

# Portolan Atlases

Battista Agnese, Portolan atlas. Manuscript on parchment. Venice, 1559.

Beinecke MS 560.

Atlas of the islands in the Eastern Mediterranean (*Isolario*). Manuscript on paper.

Venice, 1560–1564. Beinecke MS 561.

These two atlases were produced in Venice at almost exactly the same time, but for very different audiences. The Agnese atlas (*left*) is on vellum with expensive pigments, while the *isolario*, or island book (*right*), was made on paper using inexpensive pigments. Between 1536 and 1564 Battista Agnese (c. 1500–1564), a Genoese cartographer working in Venice, made many beautiful atlases, seventy-one of which survive, and each is unique. Both atlases exhibited here contain portolan charts showing the Old World and the New World as well as maps of the earth's entire surface. The route of Magellan's voyage (1525) is sketched in red in the Agnese atlas. This world map is based on the Ptolemaic rather than the portolan model and shows the east coast of Africa and much of the west coast of the Americas. The *isolario*, on the other hand, presents the earth as if seen from an Antarctic perspective, and the west coast of the Americas is simply sketched in. On its second page, a navigator is shown using an astrolabe to position himself in relation to the sun, stars, and planets.

# Gregorio Dati's *La sfera*

Photograph of Gregorio Dati, *La sfera*.

Gregorio Dati, *La sfera*. Manuscript on paper. Florence, 1450–1500. Beinecke MS 328.

Gregorio Dati, *La sfera*. Manuscript on paper. Florence, 1423–1500. Beinecke MS 1030.

*La sfera* [The spheres], designed to teach members of the merchant class everything they needed to know about the geography of the Mediterranean world, was an extremely popular text in Renaissance Italy. Written in rhyming stanzas by Gregorio Dati (d. 1435), a silk merchant in Florence, the manuscript was often illustrated with diagrams to make learning easier. On the reproduction (*left*), Dati first places a T-O map – a diagram roughly indicating landforms' relationships to one another – to demonstrate the division of the world into three continents separated by water. (Dati was the first to name this type a *T-O map* for its shape.) Below the T-O map he includes another, rougher map, with East at the top, to show landforms roughly to scale. On the open page we see Dati's map of the Middle East. Similar to the practice used for portolans, the Red Sea on his map has been colored red. He includes historical as well as geographical information, such as the post-flood resting place of Noah's Ark. The example to the far right is a copy of *La sfera* in an account book typical of those kept by every merchant, with its distinctive cross sewing and prebound paper. Merchants were a driving force for exploration and mapping in the fifteenth century and following, and many of the maps in this exhibition reflect their needs and perspective.

# Pilgrimage

Reproduction of Bernhard von Breydenbach, *Peregrinatio in terram sanctam*. Print on paper. Mainz, 1486. Yale: Zi +156.

[Indulgences to be obtained in the pilgrimage churches of Rome.] Manuscript on parchment. Southern Low Countries, c. 1470 to 1480. Beinecke MS 639.

Franciscan Anthology (including two trips to the Holy Land). Manuscript on paper. Italy, between 1383 and 1393. Beinecke MS 1153.

Travel in the medieval world was expensive and dangerous, but the allure of holy sites proved irresistible to European pilgrims and – outside of trade – was the reason most Europeans traveled and gained an understanding of the world beyond their village or town. The backdrop here is a map of the Holy Land included in the printed version of Bernhard von Breydenbach's (1440–1497) *Peregrinatio in terram sanctam* [Pilgrimage to the Holy Land]. Producing a map this size was expensive and time consuming, but its inclusion set Breydenbach's book apart from other, solely verbal, accounts. That Breydenbach's maps were neither historically nor geographically accurate was irrelevant to his readers, most of whom would only imagine what such a journey would be like. Opposed to the monumentality of Breydenbach's map, the tiny manuscript made for Margaret of York of indulgences to be obtained in the pilgrimage churches of Rome served much the same function. Margaret was unlikely to travel to Rome, but she could partake in these indulgences by saying prayers on specified days. The last manuscript is a collection of writings by anonymous Franciscan friars, two of whom recorded salient details about their pilgrimages to Jerusalem. Although not as influential as Breydenbach, the Franciscan accounts allow us to see Jerusalem and its people through a different set of eyes, those of friars devoted to poverty, who traveled much less luxuriously.

# Map of Jerusalem in Peter of Poitiers's *Compendium historiae in genealogia*

Peter of Poitiers, *Compendium historiae in genealogia Christi*. Manuscript on parchment. France, between 1225 and 1250. Marston MS 26.

Peter of Poitiers, *Compendium historiae in genealogia Christi*. Manuscript on parchment. Northern Italy, between 1300 and 1350. Beinecke MS 1183.

The maps in Peter of Poitiers's (c. 1130–1205) *Compendium historiae in genealogia Christi* [Historical compendium of the genealogy of Christ] are not what we associate with that term but, instead, diagrams more akin to T-O maps. Peter's work is unusual in that it originally was written on a roll, but later scribes decided that it would be more useful to have in codex form, and so we now have both books and rolls of Peter's work. It was especially useful for training priests, who needed to know the historical figures in the Bible and how they were related to one another. In the openings here, one sees diagrams of the city of Jerusalem, the figurative center of the world for Christians, although rarely represented as the center of the world on maps of this period. Like the T-O diagram of the world, these diagrams helped readers to visualize and perhaps even memorize the cartographic features of the city: the six gates, the location of the temple, etc. Most importantly, the diagram depicts a city in perfect order, balanced and stable, in impeccable proportion, something realistic city maps of the time were unable to do. For Peter of Poitiers, terrestrial Jerusalem presaged heavenly Jerusalem, a perfect city that was home to all of God's elect rather than a terrestrial territory divided among various religious factions.

