

## FIVE *Visionary Globe*



They marcht not long, when of the arduous *Hill*  
They gain the top; where an inameld *Flat*  
(In a *Field Em'rauld*) *powdred Rubies* fill,  
Making them think old *PARADICE* was *That*.  
*Heer*, in the *Ayre* a *GLOBE* (by wondrous skill  
So fram'd that *Thorough Lights*) they contemplat,  
That th'unresisted *Eye* the *Center* sees,  
As plainly as the *superficies*.

—Luis Vaz de Camões, *The Lusiads*

The first-century corpus of global knowledge by Claudius Ptolemy (c. 90–168) reentered Latin knowledge space as complex transcultural texts transcribed and redacted by Arab and Byzantine scholars, as the title *Almagest* for Ptolemy's astronomical work indicates. Two versions of the *Geography* in Byzantium had come from Alexandria via Arabic scholars in Baghdad and Samarkand.<sup>1</sup> Ptolemy's texts summarized and synthesized Roman and Hellenistic terrestrial knowledge, offering instructions for calculating and representing the earth's spherical form and for recording locations on its surface. They were prized equally by Ottoman and Latin Renaissance rulers, as much for their antiquity and symbolic authority as for their scientific or practical value.<sup>2</sup> The full Ptolemaic corpus came to the attention of Western scholars at separate moments. The *Almagest* and the *Planisphaerium*, describing the earth-centered cosmos and concentric planetary spheres, had been translated into Latin in the twelfth century. A Greek manuscript of the *Geography*, studied in Byzantium since 1300, was delivered to the Florentine humanist Pallo Strozzi by Emanuel Chrysoloras in 1397; a Latin translation by Jacobus Angelus to which he gave the title *Cosmographia* was available within a decade, and the work circulated rapidly within humanist circles on both sides of the Alps.

Beyond the prestige of an ancient text to be decorated, presented, and possessed as an item of cultural capital, three specific features of Ptolemy's *Geography* helped alter the West's global image: Ptolemy's scientific hierarchy of spatial representation (book 1), his methodological descriptions for plotting the sphere on the plane (books 1 and 8), and the eight thousand coordinates for places across the ancient ecumene (books 2–7). From this gazetteer a set of world and regional maps (*tabulae*) could be constructed. These graphic images, initially in manuscript form but by the final quarter of the fifteenth century cut and engraved on wood or copper plates for printing, offered a visual bridge to the imperial spaces of antiquity. The agency of print expanded their circulation and speeded the processes of criticism and emendation. The *Geography* offered a model for the *atlas*, the mathematically coordinated and systematically scaled representation of terrestrial spatiality that connected Western global representation to the book. What the globe illustrated in three dimensions, Ptolemy's opening map, *Typus orbis terrarum* (see Fig. 1.2), projected onto two, the controlling image for the systematic spatial subdivision that followed.

Ptolemaic spatial order would be extended in the sixteenth century to a threefold hierarchy. *Cosmography* represented the totality of a spherical cosmos, *geography* provided geometrically exact images of the earth's spherical surface and its major divisions, and *chorography* pictured the form and character of localized spaces and places. This was a different spatiality from the navigator's or the chartmaker's. Ptolemaic science fitted a theoretically unlimited set of spatial data onto a geometrically predetermined surface. Fitting empirical (oceanic) information within the new spatial framework was a long, critical, and very public process, enabled largely by print culture.<sup>3</sup> Incunable editions of the *Geography* were printed in Rome, Bologna, Ulm, and Vicenza. By 1500 new *tabulae*, or maps illustrating differences between ancient and modern geography, were being bound into the text, a process of hybridizing the classical work that opened up the possibility for progressive addition of maps showing spaces unknown to the ancients and the ultimate erasure of the received world image.<sup>4</sup> Within a century of its printing the *Geography* had become a historical item only, a structural trace in Abraham Ortelius's *Theatrum orbis terrarum* of 1570 and the pedigree of atlases that followed.

But the Ptolemaic contribution to an Apollonian imperial discourse of global sovereignty in the early modern West and its implications for conceptions of a global humanity were vital. Through the graticule, globalism emerged as a conception that connected discourses of humanity and civi-

lization. In the maritime and intellectual centers of Europe, Abraham Ortelius, Gerard Mercator, and Jodocus Hondius followed earlier cosmographers—Martin Waldseemüller, Oronce Fine, Peter Apian, and others—in elaborating ways of picturing a habitable earth, not a restricted ecumene, by means of illustrated globes and atlases. These pictured in detail a great theater of the world wherein dreams of Christian redemption, global imperium, and a singular humanity might be projected and rhetorically secured.

