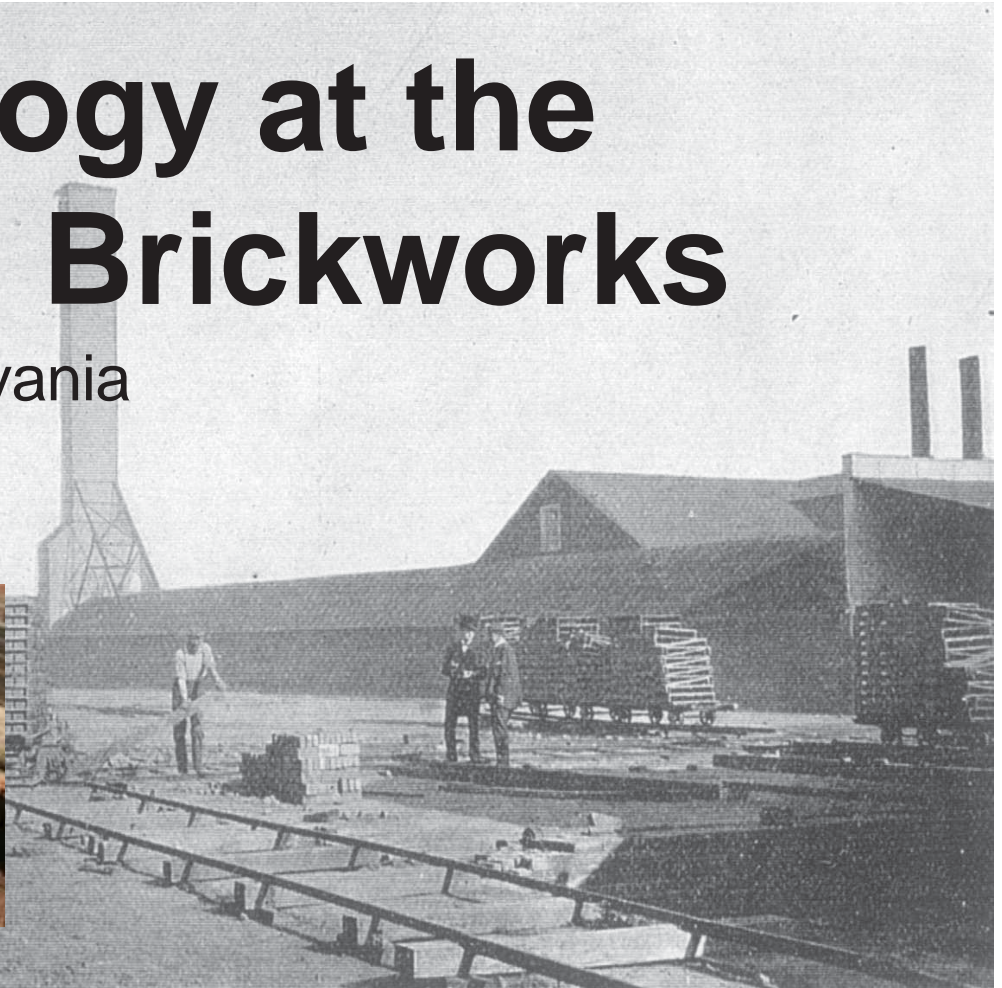




**US Army Corps  
of Engineers**  
Pittsburgh District

# Archaeology at the Harmony Brickworks

Leetsdale, Pennsylvania





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Harmony Brickworks  
Leetsdale, Pennsylvania**

*by*

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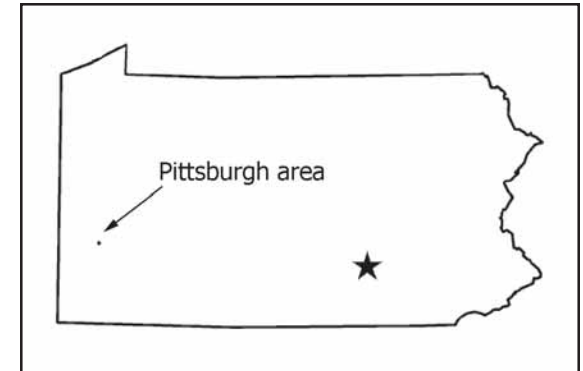
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2004**



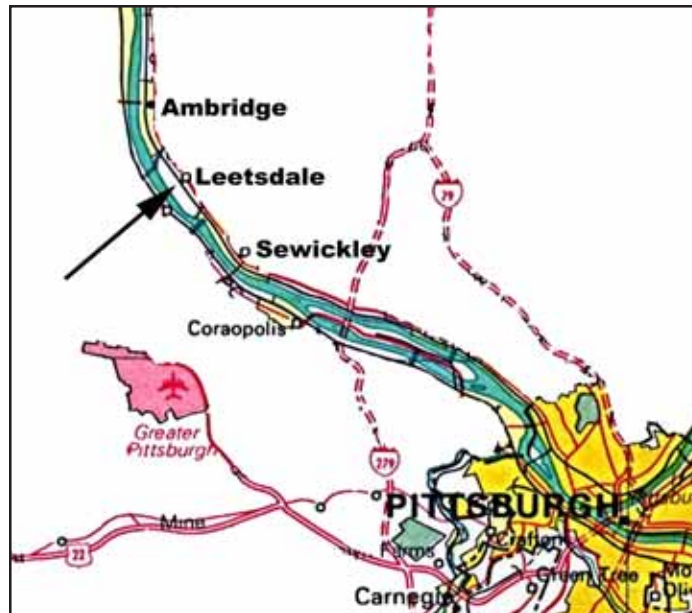
# Introduction

Communities in the Ohio River Valley near Pittsburgh have grown and changed during the past 300 years since the first settlements were founded. As new industries replace earlier factories, landscapes change and the past disappears under the new buildings. Sometimes this new construction uncovers a glimpse of the past and gives us a window to look through to learn about people who lived in earlier times. Once we have found a window into the past, we need a special type of detective, an archaeologist, to investigate the clues and tell us the

