“From Heaven to Earth”
Charles Mason and Jeremiah Dixon: A Story of their “West Line”
The Boundary Survey of the Line between the Provinces of Pennsylvania and Maryland

Surveyed April 1763 to September 1768
A brief synopsis of a solution to the 130+ year struggle to define a political boundary line between two groups of future Americans. The court-ordered decision was to trace and mark a 252-mile Line of Geographic Latitude along the surface of the Earth. No one had ever done anything like it successfully before in the New World.

The survey map that Jeremiah Dixon drew in 1768 entitled “A Plan of the Boundary Lines between the Province of Maryland and the Three Lower Counties on Delaware with Part of the Parallel of Latitude which is the Boundary between the Provinces of Maryland and Pennsylvania”. It is over 5 feet long. The seals of the representatives of the Province of Maryland are on the left and the seals of the representatives of the Province of Pennsylvania are on the right. Note that the map does not include the entire southern boundary of Pennsylvania but rather ends the “West Line” at Mile 230. It is a map of what they were able to survey, not what the Court had ordered. It also does not show Philadelphia or Newcastle. No matter, for what it does show is priceless.
Foreword

A dilemma! How to impart even a fleeting appreciation of the surveying of the “West Line”, one of the symbols remaining today of a struggle that lasted for well over 130 years, in the few pages of one little article! A struggle that involved partisan politics and nepotistic-like favors in the highest levels of government, greed, ignorance (both genuine and contrived), stupidity, nefarious schemes, armed conflicts, riots, double-taxations and more that ultimately was laid to rest by combining the arts and sciences of Land Surveying, Geodesy and Astronomy into one practical application. The art and sciences of Land Surveying measurements, remeasurements, computations, mappings, markings, checking and double-checking (and sometimes triple-checking) were performed by Charles Mason and Jeremiah Dixon in temperatures ranging from 20° below zero to over 100°, up mountains and down steep hills, across rivers, through creeks and swamps, by hard physical labors and intense mathematical applications, keeping themselves and their precision instruments undamaged, while enduring large hail and ice, intense lightning and severe rains, heavy woods, thick brush, savage Native Americans, politicians, lawyers, insects, critters and other pests. Measuring and marking the land by day, measuring and searching the heavens by night, Charles and Jeremiah did all this, while keeping meticulous journals as records for future scientific analysis. They accomplished what not many men could. It was a monumental work.

Let me remind you that, in the mid-1760’s, they were not surveying a line to divide the North from the South or to separate abolitionists from non-abolitionists. Their work was
laid down even before the United States existed! So you must rid your thoughts completely of those more modern aspects of the Lines that Mason and Dixon surveyed or nothing wondrous will be revealed to you about what these two men did.

The thoughts and facts assembled here are presented as if from an interview. It is with an affectionate and respectful tip of my tri-cornered hat that I express gratitude to all those Land Surveyors and other extraordinary people who have studied extensively and written profusely about the works of Mr. Mason and Mr. Dixon. I have consulted some of those scholarly works through the lens of my own professional education, experiences and understandings while preparing this article. There are a few Land Surveyors living today, such as Todd Babcock, founder of the MDLPP (Mason Dixon Line Preservation Partnership), for instance, who are entirely accomplished enough to do the work that Charles and Jeremiah did. Bear with me then as I attempt to introduce you to one of Mason and Dixon’s Lines.

What do you know about these two Englishmen?

Charles Mason was born in the village of Wherr, parish of Bisley, Gloucestershire, England and was baptized at Sapperton Church on May 1, 1728. Blessed with a keen intellect and the early mentorship of Reverend James Bradley, Astronomer-Royal at the Greenwich Observatory, Charles became an astronomer, largely due to his profound mathematical abilities. While at the Observatory, he performed numerous celestial observation and computations, helping to compile catalogues of the movements of stars and of lunar and planetary motions into Bradley’s Tables. Charles Mason was elected into the membership of the Royal Society and accepted assignments from them to perform celestial observations and Earth gravitational measurements around the world, including South Africa, East Indies, the New World colonies, Scotland and Ireland. He was twice married (his first wife died), and he had a large family. A member of the Church of England, Charles was friendly but meditative, sensitive to others, thorough, methodical and conservative.

