

section of the Arc be drawn so as to connect the Arc Corner with the west end of the reestablished northern section of the Arc. As a result, two different arcs, one in the north, the other in the west, came to define the curved portion of the Pennsylvania-Delaware boundary, and only one point, the Arc Corner, is as close as 12 miles to the courthouse.

The new survey also established the 4,169-foot-long Top of the Wedge Line as the extreme western border of Pennsylvania and Delaware; Hodgkins found that its length was greater than Graham had calculated. The Wedge, which was south of this line, was given to Delaware. The Horn, a curved tapering parcel of land north of the line that lay between Hodgkins' new western section of the Arc Boundary and the 1701 Arc Boundary, was given to Pennsylvania.



*The Horn and the northern part of the 1850 Wedge; detail, slightly modified, from a Chester County Archives and Records Services Facebook post, July 11, 2024*

Hodgkins used more elaborate techniques, including towers and poles to sight long distances, than Taylor and Pierson did in 1701, but a curved line still could not be surveyed. Triangulation was used to mark the Arc Boundary every half mile, except for the easternmost six miles of the boundary, where a transit and telemeter were used to mark the half-mile chords. Large monuments were placed at the Arc Corner and at the Terminal Point near the Delaware River; the Arc Corner Monument (called the Initial Monument at the time of the survey) lies between Pennsylvania's White Clay Creek Preserve and Delaware's White Clay Creek State Park and is accessible by trail. Simpler and smaller markers were installed at the mile points, and even simpler ones at the half mile points. The completed survey was contested in the Pennsylvania courts by an unhappy resident of the Horn who preferred to remain in Delaware, refused to pay Pennsylvania taxes, and thus was in danger of having his property seized. The judge ruled in 1897 that the commission, which had been tasked with resurveying the 1701 Arc, had exceeded its authority and created a new boundary in the western portion of the Arc. The new boundary required a compact between the two states to become official. The compact was ratified in Harrisburg in 1897, but legislators in Dover did not do so until March 1921, due to opposition from residents of the Horn. In June of that year the compact was approved by Congress, and the Pennsylvania-Delaware boundary dispute was finally settled.

*Franklin Township Historical Commission, rev. 2025,  
with thanks to David Hawk for sharing his research and insights*

## The Arc, Wedge & Horn: Surveying in Circles

What's now the Delaware-Pennsylvania Arc exists because, when William Penn received his colony from Charles II in 1681, Penn's grant specified that the area around New Castle lying within a circle 12 miles from that town was excluded from Pennsylvania. This was done to protect the claims of the Duke of York (the king's brother) to the former Dutch territory that is now Delaware. As it happened, Penn's colony, as described in the grant, had an ambiguous southern boundary that, depending on how it was interpreted, could have been as far north as North Philadelphia, nowhere near the Arc. The modern Pennsylvania-Maryland line was gradually defined, after contentious negotiations and lawsuits, during the mid-1700s.

In 1682, Penn acquired a 10,000-year lease on the Duke of York's lands on the west side of the Delaware Bay. Initially, Penn tried to govern the Delaware lands as an integrated part of Pennsylvania, and New Castle County had boundaries very different from its modern ones (see detail from a 1715 reprint of Thomas Holme's 1687 map of Pennsylvania, right, in which the county extends to the Brandywine's East Branch). Tensions between Pennsylvania and the Three Lower Counties (which would get their own Assembly in 1704), and challenges to Penn's control of those counties, made it wise, if not necessary, for Penn to reduce New Castle County's extent to that specified in his grant.



In 1701 colonial surveyors Isaac Taylor and Thomas Pierson surveyed the Arc, which was to be "marked two third parts of y<sup>e</sup> [i.e., the] SemiCircle." The process was supervised by the magistrates of Chester and New Castle counties, who decided on the "End of the Horse Dike next y<sup>e</sup> s<sup>d</sup> [said] Town of New Castle" as the center of the 12-mile radius. This dike, also called the Great or Broad Dike, is now Wilmington Road where it crosses the marsh north of New Castle. It, and not the New Castle Court House (which was built later, in 1732), defined the location of the Arc Boundary.

After measuring 12 miles north from New Castle to a white oak tree on the west side of the Brandywine, they marked the tree by cutting three notches in its bark on each

side, for 12 notches in all. They then surveyed eastward at a right angle to their radius line to the distance of a chord of 1 degree of the 12-mile circle, which is almost 0.21 miles. Because it is not possible to survey a curved line, they worked as if they were surveying one third of a 360-sided polygon; its vertices were also points on the Arc Boundary. After the first chord was marked, they repositioned their instruments so that their new heading eastward would be one degree further to the south. They repeated this process 43 times in all to reach the Delaware River, then returned to the white oak and reversed the process to the west and south, marking 67 chords until they reached a hickory tree “Standing Neare y<sup>e</sup> Western Branch of Christina Creek.” In all they marked 121 trees, each with 12 notches, each about one fifth of a mile from the other.