stories about the past. One window into the past was recently found in Leetsdale, a small community west of Pittsburgh on the Ohio River.



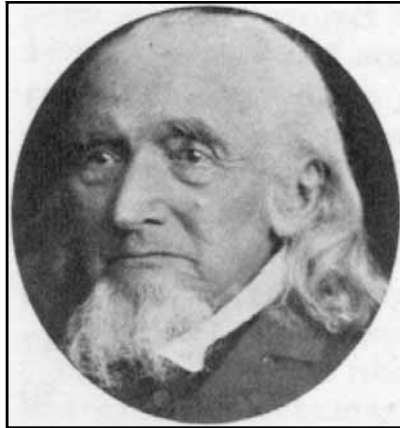
Map of Pennsylvania.



Detail map showing Leetsdale, Pennsylvania, in relation to Pittsburgh, Sewickley, and Ambridge.



In connection with a large construction project in the Leetsdale Industrial Park, a team of archaeologists excavated the brick floors and walls that had been part of an earlier factory. As they worked, they wondered who had built the building, and



Jacob Henrici, leader of the Harmony Society when the brick factory was started.

what had happened to it. This book answers those questions and shows how archaeologists found and interpreted the clues to this factory's past.

The Harmony Brickworks was owned by the Harmony Society, a group of religious people who came to America from Germany in 1803. The Harmony Society's settlement was located in Economy, a town in Beaver County, just up the road from Leetsdale.

The Harmonists lived in a close-knit community and shared all of their property. The Harmonists accepted modern technology and founded many industries,

including the Harmony Brickworks. The Harmonists were interested in efficiency and were innovative in many of their endeavors.

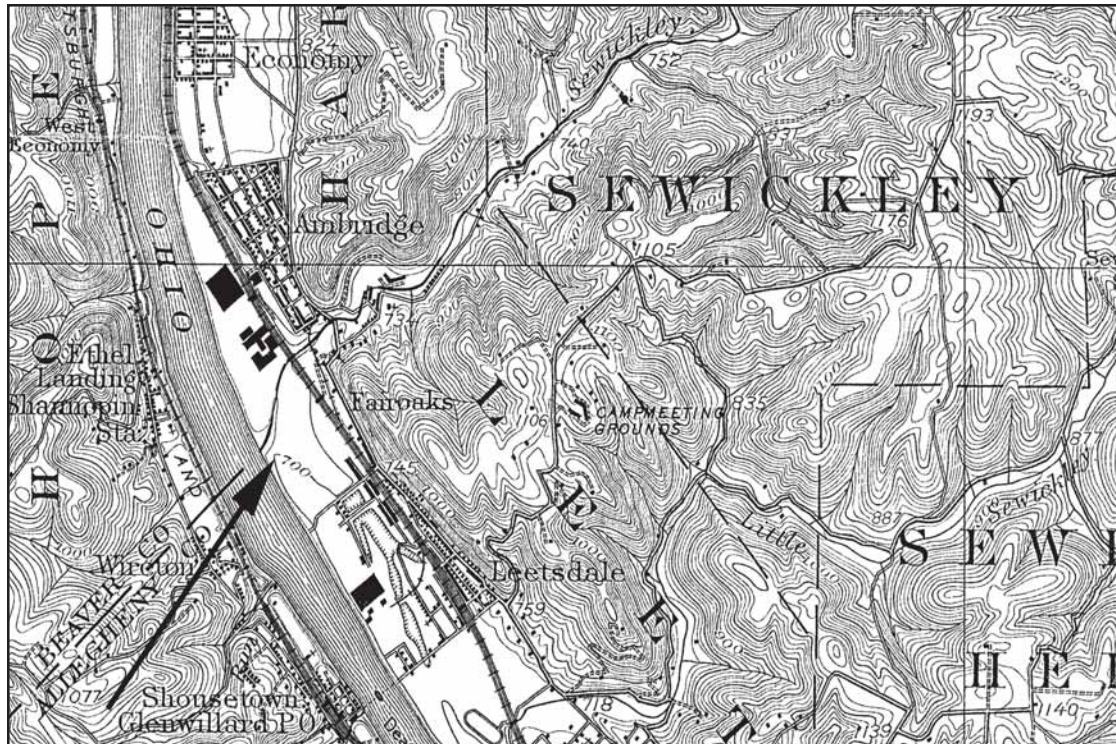


John Duss, leader of the Harmony Society when the brick factory closed in 1901.



