REFRACTORIES COMPANY TOWNS
Mt. Union Vicinity
Huntingdon County
Pennsylvania

HABS No. PA-5973

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HISTORIC AMERICAN BUILDINGS SURVEY

REFRACTORIES COMPANY TOWNS

HABS No. PA-5973

Location: Mt. Union Vicinity, Huntingdon County, Pennsylvania

Project Information: The results of the study of refractory brickyards and towns was published in 1993: Kim E. Wallace, Brickyard Towns: A History of Refractories Industry Communities in South-Central Pennsylvania (Washington, D.C.: America's Industrial Heritage Project and Historic American Buildings Survey/Historic American Engineering Record, National Park Service). Brickyard Towns focuses on eight towns with company housing that survives from the heyday of the brickyards during the first decades of the twentieth century. The towns are scattered across the region and represent a spectrum of refractories companies, company housing policies, and company town development. They include **Bolivar (HABS No. PA-5977)** and **Salina (HABS No. PA-5978)** in Westmoreland County, **Robinson (HABS No. PA-5975)** in Indiana County, **Blandburg (HABS No. PA-5972)** in Cambria County, **Sproul (HABS No. PA-5971)** and **Claysburg (HABS No. PA-5970)** in Blair County, **Mt. Union (HABS No. PA-5974)** in Huntingdon County, and **Kistler (HABS No. PA-5976)** in Mifflin County.[1]

The contents of this publication were transmitted to the Library of Congress in report form. Research notes, field photos and copies of historic photos collected during the project were transmitted to the AIHP Collection, Special Collections, Stapleton Library, Indiana University of Pennsylvania, Indiana, PA 15705.

[1]Even though Kistler is located in Mifflin County and is therefore outside AIHP boundaries, it was included in this study because it is contiguous to Mt. Union and was considered a satellite of the larger town and the refractory brick industry that was centered there.

INTRODUCTION

Viewed from the perspective of the brickyard, brickyard towns, and particularly their company housing, can be interpreted as a piece of brick-making technology. Demand for refractories increased dramatically at the turn of the century and outpaced development of automated machines. Because brick making remained very labor intensive, refractories companies concentrated on making their workers as cooperative and efficient as possible. Company housing was part of this effort; it was designed to integrate the workforce into the machinery of production. Building company housing and becoming involved in the town adjacent to the brickyard was an option for all companies, but policies were not consistent, even within the same company, and they were molded by the history and conditions at each brickyard.

The earliest brickyard in south-central Pennsylvania was built at Bolivar in the 1840s, and development there represents the refractories industry's early history as brickyards were used as investment options by local and non-resident businessmen who were also involved in other partnerships unrelated to refractories. By the end of the century the Bolivar brickyards were dominated by two local families who specialized in refractories production and who influenced the shape of the town and founded a second, neighboring town of Robinson. The brickyard at Salina was founded by one of the early Bolivar investors as a family business. It provides the bridge from the industry's nineteenth-century beginnings and business organization to early twentieth-century modernizations in the form of company housing and plant machinery as well as incorporation of the local business into a national organization. The 1903 strike against Harbison-Walker at Blandburg represents the often contentious relationship between company and employees, and the strike and the company's subsequent program of community social work are clear examples of the calculated strategies deployed in the management of the company town.

In Mt. Union and Kistler three different brick companies attracted workers who dramatically altered the local demography. Each company built houses for the newcomers, but each developed a very different housing policy. Sproul was perhaps the most closed company town of this sampling. Its workers were resistant to unionization, but welcomed it when the company began to abandon paternalistic oversight of the community. When the last brickyard in the region was built at Claysburg in 1913, the town more than doubled its geographic extent by additions developed both by the company and by local developers. As the brickyard's business declined, workers feared for their jobs and the future of the town and made a last-ditch effort to adapt the plant to produce new forms of refractories, but their efforts were finally unsuccessful.

HISTORY

> Heat is basic to all industry, without it our modern age would be nothing; the centuries before it would have been devoid of progress. Getting full value from heat depends entirely on how it is controlled and how its energies can be harnessed. . . . Without *refractories* heat is a ravaging giant.[2]

The Companies

Each of these towns' brickyards was built by a different company, but by the mid-twentieth century, the field was dominated by three companies which had acquired property throughout south-central Pennsylvania. Some familiarity with these companies is important for this study and a very brief history of each follows. The "big three" of refractories were formed through a series of mergers in the first decades of the twentieth century. Most of the businesses absorbed in the mergers owned just one or two brickyards and had names like Queen's Run, Elk, or Savage Fire Brick Company, reflecting their local, nineteenth-century origin.

Harbison-Walker Refractories (H-W), based in Pittsburgh, emerged from the consolidations of companies with the largest holdings. About mid-century these three companies had substantial holdings in the region. In 1946 Harbison-Walker employed 577 people at its plant in Mt. Union and 103 people at its Blandburg works. The second largest company, General Refractories Company (Grefco), had main offices in Philadelphia. In 1946 it employed 143 at Salina, 191 at Mt. Union, 714 at Sproul and Claysburg, and 86 at its Childs plant in Fayette County. The third company, North American Refractories Company (Narco), was headquartered in Cleveland and employed 406 in Mt. Union.[3]

North American is the youngest of the three companies. It was founded in 1929 with the combination of six companies--Ashland Fire Brick Company, Ashland, Ky.; Crescent Fire Brick Company, Curwensville, Pa. (Clearfield Co.); Dover Fire Brick Company,

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[2] John D. Ramsay, Refractories: The Backbone of Industry (Cleveland: North American Refractories Company, 1941), 9, emphasis added.

[3] Pennsylvania Industrial Directory (1946).

Cleveland, Oh.; Elk Fire Brick Company, St. Mary's, Pa. (Clinton Co.); Farber Fire Brick Company, Farber, Mo.; Queen's Run Fire Brick Company, Lock Haven, Pa. (Centre Co.)--representing important centers of refractories production in Kentucky, Missouri, and Pennsylvania. Two more companies were added to its roster in 1930--Mt. Union Refractories, Mt. Union (Kistler), Pa. (Huntingdon Co.) and Savage Fire Brick Company, Frostburg and Mt. Savage, Md.[4]

General Refractories was formed in 1910 by acquisition of an existing company, the Sandy Ridge Fire Brick Company in Centre County, Pa., and the construction of a new silica refractories plant at Sarah Furnace in southern Blair County. The latter site was renamed Sproul after William Sproul, a principal founding partner and soon-to-be governor of Pennsylvania. In the next few years the company purchased plants in West Decatur, Pa. (Clearfield Co.); Olive Hill, Ky.; Mt. Union, Pa. (Huntingdon Co.); Hayes Run, Beech Creek, and Orviston, Pa. (Clearfield Co.), and built two more silica brick works--one in Joliet, Ill., and one in Claysburg, Pa., just north of Sproul. In 1930 Grefco purchased a fourth plant in the Pennsylvania region, Kier Fire Brick Company in Salina, Pa. (Westmoreland Co.). It continued to add facilities, including plants in Texas and California and a large plant and research laboratory in Baltimore, and became a dominant force in the industry, producing a complete line of refractories for international clients.[5]

Harbison-Walker Refractories Company had a somewhat different history that reflected both nineteenth- and twentieth-century stages of refractories business history. It grew from one plant, the Star Fire Brick Company, opened in Pittsburgh in 1865. The original company was financed by ten partners who had no knowledge of brick making. Samuel P. Harbison was hired as their secretary and from that position he taught himself the manufacturing process and eventually became a partner himself. He was promoted to general manager in 1870. By 1875, he and one remaining original partner, Hay Walker, owned the company and had changed its name to Harbison and Walker. Andrew Carnegie's iron mills were their primary customers, and their development shadowed his. In the 1880s they began adding other plants and clay mines, and in the 1890s purchased two plants in south-central Pennsylvania, one at Blandburg in Cambria County and one at Mt. Union in Huntingdon County. Both of these brickyards were

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[4]Corinne Azen Krause, Refractories: The Hidden Industry, A History of Refractories in the United States, 1860 to 1985 (Pittsburgh: American Ceramic Society, 1987), 55.

[5]Krause, 50-51. "The General Refractories Company," Bulletin of the American Ceramic Society 22 (November 15, 1941): 363-65.

barely a year old when Harbison and Walker incorporated them into its expanding network. In 1902, one year after the merger of Carnegie's holdings into the U. S. Steel Corporation, the Harbison and Walker Company orchestrated a merger that brought its holdings to thirty-three plants and thousands of acres of clay mines.[6]

A number of Pennsylvania brickyards remained independent of the "big three." In 1946 in Alexandria, Huntingdon County, 88 people worked for Stowe-Fuller Refractories based in Akron, Ohio. The Eureka Fire Brick works employed 106 people in Mt. Braddock in Fayette County. In Westmoreland County, 179 people worked at the McFeely Brick Company near Latrobe, and the Garfield Fire Clay Company of Bolivar employed 107 people at its brickyard across the Conemaugh River in Robinson, Indiana County. A second brickyard in Indiana County at Clymer was owned by Hiram Swank's Sons Refractories and employed 107 people. Swank's had another plant with a staff of 129 in Johnstown, Cambria County, and A. J. Haws employed 108 at its Johnstown plant.[7]

Swank's and Haws, like most of the smaller-scale companies, were family businesses. They both opened in Johnstown in 1856. Andrew J. Haws founded his business to supply refractories to the Cambria Iron Works. Swank began manufacturing domestic pottery but by the late 1880s half of his production also consisted of refractories for Cambria Iron.[8] None of these independent companies is still in business; their last brickyard was closed in 1990.[9]

The eight brickyard towns in south-central Pennsylvania with surviving company housing represent each of the big three companies and one independent company: Garfield Refractories at Bolivar and Robinson; North American Refractories at Kistler; General Refractories at Mt. Union, Salina, Sproul, and Claysburg; and Harbison-Walker Refractories at Mt. Union and Blandburg. The towns' histories are intertwined with those of the companies as they were founded and merged, and as their officers planned

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[6]Krause, 13-17, 42-43.

[7]Commonwealth of Pennsylvania. Eleventh Industrial Directory of Pennsylvania, 1946 (Harrisburg: State Printer, 1946).

[8]Ibid. Biographical and Portrait Cyclopedia of Cambria County (Philadelphia: Union Publishing Company, 1896), 70-71. Haws Refractories Company trade catalog (Johnstown, Pa., October 1957). "Albert Swank, '10, Supplying Steel With Refractories," The Mercersburg Academy Alumni Quarterly (clipping, n.d.), 18-20. "100 Years of Service to the Steel Industry Hiram Swank's Sons," company history booklet, n.d.

[9]Ted Zellem, "International Refractories Sets Closing," Johnstown Tribune-Democrat (June 7, 1990), A10. International Refractories, a local partnership, operated the former Swank plant in Johnstown.

marketing, production, and management strategies, made acquisition and, finally, divestment decisions.

