. In 1905 Westinghouse brought the first electricity to steel mills; it quickly replaced steam as a cleaner, more efficient source of power.

Other important American companies founded or operated in Pennsylvania include the General Electric Corporation, Philco, and Sylvania Electric Products. These companies and others kept Pennsylvania among the top producers of electrical machinery from the late 19th through the mid-20th centuries. Today electronics manufacturing is Pennsylvania's primary high-tech industry.

Significance. The making of electrical machinery and related equipment is a highly significant industry in Pennsylvania. A number of Pennsylvanians have contributed to a better understanding of electrical science, and numerous important electrical firms have begun here. The continuing major presence in the Pittsburgh area of the Westinghouse Electric Corporation gives that industry added significance. Any early remains of electrical processes or machinery, and the plant layout itself, which was considered a prototype for such installations, should be considered significant. The status of the resources related to this topic has not yet been determined.

Resource Threats. The resources of the Westinghouse Electric Corporation and of other important electrical firms in the study area have not yet been surveyed and assessed. Continuing business operations might lead to replacement or alteration of historically significant equipment and plant layouts. The amount of rehabilitation or modernization work already accomplished in these plants is not known, making it impossible at this time to determine the extent of resource threats.

NATURAL VALUES

DESCRIPTION

The Mon River basin drains an area of 7,386 square miles in northern West Virginia, western Maryland, and southwestern Pennsylvania. The river forms by the confluence of the West Fork and Tygart Valley rivers near Fairmont, West Virginia, and flows in a northerly direction for about 129 miles before joining the Allegheny River at Pittsburgh to form the Ohio River. The two major tributaries entering the Mon River below Fairmont are the Cheat and Youghiogheny rivers. The hydrologic characteristics of the river basin have been significantly altered by a series of nine locks and dams. These, as well as four major tributary reservoirs constructed for flood control, provide for commercial navigation, low flow augmentation, recreation, and hydroelectric power generation.

The Mon River basin lies within the Appalachian Plateaus physiographic region. It is characterized by gently rolling hills and deep narrow valleys with steep slopes. The main stem of the Mon River and most of the drainage basin lie in the unglaciated Allegheny Plateaus section. This is an extensive mature plateau of moderate relief created by major rivers dissecting the plateau. On the eastern portion of the basin lies the Allegheny Mountain section, a mature upland plateau of strong relief, with greater altitudes and degree of dissection than the unglaciated Allegheny Plateaus section. Two prominent parallel ridges (anticlines), Laurel Hill and Chestnut Ridge, form the western boundary of this section in Pennsylvania and West

Monongahela River near Glassport, Pennsylvania

Virginia, respectively. Elevations of the basin range from about 4,840 feet above sea level, at the headwaters of the Cheat River in West Virginia, to about 700 feet at the mouth of the river in Pittsburgh.

Sedimentary bedrock formations in the river basin were deposited during the Paleozoic era, and consist mainly of limestone, dolomite, sandstone, and shale. Major economic mineral resources in the Mon River basin include bituminous coal, oil, natural gas and nonfuel minerals such as sand, gravel, sandstone, limestone, clay and shale. The bituminous coal deposits are the greatest mineral resource in the Mon River basin and are found primarily in strata of the later Paleozoic era. Most of the coal production comes from a small number of relatively thick coal seams – the Pittsburgh, Sewickley, Lower Kittanning, Upper Freeport, Waynesburg, and Brookville-Clarion coal beds. The concentration of these natural resources, coupled with a transportation infrastructure of navigable waterways and railroads, helped support the development and growth of heavy industry, particularly the iron and steel industries, throughout the region.

Until 1970, the Mon River system was almost devoid of fish populations except for acid-tolerant bullhead catfish. Acid mine drainage, industrial effluents, and domestic pollutants severely degraded water quality and habitat in the river basin. Recently, however, environmental controls, clean-up efforts, and reduced industrial activities in the river valley have brought about an improvement in water quality, allowing for recolonization of the river by fish and other aquatic fauna. The river now supports good populations of game and forage fish and is an intensively used fishery. Perhaps the improvement in water quality could be the principal reason. Although significant progress has been made in improving the water quality of the river, drainage from abandoned bituminous coal mining areas, particularly in the upper drainage, continues to be a major source of degradation.

The Mon River basin is within the Eastern Deciduous Forest Biome and consists mainly of three primary forest associations – mixed mesophytic forest, hemlock-white pine-northern hardwood forest, and beech maple forest. Second and third growth forest occupies much of the area, and only a few virgin forest stands remain. This is due to the earlier clearing of land by pioneers for farming and lumbering and producing charcoal, followed by extensive coal mining and industrial development. The mixed mesophytic forest is dominated by several species of trees, including beech, tuliptree, basswood, sugar maple, sweet buckeye, red oak, white oak, and hemlock. The hemlock-white pine-hardwood forest is dominated by northern red oak, basswood, sugar maple, yellow birch, beech, red maple, tuliptree, cucumber magnolia, elms, and other mesic species and hemlock. Although hemlock and the northern hardwoods tend to regenerate following disturbance, white pine has been drastically reduced to a limited role in this association. The distribution of these forest communities varies according to topography, slope orientation, and degree of incline.

Three federally listed endangered species – Indiana bat, pink mucket pearly mussel, and small-whorled pagonia – and one federally listed threatened species – the flat-spired three-toothed snail – inhabit the study area. The latter species is known to occur only in the Cheat River drainage. Three federally listed endangered species – peregrine falcon, orange-foot pimpleback, and rough pigtoe – and one federally listed threatened species – Virginia spirea – are believed to be extirpated in Pennsylvania. The federally listed endangered bald eagle is considered a transient species in the area. There are also several state species of special concern. A list of federal and state listed species and other

species of special concern is included in appendix C.

Geographic areas of high concentrations of confirmed species of special concern include the upper Youghiogheny River gorge between Confluence and Connellsville, Pennsylvania; Chestnut Ridge; Laurel Ridge; the Cheat River gorge; and Dunkard Creek. In addition to supporting four freshwater mussel species of special concern, Dunkard Creek has a high diversity of mussel species (12) in general. This is noteworthy in that studies have documented that the upper Ohio River and Mon River are lacking freshwater mussels evidently due to navigational development and water pollution since the turn of the century.

According to the Pennsylvania Natural Diversity Data Inventory and the West Virginia Natural Heritage Program, other important biological communities or geologic features identified in the area include limestone solutional caves, sphagnum moss-sedge species community, oak forest, mixed mesophytic hardwoods forest, alluvial island, waterfalls-rapids, black chokecherry thicket, high gradient clear water creek, nonglacial bog, igneous materials, and bat hibernaculum.

The Commonwealth of Pennsylvania, Bureau of Forestry, designates and manages state forest natural areas and wild areas. State natural areas are defined as areas of unique scenic, historic, geologic, or ecological value. They are maintained in a natural condition by allowing physical and biological processes to function normally and usually without direct human intervention. State wild areas are defined as extensive areas that the public is permitted to use and enjoy in pursuing activities such as hiking, hunting, and fishing, or for peace and solitude. Roaring Run Natural Area on Laurel Ridge and Quebec Run Wild Area on Chestnut Ridge, both within Forbes State Forest, lie to the east of the primary study area (see Natural and Recreational Values map).

SIGNIFICANCE

National significance denotes that a site exemplifies one of a natural region's characteristic biotic or geologic features. Using criteria for parklands established in the NPS *Management Policies*, a determination was made that a particular site represents one of the best examples of that feature known. A study entitled *A Survey of Potential Natural Landmarks of the Appalachian Plateaus Region* was prepared for the National Park Service by West Virginia University (Baer et al. 1982). The study surveyed and evaluated natural areas within the Appalachian Plateaus province for potential addition to the National Registry of Natural Landmarks based on their national significance. The study identified outstanding examples of natural history features within this province and examined the significance of each site in relationship to their representation of regional themes identified in *Natural History in the National Park System and on the National Registry of Natural Landmarks*.

Two sites, the upper Youghiogheny River Gorge and the Cheat River Gorge/Coopers Rock, were identified as potential natural landmarks in the 1982 survey. Both sites are representative landforms of river valleys (across anticlines) within the Allegheny Mountains section, and fall under the natural history themes of sculpture of the land, river systems and lakes, and eastern deciduous forest.