We first need to understand why a factory was built at Leetsdale. In the late 1800s, Pittsburgh was still growing into a big city, and the people living there needed bricks for new buildings. In 1890, the hardworking members of the Harmony Society in Economy, Pennsylvania, opened a brick factory in nearby

Leetsdale. The factory was built overlooking the Ohio River near a good source of clay for making bricks. The Harmony Society knew this was a good spot, since there used to be an older brick factory on the same site.



Historic map with arrow showing brickworks site (US Geological Survey, 1906).

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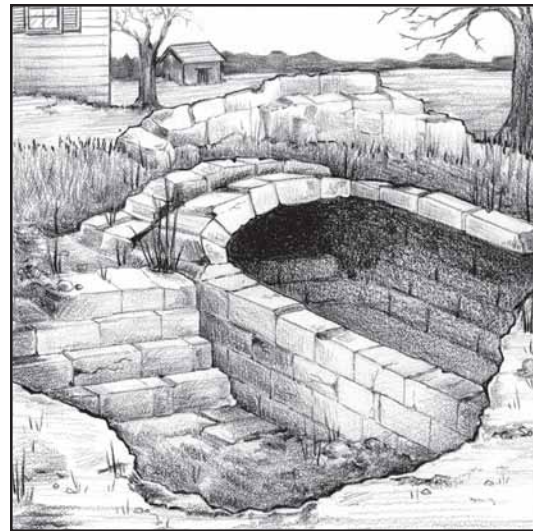


The Harmony Society built their factory to produce thousands of bricks a day. The bricks were not used at the Harmonist settlement in Economy. Rather, the bricks may have been used for other buildings the Harmonists were planning to build nearby, such as houses, churches, and schools. The Harmony Society also sold bricks to builders in Pittsburgh, Sewickley, and other towns. The factory itself was not staffed by Harmony Society members, since there were few members left. Instead, outside help worked the factory.

The workers had machines to mold the clay into bricks. They built a large building

called a *hot floor* to dry the bricks. The workers then put the dried bricks into *kilns*, where the bricks were baked until they were hard. In 1897, a fire destroyed part of the factory. Because of the fire, the Harmony Society built a new building to dry the bricks, and the brick factory continued operating.

The factory made bricks for eleven years. The brickworks had to close in 1901 because it was unable to compete with other brick factories in the area. The brick factory was mostly demolished soon after, and floods from the Ohio River covered the old factory with dirt.



Drawing of abandoned ruins.



# How Did the Archaeologists Find and Excavate the Factory?

Between 1999-2002, the land where the brick factory used to be located was needed for important new construction by the US Army Corps of Engineers. When they realized that such a large and interesting brick factory once existed there, they had archaeologists dig up the factory remains before construction could affect the site.

First, archaeologists dug a series of small holes to find areas where there were remains of the factory, because over the years the entire site had been buried by dirt washed over it when the Ohio River flooded. They also measured the site so they could make a map of the excavations.



*Above:* Archaeologist photographing the site on a snowy day.



*Far Left:* Part of the factory used to dry wet bricks.

*Left:* Part of the factory that was found by digging a series of small holes across the site.

The archaeologists also used a backhoe to help find where the ruins of the factory were located. When the



A backhoe at work on the site.

archaeologists found a good spot to dig, they carefully dug larger holes to examine what was under ground.



A trench cut by the backhoe, with part of the factory exposed.

Some of these holes were fairly small and were dug by hand. These excavations were used to identify the different parts of the brick factory.



One of the holes dug by archaeologists to examine part of the factory.



The archaeologists uncovered and identified different parts of the factory. They found *hot floors*, which were heated floors used to dry bricks. They identified *kilns* (giant ovens) used to



Parts of two kilns in the background and furnaces in the foreground, as excavated by the archaeologists.

bake bricks. They also found *furnaces* that provided the high heat needed to bake bricks in the kilns. The archaeologists used a large backhoe as well as shovels to remove dirt from the most



A brick-lined water well uncovered by the archaeologists.

interesting areas so they could learn more about the different parts of the factory. The archaeologists were then able to match up what they found in the ground with surviving historic records.

