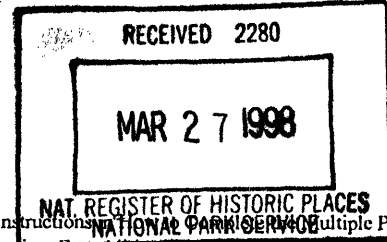


**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Multiple Property Documentation Form**



This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions on the back of this form. Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

New Submission Amended Submission

A. Name of Multiple Property Listing

Historic Aluminum Industry Resources of Southwestern Pennsylvania, 1888-1947

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

Alcoa and the Aluminum Industry in Southwestern Pennsylvania, 1888-1971

C. Form Prepared by

name/title Bonnie J. Wilkinson, Consultant

street & number 4155 Spring Valley Road telephone (717)-526-4613

city or town Harrisburg state PA zip code 17109

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation. (See continuation sheet for additional comments.)

Brent Glass Brent Glass, Ex. Dir. 3/11/98
Signature and title of certifying official Date

PA Historical and Museum Commission
State or Federal agency and bureau

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Patrick Andrews 5/7/98
Signature of the Keeper Date

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Introduction

The history of the aluminum industry can be traced through periods influenced by technological, economic, and social changes which define the context for the aluminum industry. *The Beginning - 1888 -1895* traces the development of the aluminum industry and its beginnings on Smallman Street in Pittsburgh. *Pittsburgh Reduction Company Expansion - 1896 -1919* discusses the growth of the various divisions within the company that became Alcoa. *Research & Development -1920 -1929* discusses the evolution of research and production within the company. *The Depression and Beginnings of Recovery - 1930 -1938* examines the emergence of workforce relations and anti-trust litigation as a backdrop to the Depression. *World War II - 1939-1946* reviews Alcoa's and New Kensington's role within war production and work culture of World War II. *Alcoa and the Post War Era* summarizes the anti-trust litigation, Alcoa's role in post war production, and the outcome of anti-trust litigation.

Located nineteen miles northeast of Pittsburgh along the Allegheny River in Westmoreland County, the communities of New Kensington and Arnold were the center of the aluminum industry for the United States for much of the 20th century. The Aluminum Company of America's (Alcoa) New Kensington Works began production in 1891, and was expanded into Arnold in 1913. The plant was closed in 1971, effectively ending one of the oldest production plants that the company operated. The historic aluminum resources for this multiple property document cover the years 1888 to 1947.

For Alcoa, as for most large business enterprises, sustained growth required significant control over competitive forces. Many companies attempted to achieve growth through horizontal integration, the consolidation of firms in the same line of business. Such growth was typical of many industries of the time, including oil, sugar refining, linseed and cotton oil processing, and lead processing.¹ Alcoa on the other hand, relied much more on internally generated growth than on acquisition to expand its business and keep competition in check. This growth in research, new plants, and equipment required huge amounts of capital. Part of this capital was generated by retained earnings, but such earnings were not enough. Investment bankers became crucial sources of venture capital for rapidly growing business.

In order to establish long term growth, Alcoa began systematic vertical integration. This involved moving forward from the simple making of aluminum into fabrication of industrial, consumer and other goods as well as moving backwards into acquisition of electrical power and raw materials. From a largely unknown material in 1886, Alcoa's research and sales departments promoted the use of aluminum in the manufacture of building materials, cooking utensils, automobiles, airplanes and computers, making aluminum a common material in today's society. Alcoa was aggressively involved with other forms of integration. When they needed a railroad in Calderwood, Tennessee, Southern Railway estimated six months to complete the task. Alcoa, on the other hand, was able to construct the line in six weeks. They also utilized in-house civil and hydraulic engineers on staff as early as 1906. Then in 1918, when there was a coal shortage, they bought and operated their own coal

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mine. No obstacle was considered so insurmountable that a solution could not be found. Integration served to extend and protect Alcoa's long term prominence in the aluminum market, in essence a monopoly. Not until antitrust divestiture in the 1950s, did other major manufactures, Reynolds and Kaiser, take a larger presence within the market.

During the initial construction of the buildings at the New Kensington plant, thought was not given to the growth of the plant itself. The original New Kensington Works evolved by increments rather than by long term planning. With the expansion into Arnold, Alcoa treated the entire complex as the New Kensington Works. Growth of the residential neighborhoods encroached upon plant gates, forcing plant development towards the river and closing expansion opportunities. With limited growth capabilities, Alcoa was forced to look to other communities for expansion.

New Kensington and Arnold are historically unique as being associated with the aluminum industry. From the organization of the Pittsburgh Reduction Company to the construction of production plants in the south, New Kensington and Arnold were Alcoa's primary plants. They were the only plants for a generation or more involved in the production of aluminum. New Kensington and Arnold are typical industrial towns in western Pennsylvania and are defined by a plant, a commercial area that supports the workers, specialized residential areas for the workers to live in, a railroad line and a river representative of major transportation systems, local leadership that is parochial in nature, and little zoning or planned development ordinances within the community.

Beginning - 1888-1895

This section discusses the early years of the aluminum industry which includes the development of the electrolytic process for aluminum, the formation of the Pittsburgh Reduction Company, and the first plant buildings at New Kensington.

Aluminum played no role in America until 1886 when Charles Martin Hall of Oberlin, Ohio, developed an electrolytic process for the reduction of aluminum from its alumina (its oxide). Hall tried unsuccessfully to get funding support to perfect his process. Through a contact at Cowles Electric Smelting and Aluminum Company located in Lockport, New York, Hall contacted Alfred E. Hunt, a well known metallurgist and co-owner of the Pittsburgh Testing Laboratory, to assist him. Hunt became interested in Hall's process, committed his partner George Clapp to the effort, and assembled a group of investors associated with the steel industry in Pittsburgh to finance initial research and development. These investors included Howard Lash, president of Carbon Steel Company; Millard Hunsiker, General Sales Manager of the same company; Robert J. Scott, Superintendent of the Union Mills of Carnegie, Phipps & Company; and W. S. Sample, Chief Chemist for the Pittsburgh Testing Laboratory. On July 31, 1888, the group met at Captain Hunt's home at 272 Shady Avenue in Pittsburgh and reached a decision to begin commercial aluminum production.

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On August 8, 1888, the group officially formed the Pittsburgh Reduction Company (PRC) with \$20,000.00 in capitalization (200 shares at \$100.00 a share). Alfred Hunt was chosen as president of the corporation. A week later the firm leased a 120 foot wide lot in the 3200 block of Smallman Street in Pittsburgh's Strip District and contracted with Keystone Construction Company for the construction of a two room building (demolished), measuring 24 feet wide, 70 feet long and 16 feet high to the bottom of the roof trusses to house the plant. The building was constructed of corrugated iron on a wood frame. In it they placed plant machinery consisting of a 125 horsepower engine, two Westinghouse dynamos, and a few crucibles or reduction pots.²

The first attempt at aluminum production was on Thanksgiving Day, November 29, 1888. Actual aluminum was not produced until December 1 or 2, 1888.³ Early production was not without problems. It was necessary to constantly monitor and supervise the reduction process. The labor force consisted of five individuals: Charles M. Hall and Arthur Vining Davis worked 12-hour shifts, 7 days a week; two engineers, Mathews on day shift and Douglas on the night shift; and a handy man named White.⁴ Eventually a night superintendent and two furnace men were hired to assist in the process. The process consists of electric smelting with an enormous quantities of electrical current in the "pot lines" of crucible pots.

Six months after start-up, the PRC was selling an average daily output of 50 pounds of aluminum for \$5.00 per pound. With increased production, the company hoped to expand its operations. Alfred Hunt, Arthur Vining Davis and George Clapp approached banker Andrew Mellon for a \$4,000.00 loan to continue operation of the Smallman Street plant. Mellon convinced them to accept a \$25,000.00 loan instead. With these funds, they hired Pittsburgh Bridge Company to enlarge the plant. The resulting building was 70 feet by 119 feet, and housed the production of 475 pounds of aluminum a day which sold for \$2.00 per pound.

By 1891, the Smallman Street Plant output increased from fifty to five hundred pounds of aluminum per day.⁵ Additional production facilities would be necessary, not only for the production of ingot, but sheet, rod, wire and other forms as well. The need for more space became pressing; PRC officials sought land that could allow for future growth where expenses for fuel, water and other supplies were low, and the cost of taxes was at a minimum.⁶

Although production was below capacity at the recently enlarged plant on Smallman Street in Pittsburgh, the owners began planning a new plant in New Kensington. New Kensington had the advantages of natural gas and cheap coal deposits for power,⁷ as well as good transportation for incoming ore supplies and outgoing metal.⁸ Andrew W. Mellon and his brother Richard B. Mellon advanced the company \$7,000.00 necessary for its move to New Kensington. In exchange, the Mellons acquired stock and seats on the company's board.⁹ The PRC purchased the property June 6, 1891 "for promises and one dollar to manufacture aluminum."¹⁰ Two years later, the Mellons were instrumental in issuance of bonds to finance the development of smelting operations in Niagara Falls, New York.

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The New Kensington factory site was a strip of land bounded on the east by the Indian Run Branch of the Allegheny Valley Railroad, the west by the Allegheny River, the south by the Brownsville Plate Glass Company property, and on the north by Eleventh Street. Operations were moved from Smallman Street the summer of 1891. The first New Kensington building, a single story, steel framed, brick clad building located in a portion of the present Building 9A, housed a small pot room in which metal was produced with an adjacent coal-fired electrical generating equipment (boiler and engine rooms) which was housed in a portion of present Building 9B. Coal and natural gas powered the steam engines used to generate electricity used in the reduction process.

By 1893, Hunt assumed the position of General Manager as well as President of the PRC. Andrew Vining Davis became Assistant General Manager, keeping a close watch of the development of all phases of production - from calcining of alumina to smelting to producing a limited number of sheet products and castings. Hunt realized the difficulty in finding high volume applications for aluminum. In meeting with customers, he noted the potential of larger applications for which PRC could manufacture and fabricate aluminum due to the company's technical advances. As PRC officials developed their own uses for aluminum ingot, they would eventually add a foundry, wire drawing, tubing, and other fabricating facilities to its New Kensington plant. As a result, production increased by the mid 1890s to 1,000 pounds a day and 50 men were employed at the New Kensington plant.

Pittsburgh Reduction Company Expansion - 1896-1919

This section will discuss the growth of the various divisions including the Tube Department, Sheet Department, Rod, Bar and Wire Department, American Cooking Utensil Company, Extrusion Department, Jobbing Department, Foil Mill, and Aluminum Seal Company in addition to work force relations, Aluminum Club, Logans Ferry Powder Works and the Coal Mine.

By the mid-1890s, the PRC was shipping 250.4 tons of aluminum annually; 44.8 percent of this tonnage was in the form of pig and ingot, 52.6 percent in the form of sheet, 1.7 percent in the form of castings, and 0.9 percent in the form of rod, wire, bar and tube.¹¹ An 1897 catalog of the PRC indicated that it fabricated aluminum and aluminum alloys in the form of "ingots, castings, bars, sheets, tubes, wire and all forms of structural shapes,"¹² in addition to aluminum bronze powder, a finely powdered pure aluminum used for metallic paint, wall paper, and as a coloring for celluloid and rubber.¹³

Company officials soon realized that in order to gain a competitive edge in the market, the price of aluminum needed to be competitive with other common metals. Only through large scale production could costs be lowered to cultivate demand on a mass scale. PRC's material and production costs were still comparatively high, especially for energy. However, PRC's position with its patent was tenuous and they needed to consider strategies that anticipated the loss of their patent position.¹⁴

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The owners realized that aluminum making was in fact linked to all phases of production; from the mining of bauxite to the manufacture and distribution of the finished product. They began a concentrated effort of vertical integration to manufacture alumina from bauxite and manufacture the metal "at most favorable rates - more favorable than any other concern..."¹⁵ Company officials realized that to manufacture aluminum it needed to be adjacent to inexpensive power sources and raw materials. Taking advantage of the inexpensive power, PRC opened a new reduction plant in Niagara Falls, New York, on August 26, 1895. PRC's Niagara Works was the first plant to use Niagara Falls as a hydroelectric power source.¹⁶ The Niagara Works hydroelectric costs were significantly lower than coal-generated power costs in New Kensington. Within six months, the Niagara Works plant was operating at capacity.

The New Kensington plant expanded five times over the next five years. In 1896, PRC officials were able to acquire the land and buildings immediately north of Eleventh Street from the Excelsior Glass Company. These buildings were used to house ore and alumina production.¹⁷ The New Kensington works continued, concentrating on various methods for fabrication. In March, 1900, PRC moved their offices from New Kensington to two rooms on the upper floor of the Park Building in Pittsburgh.¹⁸ Production continued at the Niagara Works using a "dry process" method to process alumina until a second, large scale, "wet process" alumina reduction facility was constructed in East St. Louis, Illinois in May, 1902.

Despite the repositioning and expansion of metal production, aluminum was still viewed as a semi-precious metal with little use except for novelties.¹⁹ By the early 1900s, the subsequently lowered price of aluminum and a growing consumer acceptance for a wide range of small aluminum products rendered the light metal a viable substitute for brass, zinc, tin, and iron in machine parts, electrical apparatus, containers, utensils, and novelties.²⁰ The task facing the officials at the Pittsburgh Reduction Company was to develop mass markets that could absorb large quantities of this inexpensive metal. Established steel foundries, rolling mills, or wire-drawing plants with investments tied up in better known metals had little incentive to experiment with aluminum. Through company initiated vertical integration, however, Alcoa became its own largest customer for aluminum, which it then transformed into products for industrial, end consumer, and military use.²¹

In 1902, the New Kensington works consisted of 173,000 square feet of space on 15 acres, where 276 employees produced special alloys, ingots, castings, sheet, rod and bar, wire, rivets, tube, cooking utensils and jobshop items.²² Major plant buildings included a single story wood framed block used as a machine shop (Building 8); a melting room (Building 9A, demolished 1995); a Rolling Mill (Building 9B) measuring 69 feet by 659 feet, which had grown to include over 50,000 square feet of space; the original tube drawing mill (building 9D, demolished 1995); a two story, brick building (Building 18B, demolished 1995) housing a dipping room, stock room, and storage; and a large number of smaller service buildings.²³ These types of buildings, equipment, and activity defined Alcoa's large production facilities located in New Kensington, PA; Niagara Falls, NY(1895, hydropower and reduction), Shawinigan Falls, Quebec (1900, hydropower and reduction); Bauxite, AK (1901, mining) and East St. Louis, IL (1902, reduction).

