Down Jersey LESSON PLAN

Location, Location, Location…
Accident or Design?

Theme: **Cultural & Historical**

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Subject Areas
4th Grade New Jersey History, 5th Grade Colonial Studies, Language Arts, Science, Social Studies, Mathematics

Duration
One or two class periods

Setting
Classroom

Skills
Map and primary source documents analysis and interpretation

Charting the Course
The glassmaking industry is of particular significance to the region called "Down Jersey."

Vocabulary
Batch, pot, Quaker, natural resources, primary source document

Correlation to NJ Core Curriculum Content Standards

Science	Social Studies
5.8 (1, 2, 5)	**6.3** (1)
5.10 (1)	**6.7** (1, 2)
	6.9 (1, 2, 3)

Salem County Historical Society

Location, Location, Location — *Accident or Design?*

Objectives

The students will be able to identify the availability of natural resources and proximity to water as factors contributing to the selection of Alloway, NJ as the site for the Wistarburgh Glassworks, destined to become the first successful glass factory in North America.

Materials

Map from Gentleman's Magazine, 1776

Vocabulary list

Samples of sand, lime, soda ash, salt hay, oyster shells, wood ***(included in this kit)***

Letter heading — Caspar Wistar to German glassblowers

Copy of sale advertisement from 1780

Examples of Wistar Glass

Map of New Jersey Glassmaking Towns (copied onto a transparency)

Making Connections

Every day, in many ways, we make decisions about "where to put things." We make decisions about where to position ourselves, where to put things we'll need later, where we might want to go and the best way to go. For instance:

If you are cold, you might move toward the fire or move by a heat vent… Why?
(It is warmer there.)

If you are trying to read and there is not enough light, you might move to another seat or sit near a window… Why?
(For better light.)

If it is supposed to snow, you might put the car in the garage… Why?
(Not so much work to clean it off in the morning.)

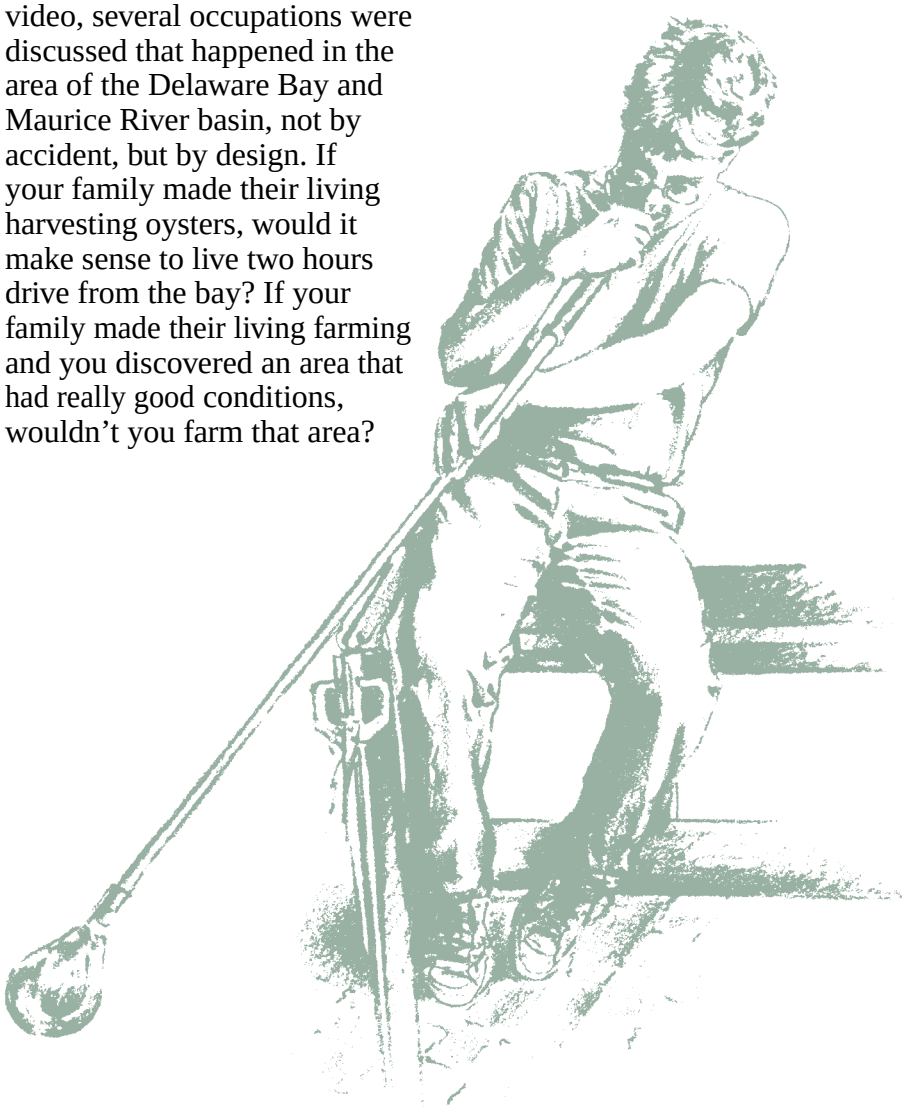
If you like to go fishing, you would want to have a house near water or to vacation near water… Why?
(Closer to the fish.)