# Conquistadors Present the New World

Francisco López de Gómara, *La historia general delas Indias, con todos los descubrimientos, y cosas notables que han acaescido enellas, dende que se ganaren hasta agora*. Print on paper. Antwerp, 1554. Pequot G59.f.

Pedro de Cieza de León, *La prima parte dell'histoire del Perv. Dove si tratta l'ordine delle prouincie, delle città nuoue in quel paese edificate, riti, & costumi de gli Indiani, con molte cose notabili, et degne di consideratione*. Print on paper. Venice, 1560 (Spanish original: Seville, 1553). Peru Cwpr j553ci, Copy 1.

These are among the latest European maps in the exhibit, and they reflect European views of the New World after Spain's conquest of the Aztecs and the beginning of colonization. (See Hernán Cortés's map of Tenochtitlán in Vitrine 8 for a slightly earlier conquistador text.) Although Francisco López de Gómara (1511–c. 1566) never traveled to the Americas, he was the personal secretary and chaplain to Hernán Cortés, the explorer who destroyed Tenochtitlán and claimed the kingdom of the Aztecs as property of the Spanish crown. Francisco thus had access to the experience of Cortés, and he wrote *La historia general delas Indias* [The general history of the Indies] to praise Hernán and his accomplishments. Its veracity concerning the native peoples has been questioned, but it is one of the few accounts based on eyewitness testimony. Pedro de Cieza de León (1520–1554), on the other hand, had traveled to the lands he described in his chronicle, leaving Seville at the age of sixteen. As the son of converted Jews, Pedro required special dispensation to travel to the New World, which was typically forbidden to the descendants of Jews, even those who had converted. After many years in the service of various conquistadors, he arrived in the “City of Kings” (now Lima, Peru), and the information he began compiling about the region would be included in his chronicle, *La prima parte dell'histoire del Perv* [The first part of the history of Peru]. Both accounts were instrumental in bringing other Europeans to the New World in search of riches and converts.

# Antonio Pigafetta, *Journal of Magellan's Voyage*

Antonio Pigafetta, *Journal of Magellan's Voyage*. Manuscript on vellum. France, c. 1525. Beinecke MS 351.

This extraordinary manuscript is the oldest surviving eyewitness account of the voyage around the world begun by Portuguese explorer Ferdinand Magellan (1480–1521), who sailed for Spain on this, his last voyage. It was written by Antonio Pigafetta (c. 1491–c. 1531), an Italian officer onboard. While we celebrate Columbus for discovering the New World, theoretically Magellan's voyage established a trade route to the East that did not rely on the ports established by the Portuguese along the coast of Africa. But Magellan was very lucky that he managed to sail around the southernmost peninsula of South America – an extremely dangerous route that, for many years, was not successfully followed by others. Unfortunately for Magellan, he was killed in 1521 at the Battle of Mactan in the Philippines and did not complete the journey. Because the sailors spent little time exploring the places he landed, Pigafetta did not know what land masses were nearby, and his book presents most of the territories as islands. Trained as a humanist, Pigafetta was keen to describe in scientific detail the people, animals, and plants he saw. Our copy of Pigafetta's journal has been nominated for inclusion in UNESCO's Memory of the World archive.

# Globes

Unknown, Wooden support with print. London, c. 1679. Globe 41.

Nathaniel Hill (1708–1768), [A new terrestrial globe]. Wooden support with print. London, 1754. Globe 45.

Isaac Habrecht, *Per illustri et generosis....* Wooden support with print. Argentina, 1621[?]. Globe 57.

Globes were unknown in Europe after the fall of Rome until they were imported from the Arab world in the fifteenth century. Recent gifts from the collection of Stephen F. Gates '68 have greatly expanded the Beinecke's holdings in these unique objects. The large globe (*right*) was made by Isaac Habrecht (1589–1633) and dates from around 1621. It would have made a handsome object in a wealthy household. Because they were small, however, the two smaller globes (*center*) could be carried in one's pocket; the maps inside the protective case likely were teaching tools. Upon opening the case, one discovers an inner globe of the world; the surrounding inner case is a celestial globe that represents the heavens. Both globes would have been useful for educating young people in early modern Europe.

# Aztec Map of Tenochtitlán

Hernán Cortés, *Praeclara Ferdina[n]di Cortesii de nova maris oceani Hyspania narratio sacratissimo*. Print on paper. Nuremberg, 1524. Taylor 58.

The *Praeclara Ferdina[n]di Cortesii de nova maris oceani Hyspania narratio sacratissimo ac Invictissimo...* [Enlightenment of Ferdinand Cortés concerning new facts about the seas and ocean] is the earliest map of the Aztec capital Tenochtitlán before it was destroyed by Hernán Cortés (1485–1547). At one point, Tenochtitlán was the largest city in the pre-Columbian Americas. As the map indicates, the city was built on an island with bridges connecting it to the mainland. It was highly structured and likely larger than any contemporary European city. After making alliances with the indigenous communities surrounding Tenochtitlán, Cortés besieged the city for more than ninety days, causing mass starvation. He then ordered its destruction, after which it was rebuilt as a Spanish city. Eventually, the island became the historic center of Mexico City.