Refractories

Refractories plants or refractory brickyards are these towns' common denominator and provide the justification for linking them together in this study. It is important then to understand something about what was made in them and why they were built. Refractories were made in the form of bricks of various sizes, but mortars and especially "special shapes" (shapes other than rectangular bricks) were also important in company product lines. Refractories are usually a light, buff color and are distinguished from ordinary building bricks by their composition of high silica and alumina clays and by being fired at much higher temperatures. These bricks, shapes, and mortars all have refractory qualities--that is they are resistant to thermal stress and chemical abrasion, potentially destructive forces that occur in some stage of most manufacturing and technological processes. Refractories therefore play a fundamental role in many kinds of industrial production, a fact spokesmen for the industry often emphasize; one company-sponsored history was titled Refractories: The Backbone of Industry.[10] Despite their importance to many manufacturing processes, refractories are also auxiliary and rather unglamorous, and the title of a more recent industry-sponsored history, Refractories: The Hidden Industry, reflects a common frustration that such an essential industry is accorded so little recognition.[11] This study recognizes the refractories industry; it was initiated to help explain the very visible forms--mine and plant sites, buildings, kilns, and company houses and towns--that the industry left on the landscape of central and western Pennsylvania.

Steel making consumed the largest portion of Pennsylvania refractories, and determined the course of the industry's development in the region. According to histories of refractories in general, their early development may also be explained in relation to advances in metals manufacture. Improvements in metal-making during the middle ages increased the temperature of furnaces. Because the stones and ordinary bricks used in furnace construction cracked and disintegrated in the higher temperatures, craftsmen replaced them with more resistant

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[10] Ramsay, 9-14. Krause, 1. Arthur F. Greaves-Walker, "History of Development of the Refractories Industry in the United States," Bulletin of the American Ceramic Society 20 (June 1941), 213.

[11] Krause, xi.

refractory bricks, sometimes called firebricks, which were molded from specially selected clays and fired at higher temperatures.[12]

Manufacturers in the North American colonies imported refractories for glass and iron furnaces. By 1825, the first U.S. firebrick works was in operation in Woodbridge, New Jersey. It was followed in the 1830s and 1840s by establishments in Pennsylvania, western Virginia, Maryland, and Ohio.[13] Location of the brickyards depended on both access to rail or water transportation for deliveries to clients and local availability of raw materials. Pennsylvania encompassed territory with the most extensive deposits of refractory clays and rocks. By the late nineteenth century it was the largest refractories producer, but the industry was also important in parts of Ohio, Kentucky, and Missouri. These areas supplied refractories to iron, steel and other primary manufacturing industries that coalesced around cities like Pittsburgh, St. Louis, and Chicago.

The two most important refractories of the late nineteenth and early twentieth centuries were firebricks made from fire clay and silica bricks made from ganister. Clay's basic mineral components are "hydrous, aluminum silicates," but ingredients and proportions vary.[14] Refractory clays were selected for their purity and high levels of silica or aluminum. Depending on the density and hydration of the clay, it may be found in plastic, earthy, or rock form and is "won" or mined from both surface and underground deposits. In Pennsylvania, fire clay was found primarily throughout the ridges of the Appalachian mountains that arc across the state and sometimes occurred in a seam underlying coal beds. Ganister, for silica bricks, is a quartzite rock with a high silica content. In some areas, particularly in central Pennsylvania, a seemingly endless supply of ganister was strewn across the ridge tops and mountain sides. Brickyards were often located on level terrain at the base of the ridges so that brick storage sheds could be built next to a river or railroad line and gravity aided transport of the dinkey cars as they were brought down from the mines or quarries.

Industrial directories that list manufacturers and number of employees by county help chart the geography of Pennsylvania

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[12]Krause, 2. Karl Gurcke, Bricks and Brickmaking: A Handbook for Historical Archaeology (Moscow, Id.: University of Idaho, 1987), 99. Hobart M. Kraner. "Refractories in the United States 1776 to 1976," Bulletin of the American Ceramic Society 56 (July 1977), 651.

[13]Locally made firebrick were found in the ruins of a ca. 1600 Spanish sugar mill near Daytona, Florida. The Boston Manufacturing Company may have made firebrick as early as 1790. Greaves-Walker, 213-15. Kraner, 651, dates the Woodbridge, N.J. plant to 1812.

[14]Gurcke, 3, 128.

refractories. Clearfield, Clinton, and Centre counties formed the center of the industry. Clearfield peaked in 1925 with fifteen plants and 2,400 employees, Clinton County had ten plants and 1,005 employees, and Centre County had nine plants and 637 employees that year. Eight of the nine counties examined by America's Industrial Heritage Project (AIHP) also had important refractories sites. Two of the counties had a higher employee-to-plant ratio than those to the north; in 1925 Huntingdon had 1,239 employees in four plants, Blair County had 701 employees in two plants.[15]

Making Bricks

> The English idea with regard to blast furnaces is to run moderately and save the lining. What do we care about the lining? We think that a lining is good for so much iron and the sooner it makes it the better.

--Charles S. Price, General Manager, 1892-1907
Cambria Steel Company, Johnstown, Pa.[16]

The rapid expansion of United States industry from the late nineteenth century through the early twentieth created a great demand for refractories. Brickyard workers made refractory mortars, bricks of all sizes, and a miscellaneous category of "special shapes" that included such things as hot tops, arch tiles, nozzles, and crucibles. Large-scale consumers of these products included beehive and by-product coke ovens, blast and open-hearth steel furnaces, glass furnaces, ship boilers, and locomotive fireboxes. Brickyarders had a sense of where their refractories would be shipped and how they would be used, but they rarely had the opportunity to see the end use of their work.

Using Bricks

Handling bricks after they reached their destination was sometimes as labor intensive as making them. They had to be unpacked and often unstacked and restacked before they were used to build a new structure or patch an existing one. At any manufacturing operation where refractories were used there were workers skilled in bricklaying. In a large steel company bricklayers were further specialized to work on repair or

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[15]Fifth Industrial Directory of Pennsylvania, 1925 (Harrisburg, Pa.: Bureau of Statistics and Information, 1925).

[16]The Romance of Steel (New York, 1907), 362.

construction of various parts of the furnaces or of captive coke ovens. Throughout a furnace's running life occasional weak spots--potential "burn-outs"--in its lining occurred, and "hot bricklayers" or "hot doggers" made repairs, chiseling out an area around the decayed brick and setting in replacements. This job was one of the steel mill's most stressful and dramatic. Hot doggers wore layers of clothing to block and protect their skin from the heat of a charged furnace. When the furnace was at a "tapped out" or drained stage they put on wooden shoes and extra clothing, took a breath of relatively cooler air to last during their immersion in still searing heat, and carried patching bricks or bags of mortar inside the furnace. As one hot bricklayer testified, it was a job where "there was fear . . . you had to start young" to become inured to the stress. When the lining was deteriorated beyond repair, the furnace was tapped out or drained and allowed to cool somewhat. Then laborers stripped the caked bricks from their metal framework, and a gang of "cold bricklayers" began the complex task of rebuilding the furnace's refractory body.[17]

As the steel industry expanded, companies built more furnaces and used them much harder than they had in the past. Thousands of bricks were used to form furnaces' interior linings and checkerwork. In addition to bricks for new construction, there was steady demand for repairs and relining. According to the Iron Trade Review, in the 1870s refractory linings lasted fifteen to twenty years, but with more intense use after the turn of the century they had to be replaced every two to five years.[18] Coke ovens, which supplied coke for steel making, were entirely constructed of bricks. As the nineteenth century ended, thousands more of them were built and they were subjected to higher production schedules. About five thousand bricks were needed to build one oven. While the entire structure might stand twenty years, machines that punched coke out of the ovens often damaged them, creating another source of steady demand for new bricks.[19]

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[17]Walter Gemza (hot bricklayer, Bethlehem Steel, Johnstown, Pa.), interview by Bruce Williams, June 27, 1990. George Buchan (cold bricklayer, Bethlehem Steel, Johnstown, Pa.), interview by Bruce Williams, July 9, 1990. Charles Rumford Walker, Steel: The Diary of a Furnace Worker (Boston: Atlantic Monthly Press, 1922), 130-33.

[18]A. F. Greaves-Walker, "Fire Brick Problems of Metallurgy," The Iron Trade Review 39 (August 23, 1906), 17.

[19]"The Manufacture of Fire Brick for Coke Ovens," Connellsville Weekly Courier: Special Historical and Statistical Number (May 1914), 58.

Brick Production

When the first brickyards in south-central Pennsylvania began operation in the mid-nineteenth century, brick making, like bricklaying, was a very labor-intensive process. Industry historians liked to say that it had changed little since bricks were first burned in kilns about 2000 B.C.[20] By 1990, however, this staple industry had changed so drastically that only one plant in the region, at Sproul, Pa., was still operating, and technically, it did not qualify as a brickyard because it no longer produced bricks but instead made refractory mortars, cements, and castables. It employed only twenty-five compared to 256 in 1919, its peak year. The basic elements of making bricks were the same, but they had been transformed by shifting economies, science and machinery with drastic consequences for the people who made them and the communities in which they lived.

> Perhaps there is no process so easy to describe and yet so hard to execute as the making of brick. The clay is dug, kneaded, moulded, and burned, and each detail appears so simple that it would seem any one ought to be able to transform a little clay into a good brick; but between the pit and kiln stand two characteristics which must be present in order to insure good results--these are experience and skill.[21]

Histories of technology and work in the nineteenth and twentieth centuries usually tell a story of mechanization that results in higher production, and from the workers' point of view, reduces the number of jobs and decreases the skill requirements and increases the monotony of those remaining. Although the history of brick making in south-central Pennsylvania follows the general outline of mechanization, there are important qualifications. Mechanization in the brickyards was never monolithic, it progressed in fits and starts and was incomplete when the plants closed. Even though technology changed and often mechanically replaced workers' expertise, brickyarders did not simply forfeit their "experience and skill." They elaborated it to adopt new equipment to their own understanding of the brick-making process. So rather than a story of the progression of labor-replacing and alienating machinery, a history of brick-making technology should be more a history of the machinery brickyarders had to work with, of how brickyarders made bricks.

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[20] C. H. Schumann, "The Manufacture of Bricks," Cassier's Magazine 4 (October 1893), 403. Karl Gurcke, Bricks and Brickmaking: A Handbook for Historical Archaeology (Moscow, Id.: University of Idaho Press, 1987), 39.

[21] "Brick Making," Scientific American (November 27, 1886), 343.

The essentials of refractory brick making were set as inherited from early building brick manufacture.[22] Some form of mud was mixed, shaped, dried, and then baked. This was the basic framework within which brickyarders saw their work; it remained unchanged. The refractory brick industry was transformed by three factors, each with an increasing degree of impact: gradual mechanization of each step in the brickmaking process, changes in the composition of refractories, and changes in the form and use of refractories.