If you want to build a business/ store and sell newspapers and coffee, you would look for a busy street or intersection… Why?
(To be near the most potential customers.)

Having seen the ***Down Jersey*** video, several occupations were discussed that happened in the area of the Delaware Bay and Maurice River basin, not by accident, but by design. If your family made their living harvesting oysters, would it make sense to live two hours drive from the bay? If your family made their living farming and you discovered an area that had really good conditions, wouldn't you farm that area?

If you wanted to sell that produce locally, wouldn't it be good if you set up a stand at a spot where a lot of people passed? In business and in selling land and space, like space in a mall or apartment building, you frequently hear: "Location, Location, Location" or that "Location is everything!" The features and characteristics of an area often influence activities that happen there. You don't see sledding on the beach or snorkeling in the mountains!

Now, let's go back more than 250 years and meet a gentleman named Caspar Wistar.



Background

Blue Book pages 77–85

Caspar Wistar, an immigrant from Germany, arrived in Philadelphia in September 1717. It had been assumed that he would follow in the footsteps of his father, forester for the Elector of Palatine, but he protested that his "heart was so taken with the new world that I would not be able to stay."[1] He arrived in Philadelphia with ambition and not much money, but soon became a successful maker of brass buttons. In 1725, he joined the Quaker faith and married a woman from a successful Quaker family. In general, Philadelphia's Quakers were a financially ambitious group and Caspar Wistar "fit the profile" so to speak.

It isn't known how Caspar Wistar formed an association with four German glassblowers, calling themselves the United Glass Company, but during 1738, Wistar purchased 2,000-plus acres of land along Alloways Creek, eight miles from Salem, New Jersey, and in September of that year, the four German glassblowers arrived in Philadelphia. By 1739, Wistar, with the skills of his partners, was producing glass in a new factory. Since 1730, Caspar Wistar had been purchasing land in Pennsylvania, some of which he sold to the Peen family. When he purchased the Alloway, NJ tract, he already owned several thousand acres in Pennsylvania including property outside of Philadelphia near an old glassworks. Since he lived in Philadelphia and had a store in the city, it might be assumed that the glass factory was established there. This was not the case. Location was a critical consideration and the purchase of the Alloway, NJ, tract was not coincidental with the arrival of the German glassblowers in the same year. Caspar Wistar was aware of the particular needs of an operating glass enterprise and the location outside of Salem was ideal!

FASHIONING SHADES FOR OUR DRAWING-ROOM LAMPS.

Procedure

Warm Up

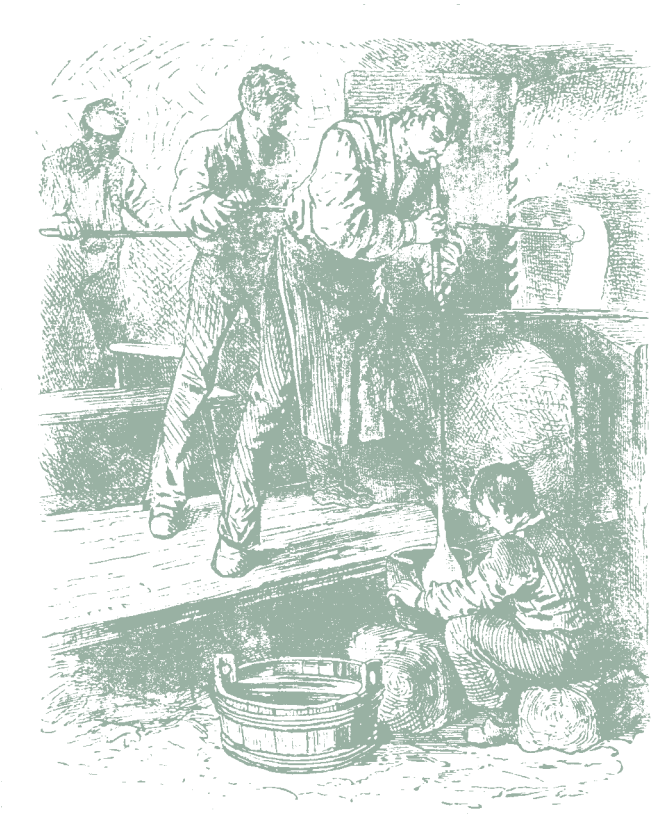
Display overhead transparency of glassmaking towns.