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On January 1, 1907, the Pittsburgh Reduction Company changed its name to the Aluminum Company of America, as its former name did not indicate the business in which the company was engaged. The name of the Pittsburgh Reduction Company was often confused with the American Reduction Company, a local garbage concern in Pittsburgh. The name was shortened to "Alcoa" in 1910 after Lucy M. Ricky, wife of the Company's Chief Hydraulic Engineer, suggested the change.

These changes were meant to bring greater stability to the still fast growing company, one which changed dramatically in appearance during this period. During the 1910s, major new buildings added to the New Kensington works included a building to house aluminum bronze powder production (Building 3); a forge shop (Building 4); a job-shop (Building 5); a boiler house (Building 10); an eight story office, packing and shipping and storage block which was situated at the southwest corner of the plant (Building 13, demolished in 1994); a receiving room and storage (Building 16, demolished n.d.); a box and paint shop and lacquering facility, (Building 24, demolished in 1935); a six story building which was used as a pattern shop, storage, and offices (Building 25, demolished n.d.); a four story clock house originally used as a chemical laboratory, restaurant, and locker room (Building 26, demolished n.d.); a stock house and research laboratory (Building 30); and a smelting plant (Building 31). In addition to the plants in New Kensington, PA; Niagara Falls, NY; Shawinigan Falls, Quebec; and East St. Louis, IL, Alcoa expanded to Massena, NY (1903, hydro-power, reduction and rod, bar and wire), Alcoa, TN (1911, hydro-power and reduction), Edgewater, NJ (1915, rolling mill) and Baden, NC (1915, hydro-power and reduction). Within the New Kensington Works there came to be six departments and two subsidiaries responsible for specific tasks. These departments included: Tube Department; Sheet Department; Rod, Bar and Wire Department; Extrusion Department; Jobbing Department; and Foil Mill. The subsidiaries were Aluminum Cooking Utensil Company and the Aluminum Seal Company.

Tube Department

While a few manufacturers made a small amount of aluminum tubing in the 1890s, none actively sought a market for the product until the PRC installed a small tube-drawing plant at New Kensington in May, 1890. The initial tube-drawing mill was located in the original section of Building 9B, a single story, 158 foot by 21 foot, wood framed building, sheathed in corrugated steel. At the same time this process was perfected, Alcoa developed and expanded the market as part of its vertical integration.²⁴ By 1909, sufficient demand emerged to enlarge the area of the tube mill. The original building was replaced with a much larger, steel frame building, constructed in two parts. By 1910, the floor area of the tube mill had grown from the original 3,318 square feet to 21,228 square feet. In 1914, the Tube Division was transferred to Building 204 in Arnold when more space was needed for manufacturing.

Sheet Department

In 1892, two experienced brass rollers, Harry Davis and George Doolittle, were brought to New Kensington from the Naugatuck Valley of Connecticut to teach aluminum workers how to roll sheet metal.²⁵ A 7,525 square foot expansion of Building 9B, was completed in 1893, providing space for the first rolling mill at the New Kensington Works.²⁶ Coiled sheet was produced first at New Kensington, and subsequently flat sheets

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were produced.²⁷ In 1893, the company tripled the floor area of its plant facilities.²⁸ In addition to expanding Building 9B to accommodate the rolling mill, the company also erected service buildings that housed the shipping, carpenter, and buffing operations, and served as an oil house, lumber shed, acid house, calcimining building, engine house, and two warehouses.²⁹

Additional plant expansion occurred in 1896.³⁰ In that year, a 70 foot by 65 foot addition was made to Building 9A in order to house a melting room and foundry (demolished, n.d.); a 209 foot by 69 foot addition was made to Building 9B to accommodate the growth of the rolling mill and additional service buildings used as storage sheds and an acid house. Additional rollers were added in 1902, 1906, and 1909. Additional sheet mills were added to the Niagara Works in October, 1907; Edgewater, NJ in 1916; Cleveland in 1918; and Alcoa, Tennessee in 1920.

Rod, Bar & Wire Department

In 1897, the PRC produced the first aluminum electric transmission wire using equipment located at the New Kensington Sheet Mill. The wire was to be used in the Chicago stock yards as a substitute for a half mile of copper telephone wire which had been damaged by corrosion from locomotive gases. The following year, the PRC reduced the price of aluminum wire from \$0.33 to \$0.29 per pound delivered, prompting the Standard Electric Company of California to try aluminum rather than copper wire for a 46-mile, three phase line to be installed from Blue Lakes to Stockton, California.³¹

Arthur Vining Davis had originally hoped to involve the PRC in the market for transmission wire in a low-risk way. Once having secured a few substantial contracts from large customers, he had envisioned subcontracting with wire producers to use their equipment. The PRC would produce the aluminum ingot, and the wire makers would do the rest. However, when Davis tried to interest wire companies in making the aluminum wire he sold, he was unsuccessful.³² To meet the California order, Davis was compelled to purchase wire making equipment for the New Kensington plant. This equipment was initially the same equipment used by manufacturers of copper wire, and included a new rod mill and a three strand wire drawing machine. From the start, the PRC met difficulty trying to fabricate wire from an aluminum-copper alloy. After problems with excessive vibration of this wire, the PRC research staff developed steel-reinforced aluminum cable, a cable that offered the necessary durability and reduced the amount of vibration.

On November 21, 1900 plans were started for a new wire mill at New Kensington. With pressure by E. S. Fickes, company engineer, the company decided to build "a different type of building, rather than the corrugated iron covered Pittsburgh rolling type mill, which had heretofore been the Company's standard and was not well suited for light manufacturing..."³³ The new buildings consisted of two 37 foot 6 inch wide bays of saw-tooth design, extending from the river bank to the present railway shipping track. The wire drawing machine was placed in the west end, cabling in the middle, and insulating and braiding in the east end. An innovation in the new mill was the use of exhaust steam and indirect hot air heating. The steam was taken from

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the exhaust of the engine driving the flat rolls in the rolling mill building.³⁴ In November, 1901, the company began to produce steel-reinforced aluminum cable, wire that became the standard for electric power lines.³⁵

Aluminum wire and stranded cable were first produced at New Kensington. However in June, 1904, this work was transferred to Massena, New York, to partake of the inexpensive hydropower offered by the St. Lawrence River and the abundance of land for plant expansion. In Massena, PRC also constructed Pine Grove, a residential area of 17 frame dwellings constructed for use by plant employees.³⁶ In 1907, the Pine Grove Realty Company, which was bought by PRC in 1906,³⁷ built a sewage system, laid sidewalks, metalled new streets and had built, under contract with H. L. Kreisler of Pittsburgh, 105 dwellings at a cost of \$250,000.00. The houses were designed by McClure and Spahr, architects in Pittsburgh.³⁸ Additional single family residential dwellings were constructed near the plant during World War II.

American Cooking Utensil Company

Among the first finished products by the PRC was aluminum cookware. Sometime between 1895 and 1900, Arthur Vining Davis borrowed a molder from the Griswold Company in Erie, Pennsylvania and brought it back to New Kensington to cast an aluminum teakettle. The goal was to demonstrate why Griswold should buy aluminum from the PRC. Instead, the Griswold Company ordered 2,000 kettles from the PRC. To fill this order, the company added a fabricating unit for kitchen utensils to its New Kensington Works.³⁹

Hill, Whitney and Wood, a Waltham, Massachusetts based company to which the PRC had been selling aluminum for cooking utensil manufacture, found itself in financial difficulty and turned over its operations to the PRC in settlement of its debt in 1900. With the acquisition of the company came C. F. Whitney, who became supervisor of the PRC's cooking utensil department. One of the accounts of the former firm was an order for 2,800 aluminum tea kettles, placed by J. H. Wilson of Wilson Manufacturing Company of Blue Island, Illinois.⁴⁰ Wilson and his partner Charles E. Zeigler organized a firm in 1895 to sell the Handy Kettle Steamer and the Ideal Percolating Coffee Pot door to door. After interviewing with General Manager Arthur Vining Davis, the two were invited by the PRC to join the company. Mr. Wilson was asked to become General Sales Agent, forming a sales force to sell aluminum cooking utensils. Dr. Zeigler joined the company but left soon thereafter to continue his career in medicine.

The dies and machinery of Hill, Whitney and Wood were moved into the second floor of the old Excelsior Flint Glass Mill on October 11, 1901. Mr. C. F. Whitney came to New Kensington as the first Superintendent in charge of factory operation. The United States Aluminum Company (USAC) was incorporated by PRC on September 28, 1901 to manufacture cooking utensils and the Aluminum Cooking Utensil Company (ACUC) was incorporated on October 24, 1901 to sell them.⁴¹ From their inception, these two wholly owned PRC subsidiaries, produced and marketed durable, thick, heavy, stamped aluminum utensils in contrast to the thin sheet utensils made by other manufacturers. Wilson developed a distribution network for the products, employing college students who spent their summers demonstrating and selling utensils door to door. These

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utensils were sold under the Wear-Ever brand name.⁴² By 1912, the USAC's kitchen utensils had created and secured more than 75 percent of the aluminum cookware sales in the United States.

In 1913, Alcoa made plans to erect an office building for the USAC and ACUC on Eleventh Street between Fourth and Fifth Avenues, adjacent to the New Kensington Town Hall. This building, a four story, steel framed, Tudor Revival style building designed by Pittsburgh architect James H. Giesey, was known as the Wear Ever Building and was completed in 1916.

Extrusion Department

In an attempt to produce better quality aluminum wire, PRC experimented with extruded shapes. In 1904, a vertical press was installed at New Kensington and Louis DeCazenove was hired to operate the machine.⁴³ After several years of experimentation, aluminum shapes produced by the extrusion method with hydraulic presses became a product of the New Kensington Mills.⁴⁴ Much of this output was first used for trim on early automobiles in 1907 and continued in use until 1913.⁴⁵ After the expansion of the Alcoa facilities to Arnold in 1913, four extrusion presses were transferred to the buildings there in 1914. The chief product was automobile trim made from a new aluminum alloy called 2S.⁴⁶ A large percentage of this trim was exported to London for foreign trade. The Extrusion Department was expanded in 1919.

Jobbing Department

The most unique of all the divisions was the Jobbing Department. This department allowed the manufacture or "jobbing" designated items for customers, such as speciality items in automobiles and cooking utensils. Jobbing started as early as 1895-1900, mostly by the Machine Shop. Late in 1901, a division of the United States Aluminum Company was organized to manufacture cooking utensils and began operations in a small shop at the New Kensington Plant. In addition to the manufacture of cooking utensils for the Aluminum Cooking Utensil Company, which was then a sales organization, the new organization also assumed other product fabrication activities for the PRC. The first jobbing activity was a large number of automobile parts for cars of the Interborough Rapid Transit Company including interior panels, brackets, and moldings.⁴⁷ This department became unofficially known as the Automobile Department.

In 1904, the Jobbing Department was located in a building formerly owned by the Hunt Airbrake Company of New Kensington. When the Wire and Cable Department moved to Massena in 1904, the Jobbing Department moved into their space. The first principal items jobbed were automobile hoods and underpans for White, Peerless, Pope-Toledo and White Steamer automobiles.⁴⁸

Between 1906 and 1907 when Henry Ford introduced the mass production assembly line, steel fabrication improved for automobiles, resulting in a decrease in the use of aluminum. As a result, two types of utensils (special orders for clients which differentiated from those in the ACUC) became the main items for the jobbing department. These utensils included 150,000 canteens, fabricated for Japan for their war with Russia; and the Fireless Cooker, fabricated for the Campbell Fireless Cooker Company.⁴⁹ Uses for aluminum in the jobbing

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department were divided into two categories: 1) cooking utensils and 2) tanks and special equipment for food and chemical industries. This work was done by hand and was hand rivetted. The following year PRC made the first steam jacketed kettle for the America Candy Company. The shells were hammered by hand over iron forms and the joints were then riveted. Demand increased dramatically, and in 1908 a spinning lathe was installed.

By 1908, additional space was required and jobbing activities were transferred to a section of the New Kensington Plant then occupied by the Sheet Inspection Department and by part of the ACUC. At this time, to more properly describe its activities, the name "Job Shop" was adopted. The engineering and manufacturing operations of the Job Shop continued as before to be an activity of the Cooking Utensil Department of the United States Aluminum Company.

In 1911, the Job Shop was moved to the cooking utensil department to economize on space. Three years later they moved back to their old job shop, Building 5. The first floor was used for welding units and the second floor was used for sheet metal work.

Foil Mill

Experimentation began in 1905 to create an aluminum foil to compete with tin. Aluminum foil had been rolled to .001 inch thick but commercial production was impractical due to limited mass production technology for aluminum. Experimentation continued and .0008 inch thickness was achieved in 1908. In 1909, commercial production of foil produced a .003 inch thick strip used as leg markers for pigeons. A year later it was rolled .002 inches thick for Eastman Kodak. This particular use was unknown.

In 1913, the first four bays of the Foil Mill were erected at the Arnold Works. The first production from the new mill rolled a gauge of .0005 inch thick sheet. A sales survey of prospective uses included foil wrappers for candy, tea, chewing gum, yeast, cheese, tobacco, cigars and soap. In 1915, the first printed presses were installed at the Arnold works for foil wrappers. Little foil was sold until 1916 and 1917 when purchasers finally recognized its usefulness and durability.