A 200-acre area within Ohiopyle State Park and the Youghiogheny River Gorge known as Ferncliff is listed in the National Registry of Natural Landmarks (see Natural and Recreational Values map). Second-growth mixed mesophytic forest is well represented here. In addition, it is a unique natural

NATURAL & RECREATIONAL VALUES

BROWNSVILLE/MON VALLEY RECONNAISSANCE SURVEY

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

DSC JAN 91 957 40,102

OH

PA

WV

TOMLINSON RUN STATE PARK

RACCOON CREEK STATE PARK

HILLMAN STATE PARK (PROPOSED)

NEIRTON

STEUBENVILLE

Ohio River

WASHINGTON

WHEELING

PITTSBURGH

POINT STATE PARK

NEW KENSINGTON

BRADDOCK

HOMESTEAD

McKEESPORT

KEYSTONE STATE PARK

FORBES TRAIL

CLAIRTON

Youghiogheny River

MONONGAHELA

CHARLEROI

MONESSEN

Monongahela River

BROWNSVILLE

CONNELLSVILLE

Youghiogheny River

RYERSON STATION STATE PARK

CATAWBA TRAIL

WARRIOR TRAIL

UNIONTOWN

BEAR RUN NATURE RESERVE TRAIL

FERNCLIFF PENINSULA NATURAL AREA

OHIOPYLE STATE PARK

FORBES STATE FOREST

FT NECESSITY NAT. BATTLEFIELD

FRIENDSHIP HILL NATIONAL HISTORIC SITE

QUEBEC RUN TRAIL

PA

WV

MD

Monongahela River

COOPERS ROCK STATE FOREST

MORGANTOWN

Cheat River

CUMBERLAND

FAIRMONT

Monongahela River

PRICKETTS FORT STATE PARK

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NATURAL & RECREATIONAL VALUES

BROWNSVILLE/MON VALLEY RECONNAISSANCE SURVEY

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NATIONAL PARK SERVICE

DSC JAN 91 957 40,102

habitat, supporting several plant species of special concern.

RESOURCE THREATS

The drainage basin of the Mon River degraded to its poorest condition in the 1940s. Direct discharges of wastes, acidic drainage from mine tailings, uncontrolled water diversion, and a lack of treatment plants were common during that decade of heavy industrial activity. Many of the industries that discharged into the Mon River have since closed or modified their management of wastes. Since the 1940s water quality has steadily improved; however, there are continued threats to contend with. A number of municipal and industrial discharges, including heated water from power plants, some poorly controlled agricultural and forestry practices, mining and drilling activities, and increasing demand for water supplies linger as threats to water quality and the fishery resource. The most significant threat to water quality through the northeastern United States in recent years has been acid deposition in the form of rain. Addressing the acid rain problem will need to be done on a national and regional scale, but improving the quality of the river resource at a local level is the first step in realizing the benefits.

Improvements to the Monongahela, Allegheny, and Ohio River navigation system are the responsibility of the U.S. Army Corps of Engineers. The extent and degree of impacts on natural resources associated with any modifications to the system will be addressed by that agency.

RECREATIONAL VALUES

DESCRIPTION

Most of the study area is within Pennsylvania's state uniform planning region number 10. That region provides approximately 10 percent (970,998 acres) of Pennsylvania's recreational acreage. As stated in *Pennsylvania's Recreation Plan, 1986-1990* (Commonwealth of Pennsylvania 1986), the southwestern portion of the state is undergoing change from blue collar, heavy industry jobs to high-tech occupations. The report also highlighted that program deficiencies center on artistic skills and environmental education, and that the priorities for facility rehabilitation are picnic areas, hiking trails, playgrounds, and historical areas. The need for development in order of priority was hiking trails, bicycle paths, and picnic areas.

According to the *West Virginia Statewide Comprehensive Outdoor Recreation Plan, 1988-1992* (State of West Virginia 1989), portions of the study area fall into three state planning regions. These regions comprise 11 counties in northern West Virginia and collectively hold less than 3 percent (51,200 acres) of the state's total recreation land. This figure includes local, state, and federal land holdings. The panhandle section of the state receives the highest nonresident activity participation rate. Highest needs for the region outlined in the plan focus on the development of facilities and opportunities for picnicking, festivals/concerts, horseback riding, and bicycling.

The southwestern portion of Pennsylvania is characterized by natural geographical divisions, numerous bridges, and subsequent community separations with limited public access to the river. Most recreational facilities along the Mon River are local in nature, primarily focusing on active recreational types of development. The river's lower 40 miles contains industrial development while the remainder is predominantly a mixture of rural and light commercial development.

According to the U.S. Army Corps of Engineers' 1981 *Monongahela River Navigation System, Stage 1 Study, Reconnaissance*, which encompassed the entire length of the river in both West Virginia and Pennsylvania, "concrete walls and earth, slag and rubble fills line the lower 20 miles of the river, and riparian vegetation is limited to a narrow strip along the water's edges or is absent altogether."

In addition to the local municipally developed active recreation areas, the Corps of Engineers has developed two recreation areas along the river at Pricketts Fort State Park (West Virginia) and at Tenmile Creek (Washington County, Pa.); these two sites include boat access points, sanitary facilities, and parking. There are two NPS areas within the study area – Fort Necessity National Battlefield, which offers picnicking/group camping and cross-country skiing; and Friendship Hill National Historic Site, which offers hiking, cross-country skiing, and limited picnicking.

There are five state parks in the Pennsylvania portion of the study area that comprise over 28,000 acres of land. Recreational opportunities provided at these facilities include boating, white-water boating, fishing, ice fishing, hiking, camping, swimming, ice skating, snowmobiling, cross-country skiing, sledding, tobogganing, horseback riding, hunting, and environmental education. The 3,600-acre Hillman State Park is proposed in Washington County. (Refer to Natural and Recreational Values map.)

The 49,210-acre Forbes State Forest is located in Westmoreland and Fayette counties. It offers 76 miles of roads, one wild area (4,600 acres), two natural areas (totaling 3,697 acres), 45 miles of hiking trails, 38 miles of cross-country ski trails, 65 miles of snowmobile trails, and two picnic areas.

The Pennsylvania Game Commission oversees some 85,000 acres of game lands in the

study area and makes available an additional 632,000 acres through its Farm Game, Forest Game, and Safety Zone programs for wildlife management, public hunting, trapping, hiking, and other related recreational activities.

The Pennsylvania portion of the study area has over 1,300 miles of trails, including those for hiking (600), snowmobiling (120), fast water (120), and slow water (290).

National recreation trails in the Pennsylvania portion of the study area include the Bear Run Natural Reserve National Recreation Trail (20 miles) and the Friendship Hill National Recreation Trail (5 miles); Warrior Path (Greene County) and Quebec Run (Fayette County) are other major trails in the study area (see Natural and Recreational Values map).

The Mon River navigation system is separated by nine lock and dam structures. The locks and dams regulate the channel depth to facilitate transport of coal from the middle and upper portions of the river. If coal becomes increasingly important as an alternative energy source (as suggested by the U.S. Army Corps of Engineers), mining activity adjacent to the river and commercial use of the river for transport would possibly increase. This would further decrease the river's potential for providing water-based recreational opportunities.

Recreational use of the river is increasing, due in part to improved water quality. The most recent data obtainable indicated there were 416,300 recreation days of use during 1986 at U.S. Army Corps of Engineers' projects on the Mon River. The highest visitation is at Opekiska Lock and Dam near Fairmont, West Virginia, and Maxwell Lock and Dam between Brownsville and Point Marion, Pennsylvania. Corps project sites encompass a total of 877 acres of recreation land, including picnic sites at Opekiska (10) and Maxwell (45). There are no developed campsites along the river.

Primary recreational activities along the river are power boating (50% to 70% of total recreation days) and fishing (10% to 20%). During 1986 some 9,700 recreation vessels moved through the locks on the Mon River. Between Pittsburgh and Fairmont, there were 24 private boat launch ramps, 22 public launch ramps, 28 recreation docks, and 660 berths. Demand for boating and fishing has been assessed by review of boat registrations and fishing licenses sold. Allegheny County license sales are the highest in Pennsylvania, with 92,243 sold in 1986. The Pennsylvania Fish Commission rated the river as low- to medium-quality, warm-water fishery, indicating limited to moderate populations of one or more species of legal-sized game fish.

SIGNIFICANCE

Opportunities to provide new recreational facilities on a regional scale are limited by topography, existing ownership along the river, and aesthetic character of the river. According to the *Pennsylvania Scenic Rivers Program: Scenic Rivers Inventory* (Commonwealth of Pennsylvania 1990), the Mon River is identified as a third priority scenic river, mainly due to its complete impoundment. These are rivers that exhibit "some outstanding values, yet not enough in quantity or quality to merit statewide recognition. These are primarily locally and regionally significant."