### Ptolemaic Perspective

The figure of Claudius Ptolemy is widely represented in art of the late Middle Ages and the Renaissance, grasping the armillary sphere or astrolabe that represents the cosmic scope of his work. He is clothed as an Arab or oriental seer, not uncommonly a magus, frequently sharing the iconography of the Wise Men, whose cosmographic skills foretold the birth of the Christ-Apollo (Fig. 5.1).<sup>5</sup> His *Almagest* catalogued 1,028 visible stars and twenty-one constellations, and its calculation of planetary movements was the empirical foundation for astrology, connecting the Alexandrian astronomer to ancient Egyptian esotericism. The most striking feature of the carved wood Ptolemy in the choir stalls at Ulm, the location for an early printing of the *Geography*, is his narrowed eyes staring intently at the armillary sphere. The astronomer's vision extends over space and time. While the mariner scans the horizon and interrogates the compass, the astronomer's vision rises conceptually over the surface, escaping the contingencies of location and moment in order to grasp a cosmic order and regularity. The cosmographic language is geometry, in the view of Platonizing Renaissance cosmographers the divine language of creation.<sup>6</sup>

This conceptual capacity to grasp the earthly sphere from a cosmic location is essential to Ptolemaic mapping. In the *Almagest* Ptolemy details constructional techniques for making a celestial globe, emphasizing its value in displaying the heavens to the eye.<sup>7</sup> The *Geography* is driven by the idea of rendering visible the form and pattern of the earthly sphere. Geography is founded on geometry, "the art of delineating solid objects upon a plane surface so that the drawing produces the same impression of apparent relative positions and magnitudes, or of distance, as do the actual objects when viewed from a particular point." Geographical science draws on geometry to make "an imitation and description of the whole of the known world and all the things which are almost universally related to it."<sup>8</sup> The globe is best represented by a graticule of 360 lines of longitude converging at the poles

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5.1. Claudius Ptolemy examines the heavens and the terrestrial globe in a fifteenth-century manuscript copy of the *Geography*. Photograph from Bibliothèque nationale de France, Paris.

and 180 degrees of parallel latitudinal lines measured from the equator. Coordinating these numbered lines allows point location to be precisely determined on the conceptual surface. The implications of representing earth space through an infinite array of fixed points are more than merely instrumental. The graticule flattens and equalizes as it universalizes space, privileging no specific point and allowing a frictionless extension of the spatial plot. At the same time it territorializes locations by fixing their relative posi-

tions across a uniformly scaled surface. Its geometry is centric only at the poles, which, practically speaking, are the least accessible points on its surface; otherwise it extends a nonhierarchical net across the sphere. Geometric projection allows the spherical surface to be transformed and molded on the plane while retaining consistency of locational relationships. What David Woodward has called the route-enhancing properties of the portolano and the center-enhancing structure of a Jerusalem-centered *mappa mundi* are displaced in favor of the space-equalizing and area-fixing properties of the graticule.<sup>9</sup>

Ptolemy offers four techniques for transforming the sphere into a two-dimensional surface, each involving areal and directional distortion. The simplest inscribes parallels and meridians as a rectangular grid, rapidly distorting shape and scale as one moves away from the equator. Two “conic” transformations seek to accommodate spherical curvature, one by radiating straight meridians from the poles to the equator across curving parallels, the other by maintaining a straight central meridian while progressively curving the longitudinal lines to its right and left, thereby maintaining their true position at both pole and equator and giving a visual impression of sphericity. In book 8 Ptolemy describes a fourth alternative, placing the observer’s eye at a position where the visual axis is in a latitudinal plane; the earth is seen frontally, and mathematical calculations are made from a distance point located within the sphere. Ptolemy effectively represents the earth as a transparent sphere, similar to the astronomer’s hand-held armillary. While this fourth “projection” cannot be produced mathematically, unlike the stereographic projection described in Ptolemy’s *Planisphaerium*, it conjures an image of how the earth might look from space—the Apollonian perspective. The close historical and cultural affinities between the reappearance and dissemination of Ptolemy’s fourth model and the pictorial method of linear perspective demonstrated by Filippo Brunelleschi in 1425 and theorized by Leon Battista Alberti a decade later have been widely remarked.<sup>10</sup> Representational space was subjected to the conceptual logic of ocular vision in the opening years of the West’s historic encounter with transoceanic global space. Given the increased mobility of reproduced images promoted by movable type, printmaking, and small-scale oil painting on canvas, the imaginative and intellectual possibilities opened up by Ptolemaic mapping were considerable. It entered and enhanced a culture in which visual images of terrestrial, architectural, and natural spaces at a variety of scales circulated widely.<sup>11</sup>

Ptolemy’s graticule covers 360 degrees, and his transformations can gen-

erate flat maps of the sphere. But the specific locations coordinated in his text are limited to the classical ecumene. Conical sections easily accommodate this curving rectangle, largely confined to the Northern Hemisphere. Ptolemy's text thus confirmed the continental image on Macrobian maps while more precisely elaborating it.<sup>12</sup> It described the same coasts as portolanos did, reinforcing a sense of an unmediated inheritance of classical empire, while the graticule offered the flexibility of assimilating and integrating ancient authority with empirical discovery. Thus Giovanni Leardo's and Fra Mauro's mid-fifteenth-century circular *mappae mundi* combine Ptolemaic and maritime modes of representing global space. For the scholars who introduced the *Geography* to the West, and for those who financed translations and reproductions of its text and maps—the Medici in Florence, the Montefeltri in Urbino, the Este in Ferrara, Aeneas Silvius Piccolomini (Pope Pius II) in Rome, and Mehmed II in Istanbul—accommodating new knowledge into its picture of the earth was not a primary concern. Its image of ecumenical space assumed significance in the context of other ancient texts and of competing claims to the imperial inheritance of Rome more than that of oceanic navigation. As the Greek scholar Trepuzuntios put it to Mehmed II, "You are the emperor of the Romans. Whoever holds by right the centre of the Empire is Emperor and the centre of the Empire is Constantinople."<sup>13</sup> Ptolemy's *tabulae* demonstrated such claims graphically. To add new maps that covered areas unknown to the ancients and to "correct" errors in the *Geography*'s image of the ecumene (proclaimed as the victory of experience over authority) reflected an intense geopolitical and moral debate over the patrimony of classical empire in a modern world.