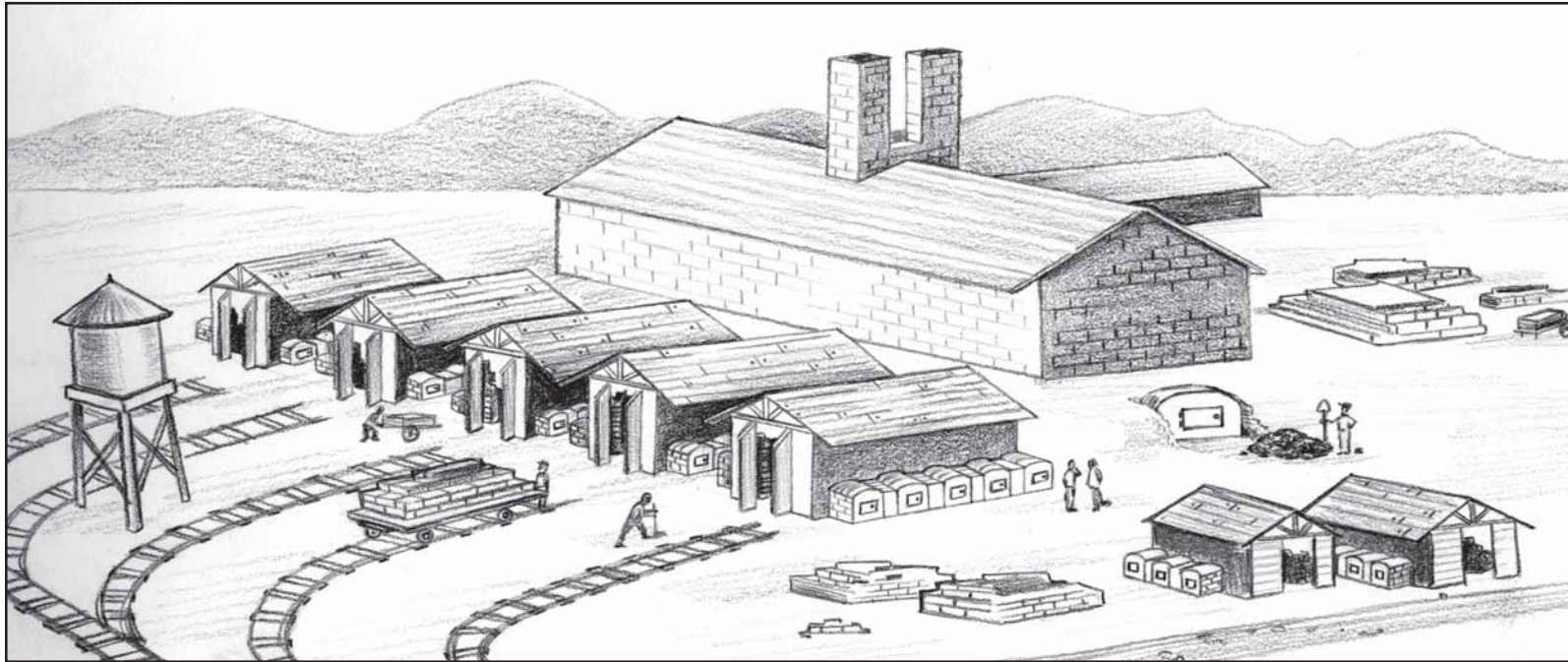


Archaeologist measuring the inside of a furnace.

Through their research and excavations, the archaeologists learned that there were seven kilns at the site. They also learned that there were different types of

hot floors at the site, and they now know how the inside of the big hot floor building was arranged. The archaeologists could compare their findings with records of how other

brick factories were organized. They found out that the Harmony Brickworks was a fairly standard brick factory for its time.



Reconstruction of whole brick factory.



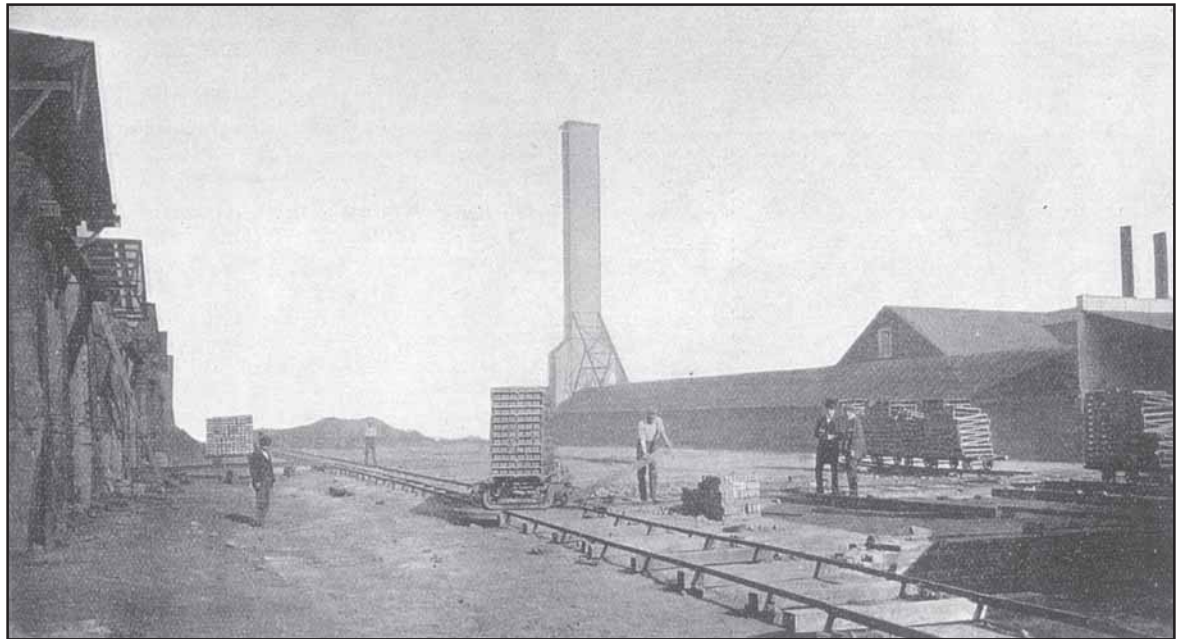
# What Did the Archaeologists Expect to Find in a Brick Factory?