A year later, the business of the P. C. Larkin Company (now known as Salada Tea) became a client of Alcoa. Within a year or two, the entire requirements of this concern were furnished in aluminum except for the tea. P.C. Larkin and Eastman Kodak are two of Alcoa's oldest foil customers. Both have used foil in their packaging since the early 20th century.

In 1917, four more bays were added to the Foil Mill. The printing department and shears were moved into this new section and an additional four bays were completed in 1920-21. Additional rolling mills were installed in this part of the building and arranged for straight-line production.

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Aluminum Seal Company

In 1910, the United States Aluminum Company started production of "Goldy" seal bottle caps. This effort was part of the larger progressive era concern for safeguard production and packaging. The seals were made of an aluminum capsule, tin plate disc and a natural cork liner. There were two sizes, 26½ and 36 mm manufactured on press equipment in the Cooking Utensil Jobbing Department. Soon thereafter Alcoa purchased a "JA" machine from Bremer and Bruckman, Braunschweig, Germany, and it was installed in the Jobbing Department on August 10, 1911.

The American Seal Company (ASC) was incorporated in Pennsylvania, March 25, 1914 and began its operation in New Kensington on May 1, 1914. Alcoa agreed to pay Ewald Goldstein a royalty for seals made and sold under his patent. As part of the agreement, ASC acquired all assets of the American Goldy Stopper Company which included the Goldy Seal and sealing machine patents.

In 1916, seals were used entirely to seal ketchup and chili sauce bottles.⁵⁰ Development and production soon started on larger diameter Goldy Seals with composition rubber ring liners. These seals were used for cold packed goods such as pickles, relishes, peanut butter and mustard. It became important to develop and build vacuuming and sealing machines. On August 24, 1915, US patents were issued to Mr. William C. Beehles and assigned to ASC for a vacuum chamber type of hand fed, power driven machine. This machine became known as the "V" machine. This technology resulted in various new types of machines being developed for the ASC.

This increase in production and demand for manufacturers necessitated additional space at Alcoa's New Kensington facility. In July 1916, construction was started on the northern half of a four story brick building with a steel frame 210 feet by 70 feet (Building 206); a machine shop whose roof was of sawtooth design, one story brick structure on a steel frame connected to Building 206; and a one story brick on steel frame building whose roof was of sawtooth design, extending south from the machine shop measuring 303 feet by 35 feet wide (Building 205). These buildings were completed in April, 1917 and occupied in November, 1917.⁵¹

Work Force Relations

Through the early 20th century, labor relations were handled individually by each mill, dependent on the demographic, social and economic conditions of each plant locality. The New Kensington Works was considered Alcoa's only "urban" workforce, with its workers coming from an urban environment and able to choose which manufacturing facility to work for. To "Americanize" its eastern European workforce, films, lectures and classroom instruction were provided by Alcoa to its workers.⁵² In isolated communities such as Baden, North Carolina and Alcoa and Maryville, Tennessee, Alcoa built schools, parks and playgrounds, and provided medical care. In some cases, this care was supplemented by medical facilities.⁵³

Aluminum work itself was unpleasant, dirty and arduous for skilled and unskilled workers alike.⁵⁴ Men were exposed to toxic chemicals including benzene, asbestos, and airborne alumina dust, in addition to explosions from bronze powder manufacture and electrocutions. In good economic times, plants found that concessions in

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wages and working conditions were needed to attract workers to dirty jobs in the refining and pot rooms. Plant managers looked to eastern and southern Europeans, Mexican, and southern blacks for especially tough jobs, such as in the hot, miserable pot rooms in the summer time.⁵⁵

In 1895, 47 men at the New Kensington Works signed a petition complaining about the "unhealthy conditions" in the pot rooms and the wear and tear on their clothes. It is unknown how Arthur Vining Davis, then Assistant General Manager, responded to their claims.⁵⁶ Five years later, The American Federation of Labor organized Aluminum Workers Local 8261. On March 27, 1900, 37 skilled men in the Wire Mill walked out in a wage dispute. Employees in other departments joined the walkout, and a strike committee was formed. Workers imported by management were met at the railroad station and persuaded to leave town. On April 4, a settlement was reached in which all the workers received a 12 percent wage increase and a reduction in Sunday work.⁵⁷

In addition to the hard work, aluminum workers were subject to outside forces that greatly affected the niche markets Alcoa pursued. As a result of a Wall Street panic on October 14, 1907, orders for aluminum fell and so did employment. The Works were closed entirely and jobs were at a premium. Those employees who were able to work were paid with clearing house checks. During the panic, a number of firms attempted to roll-back wages and benefits and, simultaneously install mutual benefit programs that would foreshadow future corporate welfare programs and scientific management of the 1920s. A partial shut-down strike lasted from November 9, 1907 until January 12, 1908. Alcoa management issued an ultimatum to its workers: dissolve the union, turn in the charter, or face the consequences. Local 8261 complied and the union was dissolved January 8, 1908.

As unionism at Alcoa dissipated, corporate paternalism began to appear. Alcoa began an early attempt to "give something more than wages to its employees." This included the development of two mutual benefit funds - a Permanent Employment Fund and a Sick Fund managed by Alcoa. According to company minutes, the Permanent Employment Fund was "to establish more permanent relations between the company and its employees" and to build up for the employee, a nest egg or pension to take care of him in his declining years. The company credited to each hourly-paid employee at the end of each month, 2.5% of the employee's previous months earnings. The employee made no contribution whatsoever. If the employee gave 30 days notice, he could access the account after 2 years. If he quit or was discharged, he received none of the fund.⁵⁸ At the determination of a committee, the Sick Fund was to provide assistance at times of illness. Employees paid \$.25 per week and the Company matched the amount in addition to moneys forfeited from the Employment Fund.⁵⁹ These funds were discontinued December 13, 1916.

Aluminum Club

In late 1916, construction began on the Aluminum Club on Freeport Road in New Kensington to house technical and professional employees new to the company while taking classes at the New Kensington plant.⁶⁰

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The firm of Janssen and Abbott , architects in Pittsburgh, prepared the plans for erecting the building. Ground was broken January 1916, and the Club was ready for occupancy March 15, 1918.

As Alcoa's only training residence, it was used to house young engineers during a training period in math, engineering and metallurgy with Alcoa. The engineers worked at different departments within the New Kensington plant during the day and attended classes during the evening. At the end of their six month training course, they were sent to other Alcoa plants around the United States.

The engineers were housed on the second floor of the club, in 31 rooms with two men per room. The first floor contained a 30 foot x 70 foot lounge/reading room that had couches, easy chairs and a grand piano. Other rooms on the first floor included a billiard room, card room, office, parcel room and a 30 x 70 swimming pool with shower and locker rooms. Tennis courts were also located in the rear of the property. The caretaker had an apartment in the basement.

Logans Ferry Powder Works

Another product of the New Kensington works was aluminum bronze powder, finely flaked bits of aluminum used in explosives, fireworks, and as pigments in paints and ink.⁶¹ This powder was first produced at Building 3C of the New Kensington Works in November, 1912. Before January, 1913, Buildings 3A, B, and C, totaling 20,000 square feet were being used to manufacture bronze powder. On November 5, 1917, a fire with an unknown origin arose and water was used to extinguish it. Subsequently an explosion occurred in the powder production facility killing eight workers, injuring 23 men, and wrecking the powder facility.

Realizing the impracticality of continuing the manufacture of powder in the old location, plans were made to relocate this manufacturing operation to a facility distant from the main works.⁶² Twenty acres of land was purchased at Logans Ferry, 3 miles south of New Kensington on the Allegheny River, and 13 buildings comprised the Powder Works, including a Boiler House (Building 401); Pump House (Building 402); Powder Storage, Box Shop and Inspection (Building 404); Store Room, Powder Stores (Building 405); Shipping (Building 406); Powder Stores and Packing (Building 407); Powder Stores and Packing (Building 408); Polishers (Building 409); Packing - Sifters (Building 411); Shredders and Sixteeners⁶³ (Building 412); Wash and Locker Room (Building 413); Shredders and Sixteeners (Building 414); and Scrap Storage (Building 415). These building were completed by August 1, 1918.

During the first year of production, the Powder Works employed 18 people. By 1919, employment rose to 42 and by 1920, there were 51 employees. In 1924 a substantial plant expansion again occurred with five new buildings constructed. These new buildings included Can Storage (Building 410); Machine Shop (Building 416); Sixteeners (Building 419); Shredders and Sixteeners (Building 420); and Gate House (Building 428). Floor space increased to 79,000 square feet with 386 machine units in production. The plant was then enlarged again in 1926, with eleven additions or new buildings. This construction included Pump House (Building 402); Powder Storage (Building 403); addition for packing (Building 411); addition for wash and locker rooms

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(Building 413); addition for Machine Shop (Building 416); office (Building 418); addition for Shredders and Sixteeners (Building 419); addition for Shredders and Sixteeners (Building 420); Scrap Storage, Shredder, and Stearic Acid (Building 421); Research Lab (Building 421-A); Powder Storage (Building 423); and Powder Storage (Building 424).

On July 18, 1929, a second serious fire and explosion occurred at the Powder Works. Twenty-three workers were injured and 8 men died. Afterward, the plant was idle for a "considerable period."⁶⁴ During this period, the demand for powder exceeded capacity, and a new powder plant was built in Alcoa, Tennessee.

Coal Mine

Aggressive and imaginative problem solving became an Alcoa trademark in this period. As a result of the high demand for steel and related products associated with World War One, an industrial coal shortage existed in 1917. Alcoa considered purchasing a tract of coal properly situated from a shipping standpoint. On October 26, 1917 Alcoa purchased property which included a coal mine in an area called Renouf's Beach from George S. Baton, a mining engineer. The coal mine was located three miles upstream, or north of the New Kensington works, on the Allegheny River.⁶⁵

The property consisted of three acres of surface ground and 1,075 acres of subsurface coal. A combination railroad and river tipple was built to clean and move the coal from the mine to Alcoa's processing facilities in New Kensington. In addition, a small office and storage building were constructed as well as railroad sidings. The company purchased three wooden barges and built a stationary dock under the river tipple. During the winter of 1919, ice destroyed the dock and thereafter floating docks were used.⁶⁶

The mine, known as the "Aluminum Mine", was well equipped with an inside generator station, an electric fan, locomotives and about 200 mine cars. An unloading structure (not extant) was installed at the New Kensington works with a hopper and derrick. Connecting the hopper to the boiler house at the New Kensington Works, was an underground conveyor, leading to the bucket conveyor feeding the boiler house. Coal was supplied by rail from the mine to company plants in Niagara, Massena, Edgewater, Detroit, Cleveland and Buffalo. The coal was carried by a fleet of 21 railroad hopper cars, of which 19 were steel and two were of wood construction.

By the end of World War I, the New Kensington and Arnold Works as well as Logans Ferry, the Coal Mine and the Aluminum Cooking Utensil Company accounted for over 3,292 employees, 19% of the total population of the two communities. The New Kensington and Arnold Works covered 75 acres, having a manufacturing floor space of over one million square feet.⁶⁷

Community Development

In 1900, less than 10 years after its establishment, the population of New Kensington reached 4,665. Arnold's population reached 1,426 in the same year. Much of this population growth came from influxes of immigrants

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who came to work in the growing industrial enterprises in the two communities including substantial numbers of western, central, and eastern European immigrants. Western European immigrants were primarily from England and Wales, while lesser numbers came from Scotland and Ireland. English and Welsh immigrants were predominantly employed as skilled workers at the aluminum works. These were among the earliest arriving immigrants, and may have been recruited by the Pittsburgh Reduction Company as skilled metalworkers to supervise the operation of plant machinery. During the 1890s, New Kensington witnessed a large population influx of Italians and Poles and lesser numbers of Germans and Russians as mass production techniques spread, the need for lesser skilled labor increased. Many of these immigrants worked as laborers in the aluminum works, while others worked as laborers in the Arnold glass works, or as coal miners.

By 1910, the population of New Kensington had grown to 7,707, and Arnold had grown to 1,818. A large portion of this increase represented immigrants who provided much of the unskilled and semi-skilled labor for the aluminum and glass plants. Many of these workers lived in boarding houses or boarded with families who had arrived previously. The largest proportion of immigrants remained Italian and Polish. When plans for a sanitary sewer system for Arnold were published in 1913, lot ownership by persons of Italian and Slavic origin had risen to nearly half the population in Arnold's new neighborhoods.⁶⁸ In addition, significant numbers of Hungarian-Slovak, Austrian, and Russians populated both New Kensington and Arnold. Arnold itself, retained a substantial Belgian population. Most of the Belgians worked in the glass factory, while lesser numbers worked in the coal mines. The glass factory remained the largest employer in Arnold, but significant numbers of residents worked for Alcoa.⁶⁹ In addition, a small group of Mexican immigrants also settled in Arnold in 1914-1915.

In New Kensington, the immigrants settled closer to the central business district on the numbered streets. The new residential areas along the ridge east of downtown (Ridge Avenue) were largely settled by native-born white Americans. The residential areas were located between the commercial district and the New Kensington Works along Second and Third Streets from Ninth Avenue to Eighteenth Avenue, and on the other side of the railroad along Kenneth and Victoria Avenues. The streets were laid out in a grid pattern, with long narrow lots bisected by alleys. The frame or masonry constructed houses were setback along the street, with small side yards and often had garages at the rear. The houses were vernacular, 2 to 2 ½ stories, with a one story full length porch across the front. Above the porch were regularly spaced double hung sash windows. The roofs were either gable, hipped gable, or cross gable with the ridge lines perpendicular to the street.

During the second decade of the twentieth century, residential development of the land surrounding New Kensington and Arnold continued. In 1915, the subdivision of Mount Vernon was established southeast of downtown New Kensington by the Honorable Joseph Buffington, Reverend E. J. Knox and Orr Buffington, Executors of Grier C. Orr of Kittanning. The plan, drawn by Ben S. Densmore, was constructed in four phases. The first section included Summit and Spring Streets, and the first houses were constructed along Spring Street. During the latter portion of the decade, the second and third sections of the subdivision were platted. The roads in this section were given names in honor of battle sites, military divisions, and soldiers from World War I.⁷⁰

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These houses, constructed in clapboard, brick, stone and stucco, were designed in the Bungalow, Four Square, Craftsmen and Vernacular styles for Alcoa division heads and business owners in New Kensington. The streets were laid out in a grid pattern, with two different lot sizes bisected by alleys. These residences were setback along the street, with somewhat larger yards and often had garages in the rear of the lot.