Jeremiah Dixon was born at Bishop Auckland near Cockfield Fell in County Durham, England on July 27, 1733. He was a Quaker, as was his family. He acquired a profound knowledge of mathematics and astronomy, becoming an outstanding Land Surveyor and map maker. It is thought that John Bird, England’s premier maker of astronomical, surveying and mathematical instruments, recommended Jeremiah to the Royal Society as a suitable co-worker for Charles Mason on the 1761 Transit of Venus expedition. Jeremiah too accepted assignments from the Royal Society to perform celestial observations and Earth gravitational measurements around the world, including South Africa, East Indies, the New World colonies and Norway. A natural scholar with exceptional talents, he had a keen sense of humor and great affection for children.

And they both were God-fearing men who recognized the hand of the Divine Creator in all that they experienced and saw, often making mention of Him in their notes and journals. No work on Sunday or religious holidays, except in dire emergencies. They went to church as often as they could. On Sunday, September 22, 1765, they went to Cavetown for church services that were being held in the remarkable cave for which the village is named. (Author’s note: the Village of Cavetown has its own Post Office Zip Code. It still exists near Smithsburg in what-is-now Washington County, MD. Sadly, the Cave does not.)

I thought that there was only one Mason-Dixon Line. You say there are more?

Yes. Mason and Dixon worked with four political boundary lines while here in the New World Colonies. Those lines were: the 12-mile radius arc-boundary, a.k.a., the “Newcastle Arc”, which was the northernmost boundary of the County of Newcastle, one of the “Three Lower Counties [of Pennsylvania]”, now the State of
Delaware; the Trans-peninsula Line, the east half of which is the southernmost line of the County of Sussex; the “North” or Tangent Line along the west side of the “Three Lower Counties”; and of course, the most famous West Line, the subject of this article, the court-imposed boundary between the Provinces of Pennsylvania and Maryland.

Mason and Dixon did not ever refer to any of the political boundary lines in which they were involved as a “Mason-Dixon Line” nor did anyone else until long after their deaths. Doubtless Charles and Jeremiah would have felt surprised, and perhaps a little self-conscious at the label, although they certainly earned the honor. Ensuing years came to apply the label to the “West Line” only, thereby relegating it to political and social status without any regard to the Line’s true original significance. (Author’s note: the “West Line” may be the only political boundary line in the United States that is named after the Land Surveyors who laid it down.)

What did Charles and Jeremiah do first?

Aboard a packet from Falmouth, England, they sailed up the Delaware River into Philadelphia on November 15, 1763. After first determining the Latitude and the Longitude of the agreed-upon “southernmost point of the City of Philadelphia” and establishing several other important markers that would relate to their West Line, they went to the Town of Newcastle to ascertain the geographic position of the courthouse spire there. This structure had been decided to be the center point of a 12-mile radius circle, a.k.a. the “Newcastle Arc”. Mason and Dixon needed these geographic coordinates in order to calculate the tangent intersection of the 12-mile long radius line from the courthouse spire at 90° with a line drawn northward from the...
mid-point of the Trans-peninsula Line.

A few years earlier, other talented Land Surveyors had measured the distance across what-is-now-known-as the Delmarva Peninsula, from Fenwick Island on the Atlantic Coast to James (or Taylor’s) Island on the east side of the Chesapeake Bay. Accepting their mid-point of their Line as the basic southwest corner of the “Three Lower Counties” and checking the direction of the line eastward to the Atlantic (the southernmost border of County Sussex), Charles and Jeremiah set up their celestial observatory over the mid-point to determine its Latitude and Longitude.