The archaeologists faced a big challenge, because 100 years ago the brick factory was closed and its buildings were destroyed. The site was then covered by flood deposits from the Ohio River. The archaeologists knew that whatever they found was not going to look like it did when it was new. The archaeologists needed to study old pictures and books to learn what these buildings would have looked like, so they could identify

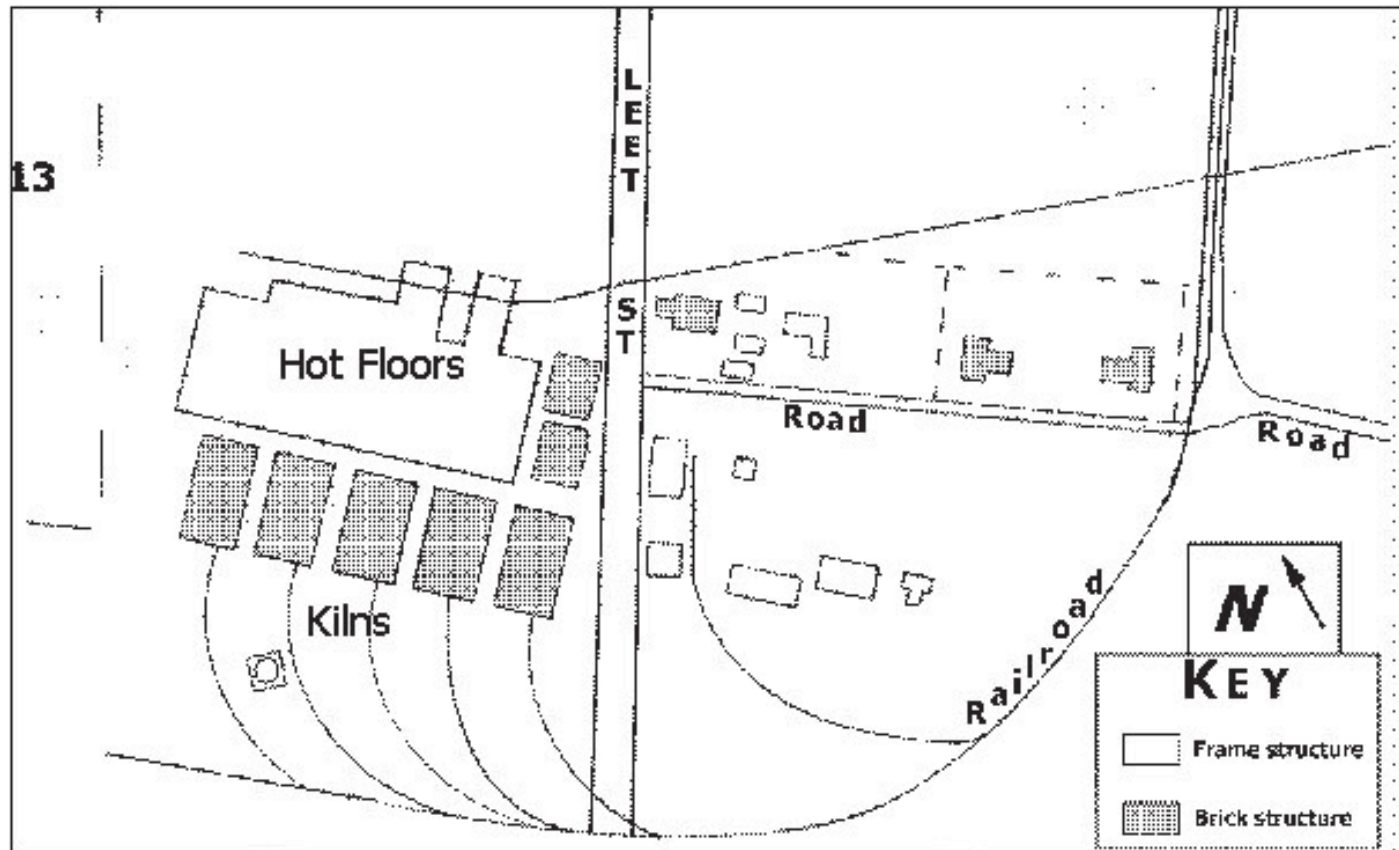
what they found in the ground.

So, the archaeologists found old records and maps that helped them know what they could expect to find.

There were not a lot of old records to help them though, and they had only one map and only one photograph of the factory.



The only known photograph of the Harmony Brickworks (from *Brick*, June 1898: 295).



Original map courtesy of Old Economy Village, Pennsylvania Historical and Museum Commission (PHMC).

The archaeologists were able to use this 1894 map (above) and the photograph on the previous page to determine where they should dig to find the old factory.

This map and photograph also helped them figure out what the factory looked like. Their careful work has helped us understand how a brick factory operated in the late 1800s.