According to the *Abandoned Rail Corridor Assessment Report: Pittsburgh Metropolitan Area*, published by the Rails to Trails Foundation in 1989, two abandoned rail corridors parallel the Mon River – Rice's Landing to Smithfield and Pittsburgh to McKeesport. The railroad lines were evaluated as having limited potential for conversion or were described as little known. There is the potential for several rail lines to convert to recreation trails in the broad southwestern Pennsylvania and northern West Virginia region, and could serve as paths to interpret both the industrial heritage of the

area and the natural features as well as link recreation developments. A good example is the Youghiogheny River trail, which could potentially connect Pittsburgh to Washington, D.C.

While the Mon River lacks the attributes of an outstanding or unique recreational river resource, it is a major water body that can serve as the primary recreation resource offering an opportunity to link locally significant historic sites with trails and green spaces. This would augment the need for both regional parks and community level recreation developments in the more populated, lower 40 miles of the river. For example, the large parcels of land formerly occupied by steel mills offer the following features: riverfront acreage, close proximity to central business districts and residential areas, and a link to other former industrial sites via railroad rights-of-way no longer used.

RESOURCE THREATS

Enhancing and improving resource-based, outdoor recreation experiences begins with improving the quality of the basic resources. Threats to natural resources, while they are being reduced, still exist, and continued attention at the state and local level is encouraging. The opportunity to secure potential recreation sites may also be threatened by piecemeal sale of riverfront lands and abandoned rail corridors.

Monongahela River, Pittsburgh, Pennsylvania.

SCENIC VALUES

DESCRIPTION

The principal physical features expressed in the vicinity of the Mon River are its meandering pattern and floodplains. The primary vegetation near the river are oak-hickory-beech forest on the uplands and willow-beech-maple in the lowlands. Much of the vegetation adjacent to the river has been cleared where the topography is flat and conducive to development. Away from the river and across the broad southwestern Pennsylvania and northern West Virginia area, forests have been cleared for agriculture and mineral or lumber extraction.

Historically, the topography and the dense forests of the area made access difficult across the region. As a result, rivers became the easiest means of transporting people and goods to support the expanding frontier. The region was found to possess an abundant supply of natural resources contributing to America's growth during the industrial development of the 19th and 20th centuries. The Mon River was harnessed for navigation purposes through a series of locks and dams to maintain minimal navigation depth year-around. Railroads and shipping facilities occupied much of the land adjacent to the river and public roads made limited approaches to the river. Towns sprung up to supply the industries of iron and steel, coal, transportation, glass, and a host of other supporting enterprises.

The floodplain of the lower Mon River, to a great extent, is occupied by industrial land use. Steel mills, railroad yards, fuel storage depots, power plants, barge loading facilities,

Monongahela River near Point Marion, Pennsylvania.

locks, dams, and bridges constructed, abandoned, and replaced over the last 150 years have drastically altered the face of the lower 40 miles of river. Limited public access to the river is available through recreational opportunities. Since few public roads or trails follow the river, boating offers the greatest opportunity to experience the character of the river.

Away from the river the rolling upland scenery reflects much of the area's historic farming and mining heritage. Remnants of former company towns are dispersed across the landscape. The socioeconomic pattern of the rural areas has not changed considerably as most new growth takes place in the communities.

SIGNIFICANCE

There is no criteria established by the National Park Service, the states of Pennsylvania, West Virginia, or Maryland to evaluate significant scenic land areas. Within the study area there is no designated national wild and scenic river. In 1975 the Pennsylvania Department of Environmental Resources conducted a *Scenic Rivers Inventory*, which evaluated rivers for the following values:

- outstanding wild features having minimal human influence
- recreational value suitable for the widest range of outdoor recreation

Newell, Pennsylvania.

- geological features significantly illustrating geologic processes
- quality of fishery, wildlife, and/or vegetation by existing value or its potential
- historical value from events, eras, or structures associated with the river or its environs
- cultural value by reason of its influence on local/regional/state traditions
- scientific values

Rivers were classified in three priority groups. First priority waterways possess a number of the values listed above. Second and third priority waterways exhibit some outstanding values, but not enough to merit statewide recognition. These are locally and regionally significant. Potential scenic rivers were further classified as wild, scenic, recreational, or modified recreational rivers.

The *Scenic Rivers Inventory* recommended 91 miles of the Monongahela River between Point Marion and Pittsburgh as a potential scenic river candidate under the classification of third priority group, modified recreational river.

According to the *Scenic Rivers Inventory*, potential scenic rivers near the study area include 116 miles of tributaries within the Youghiogheny River basin and 50 miles of tributaries in the Ohio River basin. Potential wild river designations include 17 miles of tributaries within the Youghiogheny River basin and 14 miles of tributaries within the Cheat River basin.

No comparable river evaluation program was found for Maryland or West Virginia. A federal wild and scenic river study did not recommend any potential wild, scenic, or recreational river designations in the study area.

RESOURCE THREATS

Within the study area the Pennsylvania Scenic Rivers Inventory identified 33 miles of potential scenic rivers, 13 miles of potential recreational rivers, and 17 miles of potential wild rivers in their first priority classification. These waterways possess the highest level of environmental quality, potential resource degradation, and potential recreation potential. All of these tributaries are located in the upper Youghiogheny River drainage.

RESOURCE PROTECTION EFFORTS

The study area includes 11 counties in two states where several federal, state, regional, and community agencies have some authority to influence resource protection. No one particular group has the exclusive power to enforce a plan for the entire southwestern Pennsylvania and northern West Virginia region.

The primary focus of preservation groups in this region, such as the America's Industrial Heritage Project, is to develop and enhance the interpretation of the highly significant historical themes of coal mining, iron and steel making, and transportation.

AMERICA'S INDUSTRIAL HERITAGE PROJECT STUDIES

There are studies underway by AIHP in the nine-county region that focus on preserving, protecting, and interpreting industrial-related resources as well as the area's social and labor history. Portions of Westmoreland and Fayette counties covered in this survey are included in the nine-county region encompassed by AIHP.

HERITAGE PARKS PROGRAM

In 1989 the commonwealth of Pennsylvania initiated the Heritage Parks Program to highlight particular regions whose cultural, historic, and recreational resources exemplify Pennsylvania's industrial traditions. With planning through intergovernmental cooperation, the program aims to enhance regional economies through tourism and increased employment. It encourages public and private partnerships for new investment opportunities. The planning process used for heritage parks ensures that the region's natural, cultural, and historic resources are protected for future generations and enhances opportunities for recreation and education. Agencies participating in the planning process with the cities and counties include the Pennsylvania Historical and Museum Commission and the Pennsylvania Departments of Environmental Resources and Community Affairs with technical assistance provided by the National Park Service. Heritage park planning efforts currently underway in the study area include the Mon Valley Steel Heritage Park and the National Road Heritage Park. Both projects are in the early stages of planning, and each has a local task force to provide guidance and organization.

HISTORIC AMERICAN ENGINEERING RECORD STUDIES

In April 1989, HAER commenced a study of historic structures and equipment at select steel mills along the Mon River in Allegheny County. The study was carried out in conjunction with the Mon Valley Steel Heritage Task Force, the Pennsylvania Historical and Museum Commission, and the National Park Service's Mid-Atlantic Regional Office. The study focused on four large steel mills – Homestead Works and Carrie Furnaces, Duquesne Works, Edgar Thomson Works, and National Works. Its purpose was to identify significant buildings, structures, and equipment and assist in producing national historic landmark nominations, as well as to produce architectural measured drawings and provide photographs and histories of significant resources.

HAER has completed inventories of historic industrial sites in Fayette and Westmoreland counties, and has identified most of the counties' regionally and nationally significant sites as well as select representative sites of local significance. These inventories have already revealed a rich variety of historic resources in the coal, iron, coke, and steel industries as well as in relation to glass, aluminum, and brick plants. HAER will be continuing this county-by-county inventory of historic engineering and industrial resources in southwestern Pennsylvania and will soon begin a study of the glass industry in Westmoreland County.