The typical mid-nineteenth-century brickyard contained the same elements as those in Pennsylvania over a century later. There was a clay pit, grinding and tempering machines, a molding room, drying floor, kilns, and storage sheds. Brickmaking was understood in terms of a series of steps, and the brickyard was ordered into corresponding sections.[23] Wheelers pushed loaded wheelbarrows between the steps. Most workers specialized in one section, although, over time, they might have worked in several different areas. The tools and machines they worked with were specific to each section.

A clay mine to supply the molding room and a coal mine to fuel the kilns were often located on or near the brickyard site. Clay miners loaded raw clay onto carts or railroad dinkey cars, then mules hauled them from the mine to the brickyard clay pile where weathering helped remove impurities and made it more workable. If the clay was in rock or flint form it was shoveled into a grinding and crushing machine with heavy iron rollers variously called a "dry pan" or "roller" or "pug mill." Next, a "mud machine," "pug mill," "tempering" or "wet pan" was used to thoroughly knead the dampened, now pliable, crushed clay.

The "pan tender" oversaw the mixing and decided what other ingredients to add and when the mixture--called mud--reached the proper consistency. The pan tender chose whether to combine proportions of water, other clays, lime, crushed charcoal, or "grog"--crushed bricks. Charcoal insured that the bricks would burn more thoroughly, grog acted as a binding and strengthening material. Once prepared, mud was carried to a molding table where a molder kneaded, dropped and tamped it into a mold that was dampened and dusted with sand. The molder then "struck" the brick, scraping a straight edge across the top of the mold to

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[22]Schumann, "The Manufacture of Bricks." "Brick Making," Scientific American (November 27, 1886), 343. Kevin Anderson, "A History of Brick Manufacturing," Fine Homebuilding 53 (April/May 1989).

[23]The following outline of the brick-making process has been assembled from a number of sources. One of the best descriptions is given in William B. Fulton et al., A Study of Silicosis in the Silica Brick Industry (Harrisburg: Bureau of Industrial Hygiene, Department of Health, Commonwealth of Pennsylvania, 1941), 4-23.

remove excess mud. "Off-bearers"--often teenage boys--carried the molds to the drying yard or floor, dumped out the bricks, and set them in rows to dry. While on the drying floor the "green" bricks were usually repressed in a portable brick press or mold to increase their density and uniformity.

Dried bricks were stacked on a wheelbarrow and taken by a "wheeler" to either a round "beehive" or a rectangular kiln where "green brick setters" and "tossers" arranged them in intricate stack designs to allow the maximum amount of heat circulation and even burning. When filled, the kiln door was bricked in and sealed. Kiln firemen lit fires in surrounding fireboxes, raising the temperature gradually over a period of days to a peak of more than 2,000 degrees. The temperature had to be lowered gradually as well, making the firing cycle as long as twenty days, with loading and unloading taking several more days. "Burnt brick" handlers unloaded the kiln, sorted, graded, and wheeled bricks to storage sheds or packed them directly onto carts, boats, or railroad boxcars for shipment.

Brick making required the combination of a great deal of hand labor with the skill and site-specific knowledge accumulated over years of experience. As the Scientific American observed in 1886:

> No rule can be laid down for the handling of clay; the routine which in one yard produces first quality would, if transferred without change to another, only cause miserable failure. The method of burning and the degree of heat which in one locality will turn the clay there found into good, hard brick would, in the next yard perhaps, yield only a kiln of spoiled and useless clay. So that it is safe to say that a brickmaker who had only worked one clay in one yard would be compelled to begin anew his apprenticeship if he were thrown in contact with different features.[24]

As demand for refractory bricks increased in the later years of the nineteenth century, efforts to cut production costs focused on reducing labor and manufacturing time and finding ways to rationalize the idiosyncracies of each brickyard. Reducing brick manufacturing to a mechanized routine was not a simple undertaking. It progressed in a piecemeal fashion as various parts of the process were subjected to chemical and mechanical analysis in a search for ways to replace human labor and judgment.

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[24]"Brick Making," Scientific American (November 27, 1886), 343.

One might assume that the most crucial skills in brick making were contributed by the pan tender who oversaw the mixing and preparation of the clay or by the fireman who controlled the duration and temperature of burning. Yet, it was the molder who was generally regarded as the "key craftsman" who "dictated the quality and quantity of production."[25] In other words, he represented a bottleneck in production, and the earliest attempts to mechanize the industry focused on his position. Most of the early-nineteenth-century patent designs for molding machines mimicked the action of the hand molder and usually had some form of "charger" that dumped and pressed clay into a set of revolving molds.[26] By the end of the century a refined version of these "soft mud" machines, the "dry press," had become important for making refractory bricks and shapes. It worked on the same principle, with clay pressed and discharged from molds automatically, but the clay was drier, containing less than 10 percent water and was subjected to higher pressure in the mold.[27]

A second machine type exaggerated the action of the hand molder slamming the clay into the mold. In the "drop-mold machine," silica clay was dropped into a mold from a 20' to 30' height. The force of the fall compacted it into the form.[28] More important was the "stiff-mud machine" which did not mold bricks but was derived conceptually from the pug mill. Clay was forced through the machine and extruded through a die in a stiff column that was sliced off in brick-sized lengths by rotating wires. Because of the need for high density and precise shape in refractories, these bricks were usually repressed before firing.[29]

The difference in capacity between hand and machine production was dramatic. According to one estimate, a hand molder working in 1898 could turn out 3,000-4,000 bricks each day. A contemporary advertisement for a brick-making machine promised an output of 3,000 bricks each hour.[30] Refractory brick molders were never entirely replaced by machines because some of the

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[25]Carroll Pursell, "Parallelograms of Perfect Form: Some Early American Brick-Making Machines," Smithsonian Journal of History 3 (Spring 1968), 22-3. Gurcke, 86.

[26]Ibid., 23.

[27]Gurcke, 22. Anderson, 51-52.

[28]Ramsay, 41. James E. MacCloskey, History of Harbison-Walker Refractories Company: From *Star* to *Vega* and Beyond (Pittsburgh, 1952), 83.

[29]Gurcke, 21-22.

[30]Pursell, 23, 26.

special shapes were too complicated, but their numbers were certainly reduced.

Between molding and burning, a brick's water content had to be reduced to a minimum. Even green bricks from the dry press contained so much moisture that they would have exploded in the kiln. Drying in the yard could take days and depended on good weather. The interval was shortened and regulated by installing flues under drying floors. These early "hot floors" were fired directly; late-nineteenth-century plants circulated steam heat or waste heat from the kilns. Photographs of early-twentieth-century plant interiors show expansive hot floors with men and boys busy among rows and rows of bricks and shapes. They worked in a steamy atmosphere over a floor that might have been heated to 100 degrees.[31]

By the 1890s machinery manufacturers were urging brick companies to replace their hot floors with tunnel dryers, described as "absolutely necessary to the modern plant." Bricks were loaded on cars that inched through heated tunnels, further regulating and reducing drying time. Attempts to apply the same principle--moving bricks through regulated heat increments, although of much higher intensity--to the burning stage were not successful for refractories until the late 1920s.[32] When plants risked the investment expense of installing tunnel kilns, burning time was reduced from a few weeks to a few hours.

The uninterrupted flow through the plant represented by tunnel dryers and kilns was an ideal that, in practice, was rarely achieved. It was hard to get around the fact that bricks had to be handled individually as they were taken from hand molds or press machines and moved through the subsequent stages. On the hot floor they were constantly shifted and rearranged as they were turned, repressed, "hacked" in short stacks, and finally loaded and wheeled to rectangular or dome-shaped kilns where they were stacked in dense, intricate order. This labor-intensity challenged the ingenuity of engineers and owners at the turn of the century. They were determined to modernize and streamline production. Brick manufacturer J. Parker B. Fiske spoke for many of his peers in the Transactions of the American Ceramic Society in 1903:

> This is the age of machinery--automatic machinery, often with the most intricate mechanism, which works with

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[31]Anderson, 52. MacCloskey, 79.

[32]"A Practical Brick Drier," Clay Record 3 (August 16, 1893). MacCloskely 81-82. John D. Ramsay, Refractories: The Backbone of Industry (Cleveland: North American Refractories Company, 1941), 36-37. Gurcke, 26, 34.

> marvelous speed and accuracy, and which accomplishes tasks far beyond the capability of the human hand, both in quality and quantity of product manufactured. As a result of such machinery, the cost of nearly all manufactured articles has been enormously reduced and the consumption by the people correspondingly increased.[33]

Fiske was frustrated that his industry seemed so behind the times and so dependent on its workers; "an excessive proportion of the entire cost of brick making today is in the labor item."[34] Although "much ingenious and useful brick machinery" had already been invented and implemented, Fiske continued, it usually pertained only to preparing clay or forming bricks. He proposed extending the use of machinery "with a view to the practical elimination of hand labor" which constituted "an expensive proportion of the entire cost of brick making." His goal was a virtually automatic plant--"raw material would enter at one end, proceed systematically through the various processes and emerge a finished product at the other." To achieve such "radical improvements" the overall design of the entire plant had to be rethought.

> [The] 'open yard' idea must be abandoned and a permanent, substantial construction must be adopted, with the best possible form of brick molding machinery, artificial driers and fuel saving kilns, specially constructed to suit the new conditions involved in the use of automatic handling machinery, the whole plant representing a comprehensive scheme complete in all its arrangements.[35]

Fiske's solution to the hand labor "problem" was to install a rolling overhead crane that carried a platform of stacked bricks from the molding machines to open-topped driers and kilns to shipping dock. Bricks were handled once when they came off the press and once after burning. He reported that the system was proving successful in his own plant, but his peers were skeptical that the long-term results would encourage others to take the risk of reorganizing existing plants and making such a large-scale capital investment.[36] His crane-dependent system was never adopted as an industry-wide model, but it contained some elements

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[33] J. Parker B. Fiske, "The Elimination of Hand Labor in Brick Making," Transactions American Ceramic Society 5 (1903), 21.

[34] Fiske, 22.

[35] Fiske, 21, 23.