In 1750, in England, the Lord Chancellor reaffirmed a 1732 Penn-Calvert agreement, and ruled that what’s now the north-south Delaware-Maryland boundary would run northward from the middle of a line from Fenwick Island west across the Delmarva Peninsula and meet a 12-mile circle around New Castle at a tangent. The line would then continue north. A final ruling in 1760 set the New Castle Court House cupola as this circle’s center. The difference between the two centers, the horse dike in 1701 and the Court House for the boundaries Mason and Dixon would survey in the 1760s, contributed to complications that were not resolved for more than 150 years.

The decisions that settled the boundary dispute between the Penn family and successive Lords Baltimore, which was about the boundaries of what’s now Pennsylvania and Delaware with Maryland, established the boundaries of Penn’s lands with Maryland, but did not reaffirm, reject, or revisit in any way the wording in the 1681 grant that called for Pennsylvania’s southern boundary to run straight west from the 12-mile circle. These decisions and the Mason-Dixon survey, which was based on them, created a roughly triangular, narrow piece of land, the Wedge, south of the latitude of the east-west Maryland-Pennsylvania line between the north-south Maryland line on the west and the Arc Boundary on the east. Which state owned the Wedge? Pennsylvania partisans could say it should be theirs because the Arc Boundary was the

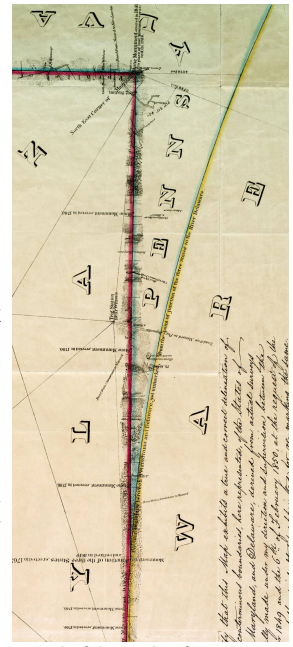


Detail from Howell's 1792 map of Pennsylvania, showing the Wedge.

agreed-on northern boundary of the northern county of Delaware and any land beyond it was Chester County, Pennsylvania. Delaware’s advocates could say that the 1750 and 1760 decisions in England did not alter the Pennsylvania charter’s requirement that its southern boundary head in a straight line westward from the 12-mile circle. Did the agreement on the counties boundaries alter the colonies’ boundaries?

The Wedge was claimed by both Pennsylvania and Delaware, but its residents paid taxes to Delaware and voted for representatives to its legislature. Most maps, though, especially those specifically of Pennsylvania, show the Wedge as part of it, a situation that might be explained by cynics as due in part to the larger market for maps in the more populous state.

In 1849–1850, as a result of the loss of the Mason-Dixon marker at the northeast corner of Maryland (now the site of the Tri-State Marker), a tristate commission undertook to re-mark it. Lt. Col. James Graham of the U.S. Topographical Engineers was employed to oversee the work. Though it was not specified as part of his or the tristate commission’s task, they judged and Graham stated in his report that the Wedge was part of Pennsylvania. Graham used the courthouse, rather than the horse dike location agreed on in 1701, to define the extreme southwest section of the Arc Boundary, and calculated the position of this section for about 3¾ miles northeast of its northern intersection with the Delaware-Maryland border. He also noted that the Arc would intersect with an extension of the Pennsylvania-Maryland border 3,786 feet east of the northeast corner of Maryland. He prepared a map of, but did not place any boundary markers on, this section of the Arc, and the map clearly labels the Wedge as Pennsylvania. Delaware did not accept the commission’s work, but subsequent maps in the 1800s that assigned Pennsylvania the Wedge usually show Graham’s Wedge, which is larger due to his use of the courthouse as the center.



Detail of the Wedge from Graham's map, 1850 (rotated to show north at the top).

In 1892, a Pennsylvania-Delaware commission charged with resurveying and marking the states’ Arc Boundary secured W. C. Hodgkins of the U.S. Coast and Geodetic Survey to lead the field survey. The trees that had been marked by the surveyors in 1701, except perhaps for one stump, no longer existed or were identifiable, and it had become unclear precisely where the boundary was. The northern portion of the Arc Boundary was reconstructed on the basis of a handful of agreed-on markers (including that stump) associated with the 1701 Arc. The survey of its western section – where such points could not be agreed on – followed Graham in using the courthouse to determine the point where an extension of the east-west Mason-Dixon Line (the Top of the Wedge Line) intersected the Arc, a point now known as the Arc Corner. This choice required that the western