The largest ethnic concentrations in Arnold and New Kensington were represented by churches and social organizations. St. Peter's Roman Catholic Church served the Italian community, while St. Mary's Roman Catholic Church served the Polish Community. The Polish community had its Polish Falcon Hall, Polish National Alliance, and Veterans Hall, while the Italians had the Italian Club and the Young Italy Organization. To this day, these two churches and several social organizations remain active, testimony to the continuing growth of the aluminum industry and strong ties within these two largest ethnic communities of the area. Despite the large influxes of immigrants, there is no evidence that whole communities were recruited from Europe, as was the case in some other western Pennsylvania industrial communities.

With the continuing growth in aluminum markets in the 1910s, Alcoa, with assistance from the Mellons, acquired all the vacant lots between Fourth Avenue and the Allegheny River and between Fourteenth and Eighteenth Streets in the Borough of Arnold in April, 1912.⁷¹ Roy Hunt, Superintendent at the New Kensington Works, presented 12 ordinances to the Borough Council in Arnold to close certain streets and alleys between Spruce Alley and the Allegheny River in March, 1913. Council passed the ordinances at their meeting on Friday, April 18, 1913. In agreeing to pass the 12 ordinances vacating streets and alleys, the "Borough (of Arnold) keeps two streets to the River and wharfage and also the right to maintain the present sewers."⁷² Thereafter, New Kensington's Alcoa Works grew into Arnold, and commercial and residential growth followed.

By 1915, the streets were laid out in a grid pattern, with long narrow lots bisected by alleys. Houses were constructed on the east side of the 1300 block of Third Avenue. The west side of the 1600 block and the east side of the 1700 block of Second Avenue was almost completely developed with semi-detached houses. These 2 ½ story houses had cross gable roofs with wood clapboard siding. The north side of Sixteenth Street at Riverside Drive and Seventeenth at Third Avenue were also developed by 2 ½ story, clipped gable buildings with aluminum siding. Primarily all of these buildings were vernacular in design. The frame or masonry constructed houses were setback along the street with small side yards, often having garages at the rear. They had a one story full length porch across the front and above the porches were regularly spaced double hung sash windows. Arnold's growth was limited and on a smaller scale than New Kensington's. As with New Kensington, private development occurred on a project by project basis typical of period manufacturing communities.

Working class businesses were located along Fifth Avenue from Sixteenth Street to Eighteenth Street.⁷³ These vernacular commercial buildings varied in height from one to three stories and were constructed in brick or terra cotta.

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On August 17, 1915, the Borough of Arnold contacted Roy Hunt, the son of Alfred Hunt who had worked his way up from janitor to Plant Superintendent, to see if Alcoa would sell $4\frac{1}{8}$ acres to another manufacturing company at \$2,000.00 an acre. Arthur Vining Davis responded three days later, "We are growing fast and the Town ought to be glad to let us grow and hunt other sites for new people. Then too \$2,000.00 an acre is far too low a price for river front property. If we sell at all we ought to get a much higher price." Alcoa decided not to sell the property on August 25, 1915.⁷⁴ Arnold remained an industrial town dominated by Alcoa.

In 1916, Wear-Ever built a soft-ball field on land next to the mills. Wear Ever Park was home to the Wear Ever Semi-professional Baseball Team that won the National Semi-professional Baseball Championship in 1917. When the plant expanded in 1920 with the construction of Buildings 202 and 210, the ball field was moved to its present location at Riverside Drive and Seventeenth Street.⁷⁵ Americanization as well as the establishment of the Aluminum Club through passive recreation, helped draw worker's allegiance to Alcoa.

Research and Development, 1920 - 1929

Research and Development, 1920 - 1929 discusses the evolution of research and development within Alcoa and the continual growth of the New Kensington Works.

During the 1920s, the variety of products produced by Alcoa increased substantially. By the end of 1921, the New Kensington Works began working at a high level of production as the demand for aluminum sheet returned, primarily in cooking utensils and automobile bodies, and to a lesser degree in license plates, reflector, cameras, refrigerator trays, washing machine cylinders, drainboards, airplanes, and radio parts. In 1924, Chevrolet decided to use aluminum radiator shells. Ten million pounds went into radiators between 1925 and 1927.⁷⁶

Research & Development

Prior to World War I, the company undertook little fundamental research. Although research on the alumina refining process had received considerable attention, the company had invested little in exploration into the fundamental nature of aluminum, its alloys, or their fabrication and application. Often research projects were "informally organized and frequently had to be put aside for more pressing production problems."⁷⁷ Instead, ideas for niche marketing, as with foil and cookware, had driven Alcoa's research and development.

After World War I, however, Alcoa could no longer afford to ignore prolonged research into the fundamental aspects of metallurgy. The invention of Duraluminum, an aluminum alloy used in the construction of Zeppelins in Germany, demonstrated that without an in-house capability of responding to or anticipating such technical discoveries, the company might not have been able to replicate an important new technology, find a reasonable substitute, or bring key patents under its control. As a company which thereafter operated on the

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frontiers of knowledge and application, Alcoa found it imperative to conduct fundamental research and development.⁷⁸

In 1918, Alcoa selected Francis C. Frary, a 33 year old research chemist from the University of Minnesota, to head its research efforts. Frary was interviewed by the superintendent of Alcoa's Niagara Falls Works and expressed interest in "handling work of an original nature, but not in solving problems that arise from time to time at the works relating to process control." Frary was assured that it was the company's intention "to establish a general research laboratory, somewhat along the lines of those established by General Electric and other companies, and that the work carried on would be thereof an investigating nature and is not to pertain to troubles of various kinds relating to the Work's operations."⁷⁹

Initially, the Research Bureau was one of two branches of the new Technical Department. The other branch, the Technical Direction Bureau, was responsible for functions related to process improvements and quality control. The Research Bureau was intended to operate without regard to the routine work of the company. The original plan of the Research Committee was that the Technical Department would remain in New Kensington only until a new laboratory could be built at a new location. Edwin Fickes recorded the rationale of the committee:

...neither Mr. Hoopes nor I wanted the laboratory at any of the works or too closely associated with them, as we feared in time the works where it was situated would become a dominant factor in determining a research policy which would neglect other problems which might be of far greater importance to the Company than those of the single works where the laboratory was located.⁸⁰

Possible sites of the laboratory were Pittsburgh, Alcoa's headquarters city and home to Carnegie Institute, or Edgewater, NJ, the site of an Alcoa mill and near the campus of Stevens Institute of Technology in Hoboken, NJ. However, the post war business slump and lingering skepticism on the part of some senior Alcoa Managers thwarted the wishes of the Research Committee. The Research and Technical Bureaus were located for the first ten years in cramped and inadequate facilities on the third floor of the New Kensington works clock house.

On one of his infrequent trips to New Kensington, company chairman Arthur Vining Davis visited the research quarters at the New Kensington works and pronounced them "a slop hole of a laboratory." In 1929, Alcoa completed its long awaited central research laboratory, located on a bluff high above the Allegheny River in New Kensington. The building was constructed to house more than 150 researchers.⁸¹ With the new laboratory came a new corporate research structure dividing the research function between the center and branch. In *R & D for Industry*, Graham and Pruitt note, "If the center created a new alloy, the branch put it to use, designing the project and the process to produce it...If the Aluminum Research Laboratories...in New Kensington worked on the chemical and physical characteristics of a particular class of alloys, metallurgists in Mesenna would work on casting it into ingot and trying out its rolling characteristics.

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The new \$50 million laboratory building, designed by noted Pittsburgh architect Henry Hornbostel, incorporated the latest ideas in chemical research laboratory design while serving as a showcase for aluminum buildings yet to be constructed. The new laboratory (Building 29) introduced the architectural possibilities of aluminum and was described in *Iron Age* magazine as a "laboratory of dignity and beauty."⁸²

In *R & D for Industry*, Graham and Pruitt noted:

Aluminum was everywhere, visible and invisible--from the elevator with hammered doors to the floors with aluminum strips in the terrazzo, the window casings, piping, ornamentation, furniture..., railings and paint. Many of the features--paint, floors, aluminum radiators, and piping--required preliminary research to determine the reaction of the aluminum to surrounding materials, and all would provide a chance for close daily follow-up.

The courtyard of the new building was specially designed to rig all configurations of test equipment and to accommodate medium-term experiments such as testing activated alumina for its adsorptive qualities, which were useful for filtering industrial wastes and later in air conditioning. The laboratory had its own melting, casting, and rolling equipment, including several electrical furnaces on the ground floor.⁸³

The company began officially using the name Alcoa on ingots July 1, 1926. A trademark application was filed on March 30, 1927, and the name became officially recognized thereafter.

During the years prior to World War II, the Alcoa Research Laboratories generated and published basic data stemming from long-term systematic work in three primary technical areas: alloy composition and properties, corrosion, and structures.

Plant Expansion

At the coal mine, employment averaged 100 in 1918; 120 in 1919; 110 in 1920; 85 in 1921; 145 in 1922; 148 in 1923 and 4 in 1924. The drop in employment in 1921 was due to economic depression that year. The coal mine ceased operation in December 1923, and no coal was taken out after that date since coal could once again be purchased cheaper from other sources.⁸⁴ The railroad cars were shipped to the East St. Louis Plant, and the dock and barges were sold.

In 1923, the Arnold Sheet Mill consolidated its works. Some of the products they produced included 17S and 25S grade aluminum sheets. However, due to lack of further expansion space in Arnold, Alcoa built a plant in Detroit to be near automobile manufacturers.

Two years later the ACUC took over manufacture as well as sales of Wear-Ever utensils at the New Kensington Works.

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By 1927, a final four bay section was added to the Foil Mill Building in Arnold. However, the Arnold foil mills were unable to meet demand. An additional foil plant was opened in Edgewater, New Jersey and another plant was begun in Toronto, Ontario.

In 1928, a four story, 420 feet by 70 feet wide addition was added to the southern half of Building 206 as additional manufacturing and warehouse space for the American Seal Company.⁸⁵ This addition reflected the increased business volume that resulted from the company's development of "Rolled-on" sealing in 1924. This process provided a tailor-made fit and hermetic seal for each cap. As a result, this method not only increased the use of aluminum caps but extended the market for glass jars. Two years later, the Aluminum Seal Company first produced mason jar caps, and during the following year, 25,000,000 were sold.⁸⁶

Community Development

By 1920, the population of New Kensington had risen to 11,487 and the ethnic mix of New Kensington became more diverse. The Italian and Polish immigrant population continued to increase in the community. Earlier immigrants were joined by significant numbers of Czech-Slovaks, Austrians and Russians, as well as smaller numbers of Syrians and Greeks. A substantial portion of each of these ethnic communities found employment in the aluminum works. Smaller numbers, primarily earlier arriving immigrants, worked as shopkeepers and small businessmen.⁸⁷

New Kensington of the 1920s was somewhat segregated ethnically, although the level of segregation was less than that of some other western Pennsylvanian communities. Some blocks in downtown New Kensington were overwhelmingly populated by Polish immigrants, while others were overwhelmingly populated by Italian immigrants. Most of these blocks were concentrated in the area of Second to Fifth Avenues, east of the Alcoa Works. Blocks at the southern end of New Kensington and the seat of the downtown area contained some immigrant residents but remained predominantly populated by native-born white Americans. This segregation continued through the 1930s.

Development of the outlying areas as residential areas continued in the 1920s and 1930s. Houses continued to be constructed in the Mount Vernon subdivision with the opening of Additions I, II, and III. These areas were surveyed by H. Park Martin, who later became the Pennsylvania Secretary of Highways. These houses, constructed in brick, stone and stucco, were designed in the Bungalow, Four Square, Craftsmen and Vernacular styles for Alcoa division heads and business owners in New Kensington. Several grocery stores were also constructed to serve residents of the area.

Pine Manor subdivision was developed by Henry Saxman from Latrobe in 1925-26. The land was the former dairy farm on Woodbury Road northeast of downtown New Kensington. Many of the larger homes in the subdivision were designed by Enos Cooke, also the architect of Mt. Saint Peter's Roman Catholic Church, the central religious and ethnic center for the Aluminum industry's Italian laborers. These houses, constructed in stone, clapboard and brick, were designed in Tudor Revival, Colonial Revival and Bungalows with steep

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gambrel, cross gable and gable roofs. These houses were set back on the sites, with large side yards. The houses were generally occupied by scientists, engineers and executives who worked at the Alcoa Research Laboratory.

Development of the central business district continued in the 1920s. By 1921, when new immigration laws severely curtailed immigration, the central business district had begun to expand northward and eastward. Commercial development extended to the railroad tracks on the east side of downtown. Several social clubs and churches were also located in the northern section of downtown New Kensington. On May 2, 1921, the Liberty Theater opened on the corner of Fifth Avenue and Eighth Street. The State Theater opened on Fifth Avenue in 1925, the newest of five theaters in New Kensington, reflecting the growing popularity of movies as entertainment. In 1928, the city's first public free library opened. No longer just an Aluminum boom town, New Kensington matured into a community managed and dominated by Aluminum interests but with social, religious, ethnic institutions, and recreation and entertainment facilities typical of the 20th century industrial communities.

By 1920, the population of Arnold grew to 6,120, reflecting the additional employment provided by the new Arnold Works. The immigrant population continued to increase in both communities during the 1910s. Immigration from Eastern Europe increased, and predominantly immigrant neighborhoods dominated much of the community. Some blocks in Arnold were almost exclusively Italian, while some were almost exclusively Polish. Large numbers of these immigrants worked at the glass factory, while equally large numbers worked at the Alcoa Works. These ethnic groups constituted at least twenty five percent of the population of both communities. Arnold became home to other ethnic groups including a significant number of Galician immigrants who came to the United States from an area in eastern Europe now divided between Poland and Ukraine. Other Arnold immigrants came from Ukraine and Russia. This growing Ukrainian-Russian community provided the impetus for the establishment of the Ukrainian Citizens Club, situated at the corner of Fourteenth Street and Fifth Avenue. Most of these Eastern European immigrants worked as laborers in other semi-skilled occupations, such as packers. All were employed as laborers at the Alcoa Works.