MON VALLEY STEEL HERITAGE CONCEPT PLAN

The Mon Valley Steel Heritage Task Force is a broad-based citizens group assembled to initiate steel-related industrial heritage conservation actions in the Mon Valley. The task force is developing a broadly supported Mon Valley steel heritage concept plan/feasibility study and action plan. Several agencies and organizations are involved in a coordinated planning effort including Pittsburgh, six counties in Pennsylvania, a regional planning commission, several state agencies, and the National Park Service's Mid-Atlantic Regional Office. The plan will be developed to conserve, interpret, promote, and manage the historic, cultural, natural, and recreational resources associated with the Mon River valley's steel-related industrial heritage, and to enhance the area's potential for tourism and economic revitalization.

Over the past year, the Bureau for Historic Preservation, a component of the Pennsylvania Historical and Museum Commission, has been surveying and researching iron and steel production sites throughout Pennsylvania preparatory to making nominations to the National Register. The Mon Valley Steel Heritage Task Force plans in 1990-91 to continue the study and documentation of sites associated with iron and steel manufacture and related industries such as coal. It is directing research efforts within the Mon Valley corridor toward acquisition of archeological and ethnographic data as well as new historical information.

The current schedule calls for completion of the resource inventory phase in the spring of 1991 and final concept plan/feasibility study in late 1991.

HISTORIC RESOURCE SURVEY OF THE NATIONAL ROAD

In 1987 a historic resource survey of the National Road was accomplished by the Bureau for Historic Preservation, Pennsylvania Historical and Museum Commission, to gather data for a thematic nomination of the road and associated resources for listing in the National Register. The study, which included the road's history from about 1818 to 1936, identified 205 individual resources. Of the 205 inventoried National Road resources, 79 were evaluated as probably eligible for listing on the National Register as individual thematic components of the nationally significant road. Resource types included structural features (e.g., bridges, trail markers), public houses, toll house complexes, and cottage industries and dwellings associated with the earlier period of use, and structural features, overnight accommodations, and auto facilities connected with the later period of the route's use as US 40.

WHEELING HERITAGE CONCEPT PLAN

The Wheeling Heritage Project, a cooperative effort by the city of Wheeling, the state of West Virginia, and the National Park Service to provide an overall framework and vision for conserving, interpreting, enhancing, and developing the resources of Wheeling's heritage, has already defined several historical themes that are closely tied to those of the Mon River valley and AIHP. Through special legislation, the Wheeling Heritage Task Force was formed. With the assistance of the city of Wheeling, the state of West Virginia, and the National Park Service, a Wheeling Heritage Concept Plan is being developed using a process similar to what was used for Pennsylvania's plan. The draft plan was released in January 1991. Several major heritage themes for that city have been identified that are linked to those identified for the Mon River valley and AIHP, such as the influence of rivers (in this case the Ohio River) and regional topography on the settlement and development of Wheeling; transportation networks; and the city's place as a major commercial and industrial center.

COAL HERITAGE PROJECT

The Coal Heritage Project is a planning effort being conducted by the National Park Service's Mid-Atlantic Regional Office. The study will determine the feasibility of protecting and preserving certain cultural, historic, and natural resources associated with the coal mining heritage of 11 counties of southern West Virginia. While the project is outside the geographic area of concern for the Mon Valley study, it could serve as a prototype for similar efforts in the southwestern Pennsylvania and northern West Virginia area. Completion of the final report is expected in January 1992.

WEST VIRGINIA HERITAGE TASK FORCE

A West Virginia Heritage Task Force is in the process of developing a statewide assessment of opportunities to conserve the state's outstanding cultural, natural, and recreational resources. The National Park Service is providing technical assistance in this effort. The assessment will develop a comprehensive base of information to be used as a tool in setting priorities and coordinating future planning and management activities. Initial findings identified, among others, the Ohio River Road project and the Cheat River drainage as priority areas of West Virginia that offer unique combinations of significant resources, development opportunities, and threats to important resources. The next phase of the assessment will attempt to develop more detailed action plans for each priority area. This will include the identification of potential roles and responsibilities for federal, state, local, and private groups.

MON VALLEY TRI-STATE NETWORK, INC.

The Mon Valley Tri-State Network, Inc. is a nonprofit, independent leadership organization composed of representatives of government, social, economic, environmental, and educational institutions. Its goal is to assist in promoting cooperative economic development and resource management in the three-state, 18-county Monongahela River basin of Pennsylvania, West Virginia, and Maryland. It has the support of local, state, and congressional delegations and seeks assistance from the state and local river and trail conservation program of the National Park Service in its water management and riverfront development projects.

WEST VIRGINIA UNIVERSITY, INSTITUTE FOR THE HISTORY OF TECHNOLOGY AND INDUSTRIAL ARCHEOLOGY

The institute is both an academic and professional organization intended to support public and private programs and projects concerned with the history of technology, industrial archeology, and the preservation of engineering works. The organization conducts research that is valuable as background material for resource preservation plans. Several projects are planned to be underway that concern topics and resources in the reconnaissance survey area.

Funded and underway:
Pennsylvania Covered Bridge Project

Proposed short-term projects supported by congressional appropriation – fiscal year 1992:
Northern West Virginia and Southwestern Pennsylvania Coal Fields; A History of Industrialization of the Upper Ohio Valley

Proposed long-term projects – through fiscal year 1995:
A History of the Monongahela River Navigation; The Morgantown Glass Industry

Future projects – fiscal year 1995 and beyond:
Cheat Iron Industry; Industrial Archeology of the National Road

RECOMMENDATIONS FOR FURTHER STUDY

COAL AND COKE INDUSTRIES

Western Pennsylvania retains a large number of resources associated with coal mining and coke production and illustrative of the settlement patterns and labor history of those industries. Fayette County, for instance, contains thousands of abandoned beehive coke ovens, some of which have a potential for restoration and interpretation. Several counties within the study area, particularly those west of the Mon River, have not yet been inventoried for coal and coke resources. Some individual company towns and manufacturing sites in Fayette and Westmoreland counties have already been identified as being potentially regionally significant.

Further evaluation of particular resources of these towns and sites – their architectural styles, mines and equipment, charcoal furnaces, beehive ovens, and transportation systems and networks – awaits completion of a thematic study on coal mining. This study, which has been identified as needed but has yet to be initiated, would enable an assessment of significance on a regional and national scale. Because similar resources extend into West Virginia and throughout Appalachia, it is mandatory that the entire area be studied in order to create the contextual framework and comparative perspective within which Pennsylvania's coal resources can be assessed for their significance, integrity, interpretive value, and protection.

IRON AND STEEL INDUSTRIES

HAER has identified a large number of historic industrial sites in Fayette and Westmoreland counties that have industrial and/or engineering significance. Because these are not complete inventories, remaining sites with possible significance for National Register listing in those counties and in the other counties within this survey area should be inspected and inventoried. Significant sites should be included in some sort of county preservation/ management plan.

The Pittsburgh/Mon Valley area is the largest iron- and steel-producing district in the nation which is controlled by one company – U.S. Steel. Its iron and steel resources, which are being lost daily, are potentially nationally significant. The history of the steel industry is fascinating and complex, involving the creation and merger of numerous companies nationwide and a continuing evolution of equipment and production processes.

No single site has been found in the Pittsburgh/Mon Valley area that can be considered a complete and unaltered showpiece of late 19th–20th century steel making and manufacturing technology. Periodic modernization and changes in manufacturing processes have resulted in structural or architectural alterations to every mill. Rarely does historic machinery survive in situ.

Steel complexes with complete historical integrity are not available for interpretive purposes. Therefore, those plants containing a relatively large number of historic structures or particularly significant pieces of equipment, which would provide the best physical evidence of steel manufacturing processes, need to be identified. This would tie in with HAER's recommended strategy of preserving individual buildings and equipment at several plants, linking them within a broader contextual framework of the iron and steel period in the Mon Valley and its relationship to national growth and expansion of the industry.

In order to place the steel-manufacturing role of the Pittsburgh District (including Wheeling) in its proper regional and national perspective, the entire iron and steel industry needs to be studied immediately on a national scale in terms of historical and geographical settings, resource availability, expansion of markets, changes in technology

and organization, national economic cycles, transportation needs, and constraints imposed by government policy. In addition, labor history – the steel worker's attempt to attain higher wages and better working conditions, his response to changing technology, the ethnicity shaping communities and the work place, and the relationship between management and workers in company towns and mills – needs to be examined. It is imperative that this study be undertaken immediately because of the rapid demolition of significant resources in the course of site redevelopment. The National Park Service encourages the HPC to work with the Mon Valley Steel Heritage Task Force in the Mon Valley steel heritage park process to help meet this need.