Armed with that data and using spherical trigonometry, they calculated the Tangent Point and then surveyed and marked the 81+ mile Tangent Line. The direction didn’t turn out to be True North after all, as previous intentions had indicated. Contrary to Maryland’s original charter, this Line had become the easterly dividing line of the Province along the “Three Lower Counties [of Pennsylvania]”, which ultimately became the State of Delaware.

After establishing and marking the Tangent Point, they ran a True North line from it for several more miles to intersect (at the “Zero Stone”) the Line of the Parallel of Latitude Boundary which the English Court of Chancery had decreed. They had previously surveyed 15 miles south from the City of Philadelphia’s southernmost point and set a post (the famous “Post Marked West”). Charles and Jeremiah determined the Post’s position by astronomical observation and calculated that the “West Line”, the decision of the Court, would be run along the Parallel of North Latitude of 39°43’18.2” westward from the “Zero Stone”. ((Author’s note: a stone has since been placed at the location of Mason and Dixon’s PMW (Post Marked West). Its modern Latitude value is 39°43’20.6”. Since Mason’s time, others have averaged the computed Latitudes from the three stars that he used and have stated the value of the PMW at 39°43’17.6”)).

Who decided how the Colonies would be shaped, how much land there would be in each one?

To grasp that concept, we’ll have to look nearly 135 years prior to Charles and Jeremiah’s births, to the early 1600’s. Geodesy, a science concerned with the shape, size, composition, density and synergy of the Earth, was essentially still in its infancy then. As a consequence, mapping was poor, even at times horrendous. As the knowledge of the size and shape of the Earth began to improve, navigation was beginning to improve as well, but at a rate much too slow for commerce and safety. Even on good days at sea, a ship’s sextant could scarcely establish the relative positions (Latitude and Longitude) of the ship and nearby surface features within several miles. After all, the user of a ship’s sextant must see the local horizon, difficult from the rolling deck and more so when sailing close to shore. Charts and survey maps sketched from the decks of ships that were sailing along coastlines were, at times, little more than conceptual. Maps showing inland features were often wildly distorted.

Such were the maps that King Charles I had available to him to describe the lands that the English had carved out for themselves. The lands of the New World were claimed by England, France and Spain by “Right of Discovery”. France and Spain moved to occupy the interior and the southern territories by use of the Gulf Coast and the Saint Lawrence and the Mississippi Rivers, while England claimed the lands along the seacoast first by using the Chesapeake Bay and the Delaware and the Hudson Rivers.

In 1632, in payment for services rendered by the Calvert family to the Crown, King Charles I, a Roman Catholic, granted and chartered to Cecil Calvert, also a Catholic, the Patent (a.k.a. Title) to the lands from the southern shore of the Potowmack [sic] River northward to the 40th Parallel and westward from the Atlantic Ocean to the source (the so-called “fountain”) of the Potomac River. These lands included the Delaware Territory on which there were some Dutch and Swedish settlements, the governments of whom had no
actual claims by “Right of Discovery”. King Charles was largely interested in current cash and future assets (goods and taxes), so lands were allotted to individuals who were able to pay the Crown a huge enough sum of money or to whom the Crown owed large debts. The use of physical features (such as rivers and waterways) and degrees of Latitude and Longitude, even indistinct positions of them, were feasible and acceptable methods available for describing the allotments of territories. The maps used by the Crown for those allotments were so distorted that they indicated that the 40th Parallel intersected the 12-mile radius arc from the Town of Newcastle. They weren’t even close.

How did the two Colonies ever get into a land dispute?

William Penn decided to become a Proprietor in the spring of 1680, nearly 50 years after the Calvert’s title had been granted. Penn had already been active in establishing Quaker settlements on the east side of the Delaware River in the Duke of York’s New Jersey colony. He was in close favor with the Duke of York, who would soon carve out for himself the Province of Delaware. The Duke later became King James II, a man known as one to whom the end justified the means.