By 1921, most of Arnold's empty lots were developed with houses. Intensive development occurred in the 1400 block of Fourth Avenue, while the eastern side of the 1500 and 1600 block of Second Avenue was still undeveloped. By 1928, most of Arnold had been developed.⁸⁸ The streets were laid out in a grid pattern, with long narrow lots bisected by alleys. The frame or masonry constructed houses were setback along the street, with small side yards and often had garages at the rear. The houses were vernacular, 2 to 2 ½ stories, with a one story full length porch across the front. Above the porch were regularly spaced double hung sash windows. The roofs were either gable, hipped gable, or cross gable with the ridge lines perpendicular to the street.

In Arnold, commercial development based on private investment grew at a much slower pace than in New Kensington. However, this growth was typical of small industrial manufacturing communities. Businesses located along Fifth Avenue from Sixteenth Street to Eighteenth Street varied in height from one to three stories

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and were constructed in brick or terra cotta.⁸⁹ They were vernacular in style and typical of working class commercial buildings in western Pennsylvania.

The Depression and Beginnings of Recovery - 1930-1938

The Depression and Beginnings of Recovery - 1930 - 1938 examines the emergence of anti-trust litigation and workforce relations as a backdrop of the Depression and preparation for World War II.

After sustained growth through much of the 1920s, aluminum sales were severely affected by the Depression. Gross revenues declined from \$34.4 million in 1929 to \$1.1 million in 1932. The number of U.S. employees fell 45% from 24,857 to 13,652 during the same period, while employee figures at the New Kensington Works fell 30% from 5,245 to 3,707. This was a dramatic change for these workers. Engineers as well as workers were dismissed, and the sales force was pared back. In 1931, Alcoa cut wages 10% and again in 1932, but still lost \$2,000,000.⁹⁰ On May 1, 1933, corporate offices were moved from the Oliver Building to the Gulf Oil Building in Pittsburgh. In this same year, construction projects and improvements were suspended; men were hired for \$.35 per hour and women were hired for \$.18 an hour. These wages were comparable to those that were being paid in the local coal mines.⁹¹

These were the same problems facing all industrial communities throughout the United States. In electing Franklin D. Roosevelt in 1932, workers hoped that the economy would improve and they could go back to work. During FDR's first 100 days in office, the public got what it wanted: a wide variety of new government agencies created, signaling a fundamental shift in relations between government, business, and those who simply worked for a living.

With the passage of the National Industrial Recovery Act (NIRA) on June 16, 1933, workers received the legal right to unionize. Section 7A of the NIRA granted workers the right to collective bargaining under representatives of their own choosing, and established a maximum number of work hours and minimum wages. The act also authorized the National Recovery Administration to assist in stabilizing distressed industries through government sponsored cartelization and suspension of anti-trust pressure on production practices, price fixing and employment practices.⁹² Included was the establishment of minimum industry standards for production to eliminate cut throat competition. Alcoa never had competition, because they initiated the industry. In this instance the monopoly was legal because there was no evidence of competition. However, on May 27, 1935, the Supreme Court outlawed the NIRA as an unconstitutional usurpation of Congressional power. Labor's right to unionize reemerged as the National Labor Relations Act (NLRA) with the National Labor Relations Board (NLRB) as the mediating body. Section 7A was rewritten so that collective bargaining was less ambiguous and less susceptible to company interpretation. It gave employees the right to organize, it outlawed company unions, it forbade companies to interfere with unionization, and it gave them the exclusive right to collective bargaining. In 1939, the NLRA withstood the test of the Supreme Court.

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Work Force Relations

From 1908 to 1934 there were almost three decades of labor peace within Alcoa and the communities of New Kensington and Arnold. This was due in part to the pro-business and anti-labor Republican government and Supreme Court but also the corporate welfare activities of Alcoa at the same time. During the 1920s Alcoa, like other large industrial firms of the era including GE, J & P Coates, and General Motors, provided health clinics, recreational programs, housing and educational facilities at various plants in order to promote morale and loyalty. Alcoa did not develop a formal personnel department until the mid-1930s, relying on traditional methods of hiring and firing to maintain its workforce. With the onset of the Depression and pro-labor Democrats, legislation was passed for industrial organization of labor including mass production workers.⁹³

Alcoa adhered to some provisions of the National Industrial Recovery Act by adopting wage rates similar to those of other industrial groups in the northeast: refining - \$.30 an hour, smelting (male) - \$.35 an hour, and smelting (female) \$.30 and hour. The end of welfarism and the problems of the Depression heightened workers' insecurities. Aluminum workers signed up in July, 1933 when Howard Crowe and Edward Croghan, organizers for the Allegheny Valley Central Labor Union, appeared at the gates of the New Kensington Works. On August 1, 1933, Federal Local Union 18356 was chartered by the American Federation of Labor (AFL) as a way to house aluminum workers until they could be dispersed into appropriate craft unions. Alcoa did not recognize Local 18356 and refused all attempts at collective bargaining.

With the advent of the NLRA and its predecessor NIRA, Alcoa dealt with unionization with restraint and evenhandedness in handling labor conflicts. When they took a stance, Alcoa management did not use scab labor, armed troops and "vicious" propaganda against "the foreign element" all which were major factors in the continuing violence elsewhere in the Valley.⁹⁴ According to Carl Meyerhuber, author of several articles and books on labor relations in Western Pennsylvania, Alcoa believed in a carefully calculated policy to ensure labor peace:

Alcoa had refused to employ industrial violence to defeat unionization. The company apparently preferred economic coercion, selective dismissals and promotions, and watchful waiting to thugs and strikebreakers.⁹⁵

An example of Alcoa's labor relations and community control occurred in 1933, when Mary Peli, a storeroom clerk, led 40 women down to the Broad Building in New Kensington to sign union cards.⁹⁶ After her dismissal, the union hired Peli to do clerical work and spot organizing. Shortly after she started her new job, an Alcoa plant superintendent appeared at her home and offered her family financial security if she agreed to forgo union activities. After Peli refused, she was called in by her parish priest, Father Fusco of Mt. St. Peter's Roman Catholic Church who was a supporter of Alcoa's anti-unionism, and offered Mary Peli a job at the Italian Consulate in Pittsburgh. She refused, citing her intentions to remain actively involved in union organizing in New Kensington.⁹⁷ Peli continued to work as an effective recruiter for Local 18356. She was elected as

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financial secretary and later assisted Nick Zonarich, Local 18356 President, and John Haser, Local 18356 Business Manager, in leading local union workers from the AFL to the CIO.

On March 1, 1934, 3,800 company employees walked out on a job "holiday",⁹⁸ striking for increased pay and changed work hours. After a complete shut-down and eleven days later, Alcoa agreed to an 11% pay increase. Workers struck again from August 10 to September 6, 1934, when Alcoa failed to accept the agreement reached to end the previous strike. Primary points of contention were union membership check-off, closed shop, wage rates, seniority rights, dismissal rules, and grievance procedures. The strike ended with temporary union capitulation.⁹⁹ In the face of dissension among the strikers, Alcoa did not hesitate to take advantage of the situation. Strikers received hostility from the local merchants, who had extended credit to unemployed workers, and the Catholic clergy, who continued to lobby against unionization.

Many of the union workers felt the AFL let Alcoa get away with too much, and as a result the membership of the union dwindled from "thousands" to 17. This small but cohesive group of militant workers were determined to organize a group of individuals more aggressive in challenging Alcoa.¹⁰⁰ This small band petitioned the AFL for an International Charter. The AFL responded by forming an Aluminum Workers Council. Local 18356 saw the council as "a sham".¹⁰¹ In-fighting continued back and forth between Local 18356 and the AFL. Local 18356's troubles parallel union struggles ongoing in other industries, where AFL's conservative craft traditions were being challenged by first and second generation Middle European immigrant workers. The AFL's unwillingness to issue a full fledged international charter and the red-baiting rhetoric of the district representative alienated the moderate heads of Local 18356.¹⁰²

By January, 1937, a majority of the Local supported the recently organized Congress of Industrial Organization (CIO). On April 12, a workers' convention was held in New Kensington for the purpose of founding an industrial union under the auspices of the CIO. Twenty-two delegates, representing only four AWU locals, founded the Aluminum Workers of America (AWA), CIO. The CIO granted the AWA a charter on June 15, 1937. The former AFL local 18356 became Local 2, AWA. Nick Zonarich, of New Kensington, was elected international president, and John Haser, also of New Kensington, became business agent for Local 2.

The CIO and Alcoa never settled into an easy relationship with collective bargaining. Strikes occurred in 1937, 1938, and 1939.¹⁰³ This series of strikes led to a comprehensive CIO contract, which included bargaining rights, shortly after the Supreme Court upheld the right to collective bargaining and government mediation of labor disputes in November, 1939.

Anti-trust Litigation

In the midst of its expansion in 1937, Alcoa faced the prospect of antitrust litigation. In 1931, a suit was brought by Baush Machine Tool Company after Baush's aluminum plant closed in 1931. Company president George Haskell filed suit seeking \$3,000,000 in anti-trust damages.¹⁰⁴ The suit was based on Baush's failure to sustain markets in Duraluminum forgings and sheet. Baush's attorney's had two lines of attack. One, Alcoa

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undercut Baush's prices for forging and sheet by reducing the differentials between prices of its ingot and its semi-fabricated products below the true cost. Price squeezing by an integrated firm was deemed anti-competitive under anti-trust laws. Two, Alcoa was conspiring with and coercing foreign producers to keep their aluminum out of American markets.¹⁰⁵

The suit went to trial in the fall of 1933. After ten weeks of trial, Alcoa was cleared by a Connecticut jury. A Federal Appeals Court then ordered a new trial after finding the judge's instructions to the jury had been too narrowly framed and that evidence was erroneously excluded. The Appeals Court found that there could be no direct evidence of control of importation of aluminum by Alcoa if the condition of monopolization of the domestic market was found to exist. In 1935, the second trial resulted in a verdict for Baush with the jury awarding \$2,868,900 and treble damages plus attorney's fees. Alcoa immediately appealed.

Alcoa won the second appeal based on two arguments. One, that uniform prices and or high prices on ingot charged by Alcoa and importers should not be construed as violations of the Anti-Trust Law if pricing resulted from independent actions of the producers (through oligopolistic pricing behavior). Two, Alcoa argued that price spreads that did not cover the conversion costs at every stage of a vertically integrated enterprise were not unlawful. Baush threatened more litigation and Alcoa, rather than suffer continual law suits, settled the suit with Haskell.¹⁰⁶

The issues in the Baush settlement became the basis for a United States Department of Justice case against Alcoa filed in 1937. Complaints were filed in the Federal District Court for the Southern District of New York and asked that the company be dissolved. Alcoa faced 140 separate charges for monopolizing interstate commerce in 16 markets and commodities, and being a party to comprehensive conspiracies with foreign producers.¹⁰⁷

The Government's complaint fell under three main headings: monopolization, illegal conduct in domestic competition, and conspiracy with foreign producers. The principle commodities which Alcoa was accused of monopolizing were bauxite, water power, alumina, virgin aluminum, castings, cooking utensils, pistons, extrusions and structural shapes, foil, sheet, and miscellaneous fabricated products. The conspiracy charges accused Alcoa of making deals with foreign producers to control the price of aluminum in the United States. The case went to trial on June 1, 1938 and lasted until 1940, when new briefs were produced and then the judge needed time to consider the verdict.

Return of Prosperity

By 1936, when the "Hoover Depression" came to a close, a renewed demand for aluminum burst with a new round of orders, and Alcoa generally recovered in the following years. By 1936, employment had risen to 7,240 at the New Kensington Works. In 1937, total company revenues climbed to \$12.8 million dollars. The largest portion of sales - 35.4 percent, came from sheet, plate and foil. Pig and ingot represented 17.8 percent of sales; castings, jobbing, and screw machine products, 16.4 percent; rod, bar and wire, 14.4 percent; tubing, rolled

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structures, forgings and extrusions, 12.9 percent; and powder and paste, 2.8 percent. Alcoa suffered little from the Roosevelt Depression of 1938-39.

With the return of prosperity, Alcoa began a limited expansion at the New Kensington Works. On June 9, 1931, the ACUC took over the distribution and marketing of household foil.¹⁰⁸ Alcoa aluminum foil was packaged in glassine paper package, printed for suitable uses, and manufactured under the name of "Wear-Ever Household Foil".¹⁰⁹ In subsequent years unlimited uses for foil were found.

At the Powder Works, Alcoa also began a search to make powder production and use less dangerous and destructive. In 1933, the Metals Disintegrating Company of New Jersey developed a process of making aluminum paste by using atomized aluminum placed in ball mills with an inert liquid, such as mineral spirits, and a lubricant, such as stearic acid, in such proportions to form a sludge of creamy consistency. The sludge uniformly coated the balls in the mill and when the mill rotated, the aluminum was hammered into flakes under continued impact of the polished steel ball. These flakes in paste were finer than those found in powders used in paint pigments. The paste called "albron" became an immediate success because it was less hazardous to manufacture (fear of explosion), and more convenient to store and use. Alcoa entered into an agreement with the Metals Disintegrating Company on November 11, 1933 which supplied Alcoa with paste for resale to its customers, and under royalty agreement allowed Alcoa to manufacture paste. This process revolutionized production and the equipment in the plants. In 1935, "albron paste" manufacture began at Logans Ferry. An atomizer unit and four ball mills were constructed, and in August, 1935, production was started.¹¹⁰

In 1936, due to crowded conditions at the Job Shop, it was moved to Building 44, a 3 story, 80,000 square foot building. The first floor was for manufacturing steam jacketed kettles and spinning. The second floor was for general fabrication and the third floor manufactured large tanks and chemical equipment; 200 workmen manufactured over 375,000 pounds of aluminum products a month.