ALUMINUM INDUSTRY

To complete the interpretive story of the aluminum industry in America, additional research needs to be accomplished on the role and contributions of competing companies, especially Reynolds Aluminum and Permanente Metals after WW II. The ethnic heritage in connection with the aluminum industry also needs to be stressed. The immigration to Pittsburgh of foreign laborers, such as the Italians who transplanted almost entire villages to the area, changed the city's entire social fabric. Attempts should be made to preserve family reminiscences of those early days through interviews and acquisition of photographs. At the present time, the commonwealth of Pennsylvania has contracted for an ethnographic survey of the southwestern Pennsylvania region.

Labor activities in connection with the aluminum industry should also be interpreted as part of the development and growth of the industrial labor movement in America. In addition, oral history needs to be accomplished soon with early Alcoa plant and research workers and with people, such as military pilots, whose occupations were made easier or safer by the use of aluminum products.

This study also recommends further evaluation of the 1952 Alcoa corporate headquarters building in Pittsburgh. This 30-story structure was considered a technical triumph, a monument to aluminum in the "iron city," and should be assessed for architectural as well as historical significance.

TRANSPORTATION (RIVER, RAIL, AND ROAD)

Specific recommendations are suggested concerning the National Road. The study team concurs that this route is a nationally significant resource and encourages the states of Pennsylvania, West Virginia, and Maryland to actively pursue surveys of the National Road and its associated remains. It urges NPS coordination with ongoing state heritage park planning efforts in the three states regarding this resource.

A study of navigation systems and structures on the Mon and Ohio rivers is needed. The Mon River navigation system is known to be significant as a prototype for inland river navigation systems, but it needs further study from both historical and engineering aspects to adequately assess the integrity and significance of remains.

OTHER TOPICS

GLASS INDUSTRY

Recognizing the historically dominant role of western Pennsylvania in the field of glass manufacturing, the study team recommends a research program to identify and assess associated industrial remains. The team fully supports proposed HAER efforts to inventory glass industry resources in Westmoreland County and the comprehensive history of the glass industry in the Morgantown area proposed by the West Virginia Institute for the History of Technology and Industrial Archaeology.

The team recommends that survey and research results from these efforts be integrated with data on glass manufacturing resulting from implementation of the "Wheeling Heritage Draft Concept Plan" and with information gathered by the Mon Valley Steel Heritage Project in its efforts to inventory and assess the industrial and cultural heritage of the Mon Valley.

A regional treatment of the glass industry is essential to compare and evaluate remaining resources properly. Such a study would provide a context within which to discuss the evolution of glass manufacturing technology, the types of glass products produced, the evolving organizational structure of the industry, and labor and management practices.

MILITARY ACTIVITIES

The French and Indian War is unrelated to the major topics addressed in this study. The sites in western Pennsylvania considered to be most significant to the story of the French and Indian War are being preserved and interpreted. The study team makes no further recommendation except that this period in American military affairs be adequately interpreted as part of western Pennsylvania's historical heritage.

The Whiskey Rebellion is also unrelated to the major topics addressed in this study. The study team recognizes the national significance of the event but also realizes that few resources remain with which to tell the story. It therefore recommends preservation and interpretation of remaining resources on a local level.

ELECTRIC POWER GENERATION AND ELECTRICAL EQUIPMENT INDUSTRIES

The study team recognizes not only the individual significance of these industries but also their important interrelationship with the coal, iron and steel, and aluminum industries. It strongly recommends an assessment of significance and evaluation of remaining resources related to these industries.

OTHER POTENTIALLY SIGNIFICANT TOPICS DESERVING FURTHER STUDY

Although not directly related to the focus of this survey, other potentially significant topics that deserve further study, evaluation, and possible interpretation on a local or regional level include (1) the cultural development, adaptations, and settlement and trade patterns manifested by early Indian inhabitants, and (2) other early commercial activities such as boat building, brick manufacturing, and distilling.

Potentially significant historical archeological sites along the rivers related to early settlement, transportation, and industrialization patterns are threatened by riverbank development for recreational or new commercial uses. Archeological resources within town boundaries are always threatened by demolition and other construction activities related to economic revitalization.

Prehistoric and historical archeological sites at a distance from the river systems are affected by mining and agricultural activities, commercial and residential development, and road construction.

Prehistoric subsurface features may remain on floodplains where alluvial deposits are deep. There archeological districts may exist composed of a number of sites with little individual significance that collectively provide information on subsistence and settlement patterns.

INTERSTATE COORDINATION

Many cultural resources in southwestern Pennsylvania, into West Virginia west toward Wheeling and south toward Fairmont, and east into Maryland can be tied to a large interpretive picture continuing work done at AIHP. Activities associated with historical themes that comprised significant chapters of American history did not honor present political boundaries and state lines. Enterprises such as coal mining, iron and glass manufacturing, brick and steel making, and brewing, with their accompanying settlements and social patterns, occurred wherever the necessary raw materials and transportation networks were located.

It is mandatory, therefore, to focus research for local, state, and federal preservation programs and planning efforts on the interrelationships between people, places, and things in several different localities. Physical resources cannot be assessed intelligently as to their integrity, significance, and interpretive value until they are studied within a broad context of regional, and sometimes national, cultural, economic, and industrial developments.

It is important that the ongoing intensive cultural surveys now underway by local, state, and federal groups be completed soon and that the information acquired be pooled to enable evaluations of significance to the National Register. The results of these research efforts – when coordinated with those conducted as part of the AIHP – should enable a much better evaluation of the comparative significance and interpretive potential of historical, archeological, and ethnographic sites in the western Pennsylvania and northern West Virginia region. This data will also help provide the context and historical perspective within which to better approach the management of resources found specifically within the Mon Valley study area.

APPENDIXES

BIBLIOGRAPHY

STUDY TEAM

APPENDIX A: LEGISLATION

COPY

Public Law 100-698 (102 Stat. 4618), November 19, 1988, 100th Congress

An Act

To establish in the Department of the Interior the Southwestern Pennsylvania Heritage Preservation Commission, and for other purposes.

SEC. 104. FUNCTIONS OF THE COMMISSION

(d) STUDY REPORT. – The Commission, in consultation with the Secretary, the Pittsburgh Area Steel Industry Heritage Task Force, and other interested parties which represent the greater Allegheny and Washington Counties/Mon Valley area shall within 2 years of enactment of this Act, submit a report concerning the cultural and historical resource values of the greater Allegheny and Washington Counties/Mon Valley area to the Secretary. Such report shall include an analysis of the methods and means of inventorying, preserving, and interpreting the cultural and historical resources of the area, along with recommendations concerning the coordination of activities in the 11 counties represented by the Commission and the Pittsburgh Area Steel Industry Heritage Task Force and other interested parties. The Secretary shall review the report and submit it along with any comments or recommendations that the Secretary may wish to make to the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate within 180 days after receipt of such report from the Commission.

APPENDIX B: CULTURAL RESOURCE INVENTORY BY COUNTY

The following resources in the Brownsville/Mon Valley reconnaissance area are listed by county. Each county contains many more significant resources that are not included because they were considered to be outside the main survey area. The resources listed are related to the region's important iron and steel resources, to the coal and coke operations that supported them, and to the transportation network that allowed the movement of passengers and freight, the importation of raw materials, and the exportation of finished products. Also presented are resources associated with American Indian occupation, glass manufacturing, military activities, and the electrical industry. Many of these resources have been evaluated for historical significance and are listed in the National Register of Historic Places. Others have not been evaluated against National Register criteria, but this step should be undertaken prior to the formulation of local and regional preservation and interpretive programs, heritage parks, and cooperative planning efforts.