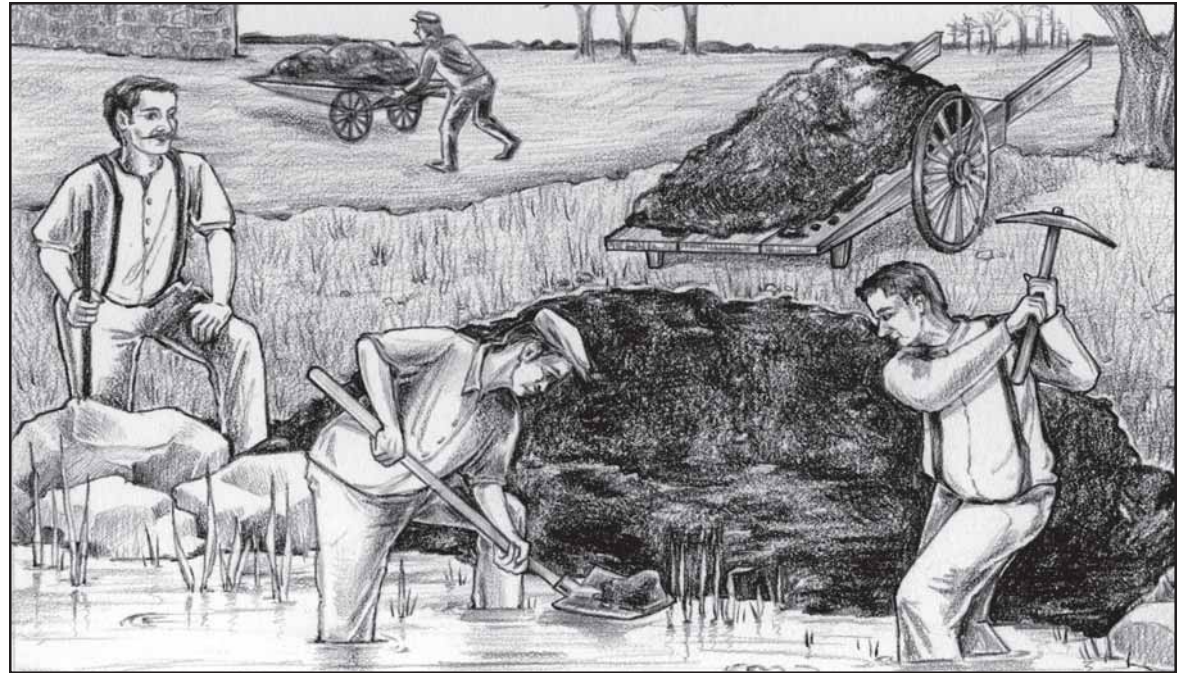
# How the Factory Operated

## Clay

All bricks are made from clay. Most brick factories were built near good sources of clay so the workers would not have to transport the clay very far. The clay for the Harmony Brickworks was dug up near the factory. The workers probably transported the fresh clay by a small railroad leading to the factory.

After the clay was brought to the factory, it was mixed in a big pit with water and left

overnight. This made the clay easier to work.



Workers digging up fresh clay.



## Brick Molding

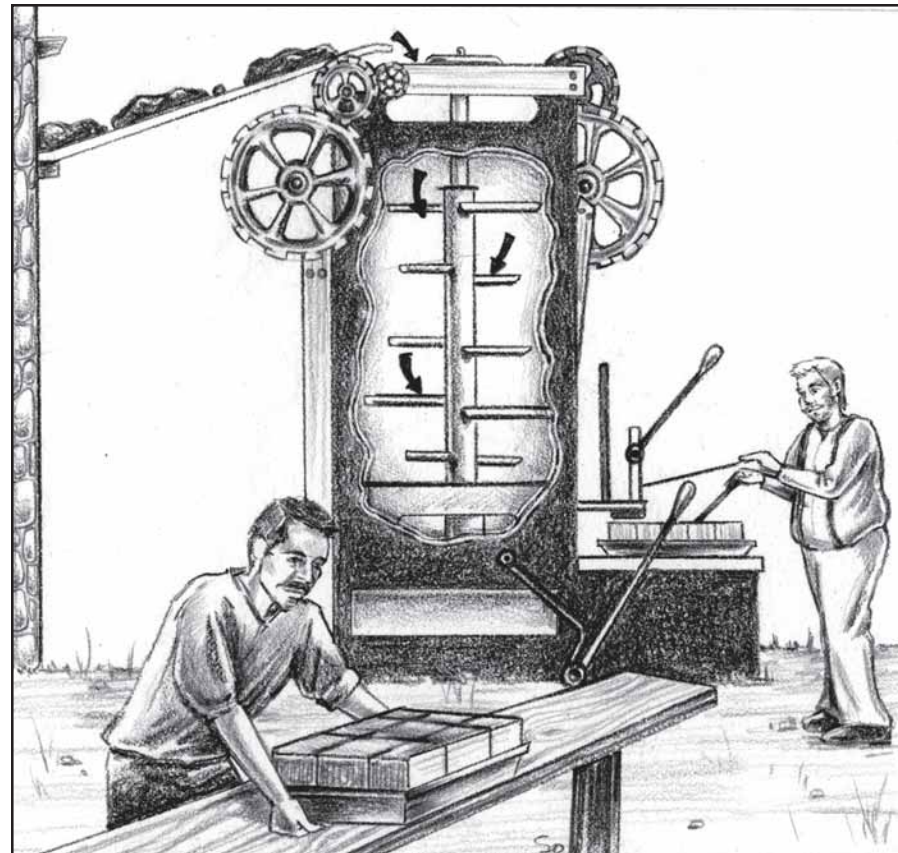
Before the 1800s, all bricks were made by hand. This took a long time and made bricks expensive to use. By the time of the Harmony Brickworks, people had invented steam-powered machines to make bricks.

At the Harmony Brickworks, there were two big brick-making machines. These were called *soft-mud machines* because the clay was soft when it went into the machines.