Like manuscript copies of the *Geography*, incunable editions were lavishly illuminated and dedicated to competitively acquisitive patrons. In the sixteenth century, the number of editions and commentaries rapidly increased as it was translated into Italian and German and became a standard library work. The Greek manuscript from which Chrysoloras and d'Angelo had worked, together with an illustrated copy of their Latin translation, was secured by Duke Federigo da Montefeltro at Urbino, part of a 1482 collection of more than eighteen hundred classical manuscripts.<sup>14</sup> Vitruvian architectural proportion and geometry are the governing spatial principles of Federigo's palace at Urbino and its managed views over ducal territory. The sumptuous decoration of the bound manuscript of the *Geography* closely mirrors that of the palace. Like Ambrogio Lorenzetti's fourteenth-century disk map at Siena, Federigo's *Geography* is more than simply an item of cultural capital; its images of terrestrial space participate in a cosmographic

rhetoric connecting Montefeltro's tiny territory across time to the classical empire and across space to the great orb itself.<sup>15</sup> The imperial conceit is pursued in the marginal decoration, which includes Federigo's stemma intertwined with portraits of Roman emperors and set against the landscape of the Italian Marches, over which the duke actually ruled. The decoration of this codex is especially extravagant, but printed editions of the *Geography* were similarly lavish, testimony to the *Geography's* cultural significance in a Renaissance visual discourse of territorial authority.

In 1482 a poetic rendering of the *Geography* was dedicated to Federigo. The work, by the Florentine Francesco Berlinghieri (1440–1500), offers an insight into the cultural context into which the Ptolemaic perspective on the globe was precipitated. Berlinghieri, trained in Greek, rhetoric, and poetics, pursued his humanist career as an orator at the Este court in Mantua and later at Lorenzo di Medici's Florentine court.<sup>16</sup> He was a member of the group that gathered around the Greek scholar and Platonist Marsilio Ficino, with whom Berlinghieri debated Ptolemy's intellectual significance.<sup>17</sup> Ficino's own Latin translation and commentary on Plato's works, to which Berlinghieri contributed financially, was a defining achievement of Renaissance humanism, a task interrupted briefly in 1463 by Lorenzo's demand that Ficino translate Hermes Trismegistus's writings, supposedly the pre-Mosaic teachings of an Egyptian priest, philosopher, and king.<sup>18</sup> Berlinghieri's poetic rendering of Ptolemy's *Geography* was begun in 1464, making it precisely contemporary with Ficino's work. It was prepared in two huge, magnificently decorated codices, and the printed edition by the German Nicolaus Laurentii was illustrated with copper engraved maps.<sup>19</sup> The dedicatory lines, composed by Marsilio Ficino himself, make explicit reference to the Hermetic theme of spiritual ascension through the spheres. In this context Berlinghieri's poetic rendering of the Apollonian perspective and its elegant visual realization in copper engraving clothe Ptolemy's *Geography* in the quasi-spiritual habits of Ficinian philosophy. The dedication to Federigo in the printed edition links this Platonic embrace of the sphere to the more secular conceit of imperial subjection of the globe.

This Neoplatonic rendering of the *Geography* into Dantean verse was published in 1482 as *Septe giornate della geografia di Francesco Berlinghieri Fiorentino*, a title suggestive of the Creation narrative in Genesis. Berlinghieri follows the structure of Ptolemy's text but incorporates commentaries on humanist themes such as the mythical and poetic origins of classical places, producing a book that is more philological than scientific. In book 5, a long dilation on ancient Egyptian burial and other sacred rituals draws upon

Strabo, Pliny, and other ancient sources as well as on medieval texts, contemporary nautical maps, and chorographies of Britain, France, Spain, Italy, and the Holy Land, implying that Ptolemy offers a foundation for cosmographic knowledge. Berlinghieri draws upon Buondelmonti's *Liber insularum archipelagi*,<sup>20</sup> whose author was familiar to the Florentine circle as the discoverer of Horapollo's *Hieroglyphica*, the foundational text on Egyptian hieroglyphics as the original universal language.<sup>21</sup> Appropriately, therefore, Berlinghieri's opening paean to geography places its study at the heart of all learning: "How many [disciplines] are affected by the delay of this great work, which takes into full view the whole earth. It feeds not only military art but also philosophy, scripture, history, and poetry. The sweet life of agriculture, medicine, and art that animates the love of nature in the human breast. In sum, no greater need have our faculties than knowledge of the earth."<sup>22</sup>

Ptolemy is the "light and ample glory of the world" who "raises us above the limits of an earth obscured by clouds, which hide our view of the surface." Berlinghieri appeals directly to Apollo and the angelic choirs to raise his poetic imagination to the task of presenting the whole universe to the marveling human eye. His song will follow Apollo's curving path over the earth to offer a conspectus, a vision of its surface, without yielding to the temptation of Icarus. His achievement betrays the imaginative power of geography, which permits an *intellectual* vision of the globe: "It offers divine intellect to human ingenuity, as if it were by nature celestial, demonstrating how with true discipline, we can leap up within ourselves, without the aid of wings, so that we may view the earth through an image marked on a parchment. Its truth and greatness declared, we may circle all or part of it, pilgrims through the colors of a flat parchment, around which the heavens and the stars revolve."<sup>23</sup> Imaginative vision across celestial space was a commonplace of the Ficinian discourse. The ascent of the soul through the stages of sensual, emotional, and intellectual love, corresponding to the terrestrial, celestial, and supercelestial realms of the Ptolemaic cosmos, respectively, was achieved by spiritual purification and contemplation. Its ultimate attainment, a beatific vision of universal love, was a key theme in Ficino's attempted synthesis of Hellenistic philosophy and Christian theology. Berlinghieri's "human genius," "divine intellect," and "rising up within ourselves" echo the language of the *prisca theologia*, the supposed pre-Mosaic anticipation of the Christ-Apollo's global redemption and renewal.<sup>24</sup> The recovery of the Ptolemaic perspective restimulated the poetic association between global vision and Apollonian ascent.