ALLEGHENY COUNTY, PENNSYLVANIA

National Historic Landmarks
- Smithfield Street Bridge
- Forks of the Ohio, Point Park

National Register Sites
- National significance:
  - Davis Island Lock and Dam Site
  - Forks of the Ohio (Point Park) – National Historic Landmark
  - Homestead High-Level Bridge
  - Rotunda of the Pennsylvania Railroad Station
  - Smithfield Street Bridge – National Historic Landmark
  - South Tenth Street Bridge
- State or local significance:
  - Bridge in Shaler Township
  - Duquesne Incline
  - Jerome Street Bridge
  - Liberty Bridge
  - Monongahela Incline
  - Pennsylvania Railroad Bridge
  - Pennsylvania Railroad Station
  - Pittsburgh & Lake Erie Railroad Station
  - Pittsburgh and Lake Erie Railroad Complex
  - Westinghouse Air Brake Company General Office Building

Allegheny County Landmarks
- Pittsburgh – The Blockhouse
- Pittsburgh Reduction Company Building
- Wainwright Brewery

Potential National Register Sites
- USX Homestead Works/Carrie Furnaces
- USX Mon Valley Works – Edgar Thomson plant, Irvin plant, and Vandergrift plant
- USX Duquesne Works
- LTV Steel Jones & Laughlin Southside Plant
- USS Clairton Works

BEAVER COUNTY, PENNSYLVANIA

National Register Sites
- National significance:
  - None
- State or local significance:
  - Merrill Lock No. 6
  - Pennsylvania and Lake Erie Passenger Station, Aliquippa

Potential National Register Sites
- Pittsburgh & Lake Erie Railroad Bridge between Monaca and Beaver
- Alliance Brick Factory
- Conway Railroad Yards
- Shippingport Power Plant

FAYETTE COUNTY, PENNSYLVANIA

National Historic Landmarks
- Albert Gallatin House (Friendship Hill NHS)
- Searight's Tollhouse, National Road
- Fallingwater – not tied to themes, but structure of architectural significance and should be noted as being in area

National Register Sites
- National significance:
  - Dunlap's Creek Bridge
  - Albert Gallatin House (Friendship Hill NHS) – National Historic Landmark
  - Fort Necessity National Battlefield
  - Jumonville Glen

Mount Washington Tavern landmarks – Washington's Spring, Half King's Rocks, and Dunbar's Campsite
Searight's Fulling Mill
Isaac Meason House

State or local significance:
Brier Hill Historic District
Peter Colley Tavern and Barn
Brownsville Bridge
Sebastian Rush Hotel and Tavern
Layton Bridge
Marion Bridge
Locus 7 site
Francis Farm Petroglyphs Site
Deffenbaugh Site

Potential National Register Sites

Coal mining:
Mount Saint Macrina (Oak Hill)
Smock
Shoaf: Company Town, Coke Works, and Mine
Star Junction: Company Town
Wharton Furnace
Linden Hall
West Leisenring
Connellsville
Frank M. Seaman Manson
Hopwood
James Barnes Estate
Frick Company Colonial Coal Belt
Alliance Iron Furnace (Alliance Iron Works, Jacob's Creek Furnace)
Coolspring Iron Furnace
Fayette Iron Furnace
Mary Ann Iron Furnace
Mount Vernon Iron Furnace
Springhill Iron Furnace

Transportation:
Wallace Tavern
Johnson-Hatfield Tavern
Abel Colley Stand
Wilkes Brown Tavern
Brubaker Tavern
Brashear Tavern (in front, only original metal milepost on National Road)
Shreve House
Old River Captain's House
Davidson's Ferry (Arensberg Ferry)
Watering Trough, east of Uniontown
John Stone Tavern
Brown Tavern
Braddock's Road sections
National Road

Military:
Black Horse Tavern
Braddock's Grave
Ohiopyle Falls
Braddock's Crossing (Stewart's Crossing)

Additional significant engineering and industrial sites identified by the HAER in *Fayette County, Pennsylvania: An Inventory of Historic Engineering and Industrial Sites* (NPS 1990b)

Primary metals industries:
Dunbar Furnace Co.
Fairview Furnace (Mary Ann #2) and Ironmaster's House
Fayette Furnace
New Laurel Furnace
Ricks Foundry
Union Furnace

Coal and coke industries:
Allison #1: Company Town
Allison #2: Company Town
Brownfield: Company Town
Buffington: Company Town
Chestnut Ridge: Company Town
Continental #2: Company Town
Continental #3: Company Town
Davidson: Company Town
Leckrone #1: Company Town
Leckrone #2: Company Town
Leisenring #1: Company Town
Leisenring #2: Company Town
Lemont: Company Town
Oliphant Furnace: Company Town
Oliver #1: Company Town
Ralph: Company Town and Mine
Republic: Company Town
Revere: Company Town
Rowes Run: Company Town
Shoaf: Company Town
Star Junction: Company Town
Allison Mine and Coke Ovens
Buffington Coke Works
Continental #2 Coke Works
Filbert Mines, Repair Shops, and Town
Griffin #1 and #2 coke works
Hoover Coke Works
Leith: Company Town
Lemont #1 and #2 coke works
Orient Coke Works
Shamrock Coke Works and Mine
Shoaf Coke Works and Mine

Transportation:
- Baltimore and Ohio Railroad: Connellsville Shops
- Confluence Bridge over Youghiogheny River
- Connellsville Central Railroad: Dunlap Creek Bridge
- Dunlap Creek Bridge, Brownsville
- Great Crossings Stone Bridge over Youghiogheny River
- Hillman Barge and Construction Company, Brownsville
- Indian Creek Railroad: Indian Creek Bridge, Mill Run
- Layton Bridge and Tunnel over Youghiogheny River
- Monongahela Railroad Company: Brownsville Tunnel
- Monongahela Railroad Company: Three Bridges, Brownsville
- Monongahela Railroad Company: Union Station, Brownsville
- National Road Mile Markers
- Pennsylvania Railroad: Mill Run Reservoir
- Pittsburgh and Lake Erie Railroad: Belle Vernon Station
- Pittsburgh and Lake Erie Railroad: Connellsville Passenger Station
- Pittsburgh and Lake Erie Railroad: Fayette City Station
- Pittsburgh and Lake Erie Railroad: Repair Shops and Roundhouse, Newell
- Pittsburgh and West Virginia Railroad: Youghiogheny River Bridge, Banning
- Redstone Creek Bridge, Smock
- Tippecanoe Bridge
- Western Maryland Railroad Company: Confluence Station
- Western Maryland Railroad Company: Ohiopyle Station
- West Penn Railways Company: Connellsville Terminal
- West Penn Railways Company: Uniontown Freight House
- West Penn Railways Company: Uniontown Terminal

Extractive industries:
- Dunbar Furnace Company: Irishtown Mines – Dunbar
- Elk Rock Ore Mines – State Gamelands #51

Glass:
- American Window Glass Company: Factory #4 – Belle Vernon
- Capstan Glass Company – South Connellsville
- L.J. Houze Convex Glass Company – Point Marion
- Pennsylvania Wire Glass Company – Dunbar
- Quertinmont Glass Company – Fairchance

Distilling and brewing:
- Brownsville Brewing Company
- Connellsville Distilling Company
- A. Overhold and Company, Broad Ford
- Pittsburgh Brewing Company: Connellsville Brewery

GREENE COUNTY, PENNSYLVANIA

National Register Sites

National significance:
- None

State or local significance:
- Bridge in Franklin Township
- Carmichaels Covered Bridge
- Davis, Horn, Overholtzer Bridge
- Grimes Covered Bridge
- King Covered Bridge
- Lippincott Covered Bridge
- Marion Bridge
- Neils Red Covered Bridge
- Scott Covered Bridge
- Shriver Covered Bridge
- White Covered Bridge
- Nettie Woods Covered Bridge

WASHINGTON COUNTY, PENNSYLVANIA

National Historic Landmarks

David Bradford House

National Register Sites

National significance:
- None

State or local significance:
- "S" Bridge
- Bailey Covered Bridge
- Scott Brownlee Covered Bridge
- Brownsville Bridge
- Charleroi-Monessen Bridge
- Crawford Covered Bridge
- Danley Covered Bridge
- Day Covered Bridge
- Devil's Den, McClurg Covered Bridge
- Ebenezer Covered Bridge
- Erskine Covered Bridge
- Henry Covered Bridge
- Hill's Tavern
- Hughes Covered Bridge
- Jackson's Mill Covered Bridge

Krepps Covered Bridge
Leatherman Covered Bridge
Lyle Covered Bridge
Malden Inn
Martin's Mill Covered Bridge
Blaney Mays Covered Bridge
Longdon L. Miller Covered Bridge
Pennsylvania Railroad Passenger Station – California
Pine Bank Covered Bridge
Plant's Covered Bridge
Ralston Freeman Covered Bridge
Sawhill Covered Bridge
Sprowl's Covered Bridge
Wilson's Mill Covered Bridge
Cerl Wright Covered Bridge
Wyit Sprowls Covered Bridge

Potential National Register Sites

Waynesburg & Washington Railroad station
National Road taverns and early houses along National Road, such as those in Claysville
Dunn's Station, Waynesburg & Washington Railroad
David Bradford House
Whiskey Point
Donora – This industrial borough is located on the Mon River 20 miles southeast of Pittsburgh. During a four-day period in October 1948, this small mill town was fog-filled with pollutants from a zinc factory. Almost half of its 14,000 inhabitants became sick; 20 died. The closing of the Donora mill in the mid-1960s because of the measures taken after the smog disaster presaged the massive closings and layoffs of the 1980s. This disaster is pertinent to the industrial theme because it is related to the effects on the area of large-scale unregulated industry and is seen by many as the beginning of the environmental awareness movement in the United States.