How did the machines work? Clay was brought from the soaking pits and dumped into the top of the machine, where a big shaft with blades cut up the clay and forced it downwards. The machine

then forced the clay into a wooden mold. A worker removed the mold after the

clay had been pressed into it. The newly molded bricks were then ready to be dried.



Workers making bricks with a soft-mud machine.



## Drying the Bricks

The newly-made bricks were placed on heated floors called *hot floors* in a large building to dry. Archaeologists digging at the Harmony Brickworks found the remains of these floors. They were able to discover how these floors were heated, and that

there were three different types of hot floors used at the factory over time.

The first hot floors used at the factory were heated by furnaces burning gas or coal at one end. The heat traveled through *flues* made of brick (shown below). These flues

were like little hallways that channeled the heat away from the furnaces and under the whole floor. The heat escaped from a chimney at the other end. The bricks were dried by the heat as it traveled through the flues.

Furnaces and flues from the coal- and gas-fired hot floor, as discovered by the archaeologists.

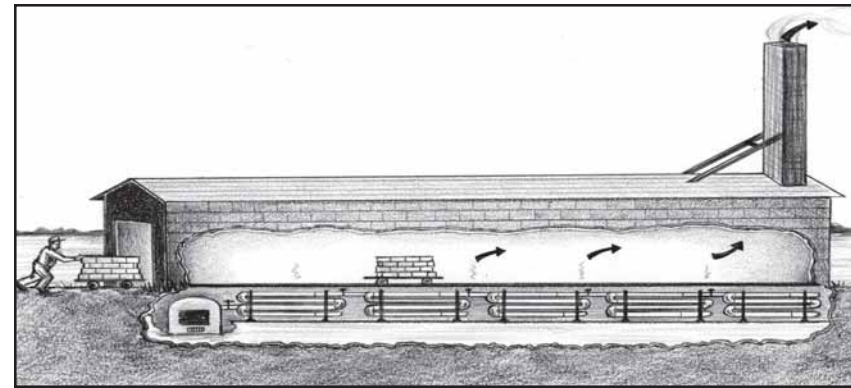
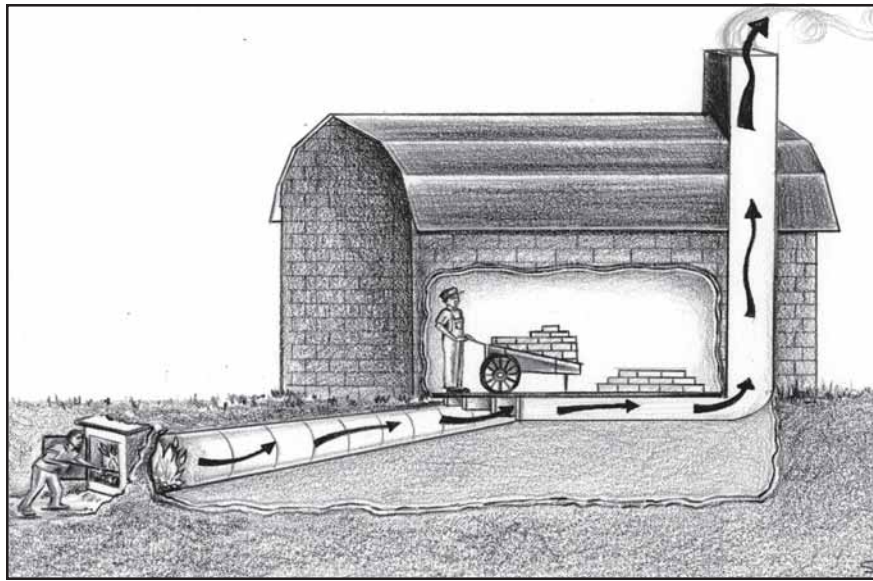


The Harmony Society also built a steam-heated hot floor, which worked like the gas- and coal-fired hot floor, except that the heat was produced by steam, and not by a furnace burning fuel.

After the factory burned in 1897, the Harmony Society

added a steam drying tunnel, a slightly different kind of system. The new steam drier was a long tunnel. Under the tunnel floor, a series of iron pipes acted like a radiator. The steam came from a boiler in one end of the drier, went through the maze of pipes,

and went up through a huge chimney at the other end of the tunnel. The bricks were placed on carts and slowly moved through the tunnel on tracks as they dried. Then the bricks were ready to be baked in the kilns.



Drawing of coal-heated hot floor (left) and tunnel drier (above).