The actual itinerary that Berlinghieri constructs across the Ptolemaic ecu-



mene is similar to a portolano *periplus*, a circuit of the Mediterranean coasts, closely dependent upon Buondelmonti's island book. But the copper engraved maps in the printed edition do not reflect the navigators' perspective, nor does their selection and arrangement follow the logic of the *isolario* (see Fig. 4.4). Their sequence is governed by the Ptolemaic *tabulae*, to which they add modern plates of Iberia, Britain, France, and Italy. Berlinghieri's is a hybrid globe, mapping the territorial logic of the classical empire from its initial *orbis terrarum* dominated by the land ecumene through the *tabulae* marked with the altars and columns of Alexander, Pompey, and Caesar, while narrating a maritime sequence more appropriate to the emerging spatiality of modern maritime empire.

### From Ptolemaic Ecumene to Global Space

No Ptolemaic map survived from antiquity. All had to be reconstructed from manuscript tables of names and coordinates. Each version contained materials for a map of the ecumene plus either twenty-six or sixty-five regional maps. Most manuscript and early printed editions of the *Geography* in the West contained twenty-seven images: a world map plus ten European, four African, and twelve Asian regional maps. Berlinghieri's Latin codex included bird's-eye chorographic maps of eleven cities. The opening world map, the key to the succeeding regional images, could be constructed according to any one of Ptolemy's methods. Early Western mappers invariably adopted one of the conical sections, illustrating a rectangular area stretching from a western meridian through the "Fortunate Islands" across 180 degrees to the shores of an enclosed eastern sea into which trans-Gangetic India and the island of Taprobane extend as if into a greater Mediterranean.

Early Western reconstructions of the Ptolemaic world map have been extensively classified and studied.<sup>25</sup> They illustrated an unambiguously spherical space, of which the geometrically framed ecumene, although occupying most of the area displayed, was clearly a limited section. A graded and numbered frame contained a gridded conceptual space of meridians and parallels. Both latitudinal and longitudinal lines constituted a purely terrestrial geometry disconnected from cosmographically determined circles of equator, tropic, ecliptic, climates. Potential expansion of the mapped space through 360 degrees was implicit in the image. Wind heads, still often angelic in their features, are awkwardly positioned between rectangular page and ecumene. They blow from the meteorological spaces of air and fire assigned them by Aristotle, disconnected from the two-dimensional surface described by the

graticule, their gaze mirroring that of the human spectator. Framing, shape, and measure rather than the pattern of lands and seas are novel. Thus the world map in Nicolaus Germanus's 1466 Ulm edition of the *Geography* quite dramatically diminishes the space of Ocean, presenting a land-dominated world.<sup>26</sup> Ptolemy's African east coast extended 25 degrees below the equator, necessitating a corresponding Atlantic coastline, currently the object of Portuguese navigation. Nicolaus extends Africa westward from the "Gulf of Hesperus" into oceanic space and eastward to connect with Asia, through *terra incognita secundum Ptolemeum*, reinforcing the graphic argument on all early Ptolemaic maps of a land-dominated global surface.

The distinction between Ptolemaic and oceanic images is epistemological rather than consistently representational. The former assumed a retrospective spatiality of territorial empire easily appropriated to the Mediterranean geopolitical context after 1453 and reinforced by its incidental contents of classical triumphs, columns, and altars. Both genres still peppered the spaces beyond the ecumene with *anthropophagi* and *ichthyophagi* and other inherited "marvels" and "monsters." From their first appearance, however, Ptolemaic and oceanic perspectives were brought into dialogue in shaping Western globalism. This is apparent, for example, in the form of coasts on the maps accompanying Berlinghieri's text. They reveal the typical scalloped form of island-book maps. And the frame of the Ptolemaic ecumene was immediately placed under pressure from oceanic knowledge, literally apparent in Nicolaus Germanus's Ulm world map, where, at the northwest corner of the ecumene, the 65° north parallel breaks to incorporate the *mare glaciale*, the Scandinavian lands and various north Atlantic islands. By 1500, cosmographers such as Martin Waldseemüller could locate oceanic knowledge within the Ptolemaic conceptual frame and challenge its territorial emphasis, although the addition of a distinct *carta marina* endured in sixteenth-century editions of the *Geography* alongside a world map on a projected graticule until Gerardus Mercator's 1569 graphic marriage of the two spatialities.