WESTMORELAND COUNTY, PENNSYLVANIA

National Historic Landmarks

Bushy Run Battlefield

National Register Sites

State or local significance:
Charleroi-Monessen Bridge
Webster Donora Bridge
Bells Mills Covered Bridge
Household #1 Site, 36WM61 (Fisher #34)
Fort Ligonier Site
Greensburg Railroad Station
Pennsylvania Railroad Station – Latrobe

Potential National Register Sites

Scottdale – early home of Henry Clay Frick
Monessen
Latrobe
Hannastown: Company Town
Crabtree Beehive Coke Ovens
Laurel Hill Furnace
New Kensington – "Aluminum City"
Arnold, Jeannette, Mount Pleasant, Grapeville glass manufacturing

The HAER "Survey of Historic Structures in Westmoreland County, Pennsylvania" (NPS 1989) identified the following significant towns:

Irwin
Slickville
Vandergrift

The study also describes the following extant industrial sites with potential significance:

Adams Mine complex – Hahntown
Lauffer, Hurst and Co. Foundry – No. Irwin
Biddle: Company Town
Rillton: Company Town and Criterion Mine
American Window Glass Factory #1 – Arnold
Alcoa: Wearever Building – New Kensington
Pennsylvania Railroad Company: New Kensington Freight Station
Alcoa: Aluminum Clubhouse
Carpentertown: Company Town
United: Company Town and Coke Ovens
Kinlock: Company Town
Aluminum City Terrace – New Kensington
U.S. Steel Corp: American Sheet and Tin Plate Co. – New Kensington
Union Spring and Manufacturing Co. – New Kensington
General Electric Co.: Sprague Division, New Kensington
Alcoa: Aluminum Research Laboratories – New Kensington
Alcoa: New Kensington Works

BROOKE COUNTY, WEST VIRGINIA

National Register Sites
National significance:
None
State or local significance:
Wellsburg Wharf
Wellsburg Historic District

HANCOCK COUNTY, WEST VIRGINIA

National Register Sites
National significance:
None
State or local significance:
Peter Tarr Furnace Site, Weirton

Potential National Register Sites
Newell Suspension Bridge, Newell
Old Lock House, Old Dam House (New Cumberland Locks)

MARION COUNTY, WEST VIRGINIA

National Register Sites
National significance:
Barrackville Covered Bridge
State or local significance:
High Gate – Fairmont

MONONGALIA COUNTY, WEST VIRGINIA

National Register Sites
National significance:
Seneca Glass Co. building – organtown
State or local significance:
Dents Run Covered Bridge
Henry Clay Furnace

OHIO COUNTY, WEST VIRGINIA

National Historic Landmarks
Wheeling Suspension Bridge

National Register Sites
National significance:
Wheeling Baltimore and Ohio RR Passenger Station
State or local significance:
Center Wheeling Market
Centre Market Square Historic District
Chapline Street Row Historic District
Elm Grove Stone Arch Bridge, US 40
North Wheeling Historic District
Wheeling Historic District
Monument Place

Potential National Register Sites
Wheeling:
Wharf iron tie-up rings (A.M. Phillips, boat builders)
Charles H. Berry Supply Co. (boat builders)
National Road and related sites – recently surveyed for National Register nomination
B&O Railroad beds and embankments
A Avenue Stone House
Madonna of the Trail Monument
Main Street Bridge over Wheeling Creek
Back Channel/Bridgeport Bridge
Wheeling Island/Bridgeport Train Trestle
Hempfield Railroad Viaduct and Tunnel
Pennsylvania Station Retaining Wall
B&O Railroad – Elm Grove Station
Wheeling and Elm Grove Railroad Car Barn
Wheeling and Lake Erie Railroad Bridge and Tunnel
Top Mill
LaBelle Co.
Wheeling Steel and Iron Co.
Centre Foundry Co.
Warwood Tool Co.
Bumgardner Foundry & Machine Co.
Hazel-Atlas Glass Co.
North Wheeling Glass Co.
Oglebay Mansion Museum Collection
John Hobbs House
Bridgeport:
Bridgeport Bridge

APPENDIX C: THREATENED AND ENDANGERED SPECIES AND SPECIES OF SPECIAL CONCERN

Scientific Name	Common Name	Status Fed.	PA	WV
Mammals				
Neotoma floridana magister	Allegheny woodrat	C2	T	
Myotis septentrionalis	Northern long-eared bat		SC	
Myotis sodalis	Indiana bat	E	E	R
Myotis leibii	Eastern small-footed bat	C2	T	
Myotis keenii	Keen's myotis		SC	
Cryptotis parva	Least shrew		E	
Mustela nivalis	Least weasel			R
Zapus hudsonius	Meadow jumping mouse			R
Felis rufus	Bobcat		SC	
Sorex palustris punculatus	WV water shrew		T	
Lepus americanus	Snowshoe hare		SC	
Birds				
Aimophila aestivalis	Bachman's sparrow	C2	Ex	
Chondestes grammacus	Lark sparrow		Ex	
Pandion haliaetus	Osprey		E	
Lanius ludovicianus migrans	Migrant loggerhead shrike	C2	Ex	
Thryomanes bewickii altus	Appalachian Bewick's wren	C1	E	
Falco peregrinus	Peregrine falcon	E	Ex	
Asio flammeus	Short-Eared owl		E	
Rallus elegans	King rail		E	
Chlidonias niger	Black tern		E	
Botaurus lentiginosus	American bittern		T	
Ixobrychus exilis	Least bittern		T	
Casmerodius albus egretta	Great egret		T	
Empidonax flaviventris	Yellow-bellied flycatcher		T	
Nycticorax violaceus	Yellow-crowned night heron		T	
Batramia longicauda	Upland sandpiper		T	
Cistothorus platensis	Sedge wren		T	
Sialia sialis	Eastern bluebird		SC	
Colinus virginianus	Northern bobwhite		SC	
Circus cyaneus	Northern harrier		SC	
Accipiter cooperii	Cooper's hawk		SC	
Buteo lineatus	Red-shouldered hawk		SC	
Ardea herodias	Great blue heron		SC	
Progne subis	Purple martin		SC	
Tyto alba	Common barn owl		SC	
Ammodramus savannarum	Grasshopper sparrow		SC	
Ammodramus henslowii	Henslow's sparrow		SC	

Scientific Name	Common Name	Status Fed.	PA	WV
Birds (cont.)				
Pooecetes gramineus	Vesper sparrow		SC	
Melanerpes erythrocephalus	Red-headed woodpecker		SC	
Cistothorus palustris	Marsh wren		SC	
Haliaeetus leucocephalus	Bald eagle	E		
Amphibians and Reptiles				
Aneides aeneus	Green salamander	C2	T	
Clonophis kirtlandii	Kirtland's snake	C2		
Sistrurus catenatus	Massasauga snake		E	
Invertebrates				
Fusconaia subrotunda	Long-solid		SC	
Pleurobema clava	Clubshell	C2		
Quadrula pustulosa	Pimpleback		SC	
Villosa iris	Rainbow mussel		SC	
Cyclonaias tuberculata	Purple wartyback		SC	
Speyeria idalia	Regal fritillary	C2		
Stygobromus allegheniensis	Allegheny Cave amphipod		SC	
Dryobius sexnotatus	Six-banded longhorn beetle		R	
Fusconaia flava	Wabash pigtoe		SC	
Potamilus alatus	Pink heelspitter		SC	
Pleurobema pyramidatum	Pyramid pigtoe		SC	
Epioblasma triquetra	Snuffbox		SC	
Lampsilis abrupta	Pink mucket pearly mussel	E		
Pleurobema cordatum	Ohio pigtoe		SC	
Truncilla truncata	Deertoe		SC	
Elliptio crassidens	Elephant ear		SC	
Obovaria subrotunda	Round hickorynut		SC	
Quadrula metanevra	Monkeyface		SC	
Ellipsaria lineolata	Butterfly mussel		SC	
Plethobasus cyphyus	Sheepnose mussel		SC	
Obovaria olivaria	Hickorynut		SC	
Quadrula cylindrica	Rabbitsfoot		SC	
Tritogonia verrucosa	Pistolgrip mussel		SC	
Leptodea fragilis	Fragile papershell		SC	
Obliquaria reflexa	Threehorn wartyback		SC	
Plethobasus cooperianus	Orange-foot pimpleback	E		
Truncilla donaciformis	Fawnsfoot		SC	
Gomphus virdifrons	Green-faced clubtail			
Cyprogenia stegaria	Fanshell	C2		