# Galileo's *Starry Message*

Background: Facsimile of 1966 Earthrise taken by Lunar Orbiter 1.

Galileo Galilei, *Siderius nunc...* Print on paper. Venice, 1610. QB41 G33 1610 Copy 1.

Galileo Galilei, *Siderius nunc...* Print on paper. Venice, 1610. QB41 G33 1610 Copy 2.

Galilei, Galileo, *Siderius nunc...* Print on paper. Venice, 1610. QB41 G33 1610 Copy  
Oversize.

Galileo's *Siderius nunc* ... [Starry message] was the first account of the moon as seen through a telescope and the first to show that the moon's topography is mountainous. In addition to the moon, Galileo (1564–1642) made two additional discoveries: he was the first to note the “planets” (moons) that orbit Jupiter, which he called Medicean stars, and he realized that what appeared to be a heavenly mist was actually made up of smaller stars, and only to the unaided eye did they take on this appearance. He was thus the first to realize that the Milky Way actually comprised hundreds of distant stars.

# Itineraries

*Itinerarium Antonini Augusti*. Manuscript on paper. Italy, c. 1500. Beinecke MS 1244.

Peutinger Table. Printed on paper. Antwerp, 1598. BEIN 2016 +333.

Do all roads lead to Rome? From ancient trade routes to religious pilgrimages still followed today, the Eternal City has served as a destination and anchor for many people's religious, social, and economic lives. The *Itinerarium Antonini Augusti* [Antonine itinerary] (*left*) is a third-century CE guide to Roman imperial roads that was copied for a new audience more than a thousand years later. This sixteenth-century edition also includes lists of ports and details on maritime travel. This list links cities and ports and cites the distances between them. In striking contrast, next to the itinerary is a map in the form of a long, narrow roll, referred to as the Peutinger Table after its sixteenth-century owner. This late-sixteenth-century printed edition reproduces a thirteenth-century manuscript. As you unroll it, an attenuated map of the road network of the late Roman Empire is revealed. While one of these objects represents this system in lists and descriptions and a visual medium was chosen for the other, both present a complex system in different but equally dynamic ways.

# Illuminated World Maps

Walter of Châtillon, *Gesta Alexandri Magni*. Manuscript on parchment.  
England, 13th and 15th centuries. Marston MS 252.

Sallust, *Bellum Catilinae* and *Bellum Iugurthinum*. Manuscript on parchment.  
France, c. 1400–1425. Beinecke MS 358.

Walter of Châtillon, *Gesta Alexandri Magni*. Manuscript on parchment.  
Northeastern Spain, c. 1265–1300. Marston MS 253.

There has always been a variety of ways of visualizing the world. Popular from late antiquity through the European Middle Ages is the so called T-O map, first introduced with the work of Isidore of Seville (d. 636 CE). This simple device divides the globe into three sections: one each for Europe, Asia, and Africa. Typically, Jerusalem is located at or near the intersection of the three divisions – a city at the center of the world. This type of map can be simple and diagrammatic, encapsulating the whole world with the flick of a quill, as seen in the two manuscripts by Walter of Châtillon (1170–1180 CE), *Gesta Alexandri Magni* [Deeds of Alexander the Great], at left and right. A T-O map can also be highly decorated, as is seen in *Bellum Catilinae* [The war of Catiline] and *Bellum Iugurthinum* [The Jugurthine war], the Sallust manuscripts on display in this case (*center*), both made by Sallust (86–34 BCE). This map has been rendered with care: special attention has been paid to each building, and the dividing waters of the world are alive with sinuous waves. The burnished-gold border only sets this vivid world apart from the page farther. T-O maps, which appear in a number of places in this exhibit, had various uses depending on their context.

# Sacro Bosco, *De spheara*

Johannes de Sacro Bosco, *De sphaera*. Manuscript on parchment. Italy, 1400–1450. Beinecke MS 335.

Johannes de Sacro Bosco, *De sphaera*. Manuscript on paper. Cambridge, England, 1525–1527. Beinecke MS 337.

Contrary to what you may have learned in school, people in medieval Europe conceived of the world as a round globe. Johannes de Sacro Bosco (1195–1256 CE) penned his enormously popular text *De sphaera* [On the sphere (of the world)], in the thirteenth century. Writing on astronomy, Sacro Bosco built on a variety of contemporary traditions, including the work of Islamic astronomers. Manuscripts of *De sphaera* often include wonderful illustrations of both the heavens and the earth. On the left, you can see an astrological model with Earth (*Terra*) at the center; on the right is a fold-out map of the world rendered in red- and green-ink washes. The connection between the terrestrial and the heavenly is one of vantage point: we can only observe the universe and its mysteries from our own small globe.

# Medieval World Maps

Zaccaria Lilio, *Orbis breviarium*. Printed on paper. Venice, 1505. 2014 1492.

Isidore of Seville, *Etymologiae*. Manuscript on paper. Bohemia, c. 1450.

Marston MS 123.