[36] Fiske, 35-49.

of the rationalization that did take place. By 1930 a few plants found a practical way to realize the basic idea of reducing hand labor by loading bricks from the presses directly onto a platform that traveled through each step in production. Rather than use a crane, bricks were loaded on cars that moved slowly into tunnel dryers, then through tunnel kilns to a storage area.[37]

The "tow motor" or forklift was arguably the most significant piece of machinery introduced in twentieth-century brickyards. It replaced much of both hand loading and wheelbarrow work. In plants equipped with moving cars and tunnel kilns, it allowed the system to be expanded to all areas of the plant, beyond the route of the car tracks. For plants still using periodic rather than tunnel kilns, the tow motor was perhaps even more important, because it allowed a substitute mechanization suited to the more cramped spaces of older yards. By the time tow motors were widely available in the 1950s, unions were established in most plants, and this labor-reducing machine met with some organized opposition. Acceptance was negotiated through union-industry arbitration and it became an essential component of plant operations.[38]

The tow motor allowed the next innovation--"palletization," a rather pretentious name for stacking bricks on pallets that indicates the importance of the practice and the ascendance of scientific management and language. Palletization was so rationalized that companies distributed diagrams of how different brick types should be stacked most efficiently. The practice not only allowed refractories companies to continue reducing their work force, it allowed their customers to do the same. After bricks were shipped on pallets, receiving, storing, and moving them required fewer men. One steel mill reported that after reorganizing its refractories warehouse to accommodate pallets and forklifts, the warehouse staff was reduced from fifty-six to four.[39]

This course of mechanization was uneven and occurred relatively late. Although brick-making machines were available in the nineteenth century, they were not widely used until after 1900. Even then there was a reluctance among customers to accept machine-made brick. It was an unknown quantity and therefore a

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[37]B. E. Whitesell, "A Tunnel Kiln Refractories Plant," preprinted for use at annual meeting of the American Ceramic Society, Chicago, Ill., February 1929. Leonard Stover, interview by author, Salina, Pa., June 29, 1991.

[38]Corinne Azen Krause, The Hidden Industry: A History of Refractories in the United States, 1860 to 1985 (Pittsburgh: American Ceramic Society, 1987), 118.

[39]Ibid.

risk to production. Some believed that the imperfect finish of hand-molded bricks made them adhere better and form a more impermeable barrier in furnace heat.[40] Later the opposite belief became accepted knowledge. Perfectly straight edges were sought for a seamless lining, and brick sizes and compositions were standardized across the industry. The most commonly used "9-inch straight" was established as the base brick.[41]

The standardization of brick size also affected brickyard work which was divided between jobs that involved brick handling--paid on a piecework basis for every thousand bricks handled--and all other jobs--paid by the day or shift. Piecework rates and the volume of all brick sizes and shapes were measured in terms of their "9-inch equivalent." Even though the rates were designed to compensate for the ease or difficulty of handling different sizes and awkward shapes, retired Salina brickyarder Robert Ripple explained that workers preferred to work on runs of "splits," thin bricks, because they could pick up several at a time in each hand and finish set tasks faster. Piecework rates and "tasks," or the minimum 1,000-lots that could be handled each shift, were originally set by the company.

After unionization in the late 1930s and 40s, the numbers were negotiated and assignments were rotated so that easier and more difficult bricks were distributed evenly. In these later years, one of the aspects of brickyard work veterans noted most often was the option to leave work when a task was completed. Working according to the union-set standards, brick handlers could often "make their day" in six hours.[42]

Dependence on hand labor persisted because the cost of investing in machine-centered production combined with initial prejudice against machine bricks to delay full-scale mechanization. The difficulty of reproducing some of the complicated shapes by machine insured that hand molding would never be completely eliminated. Robert Wagner, an engineer for Harbison-Walker, estimated that 70-75 percent of bricks were still hand molded when he started work at the Mt. Union yard in 1942. By the time he retired, the percentage had shrunk to 5 percent. Carl C. Muffley, superintendent at General Refractoires in Salina, said they began to phase out hand molding in the 1950s but "found out

[40]MacCloskey, 82. Ramsay, 99.

[41]Ramsay 51-52.

[42]Robert and Lula Ripple, interview by author, Salina, Pa., May 16, 1991. Paul MacDonald, interview by author, Sproul, Pa., June 9, 1991.

[it] wasn't so easy to replace."[43] The care needed in handling special shapes also meant that many plants kept hot floors even after driers were installed.

Hand labor and wheeling remained hallmarks of brickyard work even after cars and tow motors were the main form of in-plant transportation. Robert Ripple went to work at the Salina brickyard in 1936. He was assigned to wheelbarrow work and remembered it as a skilled job because not everyone could learn to balance and maneuver 400 or 500-pound loads of brick. Tow motors reduced the amount of this kind of work, made it easier, and could cut by half crews needed to unload kilns or load boxcars. But brickyarders and their wives still viewed moving bricks as a skilled, strenuous job. Lula Ripple described being impressed with the driver of a tow motor as he nimbly backed and steered amidst the confines of the Salina plant. The Harbison-Walker plant at Mt. Union had one tow motor when Ivan Phillips went to work there in June 1948, and added more in the 1950s. He acknowledged that they reduced the size of work crews, but dismissed the idea that using them was easy. He also testified to the persistence of hand labor when he described the "hand leathers," heavy duty gloves he and his coworkers made for themselves out of old tire tubes because the cloth ones provided by the company were quickly worn through.[44]

Perhaps the most important exception to full-scale mechanization in the Pennsylvania plants was the continuing reliance on periodic rather than tunnel kilns. Only one of the brickyards in the south-central Pennsylvania region--Kier Fire Brick at Salina, Westmoreland County--retooled for tunnel firing. Remodeled in 1928, it was one of the first in the industry to make the transition.[45] Plants equipped with tunnel kilns reported declines in labor and fuel expenses; "firing time and unwanted temperature variation were halved. . . . Workers no longer had to load and unload by hand in 150 [degrees] F temperatures."[46] Presumably, by the time other plants might have followed Salina's proven example, the depression economy made short-term cost and risk outweigh savings of long-term efficiency.

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[43]MacCloskey, 82. Robert Wagner, interview by author, Mt. Union, Pa., June 10, 1991. Carl C. Muffley, interview by author, Salina, Pa., June 29, 1991.

[44]Ripple interview. Ivan Phillips, interview by author, Mt. Union, Pa., June 11, 1991.

[45]Whitesell, "A Tunnel Kiln Refractories Plant," 1929.

[46]Quoted in Krause, 114. The anticipated expense of high natural gas bills may have been a deterrent to installing tunnel kilns, William Cummingham to author, April 6, 1992.

Most Pennsylvania plants had twenty-odd beehive kilns. They were substantial structures with thick brick walls girded by iron bands and were often photographed as the representative focal point of the brickyard. The brick setters and firemen who worked in and around them had hot, dirty jobs. As Ivan Phillips noted, 100 degrees was considered cool in the kilns.[47] Some of the most dramatic brickyard photographs show tossers and setters working in the kilns. Photographs from Hiram Swank's Sons plant near Pittsburgh show small cranes and mechanical arms set up inside kilns to aid in stacking awkward shapes. Such partial mechanization within the older framework was more typical of Pennsylvania plants than Salina's complete renovation.

A technological change that was pervasive across the region was the switch of fuels from coal to oil and then to natural gas. Both continuous and periodic kilns were modified for this transition. Fireboxes that once kept firemen busy monitoring and shoveling coal were bricked in and replaced with oil and then gas lines. As part of this form of mechanization, the knowledge and skill the kiln fireman used to control kiln temperatures with coal fires was gradually codified and translated into precise scientific language read off gauges and dials.[48] Yet, even so, kiln fireman Robert Ripple testified, two kilns could be built next to each other and they would act differently; there was no substitute for an experienced fireman.[49]

Refractories' Composition and Form

At the beginning of the century companies cautiously guarded the in-house knowledge and practice involved in making each plant's line of bricks. But in 1912 twenty manufacturers formed a trade association that began sponsoring industry-wide cooperation through standardization, scientific testing and research. The American Refractories Institute was formed from this group in 1925. It was based in Pittsburgh and, as one of its services, employed a ceramics engineer who ran a testing laboratory and consulted with refractories consumers and producers. Manufacturers agreed to adopt the precise dimensions of standardized shapes; and standardized tests for load, spalling or flaking, slag and abrasion were developed to measure refractories' resistance under different conditions. To adhere

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[47]Phillips interview.

[48]MacCloskey, 85. Stover, Phillips, and Wagner interviews. According to Wagner, at Harbison-Walker in Mt. Union, the initial shift from coal to oil was prompted by a strike of the United Mine Workers and the scarcity of coal.

[49]Ripple interview.

to the standards and establish competitiveness on the new grounds, individual companies and plants began hiring ceramics engineers and establishing their own laboratories.[50]

Standardization of brick chemistry facilitated mechanization of brick making, and like mechanization, it gradually reduced companies' dependence on the accumulated knowledge and experience of individual workers. By the 1940s the role of the college-educated ceramics engineer was well-established but continued to be a source of tension with veteran brickyarders who had first-hand knowledge of the entire brick-making process and made judgments based on sense of touch and sense of the overall operation.[51]

The need for an "expert" on refractories' content and performance grew in part from their increasing complexity and variety. In the nineteenth century firebrick was categorized in three general grades depending on the proportion of basic ingredients and on whether its specialty was in resistance to higher or lower heat, spalling, or abrasion. As industrial processes changed and became more complex so did the demand for refractories. Within the industry there was an ongoing effort to improve the general refractoriness and particularly to raise the fusion or melting point of high grade brick.[52] Although things such as density, porosity, and firing temperature could be manipulated, the most significant improvements came from changing the brick's basic composition.

Small-scale manufacturers in Wales in the early nineteenth century discovered that silica sand had superior refractory qualities in comparison to ordinary fireclay. The secret of making the sand adhere in a brick form with lime was brought to the United States in the 1880s. Raw material in the form of ganister, a highly siliceous rock, was found concentrated in the central Pennsylvania counties of Blair and Huntingdon, and the area became a center for silica brick production. Silica brick was a major component in blast furnaces, open-hearth steel furnaces, glass furnaces and flattening ovens, and the batteries of by-product coke ovens built after 1900.[53]

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[50]Ramsay, 43-57. MacCloskey, 93-95.

[51]George R. Walker, "Human Relationships and Brickmaking: A Sociological Analysis of a One-Industry Community," (Ph.D. diss., University of Pittsburgh, 1953), 108. Ripple interview. Stover interview.

[52]Krause, 64-66. Ramsay, 44.

[53]Rhys Jenkins, "The Silica Brick and Its Inventor, William Weston Young," Transactions, The Newcomen Society for the History of Engineering Technology 22 (1941-42), 141. Thomas N. Kurtz, "History of Silica Brick," Bulletin of the American Ceramic Society 11 (February 1932), 26. Krause, 69-72.