Scientific Name	Common Name	Status Fed.	PA	WV
Invertebrates (cont.)				
Tachopteryx thoreyi	Thorey's grayback dragonfly		SC	
Obovaria retusa	Ring pink	C2		
Pleurobema plenum	Rough pigtoe	E		
Quadrula quadrula	Mapleleaf		SC	
Calopteryx angustipennis	Damselfly		SC	
Macromia alleghaniensis	Allegheny River skimmer		SC	
Gomphus fraternus	Brotherly clubtail		SC	
Progomphus obscurus	Obscure clubtail		SC	
Hetaerina titia	Titian ruby-spot		SC	
Argia tibialis	Eastern dancer		SC	
Stylurus notatus	Marked clubtail	C2		
Gomphaeschna antilope	Southern bog darner		SC	
Calephelis borealis	Northern metalmark		SC	
Somatochlora linearis	Lined bog skimmer		SC	
Triodopsis platysayoides	Flat-spired three-toothed land snail	T		R
Plants				
Isotria medeoloides	Small-whorled pagonia	E		
Oxydendrum arboreum	Sourwood		Un	
Carex careyana	Carey's sedge		E	
Aconitum uncinatum	Blue monkshood		R	
Aristolochia macrophylla	Pipevine		Un	
Myriophyllum heterophyllum	Broad-leaved water-Mil.		E	
Uvularia puberula	Mt. Bellwort		Un	
Clethra acuminata	Mt. Pepper-Bush		E	
Lithospermum latifolium	American gromwell		Un	
Iris cristata	Crested dwarf iris		E	
Collinsia verna	Spring blue-eyed Mary		R	
Passiflora lutea	Passion-flower		Un	
Erigenia bulbosa	Harbinger-of-spring		T	
Marshallia grandiflora	Large-flowered marsh	C2	T	R
Cimicifuga americana	Mt. Bugbane		R	
Hypericum densiflorum	Bushy St. John's wort		Un	
Hedyotis purpurea	Purple bluet		Un	
Trautvetteria caroliniensis	Carolina tassel-rue		R	
Saxifraga micranthidifolia	Lettuce saxifrage		Un	
Agrimonia microcarpa	Small-fruited agrimony		Un	
Platanthera peramoena	Purple-fringless orchid		Un	
Arethusa bulbosa	Swamp-pink		E	
Polygala cruciata	Cross-leaved milkwort		R	
Delphinium exaltatum	Tall larkspur		E	

Scientific Name	Common Name	Status Fed.	PA	WV
Plants (cont.)				
Ratibida pinnata	Gray-headed prairie conef.		Un	
Camassia scilloides	Wild hyacinth		R	
Trillium nivale	Snow trillium		R	
Cuscuta coryli	Hazel dodder		Un	
Prenanthes crepidinea	Crepis rattlesnake-root		Un	
Monarda punctata	Spotted bee-balm		R	
Cassia marilandica	Wild senna		Un	
Trifolium reflexum	Buffalo clover		Ex	
Cyperus tenuifolius	Thin-leaved flatsedge		R	
Hierochloe odorata	Vanilla sweet-grass		E	
Iodanthus pinnatifidus	Purple rocket		R	
Lemna turionifera	Duckweed		SC	
Aplectrum hyemale	Puttyroot		R	
Scutellaria saxatilis	Rock skullcap		Un	
Amelanchier humilis	Low serviceberry		Un	
Desmodium humifusum	Trailing tick trefoil		E	
Phyla lanceolata	Lance fog-fruit		Un	
Physalis virginiana	Virginia ground-cherry		Un	
Amelanchier sanguinea	Roundleaf serviceberry		Un	
Paronychia fastigiata var pale	Chaffy Whitlow wort		Un	
Desmodium glabellum	Tall tick-trefoil		Un	
Sagittaria subulata	Subulata arrowhead		R	
Polygonum amphibium var stipulata	Water smartweed		SC	
Aconitum reclinatum	White monkshood		E	
Antennaria solitaria	Single-headed pussy-toes		Un	
Orontium aquaticum	Golden club		SC	
Lupinus perennis	Lupine		R	
Aster firmus	Firm aster		Un	
Solidago curtisii	Curtis' golden-rod		E	
Juncus brachycephalus	Small-headed rush		R	
Solidago purshii	Pursh's golden-rod		Un	
Pyrularia pubera	Buffalo-nut		R	
Salix serissima	Autumn willow		E	
Iris prismatica	Slender blue iris		E	
Thalictrum steeleanum	Steele's meadow-rue	C2	Ex	
Spiraea virginiana	Virginia spiraea	T	Ex	
Cyperus diandrus	Umbrella flatsedge	T		
Solidago erecta	Slender golden-rod		R	
Magnolia tripetala	Umbrella magnolia		R	
Eleocharis elliptica	Slender spike-rush		E	
Najas gracillima	Bushy naiad		SC	
Scirpus acutus	Hard-stemmed bullrush		E	

Scientific Name	Common Name	Status		
		Fed.	PA	WV
Plants (cont.)				
Sparganium androcladum	Branching bur-reed		Un	
Hypericum drummondii	Nits-and-lice		Un	
Onosmodium hispidissimum	False gromwell	E		
Castanea pumila	Allegheny chinkapin		R	
Nelumbo lutea	American lotus		E	
Ruellia strepens	Limestone petunia		Un	
Ranunculus micranthus	Small-flowered crowfoot		R	
Populus balsamifera	Balsam poplar		E	R
Helianthemum bicknellii	Bicknell's hoary rockrose		T	
Salvia reflexa	Lance-leaved sage		Un	
Lithospermum latifolium	American gromwell		Un	
Juncus torreyi	Torrey's rush		T	
Carex mesochorea	Midland sedge		Un	
Matelea obliqua	Oblique milkvine		Un	
Oenothera pilosella	Evening primrose		Un	
Carex buxbaumii	Brown sedge		SC	
Hypericum adpressum	Creeping St. John's-wort		Ex	
Carex alopecoidea	Foxtail sedge		Ex	R
Aster tardiflorus	Northeastern aster			
Carex aggregata	Sedge			R
Carex canescens	Sedge			R
Lespedeza x nuttallii	Lespedeza			R
Panicum columbianu	Panic grass			R
Panicum flexile	Wiry witch grass			R
Pogonia ophioglossoides	Rose pagonia			R
Polygala cruciata	Crossleaf milkwort			R
Rnaunculus carolinianus	Carolina buttercup			R
Rhus vernix	Poison sumac			R
Scirpus rubrotinctus	Woolgrass			R
Solidago patula	Roundleaf golden-rod			R
Sparganium androcladum	Staminate burreed			R
Stachys hispida	Hedge nettle			R
Synandra hispidula	Gyandotte beauty			R
Viola septentrionalis	Northern blue violet			R
Zannichellia palustris	Horned pondweed			R
Fish				
Lepomis gulosus	Warmouth		SC	
Lepisosteus osseus	Longnose gar		SC	
Moxostoma carinatum	River redhorse		SC	
Percina copelandi	Channel darter		SC	

Scientific Name	Common Name	Status		
		Fed.	PA	WV
Fish (cont.)				
Alosa chrysochloris	Skipjack herring		Ex	
Phoxinus erythrogaster	Southern redbelly dace		SC	
Ictiobus bubalus	Smallmouth buffalo		SC	
Hybopsis storeriana	Silver chub		SC	
Lepomis megalotis	Longear sunfish		SC	
Ictalurus melas	Black bullhead		SC	
Pimephales vigilax	Bullhead minnow		Ex	
Clinostomus elongatus	Redside dace			R
Rhinichthys bowersi	Cheat minnow	C2		R

Keys:

Fed = Federal	C1 = Category 1 (candidate)	R = Rare
PA = Pennsylvania	C2 = Category 2 (candidate)	SC = Special Concern
WV = West Virginia	E = Endangered	Ex = Extirpated
T = Threatened	Un = Undetermined	

Sources: Pennsylvania Natural Diversity Inventory, Pennsylvania Game Commission Wildlife Data Base, Pennsylvania Fish Commission, West Virginia Natural Heritage Program, and U.S. Fish and Wildlife Service.

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