Whether printed or in manuscript, books on the earth and the heavens were popular throughout the medieval and early modern periods. In both books displayed in this case, you can find a T-O world map. Additionally, in the smaller volume (*left*), the printer has included a six-part diagram of the various climates of the world. Diagrams, whether simple or complex, provided a way to think about the world in a categorical, scientific manner. Isidore of Seville (d. 636 CE) was the first author to propose the tripartite T-O map. Writing nearly a thousand years later, Zaccaria Lilio (d. 1522 CE) penned his *Orbis breviarium* [Short description of the world], still using Isidore's proposed method of division, but augmenting it with additional texts, images, and notes to expand upon the ancient model. Although by Lilio's lifetime serious challenges to these classical models about the world had been posed, his dedication demonstrates the longevity of these early ideas.

# *Polychronicon* and the T-O map

Ranulf Higden, *Polychronicon*. Manuscript on parchment. England, c. 1325–1350.  
Takamiya MS 43.

This sizable codex certainly was not designed to be carried in a pocket. Completed during the life of its author, this manuscript contains the *Polychronicon* – part world history, part history of England – by Ranulf Higden (d. 1364 CE). Within the first third of the *Polychronicon*, Higden discusses the creation of the world and also describes places both far and near. Although there is no evidence to suggest that Higden or the scribe who copied this book were accomplished world travelers (quite the contrary, in fact), the distant cities and landmarks are described confidently and are accompanied by little ink-wash roundels. Each of these illuminations is fantastical, having little to do with any extant architecture or cityscape. On the page shown here, you find drawings of Babylon (*Babilonia*), Chaldea (*Caldea*), Arabia, Syria (*Siria*), Judea, Galilee (*Galilea*), and Palestine (*Palestia*). Helpfully, the red marginal notations call out important sections of the text, such as the longitude and latitude of Babylon, thus alerting the reader to details they may seek in such a large book.

# Francesco Berlinghieri

Francesco Berlinghieri, *Geographia*. Printed on paper. Florence, 1482. 1978 Folio 136.

Building on the work of authors such as Ptolemy, Francesco Berlinghieri (1440–1501) compiled his *Geographia* in the last decades of the fifteenth century. With a commentary in verse, *Geographia* contains a number of additional maps, expanding the traditional repertoire of Ptolemy's work. This particular volume includes thirty-one maps, many of which fold out to reveal detailed visions of various parts of the world. This map, for example, covers much of Europe (EVROP), northern Africa (APHRICA), and western Asia. Along the bottom of the map, a section is labeled TERRA INCOGNITA, or “unknown land.” Because this map represents a great deal of area of which the mapmaker had little or no knowledge, a number of unusual geographic features are essentially imaginary. For example, large, round lakes randomly dot northern Africa, and the Indian Ocean is hemmed in on all sides by coasts unfamiliar to the Italian draftsman.

# Arabic World Maps

Zakariyā ibn Muḥammad al-Qazwīnī, Map of the world. Tempera and ink on paper. 17th century. Arabic MSS 575.

‘Abd al-Ḥalīm Suwaylam’zādah , *Risālah fī al-aṣṭurlāb* [Treatise on the astrolabe]. Manuscript on paper. 18th century. Arabic MSS suppl. 434.

Collection of 25 Arabic astronomical manuscripts by various authors. Manuscript on paper. 19th century. Arabic MSS suppl. 705.

From looking at the night sky to mapping the surface of the earth, the work of scientists and artists preserved in Arabic sources was enormously influential in the development of astronomy and cartography. In this case, a treatise on the astrolabe (*left, bottom*) joins a collection of astronomical texts (*left, top*), and a sixteenth-century map of the world (*right*). While the two books emphasize the use of scientific tools and mathematics to plot the heavens, the map on the right is from *A book of Marvels of Things Created* by al-Qazwīnī (1203–1283 CE), this copy of which dates from the seventeenth century. It is one of the most important maps in the collection. As with most Islamic maps, south is at the top of the map and the Indian Ocean is depicted as enclosed by the eastern coast of Africa. Mecca sits at the center as the surrounding world spreads out from there. The other locations shown on this map include the “Land of the Turks,” the “Land of the Slavs and Franks,” and the Red Sea (represented as a rectangular water mass). The result is more schematic than naturalistic, capturing places and geographic features that were important to the mapmaker and locating them relative to one another.



# The Astrolabe in the Medieval World

Collection of nine manuscripts by various authors on mathematics, geometry, and the astrolabe. Copied by Aḥmad ibn Yūsuf ... in the town of Qarah Ḥiṣār Sharqī (probably in Turkey) at Madrasat al-Shaykh Walī. Manuscript on paper. 17th–18th century [copied 1712]. Arabic MSS suppl. 690.

Geoffrey Chaucer, *A Treatise on the Astrolabe*. Manuscript on paper. England, c. 1450. Takamiya MS 9.

Astrological and occult or scientific treatises by various authors. Manuscript on paper. England, c. 1550. Beinecke MS 558.

Have you ever taken notes in your textbooks? On the far left is a collection of texts on mathematics, geometry, and the astrolabe with many drawings, tables, and marginal notes. An eager student used the blank space around the text block to make notes and work out math problems. During the twelfth and thirteenth centuries, hundreds of years before the enthusiastic student(s) put pen to page, numerous Arabic texts were being copied, translated, and disseminated throughout the universities of Europe. This allowed for the innovations of Arabic-speaking scientists to reach new audiences who were eager to consider new perspectives about the natural world. Although known for his *Canterbury Tales*, Geoffrey Chaucer (d. 1400 CE) also took an interest in the heavens, writing a treatise on the use of the astrolabe that he dedicated to his son. His interest was by no means isolated – fascination with the night sky and the spheres beyond our own was held by scientists and lay people as well as those interested in the occult. The volume on the far right includes complicated *vovelles*, or movable circular diagrams. Almost like a paper computer, they can be used to calculate important dates, the movement of stars, and useful astrological information. This particular example is wonderfully complex and includes details such as animal heads and even the small face peeking out.