Even though the process for making silica bricks was the same as for fire-clay bricks, they were always produced at separate facilities because ganister required heavier crushing and grinding machinery than fire clay, and the different chemical composition required different treatment through molding, drying, and burning. Brickyards like those at Mt. Union, Sproul, and Claysburg were built specifically to make silica refractories.[54] Work in silica brickyards was much the same in kind, but it was more hazardous because workers were exposed to a much higher concentration of silica dust which caused silicosis, a debilitating lung disease. Silicosis was also not uncommon among fire-clay brickyard workers because silica is an element of all clays. Workers in crushing and grinding and shipping areas were at higher risk than those in areas where the clay and bricks were damp and there was less dust in the air.[55]

The departure from the use of simple fire clay as the primary raw material in refractories is indicated in the changing frameworks of categorization. In the late-nineteenth-century refractories were described as either clay or nonclay, and the most important division was between fire-clay and silica bricks. As new refractories were developed, however, chemical specificity became more important. "Basic" refractories, composed primarily of magnesite, sometimes of chrome, were developed in the 1880s for use in the open-hearth furnace where slag of "basic" chemical composition would have eroded silica bricks. Some magnesite deposits were found in California and Washington, but most of the supply was imported. Basic brickyards were built near the domestic source or at a major port like Harbison-Walker's Baltimore works.[56]

With basic bricks added to the list of refractories, fire-clay and silica bricks were no longer seen as the two categories dominating the field, but were linked together as "acid" in distinction from "basic" refractories.
At the beginning of the century, fire-clay and silica bricks, the specialty of Pennsylvania brickyards, made up the bulk of construction of the open-hearth furnace. In 1923, it was estimated that thirty-five pounds of refractories were required in the production of one ton of steel: fire-clay and silica

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[54]Nancy S. Shedd, Huntingdon County, Pennsylvania: An Inventory of Historic Engineering and Industrial Sites (Washington, D.C.: HABS/HAER Division, National Park Service, 1991), 17-18.

[55]Fulton et al., A Study of Silicosis in the Silica Brick Industry, 59. Ripple interview. Phillips interview. Ruth Defibaugh, interview by author, Sproul, Pa., September 25, 1991. David Rosner's and Gerald Markowitz's Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth-Century America (Princeton, N.J.: Princeton University Press, 1991) is an excellent historical study of silicosis, but it does not deal with brickyard workers.

[56]Krause, 30, 53, 72-73. MacCloskey, 116.

bricks made up thirty-three pounds of the total, and basic bricks two pounds. In the 1940s basic bricks began to be used for furnace ends and sidewalls, and after 1957, when a way of constructing the roof of the furnace with basic bricks was devised, the proportions changed dramatically. Basic brick's higher quality lessened the total amount of refractories required from thirty-five to twenty pounds per ton of steel. Of this figure, ten to twelve pounds were basic brick, three to five pounds were silica, and three to four pounds were fire clay.[57]

After World War II, there were additional developments in the composition and form of refractories further edging out fireclay and silica. A third chemical category of "special refractories," classified as neither acid nor basic, was developed for new manufacturing methods in the steel, glass, and aerospace industries. Their share of the market increased from 2.6 percent in 1955 to 17 percent in 1979. A third category of refractories' form, supplementing "bricks" and "special shapes," became important after 1940. Unshaped "specialties," or "monolithic refractories," included mortars; castables, which would set without firing; and ramming and gunning mixes that were sprayed into place with "mud guns." In 1940 they made up 5 percent of refractories production. By 1984 the percentage reached 38 percent. As use of basic, special, and monolithic refractories increased over this period, fire clay and silica sales decreased from 45.1 percent in 1955 to 12.4 percent in 1979.[58]

Post-Industrial Decline

A reversal in demand from the industry's original staples of fire-clay and silica bricks to specialty products and an overall decline in demand for refractories in general typified the industry in the twentieth century[59] and led to plant closings in Pennsylvania. The fundamental transformation of both refractories' form and composition from their nineteenth-century origins is symbolic of the larger economic structural and cultural transformation of which the industry was a part. The development of more complex, high techology refractories for high technology industry and the disintegration of the solid brick

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[57]Krause, 141-43.

[58]Krause, 146, 152, 155-57. Stover interview.

[59]Krause, 85, 140.

form to a powdery spray mix fits the models of a postindustrial economy and postmodern culture.[60]

Within the industry, the trend was explained with remarkable consistency from trade publications to managers to brickyard workers to truck drivers. They all agreed that two factors contributed to the industry's decline: the decline of the United States steel industry and refractories' improving quality and changing technology that made many earlier refractory products virtually obsolete.[61] John D. Ramsay, president of North American Refractories, attributed the decrease in demand to an increase in quality. Refractories simply did not need to be replaced as often. He urged consumers to consider this when they were asked to pay higher prices for smaller orders.[62] Former superintendents at Salina and Mt. Union cited their exclusive dependence on steel mills as the fatal weakness that led to their plants' closings. An independent truck driver who hauled bricks from the area plants to the steel mills explained that locally produced bricks were replaced by more heat-resistant ones made elsewhere from more exotic raw materials. At the closing of International Refractories in Johnstown in 1990, its president commented on the event's significance: "this brings down the curtain on an era in Johnstown. [At] one time [refractory brick making] was one of the prime industries along with steel and coal . . . . We're among the last of the dinosaurs."[63]

Paul MacDonald was an employee at General Refractories in Sproul for over forty years and founding president of its UMW local. He attributed the decline of Pennsylvania refractories to both the weakening of the U. S. steel industry and to "modernization," an abstract process that he understood more concretely after a hunting trip when he met a bricklayer from Bethlehem Steel in Johnstown. When they realized their common interest, the bricklayer gave MacDonald a first-hand account of the change in steel furnace construction that affected both their jobs. Instead of shutting down a furnace when its walls deteriorated and rebuilding them brick by brick, the heat was turned down, perhaps from 3,000 to 1,200 degrees, and workers used mud guns to

[60]Steven Connor, Postmodernist Culture (Blackwell, 19). Frederic Jameson, "Postmodernism or the Cultural Logic of Late Capitalism," New Left Review 146: .

[61]Ramsay, 84. Wagner interview. Steve Andrews, interview by author, Blandburg, Pa., June 13, 1991. MacDonald interview. Max Wallace, interview by author, Breezewood, Pa., May 1991.

[62]Ramsay, 84.

[63]Stover, Wagner, and Wallace interviews. According to Wallace, truckers called the refractory bricks they hauled "poverty blocks" because of the low rate they paid in comparison to steel. Ted Zellem, "International Refractories Sets Closing," Johnstown Tribune-Democrat (June 7, 1990).

spray a refractory mixture through the flames and reline or patch the walls.[64] Dependence on refractory bricks and hand labor, once fundamental elements of production, was reduced to a minimum. All the brickyards in south-central Pennsylvania were closed. The one in Sproul was reopened--with a fraction of its original staff--to make refractory mortars and gunning mixes.

Tracking the consumption of refractories shows a steady, low-level demand from the mid nineteenth century to the 1890s when it rose dramatically to peak about 1926. Machines that increased production were developed in response to this demand, but a fully mechanized plant with machines at each step of brick making was not in operation until 1928 after demand peaked. During this period when mechanization, as traditionally defined, lagged behind demand, brick making remained very labor intensive and companies saw their workers as central to increasing production. Yet, if we broaden our definition of technology to include more than individual or groups of mechanical devices and look beyond the borders of the brickyard proper, it becomes clear that from the 1890s through the 1920s companies employed alternative, extra-mechanical strategies intended to increase production by maintaining a large, stable work force. To expand and take advantage of rising demand, they built company houses and cultivated company towns as extensions of brickyard operations.[65]

Company Houses

The company town served the purpose of securing a stable work force for the period when that was most crucial to the refractories industry, but the institution was formed with a set of internal contradictions that facilitated its disintegration. Company ownership of housing lasted only thirty to fifty years and in most cases company interest in the gestures of proprietary oversight--company-sponsored social work, schools, stores, sports teams--lasted only a portion of that time. The company town was often seen as a kind of premodern, self-contained and paternalistic society in which the company provided for its workers and workers were obligated to the company. Yet, it was part of a modern economy in which companies ultimately viewed employees only as people with the ability to provide labor; while

[64]MacDonald interview.

[65]For partial precedent for this view of company houses, see: Daniel Nelson, Managers and Workers: Origins of the New Factory System in the United States, 1880-1920 (Madison, Wis.: University of Wisconsin Press, 1975), 91, who notes that "the manufacturer viewed the company town as little more than an extension of the factory layout;" and Thomas P. Hughes, American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970 (New York, Penguin Books, 1989), 3, 5-6, who primarily defines technology as "the means of production" of goods and services and writes that technology should be seen in terms of systems rather than as isolated "hardware, devices, machines and processes."

workers were often dependent on companies for their livelihood, companies could not be held legally responsible for the welfare of employees.

This contradiction between reality and the rhetoric of the model company town can be discerned in the planning of company residences. In the company town's most stringent form the local plant superintendent was an all-powerful father figure; all other employees were constituent parts of the company family. The hierarchy was often evident in the size and placement of company housing, with a large, stylistically distinctive house for the superintendent placed at a distance, sometimes on an elevation, from the much smaller, identical and unadorned houses for the main body of the workforce. Yet these workers were also viewed ideally as self-determining, rational individuals in a democratic society. They were expected to fend for themselves when the company no longer needed them. Their houses were most often detached or semi-detached for individual families and their uniformity symbolized the equality of working men.

Industrial capitalism had fostered republican individualism by its atomization of society into discrete individuals dependent on their ability to sell their own labor.[66] In its late nineteenth- and early twentieth-century ascendance it also encouraged various forms of incorporation, perhaps best represented by company towns and the manufacturing policy of vertical integration--control of raw materials, production, distribution--followed by business leaders like Andrew Carnegie.[67] The interdependent evolution of individualism and centralization of power was a contradiction addressed in various ways by members of industrializing society--from Carnegie's donation of libraries for individual self-education to Progressive social workers' establishment of neighborhood community aid centers to labor organizers' promotion of class solidarity. An industrial engineer working at the turn of the century described the changes he and his contemporaries were living through:

> The ten years just past have been characterised above all by mechanical progress and, as its corollary, by centralisation

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[66]Ideas about the equality of individual citizens went hand in hand with the development of capitalist economies. E. J. Hobsbawm, The Age Of Revolution, 1789-1848 (New York: New American Library, 1962), 17-18. Carroll Smith-Rosenberg, "Bourgeois Discourse and the Age of Jackson," in Disorderly Conduct: Visions of Gender in Victorian America (New York: Oxford University Press, 1985), 79-89, 107. Linda Kerber, "The Republican Ideology of the Revolutionary Generation," American Quarterly 37 (Fall 1985), 488-89. Barbara Jeane Fields, "The Advent of Capitalist Agriculture: The New South in a Bourgeois World" in Essays on the Postbellum Southern Economy, Thavolia Glymph and John J. Kushma, eds. (College Station, Tex.: Texas A & M University Press, 1985, 75.

[67]Alfred Chandler, The Visible Hand: The Managerial Revolution in American Business (Cambridge, Mass.: Harvard University Press, 1977), 285-86.