During that same year, additional office space was needed to handle the increased volume at the American Seal Company. An addition of a fifth floor to the north half of Building 206 was constructed. On March 13, 1944, Mr. M. M. Kipfer, ASC, wrote to Mr. J. E. Sharp, ASC, noting:

During the last few years it had become evident that manufacturing and storage space at the Aluminum Seal Company was entirely inadequate for efficient and economic plant operation; that our volume of business per year had increased more than 100% during the fifteen year period immediately prior to 1944...¹¹¹

Mr. Kipfer went on to note that the entire plant should be relocated to food processing regions in western Ohio or southern Indiana which was the center of their sales efforts. Alcoa purchased property in Richmond, Indiana and moved the entire Aluminum Seal Company facility there March 17, 1947. In addition to the mill, they constructed 35 homes for workers to live in.¹¹²

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The New Kensington Works could not handle the additional requirements to meet the growing aluminum need. Plant expansion shifted to the mid-west where land was available, utilities were inexpensive, and there was an abundant labor supply. After the hard alloy sheet rolling technique was developed at New Kensington, it was transferred to Alcoa, Tennessee in 1930 and production began in 1931. In 1938, another new extrusion plant was constructed in Lafayette, Indiana.

Community Growth

By 1930, New Kensington reached a population of 16,762 and Arnold reached a population of 10,575. Italian-Americans constituted more than 60 percent of Alcoa's New Kensington area labor force.¹¹³ In 1930, the city sustained a severe setback when a fire destroyed the Wainwright Department Store, three other business establishments, and several apartments.¹¹⁴ In 1931, as part of Depression-era public works programs, the Treasury Department awarded a contract to construct a new post office at Fifth Avenue and Eleventh Street. This building, incorporating Art Deco and Neo-Classical elements, was designed by James A. Wetmore, supervising architect of the Treasury Department.¹¹⁵ During this period, paired one way streets were begun on Fourth and Fifth Streets, and parking meters were installed.

In 1937, Germany accounted for 30 percent of the increase in the world production of aluminum. By 1938, Germany became the largest aluminum producer in the world. By the end of 1937, European political developments increased the German threat, and Alcoa began to study the potential aluminum requirements of England and France. With war preparations, Alcoa's fortunes improved, beginning with a \$582,000.00 U.S. Navy contract the company received in 1939.

By 1937, world aluminum consumption reached an all-time high of 499,666 metric tons. In the midst of the economic expansion following the Depression, Alcoa began to implement plans to expand its business. In early 1937, the company established a second bauxite transportation fleet. A new aluminum refinery was established in Mobile, Alabama, and aluminum production at the company's four smelting locations was expanded toward full capacity. Alcoa also opened a fabricating plant in Lafayette, Indiana to meet the growing demand for aluminum tubing and expanded its aluminum rivet capacity at Massena, New York.

World War II - 1939-1946

After viewing the booming potential for primary aluminum and aluminum products, Alcoa's first domestic competition entered the primary aluminum field. In 1939, Reynolds Metals found itself cut off from its supply of ingot as Alcoa was unable to fill all the orders it received. The Richmond, Virginia based company founded by tobacco magnate Richard S. Reynolds, had been involved in small scale aluminum production. They made aluminum powder and paste and aluminum foil for cigarettes and other packaging since the late 1920s.¹¹⁶ When Reynolds couldn't get ingot, it exerted pressure on the Reconstruction Finance Corporation to loan him money to construct a smelter in Washington State and a smelter and sheet mill in Listerhill, Alabama.

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The shortage of aluminum capacity for World War II was the immediate precipitating factor in the apparent end of Alcoa's monopoly on primary aluminum production in the United States. The company's production facilities were soon overwhelmed by United States and Allied demands for aluminum. Initially, both company officials and federal government officials believed that Alcoa's reserves and production capability would be sufficient for military needs. But by 1940, Northrup Aircraft, Inc. complained of insufficient aluminum for its production requirements.

In 1941, a congressional committee chaired by Senator Harry S. Truman, had been set up to investigate defense program problems and abuses. After examination of the shortage of aluminum capacity for war time uses, the committee prodded the government to enter the aluminum business directly. Some senators thought that the only way to ascertain if Alcoa's production levels could be exceeded and its prices bettered was either for the government to sponsor other companies, or to build its own plants. It was no longer expected that Alcoa, which was in the midst of increasing its net plant investment from \$236.6 million on January 1, 1937 to \$427 million by the end of 1941, could afford to single handedly finance the wartime effort. The government relied on Alcoa's expertise and good will throughout the war, including on Alcoa's engineers to build and operate the new plants.

The extent of federal subsidy for wartime aluminum production is indicated by the total commitments of the Defense Plant Committee (DPC), a governmental entity established by Congress to supervise construction of plants, not just aluminum, critical to the war effort. A total of \$774,465,000 dollars was appropriated for aluminum plants, of which \$185,799,000 went to aluminum smelters, \$83,398,000 to alumina plants, \$441,429,000 to fabrication plants, \$28,204,000 to power facilities for aluminum production, and the remaining \$35,635,000 to miscellaneous projects related to aluminum. Alcoa's Engineering Department constructed most of these facilities. During 1941, Alcoa contracted for work that led to the building and operation of eight smelters, eleven fabricating facilities, and four alumina refineries (two of which were never activated). All but one of these facilities were operated by Alcoa personnel. The sole exception was a smelter in Tacoma, Washington, operated by Olin Corporation. In all, Alcoa personnel were responsible for 96 percent of DPC alumina production and 93 percent of U.S. aluminum production in World War II. Alcoa insisted on cost-plus leases so that the government retained 85% of the net profits from the Defense Plant Corporation (DPC), while standing for any loss. In turn, Alcoa agreed to build the plants at cost and without fee.

During the war, production shifted almost entirely from civilian to military markets. Most of this annual output was dedicated to aircraft. In five and one-half years of military production, approximately 3.5 billion pounds of aluminum were used to manufacture 304,000 military airplanes. Most of these planes were constructed using hard aluminum alloys developed by Alcoa in the 1930s.¹¹⁷ Over its duration, the federal government's aluminum program added approximately 511 thousand metric tons to the nation's annual aluminum capacity, as aluminum output increased from 148.3 thousand metric tons in 1939 to 834.1 thousand tons in 1944.¹¹⁸

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From the start of the defense program in May 1940 to the end of the war, Alcoa produced 11.4 billion pounds of alumina, smelted 5.5 billion pounds of aluminum, and fabricated 2.7 billion pounds of sheet, 450 billion pounds of extruded shapes, 500 million pounds of forgings and 400 million pounds of castings. Total net for the period was \$199 million.¹¹⁹

Work Force Relations

For Alcoa, the war brought intense supervision of labor relations by the government. It is difficult to measure the effect of government intervention, anti-trust divestiture, and expanded production capacity on Alcoa and its communities. The National War Labor Relations Board (NWLRB) weakened management's ability to weaken the union shop, but also strengthened profits, management prerogative, and corporate security over both the long and short term. With this constant supervision, Alcoa had to say yes to everything, and became rich doing so.¹²⁰

As part of wartime production, all labor disputes were to be settled by the NWLRB. Organized labor generally cooperated and as a result, preserved the permanence of industrial unionism and the institutionalization of collective bargaining. However, there was much rank and file dissatisfaction with the CIO and its "no strike pledge".¹²¹

Increased productivity was not without demands for higher wages. In April, 1941, Local 2 received a 15 cent per hour increase.¹²² However, this raise was not satisfactory to the Local 2 members. The National War Labor Relations Board refused AWA application for a \$1.00 a day increase, and AWA president, Nick Zonarich warned of a strike. On August 25, 1942, a special union meeting was called to reject both the War Labor Board decree and Zonarich's call for a strike. The membership wanted the wage negotiations reopened, arbitration resumed, and a direct appeal made to Franklin Delano Roosevelt. If these measures failed, then they would call for a strike. A one-day strike would shut down the pot rooms and this meant a three month stoppage -- because once the pots were chilled, the carbon would crack, and the damaged pots would have to be replaced.¹²³ Within the next few weeks, labor agitation subsided, due to Alcoa's agreement to reopen wage negotiations. The workers also may have been quiet due to Zonarich's secretive conversations with United Steelworkers of America (USWA) to absorb the AWA.

The New Kensington Works endured the first year of the war without a work stoppage. But this peace did not last and wage tensions still existed. In January 1943, 100 machinists walked out but were coaxed back by patriotic appeals. A month later, a shift reported late to the extrusion department, and three days after that, 60 shipping room employees walked out. Production fell and the New Kensington Works lost their Navy "E" in March, one of the only war time efficiency awards ever withdrawn from American industry.

Management responded by creating joint Labor-Management Committees to deal with local plant issues. The committee was staffed with veteran AWA members whose departments participated in flash strikes at one time or another. The committee attempted to head off further production stoppages before they occurred. In spite of

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the committee trying to mediate flash strikes, there were problems. Absenteeism was growing and plant accidents increased sixty percent.

Local 2 received its first official notice of merger of AWA-USWA negotiations at its regular meeting on April 4, 1944. The USWA had 80,000 members, AWA had 20,000. The USWA had assets of \$4 million. The AWA was in debt. The USWA had four hundred organizers, the AWA had five.¹²⁴ An eighteen point agreement was worked out by the amalgamation committee. The final point was resolved by renaming the AWA the United Steel and Aluminum Workers of America. The steel workers approved the amalgamation at their convention on May 9, 1944. Without prior discussion, the aluminum workers quietly adopted the merger at their convention on June 5. Most aluminum workers realized that Zonarich had surrendered local freedom for a larger measure of hierarchical regimentation and power. The activist minority remained unconvinced that USWA security was worth the loss of Local 302 prerogatives.

In July, 1944, the War Production Board allowed Alcoa to start civilian production again and employment began to diminish, with 4,248 employees in New Kensington and Arnold in 1944. This was the lowest employment figure since 1938. Local 302 became concerned that Alcoa was laying off employees and still keeping up war-time production in the sheet and extrusion departments. Wildcat strikes became commonplace throughout 1944 and 1945. In February, 1945, 325 tube mill workers walked out following a dispute about draft deferments for workers and foremen. The transition to peace-time production and labor relations would not be easy. By the end of 1946, labor had reached a peak in power in American industry, but at Alcoa, management expected a full return to their pre-war position.

Anti-Trust Litigation

On July 23, 1942, after twenty-six months of testimony and the longest case in Anglo-Saxon jurisprudence, the District Court entered a judgement dismissing the 1937 petition of the government. The judge found that in charge after charge, Alcoa's successes were the result of sound business practices and acceptable business behavior. The government's case rested on the firm notion that free enterprise always implied vigorous competition. They viewed monopolies as social evils, too powerful and monolithic to be allowed to exist in a society in which free enterprise depended upon the existence of vigorous competition and the absence of concentrated power. What they failed to realize was that Alcoa had no competition when it began production; in fact they had to manufacture their own market.

The Department of Justice quickly appealed this ruling to the Second Circuit Court. The Supreme Court, where the appeal should have been heard could not mount a quorum. Four of the judges had been involved in the case on the side of the government. It took an act of Congress in June, 1944 to certify that this case could be heard by the lower appeals court.

The federal anti-trust suit filed against Alcoa in April of 1937, dragged through the courts, until a decision was reached in March, 1945. The explosion of government owned aluminum facilities created during the war

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greatly shaped the resolution of the monopoly question initially raised a decade earlier. A tribunal consisting of Judge Learned Hand, Augustus Hand, and Thomas Swan rendered their decision. In his opinion, Learned Hand emphasized Section 2 of the Sherman Act, which relates to monopolization. Alcoa, he found, had illegally monopolized the ingot market, not because of specifically proven acts of misconduct, but because the company was in a position of monopoly power and had not been merely a passive beneficiary of its position. Instead, the company had engaged in a "positive drive" to expand its business, a drive that resulted in the maintenance of its monopoly.¹²⁵ Noting that the industry had changed greatly since the closing of the evidence in 1940 and that the issue of wartime plants was unresolved, Judge Hand referred this portion back to U.S. District Court.

In 1944, Congress established the War Surplus Board to dispose of government property. The Board was staffed by men who discouraged monopolies.¹²⁶ Alcoa fought for its stake of all 22 plants constructed for the government, with government funds, during the war. Arthur Vining Davis also fought against the transfer of the plants to his competitors, Reynolds Aluminum and Kaiser Permanente Metals Corporation. Nevertheless, the DPC leases were canceled August 30, 1945 and Alcoa was told to be out of the plants by October 31, 1945. Of the twenty-two plants, Reynolds acquired smelters at Hurricane Creek and Jones Mills, AR, and in Troutdale, OR, sheet mills in Chicago, IL and Listerhill, AL, a forging facility at Louisville, KY, and extrusion works at Phoenix and Grand Rapids. Kaiser bought the alumina plant at Baton Rouge, LA, smelters at Spokane and Tacoma, WA, a sheet mill in Spokane and a blooming mill in Ohio. Alcoa was only able to obtain a smelter, the St. Lawrence reduction works in Massena, NY and a small extrusion plant in Cressona, PA.¹²⁷

The final anti-trust ruling began March 28, 1949 and lasted until November 9, 1949. In 1950, the courts declared their decision that Alcoa was not guilty of monopolization as long as there was effective competition. Judge John C. Knox, who had succeeded Francis Caffey as Chief Judge, was faced with a challenge of how to ensure the ability of Alcoa's competitors to survive, both at home and abroad. He sought a principle of "effective competition", allowing Kaiser and Reynolds to grow and prosper in a market where Alcoa maintained important advantages. The Second Circuit Court set capacities for the three major producers: Alcoa with 50.86%, Reynolds with 30.94% and Kaiser with 18.20%.