# Marston Portolan Roll

Portolano for the eastern Mediterranean and the Black Sea. Manuscript on parchment. Venice, 1400–1450. Beinecke MS 506.

What makes a map? Is it the visual content? Is it the distance between locations?

This roll may not look like a map at first, but it contains a long list of ports, islands, and cities. Written in a Venetian dialect, the list contains 267 courses and provides the distance between various destinations. The first column contains the names in the location pair and the bearings of each, while the third column contains the distance between the two. Who would need this information? Given the success that Venetian merchants had in harnessing the maritime power of their waterbound city state, it is easy to imagine this scroll among the documents of a ship's pilot, assisting him as the ship set off on another port-to-port trading voyage.

# Vinland Map

Vinland Map. Manuscript map (modern) on parchment (c. 1450). Beinecke MS 350A.

*Hystoria Tartarorum [The Tartar Relation]*. Manuscript on parchment. Basel, c. 1450. Beinecke MS 350A.

When the Vinland Map was given to Yale University in 1965, it was almost immediately engulfed in argument about its authenticity. The map was controversial because it purported to demonstrate that Vikings had landed on and colonized the territory of Vinland, now known as Newfoundland, Canada. Italian Americans saw Yale's acquisition of the map as an affront to the traditional role of Christopher Columbus being the first European to "discover" the New World. Ironically, archeological excavations in the 1950s at L'Anse aux Meadows, discovered that the Norse had, in fact, established, and then mysteriously abandoned, a camp in Newfoundland. Early testing on the inks revealed that they were of modern origin, however, and in 1973 Yale declared the map to be a fake. Despite the declaration, many continued to debate the map's authenticity, and in 2018 scientists at the Yale Institute for the Preservation of Cultural Heritage did extensive testing, which supported the earlier conclusions about the presence of modern ink. Shown here are the Vinland Map and the book that accompanied it, the *Tartar Relation*, which was an account of a journey to the Mongol Empire by Franciscans sent by Pope Innocent IV in 1245. There is evidence of modern titanium dioxide in the ink, suggesting the forgers practiced on this page.

Reproduction from Vincenzo Antonio Formaleoni, *Saggio sulla nautica antica de' Veneziani, con una illustrazione d'alcune carte idrografiche antiche della Biblioteca di S. Marco, che dimostrano l'isole Antille prima della scoperta di Cristoforo Colombo; di Vincenzo Formaleoni*. Paper. Venice, 1783. C13a 783f.

A few years before the new scientific testing, John Paul Floyd, a Scottish historian, discovered that the Vinland Map was based not on the 1436 world map of Andrea Bianco, as previously thought. The forger's resource was, instead, an eighteenth-century facsimile of Bianco's map – with Canada added – hand-drawn by Vincent Formaleoni and published in 1783. Floyd was able to prove this by superimposing the three maps and showing that the Vinland Map reproduced several mistakes found on the 1783 map but not on its original. We display the three maps here to show some of the mistakes, which are circled in red. These circles indicate mistakes on Formaleoni's hand-drawn facsimile that are not present on Andrea Bianco's map but occur on the Vinland map.

# Maggiolo chart and Maggiolo forgery

Portolan chart of the Mediterranean Sea, the north Atlantic Ocean, the Black Sea, and the northwestern African coast. Manuscript map on parchment. Europe, c. 1960. Art Storage 1019.

Facsimile of Vesconte Maggiolo, Portolan chart of the Mediterranean Sea, the North Atlantic Ocean, the Baltic Sea, and the northwestern African Coast. Manuscript map on vellum. Genoa[?], between 1500 and 1549. Art Storage 1980 156.

In 2018 this portolan chart came on the market presented as a genuine portolan from the workshop of Vesconte Maggiolo (act. 1504–1549). Several prominent map historians endorsed the map as genuine, and it was thought to be based on a map of Maggiolo's in the Beinecke Library (Art Storage 1980 156, shown here in reproduction). If one compares the two maps, one can see some obvious similarities, such as the inclusion of tents representing kingdoms in the Arab world. But even to an untrained eye, the pigments are very different, and x-ray fluorescence spectrometry by the Yale Institute for the Preservation of Cultural Heritage revealed that they are from after 1600. Before the portolan came to auction, carbon-14 analysis determined that the parchment is from the 1950s, not the 1550s. The Beinecke acquired it as a fake to make sure that no one mistakenly purchased it as genuine and because we study forgeries to reveal the methods and purposes of their makers.

# Anonymous Portolan

Portolan chart of Western Europe and the Mediterranean Sea. Manuscript map on paper. Italy[?], between 1800 and 1899[?]. GEN MSS FILE 601 (Oversize).

This unusual object is clearly meant to be a portolan chart of some sort, but its actual use is unknown. It does not resemble an early modern portolan, but neither does it seem to serve any contemporary function. Historians often encounter objects that they know are not genuine, but the actual purpose of which remains unknown.