> of industry. The factory system has drawn the working community toward foci, with ever-increasing intensity. Economy of production--the great all-controlling influence in the modern material world--requires the concentration of power in huge units, and about these cluster ever-growing and ever-denser swarms of machine tenders--workers of every grade.[68]

At the same time there was this impulse for consolidation and for the formation of things like company towns, he noted the corollary and potentially contradictory impulse; "not the least characteristic result of the age of machinery has been the development of individuality in the worker."

The company town was a way of gaining some control over the rather frightening prospect of "ever denser swarms of machine-tenders" by setting the framework of social organization, and for a time, rationalization and streamlining of factory production could logically include maintenance of such apparently peripheral concerns as a general store, school, and houses.[69] But by the late 1940s company properties outside the brickyard walls seemed both an economic and conceptual overextension of company resources. By the 1960s, neither town residents nor company officials could see the relevance of houses to plant operations. They explained company divestment of houses as a decision to "get out of the real estate business."[70] Sixty years earlier houses were understood as part of the refractories business. The dismantling of these company holdings signalled another restructuring, one that included the repudiation of the responsibility for maintaining the company town.

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[68]Charles Buxton Going, "Village Communities of the Factory, Machine Works, and Mine," The Engineering Magazine 21 (April-September 1901), 59.

[69]John Reps, "The Towns That Companies Built" in The Making of Urban America (Princeton: Princeton University Press, 1965), 420-21.

[70]Carl C. Muffley, interview by author, Salina, Pa., June 29, 1991. When General Refractories turned over the Sproul water system to a residents' committee, the Altoona Mirror used the same phrase: the company "was getting out of the water business," "Sproul Takeover Completed," (October 13, 1982).

Brickyard Towns and Houses

As the eight towns in this study show, there was wide variation within the company town framework. Circumstances at each plant site--local history, topography, residents, and company management--made each place represent a different possibility for the expression and experience of the company town.

Kistler and Sproul are perhaps the two "purest" examples of the company town in this study. In both, the company built and maintained virtually all of the buildings as well as the infrastructure of roads, water and electricity supply. Yet these towns represent two very different approaches to company town design. At Sproul, General Refractories commissioned a local contractor experienced in building company houses. He built five identical houses for the brickyard foremen. They were of modest colonial-revival style with living room, dining room, and kitchen, four bedrooms, and a full bathroom--amenities and a generous size befitting their management-level occupants. The remainder of the houses, also identical, were derived from local vernacular buildings. They had a traditional hall-parlor-and-rear-kitchen floor plan with an off-set front door, three small bedrooms on the second floor, and minimal plumbing to the kitchen. Unlike the individual and irregular siting of local houses, however, these were regimented in close-set rows along the town's simple grid plan.

At Kistler the company commissioned nationally prominent architects to design a town and all its buildings. Six different house designs were comparable in scale to those for workers at Sproul but included bathrooms and living and dining rooms. These more modern floor plans were incorporated in nationally popular, colonial-revival designs, and in ironic contrast to the vernacular houses at Sproul, each Kistler design was named for the vernacular form that inspired it. The architects appropriated these vernacular styles because of their belief that the architectural character of buildings could mold the moral and social character of their inhabitants. Kistler's population would be a mixture of native-born, white Americans; immigrants; and African-Americans, all of whom might not be accustomed to the middle-class life style and regulated work style envisioned for them there. The architecture was intended to influence them towards the desired behavior.[71] The vernacular style would

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[71]John Nolen, "A Village for Factory Workers: Kistler, Pennsylvania" in New Towns for Old: Achievements in Civic Improvement in Some American Small Towns and Neighborhoods (Boston, Marshall Jones Company, 1927), 73-74. Gwendolyn Wright, "Housing Factory Workers" in Building the Dream: A Social History of Housing in America (Cambridge, Mass.: The MIT Press, 1981), 65.

encourage a hard-working, salt-of-the-earth steadfastness; the modern and mainstream aspects of the designs would foster an aspiration to American, middle-class values. Sproul residents were recruited exclusively from the local native-born population. Presumably, they already possessed qualities associated with the American vernacular. They were given familiar houses under organized and controlled conditions.

At Bolivar and Robinson a combination of factors explain the relatively weak company housing policy. The brickyards at Kistler and Sproul were built in a period when the state of the art was to include company housing. Those at Bolivar and Robinson were much older and were undergoing financial instability during the peak company housing period. The multiple brickyards and partnerships were probably another deterrent to a longer-term, concerted residential building effort. A third factor may have been that the owners were local residents. The workers seemed more reliable because they were familiar, and there was less need for the distanced management techniques of absentee owners.

The earliest company housing in this study was built at Blandburg in the early 1890s at the same time as its brickyard. The first houses were very similar to those at Sproul and were probably for families drawn from the immediate area. After Harbison and Walker bought the brickyard in 1893, it moved these houses as part of its reorganization of the plant site according to more modern, efficiency-conscious standards. They were put on an axis with the brickyard, and over the next few years five more house forms were built along two streets between the brickyard and the original town. There are several examples of a side-gable, double house reportedly built in the 1890s, and of a similar double house built perhaps ten to fifteen years later.

Two different single-family designs were included in the expansion: a two-story, front gable house and a one-story, front-gable bungalow with wood-shingle siding. These houses appear to have been adapted by company engineers from both vernacular--in the case of the side-gable houses--and more popular designs. The new recruits who lived in them included Greek, Hungarian, Polish, and Czechoslovakian immigrants. In 1916 a company publication called the residential development "haphazard," perhaps in reference to the lack of organization in the placement of houses. In compensation and to encourage coherence and assimilation, two programs--for landscape beautification and social work--were instituted, making an explicit link between the influence of physical and social surroundings.

At Salina, company housing was built between 1900 and 1915 as a modernization of the already well-established brickyard, and the construction was very orderly and uniform. The houses on the main street, "the point," and "twenty row" were efficiently engineered in their use of both exterior and interior space. Their front-gable orientation and one-room width allowed them to be placed on narrow lots and gave the streets an almost urban density. Inside, there was a front living room, a rear kitchen, and two bedrooms on the second floor. In its second building stage, the company turned to somewhat larger, more modern floor plans with kitchen, living and dining rooms, but these houses were equally spare in their design and were given the same black and white exterior paint scheme. Just ten years after they were built, the company moved on to pioneer the next form of modernization, completely redesigning and retooling the brickyard proper.

Harbison-Walker's Ganister Hill neighborhood in Mt. Union also exhibited the tell-tale marks of the company engineer. Early photographs show two house forms--a front-gable, two-bay, single-family house and a side-gable, four-bay, double house. They had a rigid, box-like symmetricality devoid of ornamentation. Set in ordered rows just beyond the brickyard fence, they overlooked the brickyard on two sides. At no other town were the houses' function as an extension of the brickyard made quite so clear by proximity and design.

Across town, General Refractories' layout was less coherent, perhaps because it was the third company to choose a site and the third in size and production. It built houses on lots that were available along Shirley Street and along the railroad on Pennsylvania Avenue and Water Street. Both groups were several blocks distant from the brickyard and were plan-book type houses with some stylistic features that made them blend in with their neighbors. Room was found for seven two-story houses immediately adjacent to the brickyard. On the opposite side of the brickyard, away from the town, was General Refractories' "shanty town" of small, one-story houses. Nearby was Mt. Union Refractories' shanty town, ironically nicknamed "Little Kistler." Shanties were a common and expedient company house form. They were also represented in Sproul, Salina, and Claysburg, and like the two sites in Mt. Union, were usually somehow set off from the rest of the town.

Two-family, double-house shanties at Claysburg made up the "Little Africa" section of town as well as the "shanty row" along the railroad track behind a row of managers' houses that fronted on Main Street. Claysburg was unusual in the number of high- and low-scale company houses and in the number of privately built houses that could easily be mistaken for company houses. The variety of substantial managers' houses may be explained by the local residence of company officers. Local builders and landlords provided mid-range houses including rows of identical one-and-a-half-story bungalows and two-story, gambrel-roofed houses west of the brickyard. More typical examples of company housing were the two-story double houses built across the Frankstown river branch at the foot of Dunning Mountain.

Refractories company houses were not linked by their forms or planning. They were just as varied as the brickyard towns they were built in. Some were built in local vernacular forms, some were nationally distributed plan-book forms, some were designed by architects, some by company engineers, some by local builders. Construction dates that fall within about a thirty year period are the houses' most salient common feature. While the brickyards in these Pennsylvania towns were built as early as the 1840s, the company houses were all built between 1893 and 1926. This period of construction was mirrored by an even shorter period between 1944 and 1966 when the companies divested their residential properties--most by sale, some by demolition. These two sets of dates bracket the peak years of the company town and represent a dramatic cultural and economic shift. Examining this shift leads to two very different conclusions about the nature of company houses--first, that company houses functioned as an element of brickyard machinery insuring sufficient production, and second that "company house" is a loaded term for a house that is really no different from any other. Though they may seem incompatible, both conclusions can be simultaneously true.

Building Company Housing

The first conclusion was derived from the first set of dates. Houses were built between 1893 and 1926. These years overlap two periods--one in the general history of the refractories industry, the other in the history of its technology; each contributes a different facet to the conclusion. First, demand for refractories accelerated in the 1890s and peaked about 1926. The coincidence of the time frames of housing construction and industry expansion strongly suggests that the construction of houses represented the industry's response to the rise in demand. Companies consolidated control over their operations and resources, including the labor force, to meet and take advantage of rising demand.

When the Department of Labor sponsored a survey of company housing in 1916, companies reported a variety of reasons for building houses. Forty-three companies, about 12 percent, believed providing housing was necessary to secure any workers at all because their factories were in areas with little available housing.[72] Isolated sites and housing shortages characterized most of the brickyard towns in Pennsylvania. In places like Sproul and Salina there was no pre-existing town near the clay mine to house workers. In Mt. Union employees for three brickyards and the powder factory competed for housing. Yet at any of these sites the companies might have encouraged private development rather than diverting their own capital to solve the problem. Private housing apparently satisfied the demand during Salina's first twenty-five years, and in Bolivar and Robinson, several brickyards and coal mines were able to keep employees without building a large subdivision like Harbison-Walker's Ganister Hill in Mt. Union or a model town suburb like Kistler. Company housing was not a simple response to a housing shortage. An engineer writing in a professional journal in 1919 expressed some of the more common and more complicated reasons for company-built housing. He urged that employee housing be acknowledged and treated as an extension of the factory complex:

> As engineers, we design and write the specifications for the machinery to accomplish a definite purpose, and proceed to house it, provide the necessary building with their accessories in the way of cranes, or heating systems, or sprinkling systems, as the case may be. There is no reason why the operating force should not be built up in very much the same way: design the organization, write its specifications so that the employment department can secure the proper men, and then house that organization with just as much thought and care as is given the plant. . . . Proper surroundings and a comfortable, convenient house of good appearance exercise an influence that cannot be denied, and an employee situated in such surroundings is far more inclined to follow the policies of his employer and take an active part in furthering them than one dissatisfied with his home and surroundings. . . .[73]

Most of the respondents to the Department of Labor's 1916 survey justified building company housing in similar terms. To improve the labor force and, by extension, production levels, companies made an analogy between machinery and the people who operated it and added psychology to the list of tools used to keep them up to proper running order. Of the 348 companies surveyed, seventy-five claimed that their housing "secured a better class of workmen." Forty-seven companies believed the primary benefit was

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[72]Magnusson, Housing By Employers in the United States (Washington, D. C.: Bureau of Labor Statistics, U. S. Department of Labor, 1920), 247.