Fusion of the territorial and oceanic perspectives was a northern European rather than a Mediterranean achievement, as was the introduction of the new cosmography to a wide reading public. By 1500 the Grüninger workshop in Strasbourg was reproducing large-scale woodcut maps in significant numbers; it printed five editions of Waldseemüller's *Cosmographia introductio* between 1507 and 1509 and two Ptolemy editions in 1522 and 1525.<sup>27</sup> Lorenz Fries's 1525 German-language edition of the *Geography*, based on Angelus's Latin translation and using Waldseemüller's maps, competed

with Waldseemüller's text as an accessible guide to cosmography. It was accompanied by fifty folded maps and a twelve-sheet *carta marina*, the first indexed world map in a vernacular language. Although it explained how to coordinate a projection, Fries's map was not itself a projection; it reduced the known oceanic space, reinforcing the image of a Mediterranean-centered terrestrial world. In Nuremberg, where Regiomontanus's mathematical legacy combined with the patrician humanism of Willibald Pirckheimer's circle, interest in Ptolemy was part of a broader cultural interest in space and its representation, facilitated by the exchange of letters, books, and instruments between European centers, from navigators in Lisbon to Copernicus in Frauenburg. "Inquire into the hidden and powerful workings of the earth," proclaimed Pirckheimer, a translator of Ptolemy whose study of German place names, *Germaniae explicatio*, appeared in 1530.<sup>28</sup> The planetary spaces of the cosmos and the territorial spaces of painted landscape concerned this group as much as the oceanic space of navigation, although like those Venetians who saw in the Aztec capital, Tenochtitlan, a New World reflection of their own city, Nurembergers imagined a mirror of their own city at Refugio, on the New England coast.<sup>29</sup> Pirckheimer's close friend Albrecht Dürer, who contributed along with Michael Wöhlgemut and Wilhelm Pleydenwurff to Hartmann Schedel's *Liber chronicarum*, in 1515 designed a widely reproduced globe woodcut illustrating Ptolemy's fourth projection, while Nuremberg merchants commissioned the instrument makers Martin Behaim and Johann Schöner to produce some of the earliest terrestrial globes. Alongside his advanced mathematical texts, Peter Apian published the popular cosmographic handbook *Cosmographicus liber* in 1524, the first to distinguish and illustrate cosmography, geography, and chorography, whose clear descriptions and cleverly inserted vowels allowed ordinary readers to understand the calendrical and seasonal implications of planetary motion and a spherical earth.<sup>30</sup> The Latin work was translated into French, Flemish, Spanish, and Italian, and it was revised and republished into the 1570s.<sup>31</sup>

In northern Europe, Ptolemaic science entered a context of intense moral and theological as well as commercial debate. Ottoman expansion into the lower Danube and the Lutheran challenge to Rome cast the idea of a Christian ecumene in serious doubt. The simple, uncompromising black lines of German woodcut prints are less seductive as images of global harmony than lavish courtly images of Italy and Iberia. Lutherans saw the Ottoman expansion as divine judgment on a corrupt Christendom; some responded with a quietist and familist idea of concord that in some respects paralleled Catholic Neoplatonism in Italy.<sup>32</sup> The cordiform map projection, pioneered by

Oronce Fine for François I of France in 1519 and printed for the first time by Apian as *Tabula orbis cogniti* in 1530, would become a specific object of contemplation among northern familists, its heart shape signifying a world ruled by love in an age of intensifying doctrinal hate.<sup>33</sup>

Gerardus Mercator's mathematical resolution of oceanic and Ptolemaic images by means of a cylindrical projection, which retained the Ptolemaic grid's geographical coordinates while incorporating the mariner's loxodromes, has been criticized as a Eurocentric image, enlarging the temperate regions at the expense of the tropical regions of European imperial expansion. At the time of its making the map diminished the areal significance of Europe, and its relations with empire are subtle. Blending the practical, surface spatiality of the navigator with the conceptual, Apollonian eye of Ptolemaic mapping, Mercator's world map offered a graphic solution to the sixteenth century's growing tension between textual authority and empirical evidence as foundations of secure knowledge. At the same time, Mercator's profound interest in hermeticism, the power of terrestrial magnetism, and Pythagorean metaphysics, apparent in his *Typus vel symbolum universitatis*, suggests that for Mercator resolving different modes of vision through the mathematics of spherical projection was as much a spiritual as a geopolitical act.<sup>34</sup>

Certainly, the technical combination of oceanic and Ptolemaic visions depended on the capacity to think globally, to break the frame of the classical ecumene and imagine the world as a spherical surface. This epistemological break owed more to Ptolemy's textual descriptions of a spherical earth within a mathematically structured cosmos and its subjection to geometrical manipulation than to Ptolemaic maps.<sup>35</sup> As the *Geography* circulated in Europe's courts, terrestrial globes began to be constructed. The earliest extant example is Martin Behaim's *Erdapfel* of 1492, commissioned by Nuremberg merchants the previous year, although a Vienna-Klosterneuburg manuscript of the 1430s refers to the manufacture of spherical world maps, and in 1444 Guillaume Hobit, astronomer to the duke of Burgundy, constructed a "round world map in the form of an apple" based on Ptolemy's description. In 1477 Pope Sixtus IV obtained from the Ptolemaic mapmaker Nicolaus Germanus a terrestrial and a celestial globe for the new Vatican Library.<sup>36</sup> Bramante's *Heraclitus and Democritus*, dating from the same years as Behaim's commission, clearly intends to show a spherical earth. These examples all point to a widespread interest in the fifteenth century in representing a spherical earth.