In 1682, fifty years after Calvert’s title had been established, as payment for debts due the Penn family from the Crown, William Penn petitioned King James II for title to lands lying north of the Province of Maryland and was granted lands between Maryland and New York, that is to say, enclosed within the bounds of 2° of Latitude northward from 40° Latitude and 5 1/2° of Longitude westward from the Delaware River.

History can be a great revealer because events may be viewed from a distance, away from biases, prejudices and politics, through the lens of factual evidence. So it seems that, either through ignorance or intent, Penn decided to establish his capital city of Philadelphia below the 40th Parallel in a place along the Delaware River where his ships could still sail to the Atlantic Ocean. Geodetic technology, positioning and mapping had improved by 1673, nearly 10 years before Penn’s petition, to the point where he was able to know that the spot that he chose for his headquarters was encroaching upon the lands of the Calverts. But if he had built Philadelphia several miles up-river, beyond the river’s navigational limits, on his lands north of the 40th Parallel, his ships wouldn’t have been able to reach the city’s docks. This further indicates that he knew where the 40th Parallel actually was.

As they took possession of their Provinces, both the Penns and the Calverts already had been active in distributing lands, settling farmers, building churches and establishing towns northward from the Potowmack, intending to settle all the way up to their 40° title line. William now did the same thing, more energetically, to improve lands north and south of the 40th Parallel. Land owners, regardless of where their loyalties lie, do not want to pay double taxes or to serve two masters.

It is not surprising then that the overlaps and misunderstandings brought social, political and physical conflicts. Religious affiliations also played a role throughout, for by this time, the Crown was sympathetic to Protestants, including Quakers, instead of Catholics. Multiple meetings by representatives of both parties, by lawyers and by courts disintegrated the original title questions into a maze of details and accusations. A 1732 Agreement document set forth proposals which did not favor the Calverts. This attempt at closure ended nearly a year later with a joint note signed on November 24, 1733 by both Proprietors which stated that they were unable to arrive at a satisfactory solution to their boundary-related disputes. A petition in 1734 led to the Chancery Court of England entering into the situation in 1735, the Penns being the Plaintiffs and the Calverts being the defendants. For the next 15 years, the Great Chancery Case ground its way, meticulously, agonizingly, through court
proceedings. On May 15 in the Year 1750 A.D., the High Chancellor Lord Hardwicke decided the Case for the Penns, citing terms of the 1732 document, which had amplified a clause in the Maryland Charter of 1632 concerning early recognition of the Dutch and the Swedish settlements (remember, who had no titles by Right of Discovery or otherwise).

In an ironic note, the Duke of York, who personally was not hampered by the ethics of such recognition, ultimately captured by military force a Dutch colonial possession and then claimed all Dutch possessions for himself, with the exception of New Amsterdam, calling them Delaware, thereby also removing those lands from Calvert ownership.

There was yet another document, the Agreement of 1760. The Penns still wanted to retain all of the advantages outlined in the document of 1732. They basically resubmitted the terms, along with more legal accusations, to Frederick Calvert, the 6th (and last) Lord Baltimore. He answered that, in light of the 1750 ruling by Lord Hardwicke, he was resigned to quit-claim any rights over the trans-peninsula issues and lines, if the Penns would withdraw all charges of costs against the Calverts. Then all lawsuits would end, with each party paying his own legal bills. The Agreement of 1760 was properly signed on July 17, 1760. The stage was now finally set for the surveying of the lines between the Provinces.

Throughout all this, we cannot forget that the Native Americans did not want to serve any masters! But the English had already made their strengths felt in the New World and could not be denied. In an effort to help appease the Native American’s concerns over ever-expanding claims and to help obtain their acceptance of certain treaties, the Proclamation by then-King George III signed on October 7, 1763 stated that there would be no surveying on Native American lands.

How did Mason and Dixon survey it when others couldn’t?