# Waldseemüller Gores

After Martin Waldseemüller, globe gores (forgery). Photomechanical print on paper. Austria, early 20th century. GEN MSS 1486.

This copy of the globe gores by Martin Waldseemüller (c. 1470–c. 1520) came on the market in 2017 through Christie’s, London, with an estimated auction price of \$800,000–\$1,200,000. From images provided online, map dealers and historians determined that the gores were a sophisticated copy of the original map held by the Bell Library in Minnesota. The investigation revealed that another printing, this one in the Bavarian State Library in Munich, was also a forgery based on the Bell Map. The globe gores are the first maps that label the New World “America.” Because of their importance and rarity, someone chose to risk getting caught on the chance of scoring such an impressive payday.

## Buddhist Map. 50 1800A.

Maritime trade, astronomy, exploration, and imperial expansion are all pursuits that generate cartographic models, and each is specialized to meet the needs of its respective users. But how would you represent a spiritual vision of the world? This colorful map (*left, top*), made well into the age of scientific cartography, represents a world described by Buddhist sources. Some familiar land masses can easily be picked out—for example, the Indian subcontinent in green, the graceful curve of mainland China's coast in pink, and an enlarged Japan in purple. However, other features may be less familiar—namely the presence of Anavatapta Lake in the center. The blue lake, nestled among the snowy peaks of the Himalayas, spins out the Four Great Rivers of Dharma frequently identified as the Ganges, the Indus, the Oxus, and the Tarim. Each is associated with a cardinal direction.



Ma Junliang, Map of the Eastern Hemisphere with globe insets. 56 1644.a.

The block-printed map of China (*left, bottom*) was designed by Ma Junliang, based on Liang Zhou's *Qiankun wanguo quantu gujin renwu shiji* (Universal Map of the Myriad Countries of the World, with Traces of Human Events, Past and Present). In the top register a pair of globe diagrams provide wider context for the larger map below. At first glance, it might seem as though these are providing a clean view of both the Eastern and the Western Hemispheres. However, unlike the models seen in classrooms, the globe is turned only slightly, rather than having had a full turn. On the left, Eurasia and Africa are the primary focus but, with just a little twist, the Americas come into view. In both examples Asia remains relatively central, allowing the user to go back and forth among the diminutive globes and the colorful map of mainland China.

Korean map of Eastern Hemisphere. Woodblock, c. 1380, copied from an earlier original in a Chinese atlas. 13 1830.

Similar to the maps from China, this Korean map of the Eastern world (*second from left*) centers on China and was derived from Chinese sources. Korea is shown as an appendage of China, and Japan is located directly to the east of Korea. At the south is India, and Europe and Africa are to the far west.

*Chidoch'ŏp* [late Chosŏn, i.e., 18th century]. YAJ K4.1.

This Chosŏn dynasty (1392–1897) atlas (*third from left*) likely is a follow-up version of the *Tongguk chido*, or map of Korea, drawn by Chŏng Sang-gi (1678–1752).

Additional place names have been added to those that were included on the original, suggesting that this is a later copy. The atlas consists of a complete map of Korea and, in monumental prints, individual maps for each of the country's eight provinces.

This, the first “page” in the atlas, shows the entire country of Korea. Because each of the provincial maps is drawn to the same scale, they can be combined to produce a massive single map of Korea.

Koyano Yoshiharu, Visualized map of all the countries. Woodcut map, hand-colored on paper. Kurashiki, June 1809. 2018 +512.

This map (*second from right*) was independently printed and given to children in private schools for study. Although it is now 200 years old, the work of Koyano Yoshiharu (1756–1812) looks much like maps that hang on schoolroom walls throughout the world today, with bright colors and bold lines designed to draw students' attention to the major geographic and political features. However, it is centered on China, with North and South America at the far eastern edge of the map.

(right, top) *Bankoku Chikyu Saiken Zenzu* [A complete guide to all the countries of the globe], [c. 1700]. 11 1700E.

(right, bottom) *Bankoku Jinbutsu no Zu* [Picture of the world and its people]. Nagasaki, Hizen: published by Eijudo, Imakajiyamachi, [1825]. 11 1825.

Where do you imagine yourself to be in the world? What is a useful perspective for you? All three of these last three maps were produced in Japan. While ways of mapping the world differ among these examples, the uniting feature is the oversized and centralized depiction of Japan on each of them. One of the important truths about living on a sphere is that there are 360 degrees of perspectives. World maps *don't* need to use the mercator projection or situate the Atlantic Ocean at their hearts. The modern hemisphere divisions are arbitrary, and how a person understands the globe can differ widely from other interpretations. Maps can tell us about the maker's worldview and their culture, helping us understand what is central and what is peripheral to their experience of the world. For many centuries, the edges of maps represented the unknown, the foreign, and the dangerous – places filled with unfamiliar people and topography. What is familiar and concrete to the mapmaker – of world maps to neighborhood plans – is placed centrally, helping viewers orient themselves and find their places within the world and perhaps even the universe.

# Franciscus Becharius

Franciscus Becharius, Portolan chart of the Mediterranean Sea, the north Atlantic Ocean, the Black Sea, and the northwestern African Coast. Manuscript map on parchment. Genoa, 1403. Art Storage 1980 158.