The Magellan circumnavigation prompted an explosion of globe mak-

ing, both engraved metallic spheres and, more commonly, printed gores attached to wooden globes. Globes now became essential instruments for political strategy, academic study, and trade, if not practical navigation. Association with the spherical globe signified the social, intellectual, and moral status of “a man of vision” in the sixteenth century. One of the two tapestries called *The Spheres*, a set commissioned by João III of Portugal in the 1520s, shows “Earth under the protection of Jupiter and Juno”: the Portuguese sovereigns gesture toward a terrestrial globe, contained by the graticule, the Mediterranean ecumene entirely diminished in scale by the spaces of Portuguese navigation (Fig. 5.2). In Holbein’s *Ambassadors* globes accompany an array of astronomical and navigational instruments that underline the moral stature of the Frenchmen de Dinteville and de Selve, signal the authority and fortune of England’s Henry VIII, and respond to Pirckheimer’s injunction to “Inquire into the hidden and powerful workings of the earth.”<sup>37</sup>

Ptolemy’s graticule, so emphatically represented in these images, allows spaces to be “envisioned” before they are encountered and tied logically into uniform global space. Globes and manuscript maps were the means of achieving this. In the late 1480s Henricus Martellus extended Ptolemy’s 180-degree ecumene by nearly 100 degrees of longitude; in his *Cosmographia* Martin Waldseemüller pushed it to 360 degrees. By 1508 a “whole-earth” map covering 360 degrees of latitude and extending to both poles had been constructed by Francesco Roselli, “drawn on an oval projection into which every point on earth could be theoretically plotted and on which every potential route for exploration could be shown.”<sup>38</sup>

### The Cosmographic Globe

The Apollonian gaze assumed by Behaim’s globe, Roselli’s map, and João III’s tapestry is a powerful theme in sixteenth-century art and literature. Cosmography became the discourse that brought together celestial and geographic exploration, represented space and scale, and theorized the place of humans within nature.<sup>39</sup> This globalism was underscored by moral pressures resulting from both reformation and discovery to bring within a single intellectual frame the emerging Renaissance sense of the sovereign individual, so powerfully explored in Dürer’s self-portraits, and an expanding world of humanity.<sup>40</sup> This required simultaneously engaging with the globe’s materiality and rising above it into the celestial spaces of imaginative vision. In Bernard van Orley’s *Spheres* image sun, moon, planets, and stars have no logical location other than that determined by design considerations. Their disks

Image not available.

5.2. The imperial globe presented and protected by the Portuguese monarchs, as Jupiter and Juno. Tapestry by Bernard van Orley, "Earth under the protection of Jupiter and Juno." © Patrimonio Nacional, Madrid.

are subordinated to a dominating global sphere, to which the Portuguese monarchs gesture, at once recognizable individuals and personifications of Jupiter and Juno. They share the firmament with angelic wind heads at the margins of celestial space. The image contrasts with the cosmos in Hartman Schedel's 1493 *Liber chronicarum*, an encyclopedia, bestiary, and wonder book combined, published in Nuremberg, in which a seated patriarchal God accompanied by fixed ranks of angels and saints oversees a tightly bound cosmos whose central earth with its continents is the merest button (see Fig. 1.3).<sup>41</sup> The *Chronicle* fits its geography into a Christianized cosmographic narrative divided into seven ages, an amalgam of biblical and classical learning. The image of the cosmos succeeds six woodcuts illustrating the Creation and is followed by a simplified Ptolemaic ecumene and a chorography of Eden.<sup>42</sup> There follow a synopsis of biblical history, lives of the saints, tales from Homer, Ovid, and other classical writers, a geographical description of the parts of the earth, and illustrations of its cities. The sixth, or current, age is followed by blank pages, to be filled in the immediate future, before the seventh age, which describes the Apocalypse, judgment, and the dance of death. It is this linear and hierarchical cosmography that van Orley's globalism unconsciously subverts.

Schedel's terrestrial globe is firmly contained within the enclosing spheres of a greater cosmos (although his brief reference to Martin Behaim's "discovery" of islands in the Ocean Sea indicates Nuremberg's close contacts with Iberian events). The noncentric arrangement of supercelestial and temporal spheres illustrates the Aristotelian separation of incorruptible, "simple" heavens from the corruptible, "composed" earth. South of the Alps, the Thomist conviction that no direct interaction was possible between these spheres was under challenge from Platonic thinkers who emphasized the philosophical implications of spherical harmony and universal unity. Sixteenth-century cosmographic images such as van Orley's reflect a simultaneous erosion of physical and metaphysical boundaries upon and between globes, the philosophical legacy of thinkers from the previous century, such as Marsilio Ficino and Nicholas of Cusa (1401–64). Cusanus (his humanist name), who had been a student at Heidelberg and Padua, would play a key role in those attempts to reunify Christianity before the fall of Byzantium, which had brought Greek and Latin scholarship into such close contact.<sup>43</sup> A key figure in the Platonic critique of scholastic Aristotelianism, Cusanus was also closely involved with Ptolemaic science, purchasing cartographic materials from the Klosterneuburg monastery in 1444, discussing with German scholars at Rome in 1450 possible new *tabulae* to supplement the *Geography*, and pro-

ducing his own map of central Europe, the source for that in Schedel's *Chronicle*.<sup>44</sup> Cusanus was a *global* thinker, both theoretically and practically, whose driving belief was unity. Spherical geometry offered him intellectual evidence of divinity, "propounding the idea of an infinitely open universe, whose center was everywhere and whose circumference nowhere. As an infinite being, God transcended all limits and overcame every opposition. As the diameter of a circle [or sphere] increased, its curvature diminished; so at its limit its circumference became a straight line of infinite length. Likewise, in God all opposites coincide . . . in the universe God is both centre and circumference."<sup>45</sup>