Beginning with Caspar Wistar's factory in 1739, more than 200 glass factories have operated in South Jersey. Wistar must have uncovered a location with some very favorable conditions for glassmaking. His factory continued to make glass for more than forty years. To discover what it was about that area that made it well suited for glassmaking in Wistar's time and for years to come, we must first know more about glass.

The Activity

How is glass made? A simple explanation is that glass is made by mixing three dry substances: sand, lime and soda ash (batch), and heating this mixture to 1472 degrees F (800 Celsius), shaping the hot mixture, and then letting it cool slowly.

Access to the ingredients needed to make glass would be very important. Pass around the small vials of ingredients included in the teacher's kit as each is discussed.



GLASS-BLOWING.

1. Clean sand for making glass is plentiful in the interior areas of South Jersey. It is a readily available natural resource. Although it looks like beach sand, glass sand is chemically cleaner than beach sand. It makes sense to locate a factory close to the raw materials that are needed. [2]
2. Lime is another important ingredient in the batch. One source of lime is oyster shells. Oysters are saltwater mollusks or bivalve, with a hard, two part shell. When oysters are harvested for food, the shells are discarded. Near the oyster beds of the Delaware Bay, these shells were readily available for pulverizing into lime for the batch.
3. The third ingredient, potash, was produced from the ashes of burned wood. This would have been easily accomplished because wood was the source of fuel, burned to heat the batch for shaping. Today's batch substitutes soda ash for the potash of Wistar's time.[3]
4. Incredible quantities of wood were burned to keep the mixture of molten glass from cooling before it was shaped. We know that Wistar's glassworks used 2,400 cords of wood each year. This would have been difficult (and costly) to acquire in the area of Philadelphia, but the area of Alloway was heavily wooded. (Pass around a small piece of fire wood as a tangible connection.) Once again, the particular location proved beneficial because of natural resources available.

Math Connections: Delineate the dimensions of a cord of wood using string or tape — four feet deep, four feet high, and eight feet long. Assuming an eight-foot ceiling in a classroom, have the students (with your help) calculate how much space one season's fuel (2,400 cords) would occupy.

5. Other natural resources in the area of Alloway that were beneficial to the glass factory were clay and salt marsh hay (pass samples). Good quality clay, found in the layers of the ground, was cleaned, pressed to get rid of air pockets, and then shaped into pots or containers that held the molten glass in the furnace. Clay bricks were also used in building the furnaces. If the clay was not good quality or the pots were not made well, the pots broke, spilling and wasting the molten glass and creating a possible fire. So important was good clay that when they did find a local source, the Wistars refused to reveal its whereabouts.[4]
6. Also available because of the factory's proximity to water was the perfect packing material for the times: salt marsh hay. Glass has a tendency to break and needs to be carefully cushioned. Newspaper would have been available, but was too expensive to produce to be considered for wrapping the

factory's glassware. Because the factory was located along the creek, salt marsh hay would have been easily gathered for the factory's use. The creek would have also served as a point of departure for the finished glassware. The Alloway location wasn't going to generate enough local sales, but as Benjamin Franklin explained it, "By means of navigable Water [you can] carry your Glass to market cheaper and with less Risque of Breakage"[5] Shallops probably carried the glass to the port of Salem where it was transferred to sloops for the journey to Philadelphia or New York.

Wrap Up

Although Caspar Wistar's factory in Alloway, NJ, wasn't the first glass factory in the colonies, it was the most successful. The secret of the success of that factory was most likely its location. By building his factory in an area where the resources needed for operations were readily available, Caspar Wistar set himself up for success. While other glass factories survived a few years, his glass factory operated from 1739 until at least 1780. Primary advantages were in the form of the ingredients for the batch and abundance of available forests for fuel. Secondary advantages were nearby waterways, available clay and salt marsh hay. Wistar's choice of location for the factory was key to its success.

Action

Glassmaking became an important industry in New Jersey, influencing the growth of towns and providing jobs for generations of workers. Students can conduct research to answer the following:

Does anyone in your family work in a glass factory? Ask if anyone in your family's past ever worked in a glass factory. Take the opportunity to interview them about their experience to discover which factory, what their task was, what hours they worked, and the types of glass products the factory made.

