This monograph discusses a 1630 reconstruction by Petrus Bertius (Pieter Bert) of the world view of the Greek philosopher Posidonius who proposed that the earth was sling-shaped, broad in the middle, with tapered ends and an estimated circumference that was three-quarters of its true size, resulting in an oikoumene [inhabited world] that stretched half way around a globe. The Bertius reconstruction, published in his Ancient Geography (Paris, 1630), represents a literal interpretation of Posidonius’ “sling”, complete with looped handles.

The better-known contemporary of Theodosius, Posidonius (ca. 135-51/50 B.C.), is generally associated with his measurement of the circumference of the earth. By some scholars, who view the history of mapping as mainly concerned with the diagnosis of increasing accuracy, this measurement has been “deemed disastrous in the history of geography.” Depending on the value of the stade that is adopted, it may be true that Posidonius, seeking to improve on Eratosthenes (#112), underestimated the size of the earth, and this measurement, copied by Ptolemy, and was thereafter transmitted to Renaissance Europe significantly impacting decisions by people like Christopher Columbus.

But Posidonius clearly did more than measure the earth: such was his reputation as an educator that Strabo described him as “one of the most learned philosophers in our time.” He was born in Apamea in Syria; after traveling widely in the western Mediterranean countries and visiting Rome on several occasions, he established himself in Rhodes, where he opened a school. This was patronized by distinguished visitors, including Pompey, the Roman general and statesman, and Cicero, from whom some of our knowledge of Posidonius derives. It was also at Rhodes that he constructed a planetarium in the style of Archimedes, intended for teaching students the laws of the cosmos. Cicero describes “the orrery recently constructed by our friend Posidonius, which at each revolution reproduces the same motions of the sun, the moon and the five planets that take place in the heavens every twenty-four hours.”

Besides demonstrating his mechanical skill in this way, Posidonius was engaged in reassessing some of the theories about the earth current in his day. Indeed, in this respect his writing was to serve as an important conceptual link between cartography in the ancient and medieval worlds. In his treatise The Ocean (now lost but known to us through Strabo), for example, he discussed the problem of terrestrial zones, which is relevant to an understanding of the zonal mappaemundi of the Middle Ages.

In this text, inspired by the work of Pytheas, Posidonius began by criticizing the usual division of the earth into five zones - one uninhabited (torrid) zone, two inhabitable (temperate) zones, and two uninhabited (frigid) zones - for he considered the limits between them to be uncertain and inaccurate. According to Strabo’s Geography (see #115) Posidonius criticized Parmenides’ division of the earth into five zones because he represented the torrid zone as almost double its real breadth, and he criticized Aristotle for calling the region between the tropics “torrid” and the regions between the tropics and the arctic circles “temperate.” Posidonius disagreed with both Parmenides and Aristotle and asked “how one could determine the limits of the temperate zones, which are non-variable, by means of the ‘arctic circles,’ which are neither visible among all men nor the same everywhere.” Instead of employing the traditional terms for the zones, based on temperature or habitability, he proposed terms based on clearly defined
astronomical criteria. He divided the terrestrial globe by means of the tropics and the polar circles and named the zones as in the table below.

Reconstruction of Posidonius’ World View by Bertius, 1630

POSIDONIUS’ TERRESTRIAL ZONES

<table>
<thead>
<tr>
<th>ZONE</th>
<th>AREA</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphiskian</td>
<td>Between the tropics</td>
<td>Where the shadow of the (one zone) gnomon is directed alternately to the north and to the south.</td>
</tr>
<tr>
<td>Heteroskian</td>
<td>Between each tropic</td>
<td>Where the shadow of the (two zones) and each polar circle gnomon is directed either to the north or to the south, depending on the hemisphere.</td>
</tr>
</tbody>
</table>

Note: The Greek skia means “shadow”.