Not only is this portolan the oldest in Yale's collection, the long text in the cartouche at the bottom of the map makes it one of the most important charts in the history of mapmaking. For unknown reasons, the chart's Genoese author, Francesco Bechario, explains how he gathered information from sailors and other chart makers about lengths (in nautical miles) to aid in construction of the map. Also, for a portolan, the map is oddly shaped – square rather than following the shape of the calfskin on which it is made – and it is larger than most portolans. These oddities may point to its role as a model that was shown to prospective buyers, who would then commission a portolan that included those features most important to them.

# Jorge de Aguiar Portolan (1492)

Jorge de Aguiar. Portolan chart of the Mediterranean Sea, the north Atlantic Ocean, the Black Sea, and the west African coast as far south as Sierra Leone. Manuscript map on parchment. Lisbon, 1492. Art Storage 30cea 1492.

This typical fifteenth-century portolan chart, made by Jorge de Aguiar, is the oldest surviving dated portolan chart from Portugal. It was completed in 1492 and, along with a world map like the one by Henricus Martellus Germanus (in the next case), it is likely similar to maps that Christopher Columbus used on his voyages. Portolans were made on a single sheet of parchment where the skin retained the animal's neck portion, which was used to tie the chart when rolled. Because the Portuguese had explored far down the west coast of Africa, Aguiar needed to find a way to accommodate this new knowledge, which he did by superimposing the coastline over the interior of Africa.

# Martellus Germanus

Henricus Martellus Germanus, *Map of the World*. Manuscript on paper, linen backed. Florence, c. 1491. Art Storage 1980 157.

Multispectral facsimile of Henricus Martellus Germanus, *Map of the World*.

The map by Henricus Martellus Germanus (fl. 1480–1496) shows Europe at a critical moment in its history of worldwide exploration. It demonstrates the Portuguese discoveries along the west coast of Africa, around the Cape of Good Hope, and up the continent's east coast, showing the profitable new trade route to the Far East. Africa is distorted because Martellus (and the sailors whose reports gave him this crucial information) did not have good information about longitude. This represented the world Europeans knew before the revelation of a then-unknown landmass across the Atlantic, standing in the way of trade with Asia, which they so desperately wanted to undertake. Once established, these new routes would become a source of wealth predicated upon the triangulation of slavery, gold, and luxury goods, such as cotton, sugar, coffee, and chocolate.

Unfortunately, the Martellus map has darkened over the years, and much of its crucial information – the banderols containing names of places and descriptions of the people and topography – is now illegible. Chet van Duser and his team used multispectral cameras and computers to assemble the false-color map displayed here. While this does not restore the map itself, it does make crucial texts readable for the first time in more than 100 years.



# Judah Ben Zara

Judah Ben Zara, *Portolan Chart of the Mediterranean Sea, Cairo, Egypt, 1497.*

(Rome: Vatican Library, Borgiana vii [facsimile: Judah Abenzara, *Seekarte des Iehuda ben Zara (Borgiano VII)*, ed. Arthur Dürst. Zürich: Belser Verlag, 1983]).

Judah Ben Zara, *Portolan Chart of the Mediterranean Sea, the north Atlantic Ocean, the Black Sea, and the northwestern African Coast.* Manuscript map on goatskin. Tsefat, Israel, 1505. Art Storage 30cea 1505.

Judah Ben Zara was a Jewish mapmaker from Spain, who was forced to leave the country when Ferdinand and Isabella expelled all Jews from the kingdom in 1492. Remarkably, Judah continued mapmaking even when his locations and circumstances changed. The Beinecke Library has the last map he is known to have made, which comes from Safet de Galilea, present day Tsefat, Israel. Although Tsefat is now known as the center of Kaballistic learning, Judah's map is the only surviving evidence of secular scholarship.

The other map, shown here in facsimile, is his first known map, dated 1497 and made in Cairo; it is now in the Vatican Library. The Vatican map is problematic, however: it seems to have been cut off at the easternmost end, so the east coast of the Mediterranean is not represented. Some historians believe that the map in the Vatican collection was made in two parts, then joined together, so the map we have today is missing this second section.

# Comberford Chart (1665)

Nicholas Comberford, Portolan chart of the southern portion of the North Sea. Manuscript on parchment on boards. England, 1665. Art Storage 1009.

While early portolan chart-making was confined to the Mediterranean, as their usefulness became clear to any people who wished to sail, other regions saw native charts, often focusing on territory not covered by earlier mapmakers. The Comberford atelier exemplifies how English cartographers focused their attention on their own lands, which were peripheral to the seafaring people of the Mediterranean. The two square charts that make up this map were mounted on boards for their protection during transport. This map shows the southern portion of the North Sea from Kent and Flanders in the south to Lincoln and Frisland in the north. It was made by Nicholas Comberford (d. 1673) in 1665 in Ratcliff on the northern part of the Thames in what today is London. His choice of colors is striking in comparison with the Italian and Catalan charts shown here.

# Comberford chart (1647)

Nicholas Comberford, Portolan chart of the Mediterranean Sea, the Black Sea, and the northern coast of Africa. Manuscript parchment on boards. England, 1647. Manuscript 49 1647.

In layout, iconography, and being mounted on boards, this Comberford chart is similar to the other one displayed in this case. The area represented, however, is very different, centering on the Mediterranean, as did most early portolan charts. This one is unusual for the attention paid to small islands, which one locates using the tables at the upper corners of the map. Normally, these islands would be located the same way that ports are – by writing a name next to each one; on most maps, the majority of these are not labeled in any way. The owner of this map likely had a particular interest in these islands and their locations, although we have no information that helps corroborate that assumption. The chart also neglects to include any reference to the Holy Land and does not even include the Red Sea, but it does represent the Black Sea in great detail.