Food Storage Jar

Wistarburgh Glassworks
1739–1782

Museum of American Glass at Wheaton Village

Did they bring any glass home with them? Are there any pieces of glass in the family that have been passed from generation to generation?

Look in the phone book to see if a glass factory operates nearby. Often there were related industries that grew in the area of glass plants (factories). Sand mining companies provided sand for the furnaces, trucking companies carried the sand from the pits to the factory, packaging companies made the boxes for the finished glass. Do any of these kinds of businesses appear in the phone book or in your own town?

Optional Field Trip:

Visit the Museum of American Glass at Wheaton Village in Millville, NJ. See a piece of glass traced back to the Wistar Glassworks and use the "Notice New Jersey Tour Text" to highlight New Jersey's role in the history of glassmaking in America. It might be possible to find a piece of glass on display made by a factory from your area. You might discover photographs of a factory where someone from your family worked. The Down Jersey Folklife Center at Wheaton Village can also provide instructions on interviewing techniques. Also see *Saving Local History* earlier in this section.

Assessment

We now have a basic understanding of some of the real needs of a glass factory. It is now time to pretend to be Caspar Wistar. Let's go back to 1738 as Caspar Wistar is seated at his writing desk in his home in Philadelphia. Although he already owned property in Pennsylvania, he returned home today having purchased more than 2,000 acres of land in Alloway, New Jersey. Unable to control his excitement, he addresses a letter to the four German gentlemen of the United Glass Company, hoping to win their approval of the Alloways Creek location for the glass factory they hope to build. Wistar (now you) begins to explain all of the benefits of that site. Before you begin the letter, list the ingredients needed for the batch and think about the fuel to melt the batch, and how to transport the finished glass products to the market to be sold. (Remember the items that were passed around.) Describe the area and explain how all of the advantages add up to support construction of a glass factory. Reproduce the blank, stylized letter format included with this lesson.

Extensions

Caspar Wistar's son Richard owned the glass factory after his father's death. In 1780, Richard Wistar advertised the factory for sale. From the advertisement, we can develop a mental picture of the lay of the property, with all of the buildings mentioned. Create and draw a map of the property showing the area as described in the advertisement. (See page 78 of *Blue Book* for advertisement)

References

End notes:

[1] ***Museum of American Glass Exhibit Catalog: "The Wistars and Their Glass 1739–1777,"*** *1993, page 4.*

[2] *An example of the problems that can occur if the raw materials exist at a distance from the factory can be seen in the textile industry during the Civil War. Cotton was grown in the South and factories/mills that turned the raw cotton into fabric were located in the North. During the war, the factories were cut off from their raw materials to the extent that smuggling cotton to the North was attempted.*

[3] *Records relating to the Whitall Tatum Company indicate that this ingredient was imported from England.*

[4] *Museum of American Glass Exhibit Catalog: "The Wistars and Their Glass 1739–1777," 1993.*

[5] *Museum of American Glass Exhibit Catalog: "The Wistars and Their Glass 1739–1777," 1993.*

Bibliography:

American Bottles and Flasks and their Ancestry*, McKearin, Helen, and Wilson, Kenneth M., New York: Crown Publishers, Inc. 1978*

The Wistars and Their Glass 1739–1777*, Palmer, Arlene. Millville, NJ: Museum of American Glass Exhibit Catalog. 1993*

A Short History of Glass*, Zerwick, Chloe. Corning, NY: The Corning Museum of Glass. 1990*