Finally, we have arrived at the “West Line”, the subject of this little article. Try to put yourself in each of these men’s places. Imagine, as best you can, having to work days and nights in all weather, through dense forests, remaining clear-minded and precise with your astronomy observations and with your surveying measurements. If you can do that, you’ll begin to form a proper appreciation for these two gentlemen. Just think, they did all that (and much more) while working side-by-side for several years, maintaining their friendship, journals and communications. Incredible!

Not counting the 1763 and 1764 preparation work of surveying, computing and setting the “Star Gazers’ Stone”, the PMW (Post Marked West), the Zero Stone and the other lines, Charles and Jeremiah began surveying and marking the political boundary now known as The Mason-Dixon Line in April of 1765, two weeks after a 3-foot deep snowfall. Stone markers had been deemed necessary by the Chancery Court for delineating the lines that they had been sent to survey. So-called “Crown Stones” were 500+ lb., 4+ ft. tall, 1 ft. square monuments, with the Penn family crest chiseled on one side and the Calvert family crest on the other, to be set at every 5th mile. In between, the mile posts were shorter, with a chiseled “M” and “P”. Carved in England from the native oolitic limestone there, chosen because of its distinctive appearance, they were all brought to the Colonies as ballast in the holds of ships!

The party started out with 39 men in all. The wagons and activities of the survey party must have been impressive to the settlers through whose lands (and buildings) they passed. Two years later, while in the midst of virgin forests and rugged mountainous terrain, as many as 115 men were employed to do the work. Teams of axmen were given directions to clear-cut a 24-foot wide strip westward through woodlands along which the Parallel of North Latitude of 39°43’18.2” would be followed and marked, even through a few houses and other buildings.

They did have experienced colonial Surveyors on their team, most notable of whom were the McClean brothers, especially Moses McClean who was the Chief Steward in charge of supplies.
and men. Andrew Ellicott, David Rittenhouse and a few others, not on the team, were among the best Land Surveyors working in the Colonies at the time. While those men had the talents to perform a survey like this one, they did not have a precision Zenith Sector, a Bird-built Equal-Altitude Transit, the backing of the Royal Observatory, or the vast experience in astronomy that Charles and Jeremiah did.

**Did they use special instruments just for this survey?**

Yes, they used instruments uniquely designed for astronomical observations but also uniquely adapted for portable use on land, rather than strictly for use in a stationary celestial observatory.

Their Zenith Sector and their Equal-Altitude Transit had been built for them in England by John Bird, England’s premier maker of astronomical, surveying and mathematical instruments.

Originally designed for astronomers, their two primary instruments were intended to be permanently and securely fastened inside a celestial observatory. So for this mission, a special tripod had to be designed so as to make portable the Equal-Altitude Transit.

The Zenith Sector also required a specially designed frame, also built to be portable but firmly stable, while measuring stars near the zenith of the point of observation.

The Zenith Sector was the instrument with which they determined Latitude. Its telescope was 6 ft. long, with the observer lying prone on a mattress on the ground. If you can examine the Zenith Sector closely, please note the right-angle eyepiece that the observer used, just a few inches above the base. The plumb bob is suspended within a small canister so as not to be disturbed by air currents. Note also that,
in this Sector as shown, the telescope can be smoothly moved, by adjusting the weights on either side of the restraining bracket, no more than 30° on either side of the zenith line, a.k.a. plumb bob wire. A Zenith Sector’s objective lens was typically 3 inches in diameter. The stars from which Charles and Jeremiah determined their precise and accurate Point of Latitude had to appear within that limited field-of-view.