Despite increased competition, Alcoa remained the primary producer of aluminum in the United States. At the end of 1954, total aluminum capacity was slightly more than 1.3 billion short tons. Alcoa had 41.8 percent of this capacity, while Kaiser had 30.8 percent and Reynolds had 27.4 percent.

Aluminum City Terrace

Under the provisions of the United States Housing Act of 1937, individual states established Defense Housing Coordinators in 1940 to adjust construction to the war era economy. Beginning in 1941, defense housing was constructed close to industries important to the war effort to accommodate the large number of workers who moved from other parts of the country to work in defense plants.

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As part of the defense housing effort, the United States government's housing program had redirected its mission, emphasizing improvements and innovations in housing standards and making the shift in assigning housing projects from staff civil service architects to, as it was phrased at the time, "outstanding modern architects."

Among the defense projects undertaken by noted architects were Avion Village, near Dallas, designed by Richard Neutra; housing for 200 defense workers in Detroit by Eliel Saarinen; housing at Middletown, Pennsylvania, by George Howe; and 1,602 units at the Mare Island, California, Naval Shipyard by the San Francisco architect, William W. Wurster. The partnership of Walter Gropius and Marcel Breuer was selected to design housing for aluminum and other defense workers in New Kensington.

Low cost housing was one of the first great municipal political issues to emerge after the Depression.¹²⁸ Since New Kensington had relatively undeveloped land located near its eastern boundary with Lower Burrell Township, George Hobaugh, former treasurer of the aluminum workers union and a member of the Westmoreland County Housing Authority, applied to the United States Housing Authority in January, 1941 for a \$12.5 million housing project for defense workers. Some residents were extremely unhappy with the decision for they felt it would cause property taxes to rise and property housing values to fall.¹²⁹

The U. S. Public Building Administration commissioned internationally known architects Walter Gropius and Marcel Breuer to design the defense housing project for the aluminum and other industries in the New Kensington area. In their design for Aluminum City Terrace, Gropius and Breuer were constrained by several conditions: a 250 unit requirement, a \$3,500.00 price per unit, and a hilly 45 acre site, approximately two and one half miles from town, to which no streets had been extended. Their apparently arbitrary design of buildings scattered across the hillside was actually a deliberate design decision to take advantage of the views from this irregular landscape and to situate the units for maximum sunlight throughout the year.¹³⁰

The walls were designed so that a system of prefabrication on the site could be employed. Large panels were made on a jig table, stored in piles, and set on the ground floor joists and rough flooring as an erecting platform. The trim has been simplified for minimum mill work and simplest installation. Door and window details were standard throughout and set in place already made up, avoiding expensive field work and adjustments.

After a thirty-six hour period of continuous design, Gropius and Breuer produced the preliminary drawings for the project. Design development was completed in fourteen days. Preliminaries were approved despite four revisions in site information causing major plan adjustments, and drawings and specifications were completed in less than a month. The 250 units include rows containing 202 two story, two and three bedroom units, 30 one bedroom units in one story rows, and eight one bedroom duplexes. Amenities provided for the original tenants included a community center containing a large meeting room with a demonstration kitchen, a terrace over a ravine, a room for arts and crafts and a nursery and playground for pre-school children.

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Aluminum City Terrace was completed May 15, 1942 but not fully occupied until 1943. The actual cost per unit was \$3,188.00, with a total development cost of \$1,268,470.41. The project was the first defense housing to be purchased by the tenants under the federal governments Mutual Ownership Plan in 1948.¹³¹ This housing retains its integrity today.

Aluminum Club

In 1940, Alcoa had the largest single training class in their history. They did not have room for all of their engineers at the Club, and as a result, they were housed with families in the New Kensington area. By 1945, only 20 men were housed in the Club. After 1950, individual plants began to do their own individual training and the use of the Aluminum Club was phased out.

Plant Expansion

Painting industry demand for aluminum powder remained strong and Logans Ferry Powder Works remained open through the 1970s. In July, 1979, one of the two melting furnaces exploded, killing one worker. After the explosion, manufacture of powder was suspended permanently at the Logans Ferry Plant. However, powder was manufactured and shipped by rail or truck from other Alcoa facilities and was mixed with paste at Logans Ferry Plant. Logans Ferry Powder Works remained in a reduced manufacturing role until 1986, when the plant was sold to a competitor, Silberline Manufacturing Company. Silberline removed all of the equipment from Logans Ferry and shipped the equipment to their eastern plant in Tamaqua, Pennsylvania.

Alcoa and the Post War Era

At the end of World War II, Alcoa controlled 96% of alumina production and 91% of aluminum production. Alcoa entered aluminum's "golden age" surrounded by an oversold market in 1946. However, revenues tripled between 1946 and 1948 as new applications for aluminum were exploited in housing, transportation and automobile markets.

Research and development played a critical role in adapting aluminum for nonmilitary uses. Planning for the postwar period focused attention on problem areas, highlighting enabling technologies that would have to be developed to bring good applications to market. For example, in March 1944, Alcoa Vice President George Gibbons complained strongly about the failure to develop good joining techniques, a problem that had gone unsolved for decades and could keep aluminum out of high-volume markets, such as shipbuilding.

Alcoa continued to develop new products to maintain and expand its market share. Alcoa president Roy Hunt estimated that annual consumption of this product would reach 1,250 million pounds by 1950.¹³² A major new product was sheet roofing, developed in 1945. Resulting from this development was the construction of an all aluminum house at 2761 Grant Street, Lower Burrell. This custom house, constructed at a cost of \$45,000, was leased to veteran Alcoa employees. The house has three bedrooms, laundry, one bath, and a one car garage.

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Improved technology developed during the war also reduced the cost of aluminum, making it increasingly competitive with copper and steel. By late 1946, pig aluminum was quoted at \$0.14 per pound, and copper was quoted at \$0.143 per pound.

1947 was the beginning of major plant moves for the New Kensington - Arnold Works. The Aluminum Seal Company moved to Richmond, Indiana in 1947, leaving 330 New Kensington workers unemployed. The Wear-Ever Plant moved to Chillicothe, Ohio in 1947. The reason given for both moves was the lack of space to expand. Another major issue was labor relations.¹³³ These moves signaled the beginning of moving south to take advantage of non-union labor.

In early 1953, Alcoa began construction of a new corporate headquarters located at 425 Sixth Avenue, in downtown Pittsburgh. This, like other Alcoa buildings, provided an opportunity for experimentation and as an example of new uses for aluminum. Wallace Harrison, of the firm Harrison and Abranovitz and architect for this exceptional building, designed the 30 story, aluminum clad building not only as a monument to civic pride, but as a prototype for aluminum intensive monumental architecture. The building, sheathed in aluminum, was a showcase for aluminum in every application including elevators, ceilings, doors, thresholds, lighting fixtures, windows, blinds, baseboards, trim, furnishings, and even water pipes. By 1957, building products had become Alcoa's major market, with sales surpassing older markets in transportation, consumer durables, and electrical products.

Alcoa's research efforts in the 1950s were also aimed at addressing the changing aluminum market. In the following years, the Laboratories had been undergoing a reorientation toward products that promised short-term payoffs in product development, new product process inventions, new alloys, and production processes that promised to lower cost in high-margin areas of production.¹³⁴ Alcoa also retained a much larger technical staff than its competitors, and this staff was able to quickly address market innovations.

This was particularly critical in New Kensington when in 1957, it was decided to move the Laboratories to Merwin in Upper Burrell Township, 6.5 miles east of New Kensington. The building was completed in 1962. In the same year, the Aluminum Club was given to Citizens General Hospital for use as a nurses' residence. Four years later, Alcoa donated the Wear-Ever Building to the City of New Kensington.

During the late 1950s and early 1960s, production at Alcoa's New Kensington plant declined substantially. In early 1956, production totaled over 82 million pounds. Annual production declined to 33 million pounds in 1960.¹³⁵ This decrease in production resulted from decreased demand due to both a changing market for aluminum products, and increased competition from other aluminum producers.

During the uncertain economic climate of the 1960s, Alcoa struggled to maintain both its profitability and its market in the aluminum industry. As the decade progressed, Alcoa's share of the domestic market was

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dwindling. In 1965, Alcoa had 29.4 percent of U.S. aluminum capacity, Reynolds had 22.4 percent, and Kaiser had 20.1 percent.¹³⁶ The balance was split between smaller U. S. and foreign manufacturers.

To reverse trends, Alcoa president, John Harper, decided to concentrate company resources on the development of markets in which Alcoa's size, financial power, and unique technical capabilities gave it a market specific advantage. Harper directed Alcoa's reorientation toward high-volume and technologically sophisticated semi-finished goods.¹³⁷

Harper believed that the company would fare better overall if it established outlets for its metal analogous to some of the steel industry's mass markets for high-volume, continuous runs of semi-fabricated goods. Alcoa developed a three prong strategy: (1) to move beyond its historic concentration on "job-shop" operations in fabricating in order to develop products which could be manufactured on high-volume, low cost runs in large mills that embraced huge economies of scale; (2) to expand its business in high-margin specialty items in highly technical sectors of the market, such as aerospace, for which Alcoa, with its strong research and engineering staffs, had a decisive edge over less sophisticated producers; and (3) to cut its costs of production through large-scale process improvements, plant modernization, organizational reforms, and more sophisticated planning.

In 1965, Alcoa began a major realignment of operations at New Kensington. Impact extrusion production was moved from Edgewater, New Jersey to New Kensington and foil rolling, press extrusion, tube operations, and the Wear-Ever line were moved to new locations. The company also proposed to spend millions to modernize its plant facilities. However, commercial realities dictated the New Kensington-Arnold Works final fate. On July 1, 1970, Alcoa announced the termination of its manufactured products division and the closing of the New Kensington works. Remaining operations were shifted to other, more efficient Alcoa facilities. By March 31, 1971, the closing of the New Kensington plant had been completed. The facility remains but is mostly used as warehousing or industrial incubator space.

Conclusion

New Kensington became the center of growth for the United States aluminum industry and for the company that became known as Alcoa. From the beginning new aluminum products were developed and refined, new manufacturing equipment was purchased and new sites around the United States were selected for growth, based on access to inexpensive power sources, major transportation routes for delivery of goods, abundance of inexpensive flat land, and available non-union labor pools.

Industrial aluminum resources include the resources in New Kensington Works (1891) and, immediately adjacent Arnold (1913); the Logans Ferry Powder Works (1918) located three miles downstream; and the Aluminum Coal Mine (1918-1923) located three miles upstream. The New Kensington Works included: a

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melting department, a sheet mill, the Aluminum Cooking Utensil Company, and a job shop; in Arnold: a sheet mill, foil mill, tube mill, extrusion mill, and Aluminum Seal Company.

All phases of aluminum production occurred at the New Kensington Plant. These phases included: smelting; ingot and pig production; and rolling, shearing and fabricating.¹³⁸ The New Kensington Works initially opened for smelting and ingot production. In order to market the ingots, research was undertaken and the product was fabricated. As a result, Alcoa began a system of vertical integration. It was this concept of vertical integration that led Alcoa to the forefront of the aluminum industry.

New Kensington itself did not emerge as a "company town" in the formal sense, as there were other industrial companies operating in the community. However, as a "industrial town" it consisted of a manufacturing plant, a commercial district, specialized speculative housing, a railroad line and a river representative of major transportation systems, local leadership that was parochial in nature, and no zoning or planned development ordinances within the community. There is no question however, that all the communities in which Alcoa operated were thoroughly dominated by corporate interests and the making of aluminum. Ethnic churches, social halls, and housing were consistently developed both by and for the workers of the industry. Residential districts were produced by private developers, representing a variety of period influences typical of industrial working communities. Similarly, commercial districts served the aluminum workforce and the religious houses of worship assisted Alcoa its work force relations.

Even as the New Kensington plant emerged as a production center for the company, the main focus was on research and its machine shops which were home to creativity and technological expertise.¹³⁹ Post World War I technology forced Alcoa to broaden its research capabilities to include architectural applications. This use was initiated with the Aluminum Research Lab (Building 29) and culminated with its corporate Headquarters in 1953. This same research also allowed Alcoa to expand its cookware line to include decorative aluminum serving pieces known as Kensington Ware, and build aluminum furniture and automobiles. By the 1940s, the New Kensington Works had begun to lose its competitive edge to newer specialized plants.

With the settlement of the anti-trust suit, Alcoa was forced into competition with Reynolds and Kaiser. Though there were set production capacities, Alcoa was thrust into an expanded role of creating and selling products with domestic competition that had never existed before.

The development of aluminum as an American industry is important because of the contributions to housing and giftware, architectural building elements and design, national defense initiatives, airplanes and automobiles, and other fabricated industrial goods. The markets for each of these items are all 20th century developments, consistently changing due to international markets and suppliers.

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50. It is unknown whether these were for the Heinz Company of Pittsburgh.
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F Outline of Property Type:

1. Aluminum Manufacturing Districts
 2. Commercial-Residential Districts
 3. Individual Resources
 - A. Manufacturing Buildings
 - B. Commercial and Residential Buildings
 - C. Social Institutions
-

F. I. Aluminum Manufacturing Districts

II. Description

Aluminum manufacturing districts may include the following: boiler room, blacksmith shop, foundry, melting room, pot room, forge shop, coal bin, job shop, smelting room, machine shop, pump house, offices, packing room, shipping room, locker rooms, wash rooms, first aid room, tool room, lumber shed, chemical lab, and fabricating buildings including a rod mill, a sheet mill, a rolling mill, a tube drawing mill, bronze powder production, and a wire drawing mill. These facilities produced a wide range of aluminum products, including but not limited to: kitchen utensils, rods, bar, wire, tubing, sheet foil, automobile hoods, running boards, bronze powder, industrial chemical utensils, and beer barrels. Examples of this property type include the New Kensington-Arnold Production Works and the Logans Ferry Powder Works.