Philadelphia, June 1738

Dear Esteemed Sirs of the United Glass Company,

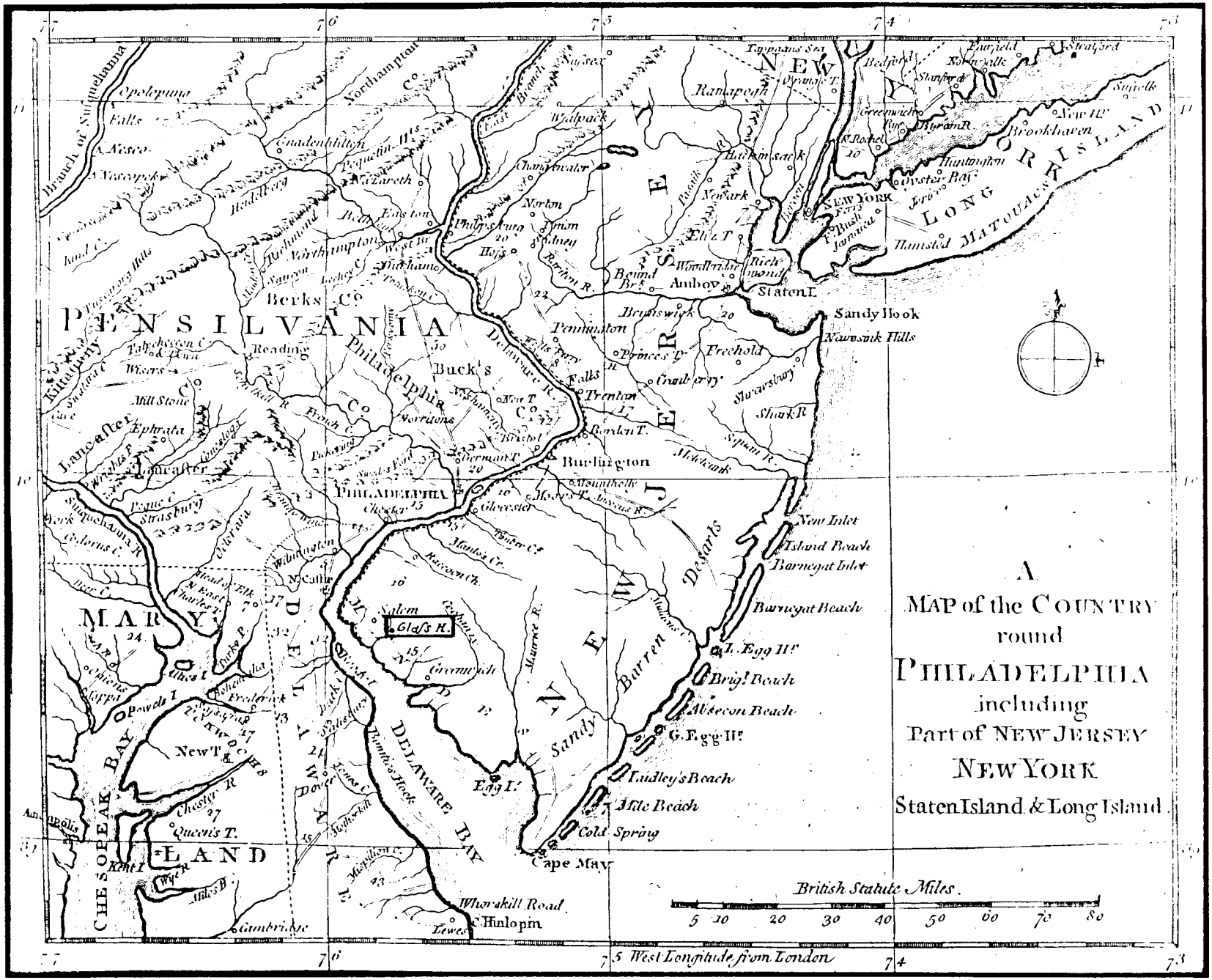
With regard for your health and haste,

Caspar Wistar

C65a

Glassmaking Towns of New Jersey

C66a



Notice the location of the glass factory near Salem, New Jersey, on this map from 1776.

C67a

The GLASS MANUFACTORY in Salem County, West Jersey, is for sale, with 1500 Acres of Land, adjoining.

It contains two Furnaces, with all the necessary Ovens for cooling the Glass, drying Wood, &c. Contiguous to the Manufactory are two flatting Ovens in separate Houses, a Store-house, Pot-house, a House fitted with Tables for the cutting of Glass, a stamping Mill, a rolling Mill for the preparing of Clay for making of Pots; and at a suitable distance are ten Dwelling-houses for the Workmen; as likewise a large Mansion-house, containing six Rooms on a Floor, with Bakehouse and Washhouse: Also a convenient Store-house, where a well assorted retail Shop has been kept above 30 years; is as good a stand for the sale of goods as any in the county, being situated one mile and half from a navigable creek where shallops load for Philadelphia, eight miles from the county town of Salem, and half a mile from a good mill. There are about 250 Acres of cleared Land within fence, 100 whereof is mowable meadow, which produces hay and pasturage sufficient for the large stock of cattle and horses employed by the Manufactory. There is Stabling sufficient for 60 head of cattle, with a large Barn, Granery, and Waggon-house. The unimproved Land is well wooded, and 200 Acres more of meadow may be made. The situation and conveniency for procuring materials, is equal of (sic) not superior to any place in Jersey.

For Terms of Sale apply to the Subscriber in Philadelphia.

RICHARD WISTAR