[73]D. Eppelsheimer, "Discussion on Housing," Transactions of the American Institute of Mining and Mechanical Engineers 60 (1919), 815.

"greater stability in the labor force." Forty-eight companies found that living in company houses made their workers more "contented," loyal, and cooperative.[74]

The company town at the turn of the century was the creation of a business community under the imperative of building an industrial infrastructure. Labor was at a premium and maintaining vigilant control of labor was justified in order to insure uninterrupted production. Control was made more important by the perceived threats to social order posed by organized labor, and by large numbers of immigrant and generally "lower class" workers. Modern management methods in which workers were treated as one more element of plant machinery was a convenient way of achieving efficient production and a distancing control. When they were successful, the psychological management strategies deployed under this philosophy--company social work, ball teams, the company town in general--might have seemed an example of enlightened paternalism preserving personal social relations in an impersonal age, but they were ultimately strategies that were discontinued when they became culturally obsolete and no longer seemed cost effective.

The timing of mechanization was the second factor in refractories industry history contributing to the construction of houses between 1893 and 1926. The technology to mechanize refractories production began to be put into operation between the 1890s and 1920s. Brickmaking machines were available in the 90s, but they were new and just beginning to be integrated in production. Handmolding of bricks and shapes continued well into the 1940s. Even when brick presses became more common in the first decades of this century, this only increased the need for hand labor, because it increased exponentially the number of bricks that had to be dried and burned, stages which were not successfully automated until 1928.

Brickmaking remained a very labor intensive undertaking through the 1920s. The chronology of mechanization as traditionally defined lagged behind that of the industry's efforts to meet rising demand. Yet, when the construction of houses in this period is inserted in this chronology and considered in the context of the industry's expansion, company housing can be seen as a form of management mechanization that functioned in lieu of machine mechanization. It helped secure and control the large

[74]Ibid.

number of stable workers that companies needed to make bricks. Viewed from the perspective of the brickyard, company housing can be interpreted as a piece of brickmaking technology.[75]

Deconstructing Company Housing

In 1954 Claysburg observed its 150th anniversary. In honor of the occasion local residents staged a historical pageant reenacting events in the town's history and demonstrating "pioneer" skills outmoded by modern life. Women in long calico skirts carded and spun wool and men made hickory brooms and rakes. In one scene two General Refractories employees stood at a table piled with clay and demonstrated "the art of making silica brick by hand."[76] Hand molding was commemorated because it was central to the town's history and livelihood and because it had been almost entirely replaced by machine. The pageant marked the first historicizing of the Pennsylvania refractories industry and the beginning of the dismantling of the brick company town.

The second conclusion about company houses is drawn from the period of divestment between 1944 and 1966 when the companies eliminated their housing. Focusing on these years when company houses technically ceased to be company houses encourages an examination of the assumptions that underlie the term and urges the conclusion that a company house is a house just like any other house. Residential divestment was a phase in the decline of the Pennsylvania refractories industry and of the larger deindustrialization of the nation's industrial heartland. To investigate and do the history of this period, it is useful and even necessary to think of it in postmodern terms; the history of the sale and demolition of company houses involves deindustrializing material culture and "deconstructing" company houses.[77]

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[75]As partial precedent for this view of company houses, see: Daniel Nelson, Managers and Workers: Origins of the New Factory System in the United States, 1880-1920 (Madison, Wis.: University of Wisconsin Press, 1975), 91, who notes that "the manufacturer viewed the company town as little more than an extension of the factory layout;" and Thomas P. Hughes, American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970 (New York, Penguin Books, 1989), 3, 5-6, who primarily defines technology as "the means of production" of goods and services and writes that technology should be seen in terms of systems rather than as isolated "hardware, devices, machines and processes."

[76]Ella M. Snowberger, "Delightful Claysburg Pageant Depicts Life In Pioneer Days," Altoona Mirror (August 19, 1954). "Depicts Phase of Industrial Activities" (photo), Altoona Mirror (August 18, 1954).

[77]There is a significant literature on deindustrialization. Some of the works include: Barry Bluestone and Bennett Harrison, The Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry (New York: Basic Books, 1982); Michael J. Birkner, ed., "Deindustrialization: A Panel Discussion," Pennsylvania History 58 (July 1991), 181-211. I am aware of no published work that addresses directly the place of material culture in

The material objects produced by a society are central in many ways to the phenomenon of deindustrialization. Houses are not usually considered as industrial objects, yet they were clearly planned and constructed as part of the industrializing effort, and they were dismantled or disowned much like other plant property during deindustrializing. Such physical dismantlings of settings that people assumed were permanent were accompanied by transformations in other cultural forms and social structures. These changes are characteristic of what is often called postmodern culture and society. A form of cultural analysis called deconstruction, which "deconstructs" or scrutinizes categories and assumptions often taken for granted, grew out of and seems appropriate for this environment.

The period of divestment of company residential property is crucial to the history of company towns. It mirrors the period of construction and illustrates the reversal of the received knowledge on the efficiency of factory operations--as the understanding of "efficiency" changed from building and maintaining company houses to getting rid of them. The means of divestment and reaction to it are also important because they provide an opportunity to examine ideas about housing and company houses.

There were two alternatives in the streamlining movement refractories companies conducted in the mid-twentieth century. In 1944 North American Refractories chose one when it began selling its houses in Kistler. Across the river in Mt. Union, Harbison-Walker took the second; it demolished the entire Ganister Hill neighborhood. The decision to sell the houses or tear them down seems to have depended on how closely they

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this process. Jim Abrams, folklorist with AIHP and the Pennsylvania Historical and Museum Commission, is working on related issues: Abrams, "Lost Frames of Reference: Cultural Recovery and the Crisis of Tradition in the Pennsylvania Coal Fields" paper delivered at the Public History Associaion conference "Cultural Conservation: Refiguring the Cultural Mission," Washington, D.C., May 1990. There is perhaps an even larger literature on deconstruction, a term that refers to both a theory of language and a related method of literary criticism. Alison Lurie, in "A Dictionary for Deconstructors," New York Review of Books (November 23, 1989), provides a sketch of the field in which she compares deconstructing language in order "to demonstrate underlying inadequacies, false assumptions, and inherent contradictions" to taking apart a building in order to reveal "flaws, and expose the illusions or bad faith of the builder." Peter N. Stearns in "Social History Update: Encountering Postmodernism," Journal of Social History 24 (Winter 1990), 449-52, sketches some of the difficulties and potential benefits of postmodern approaches for historians. Howard Brick in "Optimism of the Mind: Imagining Postindustrial Society in the 1960s and 1970s," American Quarterly 44 (September 1992), 348-80, notes the natural, yet dualistic association between "postmodern," used to discuss cultural expression, and "postindustrial," used to discuss sociological issues. One hallmark of postmodern, and particularly post-structuralist, thought is the tendency to collapse the theoretical divisions between the realms of culture and society or superstructure and infrastructure. Michel Foucault does this from the direction of culture; Stuart Hall from the direction of society. For representative writings see, Foucault, Power/Knowledge: Selected Interviews and Other Writings, 1972-77 (New York: Pantheon Books, 1982) and review of same by Ian Hacking, "The Archaeology of Foucault," New York Review of Books (May 14, 1981), 32-37; Hall, "Signification, Representation, Ideology: Althusser and the Post-Structuralist Debates," Critical Studies in Mass Communication 2 (June 1985): 91-114.

compared to the ideal single-family, American house and whether they formed a neighborhood geographically independent of the brickyard. General Refractories' one-story shanties in Claysburg were not among the houses the company sold to residents in the mid-1960s. Like those in Sproul, Little Kistler and the shanty town in Mt. Union, they were deemed unfit to be passed into the private housing stock and were demolished.[78]

When General Refractories closed its plant in Mt. Union at about the same time as the Claysburg pageant, the brickyard and seven adjacent two-story houses were leveled. The company office building, superintendent's house and a weigh shed were spared because they were on a line with residential streets rather than with the brickyard property. The house continued as a residence, the office became the local Red Cross headquarters, and the shed was converted into a residence. Harbison-Walker's houses on Ganister Hill formed a sizable neighborhood of Mt. Union, but their situation on the far side of the brickyard from the town meant that it could not be integrated as a contiguous neighborhood and that it obstructed access to the rest of the company's property. In the early 1950s, the houses were sold to residents, but only for the right to tear them down and salvage the materials.

In all the other towns the company house communities were distinct enough from the brickyards to support a conversion to private ownership, and they were cut loose to function on their own or to be absorbed into bordering municipalities. North American Refractories initiated residential divestment and sold their Kistler houses according to a policy followed by all of the companies of giving first option to the current residents. Sales were completed next at Mt. Union and Blandburg, and by 1966, the last deed transfer for all the towns had been recorded.

The companies' decision to eliminate housing was a delayed recognition that changes in economic conditions and management and operating policies had made them extraneous, obsolete pieces of brickyard machinery. In turn, the sales prompted other reevaluations of company houses. For many long-term residents, divestment gave them their first unbounded opportunity to use their house as a means of self-expression. Soon after the transition to private ownership, individualistic alterations destroyed the uniformity of the company town streetscape. New owners changed exterior paint colors and also invested in asphalt and aluminum siding to improve their home's insulation, appearance, and save the cost of periodic repainting. They made

[78]The one-story houses near the brickyard in Salina were destroyed in the 1936 flood.

cosmetic changes indoors as well, but the most common interior improvements were the installation of bathrooms and updated heating systems.

These kinds of alterations can be seen as practically and symbolically marking the difference between the private and the company house. They represent the individual owner's rights of self-determination and freedom of choice, and the sale of the houses to their tenants is easily interpreted as the long-overdue granting of those rights. But company housing as a concept, practice, and experience was much more complicated.