Cusanus was equally committed to the unification of faiths and peoples, proposing "a comprehensive vision of all reality, God, the world and man."<sup>46</sup> Developing the Majorcan Ramon Lull's argument that Christ's incarnation was necessary to unite divine and human natures and based on his own knowledge of Greek sources, Cusanus published *De docta ignorantia* in 1440. According to Cusanus, Christ is the necessary union between the cosmic spheres, which Thomism had seen as unable to communicate. Consulting *Timaeus* in the original Greek rather than its Macrobian Latin summary, Cusanus argued for a created world animated by divine love, whose expression is optical geometry. The subcelestial realm moves toward a perfect order of the supercelestial sphere, which may itself therefore be imag(in)ed through visual observations received by the globe of the human eye from the material cosmos.<sup>47</sup> Cusanus lectured on optics at Padua, where one of his students was Paolo dal Pozzo Toscanelli, who later corresponded with Columbus about the size of the globe. Cusanus's thinking gave an almost divine significance to the sun as the source of light, reinforcing the imaginative appeal of the Christ-Apollo, an indirect stimulus to Copernicanism, whose author had also studied at Padua.<sup>48</sup> Cusanus's surveying and mapping concerns complement his interest in spherical geometry and optics, as well as his interest in Christendom's geopolitics. In the aftermath of 1453 he even flirted with the idea that Mehmed II might be the agent of global religious and political unity.<sup>49</sup>

Among the theological implications of Cusanus's work was a renewed and distinctive emphasis on the medieval motif of the human microcosm, connecting it to the Platonic ascent of the soul, uniting the individual and the cosmos. For Cusanus, "man is a microcosm not because he comprises in himself all the different degrees of reality and thus is subject to all its conflicting forces, but rather because—situated at the centre of creation, at the horizon of time and eternity—he unites in himself the lowest level of intel-



lectual reality and the highest reach of sensible nature and is thus a bond which holds creation together.”<sup>50</sup> Cusanus offers a mapping conception of the microcosm: the human individual is literally relocated at the center of the cosmos, capable of rising imaginatively and spiritually above the globe as an eyewitness to the beauty and harmony of creation. Physical light connects the spheres of earth and eye within a spherical cosmos, while the divine illumination of universal love is its metaphysical equivalent. Imaginative mapping of the human individual within the cosmos was an insistent theme among Ficino’s Florentine group. According to Paul Kristeller, Ficino’s commentary on Plato’s *Symposium* “treats love as a cosmological principle of the unity of things, as a *viriculum mundi*, while his *Platonic Theology* gives the same role to the rational soul.”<sup>51</sup>

Ficino’s brilliant young colleague Giovanni Pico della Mirandola (1463–94) pushed the autonomy of the microcosm even further in his 1486 *Oration on the Dignity of Man*, detaching the human individual from any fixed cosmic location, freeing it to “observe whatever is in the world,” determining its own place in creation: “Thou canst grow downward into the lower natures which are brutes. Thou canst again grow upward from thy soul’s reason into the higher natures which are divine.”<sup>52</sup> Pico owned a personal copy of Berlinghieri’s poetic translation of the *Geography*, which offers a reading of Ptolemy’s work as a realization of the cosmographic ascension.<sup>53</sup> The elevated perspective is given moral superiority over any surface view. Correspondence between microcosm and macrocosm is figured through physical and imaginative *vision*: “Without some voyage of the soul, there can be no instantaneous point of view over the cosmos. The kinship between cosmography and sacred poetry was . . . essential and primary.”<sup>54</sup>

Terrestrial and ocular globes connect in the metaphor of the mirror, the *speculum*, an insistent trope in sixteenth-century culture. Apian’s most sophisticated vovelle, based on an azimuthal world map, is called a cosmographic *speculum*, or “mirror,” illustrating the motion of the globe to the eye. The French moral philosopher Charles de Bovelles (1479–1567) refers to the human individual as a “mirror who stands outside and opposite the rest of creation in order to observe and reflect the world. He is thus the focal point of the universe in which all degrees of reality converge.”<sup>55</sup> Cosmography thus laid claim to being “the most fundamental science” in the sixteenth century, dealing with the implications of this revolutionary relocation of a human individual liberated to soar imaginatively above the earth through the spheres of creation.<sup>56</sup> Uniting moral and natural philosophy within the universal scope of cosmography yielded both Copernicus’s reordering of the plane-

tary spheres in *De revolutionibus orbium caelestium* (1543) and the speculative hermeticism of such figures as Cornelius Agrippa.<sup>57</sup>