They also had a Hadley’s Quadrant with a hand-scribed scale, a 6-inch Surveyor’s Compass to provide alignment on short adjustment distances, several calibrated 66-feet long Gunter’s Chains and 16½-feet long fir rods with brass tips in frames called “Surveyors’ Levels” for measuring horizontal distances. Why did they go to such great lengths (no pun intended) to ensure that all measurements were precisely horizontal? Because Charles and Jeremiah were surveying along the size and shape of the oblate-spheroid of Earth. In fact, one of the secondary (but very important) purposes of their scientific geodetic survey work was to literally measure the east-west distance of 1° of North Latitude at this place. Geodetic scientists could hardly use the various measurements of the relatively small tracts on the Earth’s surface that local Surveyors were regarding as being perfectly flat [Author’s note: we Land Surveyors still do that!] Remember too that astronomers then were beginning to suspect that magnetic compasses, plumb lines and level bubbles could be deflected away from the vertical, thus giving inaccurate readings caused by the attraction of large masses, such as those of nearby mountains and of the varying densities of tectonic plates.

“He…counts the number of stars…and calls them all by name.”

How did they use stars to mark a specific line on the ground? Charles Mason was a trained astronomer, working as a Land Surveyor. Jeremiah Dixon was a talented Land Surveyor working as an astronomer. They were a perfect team. Both of them knew exactly where True North was but had no instrument available to them to turn a large accurate angle of close to 90° (Author’s note: small angles, yes, but not large ones, until the dividing engine was invented about 65 years later). Therefore Charles cleverly calculated that the line of an angle of 89°55’51” west of North would re-cross his Parallel at about 11.5 miles. He and Jeremiah laid out the direction for that intersection line by employing a large triangle laid out on the ground. The Parallel would curve south (Lines of North Latitude always do) of that line about 20 feet maximum, within the 24-foot wide clearing (Mason called it a “visto”), before intersecting his 89°55’51” line again.

Consulting Bradley’s Tables (Author’s note: remember, Mason had helped to prepare those), Charles and Jeremiah then selected a star from the Table’s ephemeris listings that would be located in the heavens near that angle (89°55’51” west of North) during their nighttime observations and interpolated the time when they should observe it. Setting up their Equal-Altitude Transit and using
their precise pendulum clock, which they had already set to precise [local] time, they tracked the star with the Transit, locked it at the exact time of the star’s transit of that calculated angle, lowered the scope, aligned a lantern 1/2 –mile away on the line using proper signals (perhaps using a lantern or a ship’s handwhistle) and chained the horizontal distance to the point in the morning. Charles and Jeremiah used several other stars, repeating their actions with each one and averaging the results.

They continued surveying in that way on the 89°55’51” line for about 11.5 miles, placing temporary markers along the way. They then erected the observatory and set up the Zenith Sector to check the Latitude. Observations and calculations revealed that they were 129 feet too far north. They computed the Due South offset distances from each of the temporary markers on their triangle-based line to the Line of Parallel and retraced their progress, making adjustments as they went.

Actual field survey measurings and markings of the Line were done with the calibrated 66-foot Gunter’s Chains and with the 16-½ foot long Surveyor’s Levels. As many as 3 measuring crews at a time used these frames, with plumb bobs to keep them horizontal (Author’s note: remember the 1° of Latitude experiment?), from one end of a fir rod tipped with brass ferrules to the other end.

Each rod and each chain was checked every day for accuracy to the nearest 0.01 of an inch (!) using a special fir-and-brass standard. A specific-length rope was used for alignment and for double-
checking the number of chaining lengths. Each of the horizontal measurements was performed at least twice and sometimes three times.

Observations with the Zenith Sector at each of the two intersections of the secant line with the measured Parallel, the instrumental repetitions, the calculations, the ever-present double-checking and the adjustments back to the Parallel took at least a week, if the weather cooperated. This was taking so long that they decided to use the Sector at every other secant intersection. So the direction between intersections was run along the hypotenuses of the large, laid-out triangles, helping to greatly speed up progress.

What did Charles and Jeremiah do when they met the mountains?

They crossed Catoctin Mountain, measuring through Blue Ridge Summit during August 1765 and on across South Mountain, seemingly without excessive problems. On October 7, 1765, they set up the Zenith Sector in Blairs Valley west of Hagerstown at 117 miles 52 chains.