The known world of Posidonius the Stoic looked like a sling, “it was shaped like a sling, that is, broad in the middle from south to north but narrowing to east and west.” He also chose the Rhodes parallel as his fundamental latitude and calculated the length of the oikoumenē [inhabited world] from the “bulge of Europe” (Cape St. Vincent, Portugal at 37° N 9° W) to an imaginary bulge on the eastern coast of India. This distance measured 70,000 stades (12,950 kilometers/8,046 miles) and marked half of the entire circle. In other words, the west-east extent of the land equaled the width of the ocean, “he suspects that the length of the inhabited world, being about seventy thousand stadia,
is half of the entire circle on which it has been taken, so that... if you sail from the west in a straight course you will reach India within the seventy thousand *stadia.* In defining the breadth of the "human planet", he was less generous than his predecessor. Both *Thule* and *Taprobane* were excluded. The only large islands that counted were Britain and Ireland. The northern boundary passed through the shores of the northern sea. The southern extreme connected the ridges of the Atlas Mountains, the rapids of the Nile, the Horn of Africa with the mouth of the Red Sea, and the coastline of the southern ocean.

Posidonius held provocative ideas about the circumnavigation of the world. He seemed to claim that it was possible to reach India on a westward journey from Spain (without going into details about the amount of time and effort involved in such voyage) and even believed in the possibility of circumnavigating Africa (if one follows a long and tangled story about the voyage across Libya, the continent's former name cited by the "master of demonstration and philosopher."

At the same time, Posidonius appreciated that if he altered the criteria for the division, so as to take temperature distribution more fully into account, the earth could be divided into seven zones. These he identified as the two frigid zones around the poles, the two temperate zones in their usual places, two narrow, extremely arid zones along the terrestrial tropics having the sun directly over head for about half a month each year, and finally the equatorial zone, more temperate and better watered than the two tropical ones. At one point Posidonius also proposed dividing the inhabited world not into continents, as was usual in his day, but by means of circles parallel to the equator, indicating variations in fauna, flora, and climate. However, Strabo commented unfavorably on this innovative idea. It was, he said, "a mere matter of argument, with no useful end in view."

Equally revisionist was Posidonius’ challenge to Eratosthenes’ measurement of the circumference of the earth. Our knowledge of his methods, as with the earlier reasoning of Eratosthenes, is derived from Cleomedes, and it becomes clear that it was based on assumptions that were sometimes false. These assumptions included the belief that Rhodes and Alexandria lay on the same meridian and that the distance between the two places was 5,000 *stadia.* Then Posidonius (according to Cleomedes), noting that Canopus was seen just on the horizon at Rhodes but rose as far as a quarter of a zodiacal sign (7.5°) above the horizon at Alexandria, concluded that the center angle intercepting the Rhodes-Alexandria arc of meridian was one-forty-eighth of the total circle or 4.5° (the arc is actually 5°14'). Thus, he argued, the total length of the meridian was forty-eight times the distance between Rhodes and Alexandria, and, assuming this latter to be 5,000 *stadia,* this gave a figure of 240,000 *stadia* for the circumference of the earth.

This, however, is only a partial history of the confusion attached to the measurement. As a teacher interested in promoting discussion, Posidonius seems to have criticized his own assumptions, in particular the estimate of 5,000 *stadia* for the distance from Rhodes to Alexandria. Evidently, at some point in his calculations he employed an alternative value of 3,750 *stadia,* derived from a careful estimate Eratosthenes made “by means of shadow-catchmg sundials.” When applied to the 1:48 ratio, this gave a correspondingly smaller length for the circumference of the earth of 180,000 *stadia* [i.e., one mile = ~10 *stadia*].

What is important for the history of cartography is that it was this measurement - whether directly or through an intermediary - that was later adopted by both Marinus of Tyre and Ptolemy (#119). Its main effect was greatly to exaggerate the portion of the globe occupied by the inhabited world, so that the length from the Straits of Gibraltar to
India, along the parallel of Rhodes, came to be considered half of the entire parallel around the earth. And such was the authority of Ptolemy that this misconception was carried forward by geographers, cosmographers, and cartographers into the 16th century. Historians of discovery have noted that it long colored the perception of that age as to the size of the unknown portion of the world. Most famously is Columbus’ belief in the proximity of the Indies when sailing westward.

**LOCATION:** *(this map only exists as a reconstruction)*

**REFERENCES:**
*Bricker, C., *Landmarks in Mapmaking*, p.15.

*illustrated*