## Kilns: Baking the Bricks

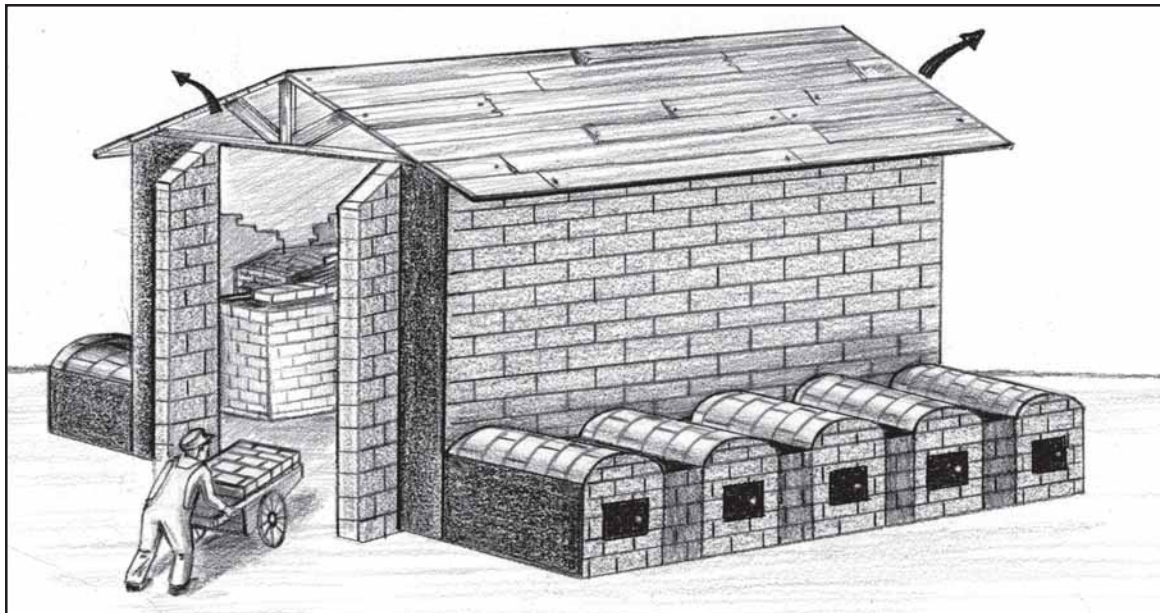
Kilns are giant ovens used for baking things made from clay, like bricks, pottery, and tiles. There are many different types of kilns, but Harmony Brickworks used only one kind.

The kilns at the Harmony Brickworks were rectangular

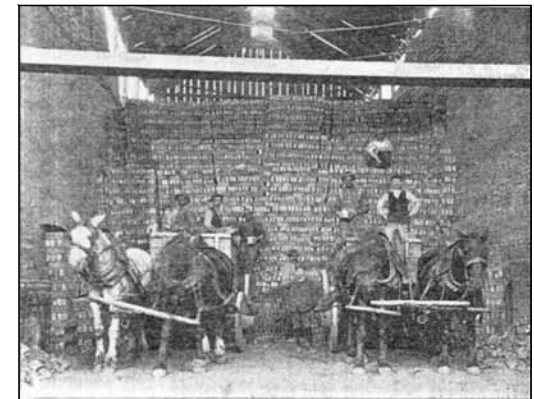
and had small furnaces along the sides to provide heat. These kilns were called *updraft kilns* because hot air from the furnaces entered the bottom of the kiln and escaped through the top. This

updraft of heat baked the bricks inside the kiln.

The bricks were stacked in the kiln with spaces in between them so hot air could move easily through the kiln and around all the bricks.



Reconstruction of Harmony Brickworks kiln.



Workers loading bricks into a kiln.

After the bricks were carefully stacked, the furnaces along the kiln were lit and the firing began. The firing took at least one week.

After the bricks were done baking, they had to cool, which took a minimum of

several days. Then the bricks could be stacked on carts, moved out of the kiln, and used to build a house or other building.

The archaeologists found remains of some of the kilns used at the Harmony Brick-

works, which is how we know what type of kiln they used. By examining the remains of the kilns, the archaeologists could tell how the kilns looked when they were in use.



General view of a furnace and outside kiln wall at the Harmony Brickworks, as excavated by archaeologists in February 2000.



# Conclusion

After the brickworks were abandoned in 1901, some local residents used the area as a dumping ground. Local children played among the ruins of the brick factory, until flooding from the Ohio River covered the site with many layers of silt. The site

remained buried until archaeologists began their excavation almost one hundred years after the factory shut down.

The archaeologists had only one map and one old photograph to help them locate the different parts of

the factory during the excavation. By carefully studying what they found, they were able to describe for us the locations of the different buildings and how they functioned.



View of the steam-heated hot floor discovered by archaeologists.

Much of what we now know about how this brick factory functioned in the late 1800s is based largely on archaeological study. There were also some written records of the brick factory, which described how some of the different parts of the factory once worked.

We now have a better idea of how important this brick factory was in the Ohio River Valley near Pittsburgh. Although the factory was just

one of many similar industrial sites while it existed, today the site educates us about industrial brick making at the end of the 1800s.

Archaeologists help us understand the ways that

people lived and worked in the past. Through archaeological investigations, we discover connections to our ancestors.

Archaeologists excavating at the brickworks site.



This project was undertaken by the Pittsburgh District of the US Army Corps of Engineers to comply with federal laws protecting important historic and archaeological sites. For more information on the project, please visit:

[http://www.lrp.usace.army.mil/lmon/harmony\\_brick\\_works.htm](http://www.lrp.usace.army.mil/lmon/harmony_brick_works.htm)

For more information on the Harmony Society, please contact Old Economy Village, or drop by for a tour!

Old Economy Village  
14th and Church Streets  
Ambridge, PA 15003  
Telephone: 724-266-4500  
<http://www.oldeconomyvillage.org>

The excavation of the Harmony Brickworks was conducted by Hardlines Design Company. For more information about Hardlines Design Company and our services, please visit :

<http://www.hardlinesdesign.com>