End of Season, 1765, at Blairs Valley, [in what-is-now] Washington County, Maryland, just east of North Mountain, which today separates Franklin County from Fulton County in Pennsylvania: (Mason’s journal)

“October 27, 1765. Captain Shelby went with us to the summit of the [North] Mountain and shew’d us the northernmost bend of the River Potowmack at the Tonoloways; from which we judge the Line will pass [at Hancock] about two miles to the North of said River.” This proved to be of great relief and enormous political importance, for no one had realized that the Province of Maryland might have been divided into two parts! Just imagine the consequences of that! The fact that the Province remained as one entity was the only aspect of this entire drama that turned out to be in favor of the Calverts.

The team of assistants was dismissed for the season. The two men wintered in Annapolis, checking their data and corresponding and indulging in some side trips. On April 4, 1766 Mason, Dixon and company once again resumed the surveying of the West Line, using the same methods and procedures. But now the mountain terrain became a severe problem. By April 26th, at 134 miles 54 chains, the mountain call Sideling Hill prevented the wagons, loaded with monuments, equipment, tents and supplies, from moving further. They were forced to leave (or cache) some of their supplies and equipment, most notably all of the remaining carved monument stones on the east side of Sideling Hill. Thereafter, they and their men carried as much as they could take with them. They continued the survey westward along the Line of Parallel, still marking each mile and the top of each hill, but this time with a large wood post set in an immense stone cairn.

Did they really experience trouble with Native Americans?

Having no idea what the surveying of Latitude and Longitude meant but recognizing that these two Englishmen were going too far for their liking, and not trusting the English treaties anyway, the Six (Mohawk, Cayuga, Onondaga, Oneida, Seneca and Tuscarora) United Nations of Indians drew their line at Warrior Path. Some Delawares, not a part of the Six Nation confederation, had accompanied the Surveyors as they progressed through the mountains. At times a few of the Six Nations’ members escorted them as well.

Surveying west with what they could carry along the Parallel until June 6, 1767, the Mason and Dixon party was stopped at 231 miles 20 chains (Author’s note: from the Post Figure 9: a 1700’s wire Gunter’s Chain
Marked West) by the Six Nations, still aroused by Pontiac and his followers (remember King George’s Proclamation of October 7, 1763?). Nearly all of their party had already deserted them, for these frontiersmen knew that these Native Americans were very serious and very dangerous.

Two hundred and fifty-two miles is a long way. Did they survey all of it?

Incredibly brave, supremely dedicated, Charles and Jeremiah still wanted to set the last “crown stone” mile point available to them. Somehow they managed to parley with the Iroquois leaders of the Six United Nations to allow them to cross Warriors’ Path and Dunkard Creek (named in memory of Dunkard settlers slaughtered several years earlier) to Brown’s Hill. Though their journals do not mention exactly how this feat was accomplished, it may have been brought about through the negotiating skills of their interpreter Hugh Crawford and by the presence with Mason and Dixon of Hendrick, a powerful and influential Mohawk chief and his nephew.

Setting up the Zenith Sector for the final time in America on October 11, 1767, calculating their celestial observations and adjusting for offsets, Mason and Dixon set a post and a large stone cairn on Brown’s Hill on October 18 at 233 miles 17 chains 48 links [Author’s note: from the Post Marked West], just 22 miles short of their goal of the southwest corner of Pennsylvania. Their survey ended at Mile 230 from the Zero Stone, Points E and D respectively, as shown on their 5-foot long, beautifully drawn map entitled “A Plan of the Boundary Lines between the Province of Maryland and the Three Lower Counties on Delaware with Part of The Parallel of Latitude which is the Boundary between the Provinces of Maryland and Pennsylvania” which they prepared as a part of their final reports to the Proprietors while back in Annapolis in 1768.