Aluminum manufacturing districts are found along transportation corridors which include rivers and rail lines, where electricity was inexpensive or hydroelectricity was available. Manufacturing districts include contributing vernacular industrial buildings constructed from 1891 to 1947. Building materials include brick masonry or corrugated metal. They are multiple stories in height, vary in width and length, with either gable, clerestory, shed, flat and saw tooth roof forms. The buildings are constructed in a linear form often along a single spin or along a transportation route such as the railroad. They are expected to be evolutionary in form, use, and appearance.

Manufacturing districts have buildings that are representative of styles of period industrial architecture. Initially, the early industrial buildings were constructed of corrugated metal on steel frames. After 1900, the saw-tooth roof form and the clerestory became the preferred roof type for industrial use to allow light and ventilation into the work areas.

Although most building floor plans have been modified over the period of 1888-1947, their variety shows the complex nature of the industry and the different types of manufacturing uses that were found there. The

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basic building shape and interior plan is a long narrow bay or building that has unobstructive areas for use with machinery. It was conceived and used as flexible manufacturing space and has integrity if it reflects that design.

After 1947, the buildings continued in various manufacturing uses associated with the aluminum industry and continued to be used until 1971 when Alcoa ceased production at its plants in Southwestern Pennsylvania.

III. Significance

Aluminum manufacturing districts played a significant contribution to the manufacturing of aluminum in the United States. They are significant under National Register Criterion A for Industry as being associated with the aluminum production which occurred in Southwestern Pennsylvania from 1888 to 1947. They are also significant under Criterion C for Architecture for embodying the styles, forms, methods of construction and artistic values of manufacturing buildings of the period.

The employees who worked in these manufacturing buildings, often worked in several different departments, transferring from one department to the another as certain jobs required assistance. As in all aluminum manufacturing plants, men became proficient in the Melting Department, Sheet Mill, and Job Shop; while both men and women worked in the Foil Mill, Tube Mill, Extrusion Department, Seal Mill and Cooking Utensil Unit. Men and women were paid on a separate pay scale because men could do heavier work. As fabrication and methodologies became refined and with the assistance of collective bargaining by the 1930's, men and women gradually were paid the same wages.

The surviving buildings are significant as examples of vernacular architecture for the manufacturing and industrial complexes associated with the aluminum industry. They possess integrity of location at the original site. The design and materials are typical of vernacular manufacturing buildings of the period. The builders' use of materials and light, adds to the industrial perception of the complex. The utilization of steel and wood frame construction covered either by brick or corrugated metal and the use of industrial multi-light glazing gives form to the buildings while permitting light and ventilation into the large open spaces.

Few industrial complexes survive sufficiently intact that convey the complete historic interpretation and development of the aluminum industry. Two examples are the New Kensington-Arnold Production Works and the Logans Ferry Powder Works. These complexes portray the growth of the industry and the development of industrial buildings to manufacture aluminum products. Stylistic concerns are limited. The use of corrugated metal and brick and steel frame construction along the roof forms are typical of industrial complexes.

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IV. Registration Requirements

To qualify for registration, a majority of the buildings within the aluminum manufacturing district must date from 1888 to 1947, should retain an industrial setting, and the form and materials that evoke the period of use. They should also retain a significant degree of integrity with a majority of the buildings associated with the production of aluminum still extant despite demolition of some earlier buildings and include the use of saw tooth and clerestory roofs, brick and metal walled buildings, typically open, flexible manufacturing space in rectilinear settings and proximately to water and over-land transit corridors. The integrity of association and feeling should be present despite the relationship of newer industrial buildings adjacent to the site. The historic association with aluminum production must be documented.

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F. I 2. Commercial-Residential Districts

II. Description

Commercial and Residential Districts associated with the aluminum industry are groupings of commercial and residential buildings within proximity of the industrial site. These districts contain buildings where the workmen and their families lived and shopped, providing the supporting services to the aluminum industry. The residences provided a place to eat, sleep, and share traditions. The commercial areas provided buildings for workers to obtain groceries, to go the barber, beauty salon or hardware store, buy clothes, jewelry, shoes, and books. Examples of commercial - residential districts associated with the aluminum industry are the New Kensington Commercial Historic District, the Arnold Historic District, and Aluminum City Terrace Residential District.

Typical groups of commercial buildings were multiple stories in height with one, two and three stories being the most common. Building width and length reflect the lot size. Buildings styles include Art Deco, Art Moderne, Beaux Arts, Craftsmen, Colonial Revival, Egyptian Revival, Gothic Revival, Mission, Italianate, Queen Anne, Romanesque, Sullivanese, Second Empire, Victorian, and Vernacular. Building materials included brick, stone and terra cotta masonry, pressed metal, and rusticated concrete block. Roof forms include (front) gable, flat, shed and mansard roofs.

Typical groups of residential buildings were laid out in either grid or picturesque plans. The houses are one and a half to two and a half stories in height. Residential building size reflected the lot size, with consistent setbacks occurring on both fronts and side lots. Predominantly vernacular in appearance, most districts include some buildings of Craftsmen, Colonial Revival, Queen Anne, Four Square, and International styles. Building materials included brick and terra cotta masonry, clapboard, and rusticated concrete block. Roof forms include (front) gable, side gable, clipped gable, cross gable, hip, hip with gable, hip with dormer, and mansard. Residences included single family, semi-detached and multi-family buildings. Some specialized residential districts, may be entirely multi-family units.

III. Significance

The commercial and residential buildings depended on the aluminum manufacturing industry to survive and grow. They are significant under Criterion A for Commerce, Industry, and Government as representing the growth of aluminum manufacturing as related to the growth of commercial and residential communities in Southwestern Pennsylvania from 1888 to 1947. They are also significant under Criterion C for Architecture

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and Planning\Development for embodying styles, forms, methods of construction, and artistic values of commercial and residential buildings of the period, in working class aluminum communities.

Some residential districts may contain or consist of outstanding examples of residential architecture designed by international architects as part of defense worker housing during World War II. These districts are significant under Criterion A for Politics/Government as a government program benefiting industrial workers and Criterion C in the area of Architecture and Planning/Development for embodying styles, forms methods of construction, patterns of growth and artistic values of residential buildings, including those designed for defense worker housing during World War II.

Commercial and residential areas provide the backdrop for the manufacturing industries. They are important for their functions, associations and the feelings they convey. These complexes not only portray the growth of the community - both commercial and residential, but the growth of residential multifamily housing during World War II. They parallel the development of the manufacturing center itself.

IV. Registration Requirements

To meet registration requirements, the districts have to be associated with and primarily reflect the period of history of 1888 and 1947. Stylistic features will display a significant number of Late Victorian, Queen Anne, Colonial Revival, Four Square, Craftsmen, Bungalow, and vernacular stylistic features to identify them as being constructed during this period. In general, to qualify of registration, the commercial buildings and dwellings should retain their integrity of setting. They must be documented as being associated with the aluminum industry.

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F I. 3. Individual Resources

II. Description

Individual resources associated with the aluminum industry includes a range of building types and functions associated with manufacturing, research, commerce, residence and civic activities not located in historic districts.

Manufacturing buildings were ultimately responsible for the research and development of alloy composition and properties, corrosion, and structures for all aluminum manufacturing plants. An example is the Aluminum Research Laboratory. This type of facility was responsible for the expansion of the aluminum product base.

Commercial and residential resources are buildings where workmen lived and shopped, providing supporting services to the manufacturing processes of the aluminum industry. Individual residential structures include dormitories. An example is the Aluminum Club. Individual commercial buildings include banks, office buildings, train depots, hospitals, theaters, and schools, providing places for workers or their children to bank, get medical assistance, or go to school. These buildings are often set with a residential setting with a consistent setback along the street or are part of a commercial street with no setback.

Social institutions could include meeting halls, clubhouses, social clubs, civic clubs, union halls, and churches. These buildings provided meeting places where groups of same or differing ethnic background, union, or religious society could meet or congregate. An example of a social institution is Mount St. Peter's Roman Catholic Church. These buildings are typically found within residential settings and may or may not have ancillary structures such as schools or residential dormitories.

All of these buildings are constructed of masonry on either steel frame or facing for concrete block. They range in size from one story to multi-stories depending on the amount of money the organization had to construct the structure. Styles included Second Renaissance Revival, Classical Revival, and Moderne styles of architecture with detailing depending on the stylistic period of construction. The roofing systems vary depending on the structure itself, but could include either flat, hip, or gable. Floor plans remained constant during the period of 1888 to 1947, with the variety of uses dictating the usage within the interior of the buildings.

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III. Significance

Individual buildings are historically significant under National Register Criterion A for Industry and Social History as being associated with the aluminum production between 1888 to 1947. They are also significant under Criterion C for Architecture for embodying the styles, forms, methods of construction and artistic values of buildings associated with the aluminum industry.

The employees who worked, lived, and shared their social beliefs recognized these buildings as part of the fabric of their community and its association with the aluminum industry. The research facilities provided a place of employment for aluminum engineers. It was the facility where experimentation on the different properties and applications of aluminum were identified and utilized. The residential dormitory was where company engineers stayed while taking night classes and becoming familiar with company and plant procedures. Social halls allowed workers to congregate, interact, and discuss current events, religious topics, work force relations and community activities.

These surviving individual buildings are representative of architectural styles that include: Classical Revival, Second Renaissance Revival, and Moderne styles of architecture. These individual buildings are significant as examples of individual buildings associated with the aluminum industry. They possess integrity due of location on their original sites. The design and materials are typical of individual buildings of the period of 1888 to 1947.

IV. Registration Requirements

Few individual buildings survive that convey the stylistic differences, as well as magnitude and effect of the aluminum industry on its adjacent community. Three examples are the Aluminum Research Laboratories, the Aluminum Club and Mount St. Peter's Catholic Church. These buildings not only portray the individualized nature of buildings associated with the aluminum industry, but are associated with production of aluminum.

In general, to qualify for registration, the individual buildings should be documented as being associated with the aluminum industry and retain either a industrial, commercial or residential setting. The forms and materials used should evoke the period of construction of 1888 to 1947. Each building should also retain a significant degree of stylistic integrity.

G. Geographical Data

Within the boundaries of Allegheny and Westmoreland Counties in Southwestern Pennsylvania

See continuation sheet

H. Summary of Identification and Evaluation Methods

Discuss the methods used in developing the multiple property listing.

Please see continuation sheet H - 1

See continuation sheet

I. Major Bibliographic References

Please see continuation sheet: I - 1

See continuation sheet

Primary location of additional documentation:

- | | |
|---|---|
| <input type="checkbox"/> State Historic Preservation Office | <input type="checkbox"/> Local Government |
| <input type="checkbox"/> Other State Agency | <input type="checkbox"/> University |
| <input type="checkbox"/> Federal Agency | <input checked="" type="checkbox"/> Other |

Specify repository: Alcoa Information Services, Aluminum Company of America, 1320 ALCOA Building Pittsburgh, PA 15219
Historical Society of Western Pennsylvania, Smallman Street, Pittsburgh, PA

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H. Summary of Identification and Evaluation Methods

The multiple property listing of the Historic Aluminum Resources of Southwestern Pennsylvania is based on an October, 1993 Historic Resources Survey of the Aluminum Industry in Westmoreland and Allegheny Counties, Pennsylvania, Final Report as prepared for the U. S. Department of the Interior, National Park Service, Denver Service Center, Western Pennsylvania Partnerships Branch, Eastern Team by Douglas C. McVarish and Richard Meyer of John Milner and Associates, Inc. 309 North Matlack Street, West Chester, Pennsylvania in association with DHM, Inc. 1660 Seventeenth Street, Suite 400, Denver, Colorado.

The Final Report identified 352 properties and groups of properties associated with the aluminum industry. Properties from vernacular to high style were recorded with emphasis given to those properties that had a direct relationship with the aluminum industry. Those that were not recorded either did not directly impact the aluminum industry in New Kensington or Arnold or had lost their integrity. For each recorded resource either in a district or an individual property, a Pennsylvania Historic Resource Survey Form was completed. Research including checking of deeds and secondary sources and the taking of oral histories; and narrative architectural and historical descriptions were written. This work was conducted by Douglas McVarish and Richard Meyer.

The properties were grouped under eight property types: Aluminum Production and Support Facilities (1 individual building and 3 districts), Aluminum Company Office Facilities (2 buildings), Aluminum Company Research Facilities (1 building), Aluminum Company Residential Facilities (1 building), Residences Associated with the Aluminum Company Founders (2 buildings), Housing for Aluminum and Other Industrial Workers (1 district), Buildings associated with Aluminum Company Employees (3 buildings), and Residential Districts adjacent to Aluminum Production Facilities (2 districts). The repository for all of the inventory materials is the Bureau for Historic Preservation of the Pennsylvania Historical and Museum Commission in Harrisburg, Pennsylvania.

The Final Report was prepared for the America's Industrial Heritage Program, of which the Allegheny-Kiski Valley Historical Society was the ultimate recipient. The Pennsylvania Historical and Museum Commission's Bureau for Historic Preservation further evaluated these resources under the National Register Guidelines. In a letter dated September 7, 1994, the Bureau of Historic Preservation suggested to the Allegheny-Kiski Valley Historical Society that several refining changes be made in proposed nominations. Staff suggested that the New Kensington commercial area be included as a district as well as additional residential areas belonging to workers, aluminum middle management, and commercial businessmen. In a site visit to New Kensington and Arnold on August 23 and 24, 1995, the staff of the Bureau of Historic Preservation assisted in defining the boundaries for five historic districts and three individual sites to be nominated under the multiple property documentation format. The Allegheny-Kiski Valley Historical Society hired Bonnie J. Wilkinson to prepare the Multiple Property Documentation Form and five district nominations and three individual site nominations.

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Bonnie Wilkinson worked closely with Chris Magoc, Executive Director of the Allegheny-Kiski Valley Historical Society in gathering information for the preparation of the Multiple Property Documentation.

The properties identified by National Park Service study and further refined by the Bureau of Historic Preservation, Allegheny-Kiski Valley Historical Society and Bonnie Wilkinson, identified a wide range of resources including industrial, residential and commercial resources. All of these resources were primarily constructed between 1888 and 1947. Integrity requirements were based upon knowledge of the existing properties.

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