# Joan Riezo Olives Portolan

Joan Riezo Olives, Portolan chart of the Mediterranean Sea and Europe.  
Manuscript map on parchment. Messina, 1590. Manuscript 49cea 1590.

This portolan by Joan Riezo Olives (act. 1580–1615), dating from 1590, demonstrates the full artistic development of the manuscript portolan tradition. The New World is represented in an inset, but no effort was made for the map to correspond with the portolan tradition. At the neck, Jesus is shown on the cross, drops of blood dripping from his hands. The various empires are shown in human caricatures, with Spain and Morocco, dressed in sixteenth-century costume, squaring off across the Strait of Gibraltar. This map represents the height of what Edward Said has called “Orientalism” – the representation of the Middle East as exotic and other. The camels, lions, and elephants help to exoticize the region. It is unlikely these maps were ever used for travel; instead they likely functioned as art. We know from post mortem inventories that merchants often had portolan charts on their walls.

Edmond Doran, Portolan chart of the Mediterranean Sea, the north Atlantic Ocean, the Baltic Sea, and the northwestern African coast. Manuscript on vellum. London, 1586. Art Storage 30cea 1586.

This chart was made in 1586, in the city of London, by Edmond Doran, an Irishman. At this late date the portolan format had become frozen, and these charts were likely produced in large numbers with little personalization. As such charts no longer were needed for actual travel, this one highlights the “exotic” animals and the eastern rulers that fascinated Europeans. This chart and those by the Comberfords demonstrate that the construction of portolan charts, which began in Italy and spread throughout the Mediterranean, was now taking place as far from the original source as England. In fact, the Yale Center for British Art has a portolan made after 1634 in North America that is claimed to have been done by a member of the Comberford family.

Peter Roselli [?], Portolan chart of the Mediterranean Sea and the Black Sea.

Manuscript on vellum. Mallorca [?], approx. 1450–1475. Art Storage 49cea 1425.

The Roselli family were multigenerational mapmakers whose production set a very high standard. This early portolan, probably made by Peter Roselli (c. 1450–1475) is included here so you can compare similarities among the early portolans and later maps. It also demonstrates how later portolans contain cultural and historical information not found in earlier exemplars, which were closer to the maps used onboard ships for navigation. Note that this chart includes few inland cities and no personifications of rulers or evidence of the exotic plants and animals often represented in Africa and the Middle East.

Anonymous, Portolan chart of the Aegaen Sea. Manuscript on vellum, 1550 [?].  
Manuscript 488 1500.

As shown on the second floor, portolan charts were often adapted into book format to form atlases. It is likely that this map was once bound into an atlas or at least included in a collection of maps. It represents the Aegean Sea and has become detached from its particular collection. Most atlases were used for study, as it is likely this map was, rather than its having been displayed. The islands bear the flags of the states of which they were possessions in the sixteenth century, but because they often changed hands, no effort was made to keep maps current. Although showing evidence of water damage, this portolan was undoubtedly an expensive and sophisticated piece of a larger project.

Portolan atlas of the Atlantic. Manuscript on vellum, undated. Manuscript 21cea 1619.

This striking map shows the outline of the Atlantic slave trade, which survived until 1888 in Brazil, the last country in the Western Hemisphere to permit the enslavement of human beings. The Gold Coast of Africa is indicated by the Castle of Elmina (labeled *Cast. D'Amina*), which dominates the map's interior. Today, Elmina is in Ghana, but it was erected in Gold Coast by the Portuguese in 1482. It takes its name from the Portuguese *a mina* [the mine] because before the arrival of the Portuguese explorers it already was established as a trading center for gold. It became one of the most important stops on the Atlantic slave trade route, and in 1637 it was taken by the Dutch, who continued the slave trade until 1814. On this map the city is shown with a Dutch flag, which likely dates it to sometime after 1637.



José Fernandes, *Carta reduzida de hua parte de costa do Brasil*. Manuscript on parchment. [Salvador, Brazil], 1789. Manuscript 911cea 1789.

This unusual portolan was discovered when maps were moved from Sterling Library to the Beinecke Library after its renovation in 2016. The cartouche indicates that this map was drawn in 1789 by José Fernandes of Baía de Todos-os-Santos, Brazil, which is known today as the city of Salvador. *Carta reduzida de hua parte de costa do Brasil* [Short chart of a part of the coast of Brazil] describes the segment of coastline from Morro de S. Paulo (today Morro de Sao Paulo) to the Santos, which served as a major slave port. This area was the site of a gold and diamond rush and, later, the world's dominant region for exporting coffee as well as a source of sugarcane, all endeavors upon which the slave trade rested. The discovery of gold and diamonds in Brazil in 1690 vastly increased the number of slaves brought to the region for mining. After the decline in mining, in the late eighteenth century the region became a center for the production and exportation of coffee. Because slavery was not abolished in Brazil until 1888, this map illustrates harbors where ships could dock to unload human beings from Africa who were then sold as slaves used to load coffee and sugar en route to Europe. Once there, the foodstuffs were exchanged for gold – the currency that perpetuated the Atlantic slave trade.