Seventeen years after the setting of the 230 Mile Post, Andrew Ellicott, David Rittenhouse and others completed the survey of the “West Line”, using Mason and Dixon’s instruments (Author’s note: since the Proprietors had bought and paid for these special instruments, Charles and Jeremiah left them in the Colonies, instead of taking them back to England with them), of the remaining 22 miles of “West Line” to the southwest corner of [the by-then State of] Pennsylvania, i.e., the intersection of 80°30’ West Longitude with Mason and Dixon’s Parallel of North Latitude. Ellicott and Rittenhouse also ran the 80°30’ West Longitude meridian boundary line north to its intersection with the Ohio River. One year after their work, in 1786, the meridian line of Pennsylvania’s west political boundary line was completed, all the way up to Lake Erie.

How much did all this cost? Who paid for it?

Each Proprietor was directed by the Court to bear one-half of the total expenses.

- Charles and Jeremiah were each paid 1 pound, 1 shilling for each day (Approx. $116.80). From 5 years annual salary, ½ was deducted for taxes, as was any advances and allowances.
- Penns’ expenses were $1,426,673.
- Calverts’ expenses were $1,426,673 (the 196 miles of their own Maryland border plus an additional 56-mile portion of the Pennsylvania border!)

Some economists, using the most current increase in the modern Consumer Price Index, have calculated the total on-the-job cost to be over $5 million, based upon the entries in The Weekly Accounts of Moses McClean, Land Surveyor and Steward to the Mason and Dixon Line Surveys. Other modern economists include all known before-and-after details to arrive at a cost of over $13 million. ((Author’s note: Scarcely any of these events were to the Calverts’ advantage since they had to pay for half of everything, while losing over 3,500 square miles to Pennsylvania and almost 2,000 square miles to Delaware. The Penns got all they were striving for. But the Province of Virginia (now West Virginia) came out best of all, because they got 56-miles of...)}
their northern border surveyed for free, even though they were claiming part of Pennsylvania as well, as shown on the “Bitler Map”).

“Thus ends my restless progress in America, C. Mason” ... Mason’s Journal, September 11, 1768.

What became of Charles and Jeremiah when this job was finished?

This was the last assignment that Charles Mason and Jeremiah Dixon worked on side-by-side, as they had once before for the June 6, 1761 Transit of Venus in South Africa. After their American adventures, while still working for the Royal Observatory, Mason again observed the repeat June 9, 1769 Transit of Venus event but this time from an observatory in Ireland, while Dixon again observed it simultaneously but in Norway.

Jeremiah Dixon is buried near his home in the soil of his native England, having died on January 22, 1779, too soon at 46 years of age. Charles Mason returned to America with his family. He died on October 25, 1786, too soon at 58 years of age, and is buried in Christ Church Burial Ground in Philadelphia. Over time, the exact spot of his final resting place, paid for by Benjamin Franklin, was lost. Finally, after 229 years, in 2015, Charles unmarked grave was honored with an appropriate headstone, a specially etched replica of a Crown Stone, thanks to MDLPP (Mason-Dixon Line Preservation Partnership), MSS (Maryland Society of Surveyors) and SHS (Surveyors’ Historical Society).

Wayne Twigg lives in the mountains of central Maryland. He has worked in and practiced all aspects of the profession of land surveying for more than 50 years, earning a college degree and numerous certificates. Several of his articles have been published. He has served as an officer in the Appalachian Chapter, MSS for the past 36 years. He gives presentations which include “The Mason & Dixon Line”, “The Colonial Land Patent System in Maryland” and “Celestial Observations”, as well as participating in historical events featuring land surveying. He is a member of the Maryland Society of Surveyors, National Society of Professional Surveyors, American Association for Geodetic Surveying and a charter member of the Mason Dixon Line Preservation Partnership.

Check out the brand-new Mason and Dixon Survey display at the Conococheague Institute, 12995 Bain Road, Mercersburg, PA. North Latitude 39°44’50.90”; West Longitude 077°52’25.42”