The term "company housing" often carries a negative connotation. It is derived in part from the implication that the inhabitants' rights were always limited, but company houses and company towns have a history of being portrayed as drab, oppressive places to live, and the presumption was based more on reactions to their appearance than a concern that democratic principles were being thwarted. A 1946 government report on coal mining towns described them as having "monotonous rows of houses and privies, all in the same faded hues, standing alongside the railroad tracks close to a foul creek."[79] Observers often made an unquestioned move from such negative aesthetic responses to an assumption that company town residents were "deprived," "low class citizens." The writers and government surveyors who were responsible for this unflattering popular image took their own middle-class tastes and life styles as the "American standard."[80]

Former and current company town residents are aware of the stereotype and are sometimes defensive about their experience. A mining town resident proclaimed that "life in a coal town was not always drab or gloomy, as some people may think." Another described the camaraderie of the coal patch towns and associated it with the side-by-side houses: "it was just one big family. All the houses were sort of close together. Everybody knew each other. If you had a problem, they had it." Residents of the refractories company towns made similar statements, expressing a common nostalgia for the close community of rural, small-town life.[81]

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[79]Cited in Crandall A. Shifflett, Coal Towns: Life, Work, and Culture in Company Towns of Southern Appalachia, 1880-1960 (Knoxville: University of Tennessee Press, 1991), 146.

[80]Shifflett, 152, 159.

[81]Shifflett, 146, 153. Steve Andrews, interview by author, Blandburg, Pa., June 13, 1991. Robert and Lula Ripple, interview by author, Salina, Pa., May 16, 1991.

Brickyard town residents were in fact rather disinclined to see their towns and company houses as different from any others. Mrs. Paul Cox, now a resident of Kistler, once lived in one of the seven company houses next to General Refractories' Mt. Union brickyard. When asked to describe it, she replied in a slightly exasperated tone that it was "just like a normal house."[82] Residents treated company houses just like any other house before they held legal title, sometimes making substantial improvements at their own expense.[83] Even when interior decoration was company-sponsored, residents were usually given a range of choices, and they made requests and demands when services seemed inadequate. In the early years at Kistler, for example, the company used "bright, deep" shades of green, blue, brown, and grey to paint the inside walls. When residents complained, a lighter palette of beiges and pastels was provided.[84]

According to the assumptions of outside observers who viewed company towns as dreary and regimented, the towns and their quality of life would improve when companies gave up ownership. Practical reality, however, often vies with the ideal of individual home-ownership as as a source of self-respect and good citizenship. Despite the efforts of middle-class reformers and even of companies' housing and social work programs, different people treated the houses they lived in differently regardless of whether they were company houses or former company houses. Neighbors and residents of some refractories company towns did agree that the look of their towns improved. Just a few years after the house sales in Sproul, a reporter for the Altoona Mirror praised residents' do-it-yourself renovation efforts; "what homeowners have done with paint and hammer and wrought iron railings and outdoor patios and carports has been amazing." Private ownership, he wrote, brought out the "Yankee ingenuity" in these southern Pennsylvanians.[85]

At other towns, however, residents believed that conditions and appearance declined when individuals were responsible for maintenance and improvement of their own property. Company control had been vigilant and consistent whereas maintenance undertaken by individuals was sporadic and varied. One resident of Blandburg's "Yellow Row" said that under company ownership

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[82]Mrs. Paul Cox, interview by author, Kistler, Pa., June 11, 1991.

[83]George and Betty Sucke, interview by author, Salina, Pa., June 26, 1991.

[84]Ressie Costlow, interview by Margaret Mulrooney, Kistler, Pa., March 30, 1989.

[85]"Blend Yankee Ingenuity With Private Ownership," Altoona Mirror (July 22, 1970).

their neighborhood was "beautiful;" it was "perfect and neat" and looked like "a picture postcard."[86] The houses were all painted, trees and shrubbery kept trimmed, walks and fences maintained, and families kept their yards neat and cultivated with flower and vegetable gardens. Forty years after Harbison-Walker turned over its property the streets were uneven and remaining sidewalks were deteriorating. Several houses were perfectly painted or sided, some had a combination of siding materials, others were vacant, and one had broken windows and a missing door. The "decline" was due in part to the local economy--especially in Blandburg where the brickyard was closed just a few years after the houses were sold--but it also had to do with individual taste and standards of upkeep.

Company housing is a surprisingly complex and indistinct form. Yet some would argue that events during the 1903 strike in Blandburg surely provide its most telling definition--brickyard workers and their families could be evicted for joining a union or going out on strike. But even this fundamental point can be qualified. In one of the letters written to the Blandburg superintendent during the strike, Harbison-Walker General Manager O. M. Reif calculated the company had more power over those who owned their own property at Blandburg than over those renting houses. Immediately firing men who joined the union, Reif predicted, "will dishearten a large proportion of your men, especially those who have property at the Works, and to a certain extent also those who are living in our houses."[87] He was apparently referring to property owners' increased dependence on the brickyard compared to the independence of renters who could move more easily to find other work. Recognition of the company's importance to the whole town was certainly clear when plants closed later in the century.

Residents did not always welcome the sale of company houses as an unqualified opportunity to own their own property and gain control over their own lives. In some places they suspected it as a signal that the company would pull out of the community and abandon all responsibility for it. They were left with houses, streets, and water systems that needed to be repaired and modernized. They were also left on their own to cope with work-related disabilities. In the early years of the brickyard towns companies usually made some provision for men who were injured on the job. Carl C. Muffley, whose right hand was amputated in a

[86]Laudelle Beers, interview by author, Blandburg, Pa., July 9, 1991. Thomas McGowan, interview by author, Blandburg, Pa., April 27, 1991. Shifflett, 150, quotes a coal town resident who described similar changes when company maintenance ended.

[87]O. M. Reif to J. A. Boyd, September 18, 1902.

brick-cutting machine at Salina about 1918, was switched to office work and eventually became plant superintendent.

Thousands of brickyarders suffered from silicosis caused by breathing brick dust, but by the time the disease was finally recognized in the late 1960s as the product of working conditions, companies had become bureaucratic entities located in distant cities. Each worker or a surviving family member had to go through a lengthy process of finding a doctor to certify their condition and a lawyer who would prosecute their "dust claim" against the company.[88]

As the refractories plants closed, brickyarders made other claims on the industry. They commemorated their own role in its history and its importance for their communities. Even though the brickyards are gone, parts of them have been stored and recycled throughout the brickyard towns. On the last day of work at Claysburg, brick setter Jake Mentzer took the last brick from the kilns and carried it home with him. At Salina residents bake pizza on thin brick slabs, and at both Salina and Bolivar miniature bricks engraved with plant anniversary dates were distributed among brickyard families.[89] Culled bricks had long been used for incidental building materials and to pave walkways in the towns.

In Mt. Union in 1989 a committee collected bricks and some of the most elaborate shapes from the three brickyards and built a small monument to the "Brick Town" on a public sidewalk next to the post office. When the Blandburg brickyard was torn down, Steve Andrews rescued some bricks and a collection of hand tools including a push broom, pick, and mud shovel.[90] Eschewing the usual local-history bias against such recent history, the Mt. Union Historical Society has collected brickyard photographs, mud shovels, and several brick wheelbarrows--one with a steel wheel and a newer one with a rubber tire. In Kistler, Kenneth and Edna Cox made another kind of contribution to remembering the brickyard era. They have carefully maintained their "Norman Cottage" house, making no exterior additions or alterations.

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[88]Muffley interview. Ruth Defibaugh, interview by author, Sproul, Pa., September 25, 1991. William B. Fulton et al., A Study of Silicosis in the Silica Brick Industry (Harrisburg: Bureau of Industrial Hygiene, Department of Health, Commonwealth of Pennsylvania, 1941). David Rosner and Gerald Markowitz, Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth-Century America (Princeton: Princeton University Press, 1991).

[89]Kathy Mellott, "End of Era: Claysburg's Brick Plant Closes Its Doors," Altoona Mirror (July 31, 1987). Robert and Lula Ripple, interview by author, Salina, Pa., May 16, 1991. Leonard Stover, interview by author, Salina, Pa., June 29, 1991.

[90]"Mailbox Holder A Tribute To Bricktowners' Heritage," Mt. Union Times (September 14, 1990). Steve Andrews, interview by author, Blandburg, Pa., June 13, 1991.

While it was once a mark of prosperity and progress to update the company house, their neighbors now urge them not to change it.[91]

Company housing is at once a more ambiguous and more loaded term than it first appears. Houses were not built simply to alleviate housing shortages but was part of an up-to-date management strategy of integrating the workforce with the plant. Company housing was decried by liberal reformers and critics who were dismayed by what they saw as the limited freedoms of the company town but whose perceptions were sometimes based on their distaste for the repetitive housing forms and working-class lifestyles. The management benefits thought to be derived from company housing--reliable good citizenship--are very similar to those often attributed to private ownership, and an analysis of company houses reveals their entanglement in ideas about property's influence and property rights. Companies claimed a right to control their property and defined it broadly as including residences. The inhabitants of company houses, on the other hand, might have lived in them for generations. They exercised de facto rights of occupation, rights that were obliquely recognized when companies gave resident families first chance to purchase legal title. The companies' divestment of residential property marked a reformulation of principles of efficient business operation. It conferred basic individual rights, but foreshadowed the loss of a community's livelihood.

The company housing in south-central Pennsylvania's brickyard towns followed no common model. Every company and town in the region constructed an unique assortment of structures. But viewed together in the context of the refractories industry and of the way they were used and lived in over time, these houses illuminate an economic restructuring and a dramatic social and cultural shift. Houses were built in order to produce refractory bricks. They were sold after brick making was mechanized, after bricks were no longer needed, and when the spheres of home and work seemed inappropriately linked.

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[91]Kenneth and Edna Cox, interview by author, Kistler, Pa., June 10, 1991.

APPENDIX

Refractories Company Plants/Employees*

County	1919	1925	1931	1938	1946	1956	1980
Bedford	1/60	---	---	---	---	---	---
Blair	2/642	2/701	2/613	2/636	2/714	2/633	3/403
Cambria	6/775	6/831	5/764	4/668	4/437	4/371	1/42
Centre	5/431	9/637	6/568	6/775	6/727	4/387	1/244
Clarion	2/287	6/305	2/174	2/243	2/263	2/166	3/135
Clearfield	8/1274	15/2400	14/1553	15/1678	15/1563	9/1338	4/765
Clinton	4/590	10/1005	9/311	7/379	3/221	3/128	---
Elk	1/143	3/125	1/64	1/47	1/40	1/31	---
Fayette	9/575	3/90	6/183	3/320	3/226	3/191	---
Huntingdon	4/1428	4/1239	4/1233	4/1172	4/1262	3/697	2/335
Indiana	2/82	2/140	2/196	2/267	2/214	1/112	2/63
Mifflin	---	1/149	1/170	1/226	1/213	1/152	---
Somerset	1/31	1/x	---	---	---	---	---
Westmoreland	5/322	8/453	4/415	4/430	3/322	4/343	1/80

*Source: Pennsylvania Industrial Directories

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Jean Markley, Claysburg
Thomas McGowan, Blandburg
C. C. Muffley, Salina
Leonard Stover, Salina
Donna Strong, Salina

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