Sixteenth-century cosmography was a pan-European project. By 1500 printing presses competed to produce texts such as Apian's *Cosmographicus* and, from 1532, Oronce Fine's *De mundi sphaerae, sive cosmographia, libri V* in large numbers for a mass market.<sup>58</sup> Broader in conception were texts such as Sebastian Franck's *World Book: The Mirror and Portrait of the Earth* (1534) and Sebastian Münster's *Cosmographiae universalis*, which appeared in 1550 and was republished into the 1590s. Part universal history, part contemporary encyclopedia and news journal, part geographical gazetteer or even atlas, these works continued the tradition established by Schedel, Rollewink, and others, complex publishing ventures in both Latin and vernacular languages. Münster, a professor of Hebrew at Basel, had produced his own edition of Ptolemy in 1542. His *Cosmographia* was structured through the conventional microcosms of *annus*, *mundus*, and *homo*, dealing, respectively, with astronomical knowledge, global geography, and the human body. Its scope and the continuous incorporation of new information produced a textual collection of marvels. Common to such texts was a recognition of the illustrative and explanatory attraction of the visual images that engraving and printing techniques allowed. But the coherence of cosmographic texts that sought to retain the medieval encyclopedic model of universal history was increasingly undermined by the desire to incorporate a totality of knowledge, producing the disconnected, fragmentary, and even contradictory collections of texts and images into which the popular cosmographic project eventually collapsed.<sup>59</sup>

Cosmography was both instrumental and intellectual, increasingly required in the sixteenth century to accommodate sectional interests within its universalizing premise as its various activities became harnessed to a competitive imperialism among the Christian nations. Cosmographers such as André Thevet and Guillaume Postel in France or the Hakluyts and John Dee in England promoted and recorded the course of their nations' discoveries. Spain's Alonso de Santa Cruz wrote a *Historia universal* in 1536, a translation of Aristotle in 1545, and an *Isolario general* in 1542, as well as a geography of Peru and a brief introduction to the sphere.<sup>60</sup> Pedro de Medina, official cosmographer to the Casa de Contratación from 1552, included among his tasks examining ships' pilots and navigational instruments. Nicolas Nicolai, the official cosmographer to Henry II of France, had similar duties, while in England William Digges and William Cuningham titled themselves cosmographers and competed for influence in the court of Eliz-

abeth I.<sup>61</sup> In Venice the cartographer Giacomo Gastaldo was given the title *cosmografo*, while Pope Gregory's official cosmographer, Egnazio Danti, was centrally involved in the 1582 reform of the Christian calendar.<sup>62</sup>

Portuguese cosmography offers an example of how these competitive demands on cosmography spread its influence widely over the sciences and the arts. One of João II's negotiators at Tordesillas, Duarte Pacheco Pereira, published his *Esmeraldo de situ orbis* in 1505. Principally a mathematical treatise on the sphere, it also includes a universal history and geography.<sup>63</sup> Bernard van Orley's tapestries, as we have seen, appropriate cosmography's graphic elements to signify the Portuguese crown's claim to universal empire. By the late sixteenth century Luis de Camões was deploying cosmography to construct a national rather than a universal history and geography. *The Lusíads*, whose lines open this chapter, concludes with its hero Vasco da Gama, here a heroic literary hybrid of Ulysses and Aeneas, offered a vision by the goddess Tethys from the mountainous peak of her island realm.<sup>64</sup> He sees a crystalline globe, "infinite, perfect, uniform, self-poised," a model of the fabric of creation, made "by that *All-wisdom*, that *All-eye*." Vasco's own "unresisted eye" penetrates to its very center, piercing the transparent orbs of individual planets and stars to reach the earthly sphere at its center:

..... the seat of MAN:  
 Who, not content in his presumptuous pride  
 T' expose to all *Earth's* Mischief's his life's span,  
 Trusts it to the unconstant *Ocean* wide.<sup>65</sup>

In the tradition of Cicero's Scipio, da Gama is literally seized with wonder and desire at his Ptolemaic vision. Tethys describes the earth's oceans and continents, bequeathing them to imperial Portugal, ruled by a Christian Alexander, who "through the WORLD shall spread." An oceanic empire, its detailed geography narrated coastwise like a portolano itinerary, is marked upon the cosmographic sphere.<sup>66</sup> Vasco's ascent and vision leads to Aeneas's choice at Dido's Carthage between an imperial vision *ad termini orbis terrarum* and insular confinement in the arms of a desirable and available woman. Similar episodes recur throughout Renaissance literary cosmography, for example, in the lunar episode of cantos 34–36 of Ariosto's *Orlando furioso*, whose printed editions included Ptolemaic maps of Roland's African and Asian adventures.<sup>67</sup>

In a series of illustrations to the Genesis narrative, Camões's contemporary Francisco de Holanda (1518–84), the Portuguese humanist and artist, seems almost to illustrate Vasco's vision and Lusitanian cosmography's asso-

Image not available.

5.3. The origins of the elemental sphere: Day One of *Genesis* according to Francisco de Holanda.  
Gouache on paper, from a set of six images, 1545–47. Courtesy Biblioteca Nacional, Madrid.

Image not available.

5.4. Copernicus's heliocentric cosmos, from *De revolutionibus orbium coelestium* (Nuremberg, 1543). By permission of the British Library.

ciation of spherical geometry and Neoplatonic speculation.<sup>68</sup> In 1573 he completed work on 154 gouache illustrations titled *De aetatibus mundi imagines*. These apply the sacred geometry of sphere and triangle, light, and vision as cosmogonic principles to the hexaemeron, drawing upon sources including Cusanus and Sacrobosco.<sup>69</sup> De Holanda represents the first day of Creation by means of a transparent heavenly globe, dividing light from dark through a trinity of triangles, simultaneously penetrating and containing with fire the other three elements of corruptible matter. The words *Fiat Lux* transform these from chaos into a spinning volumetric globe of Earth (Fig. 5.3). The image, which owes its geometrical construction to illustrations of Cusanus's *De coniecturis*, allows the Father, represented by the innermost, equilateral triangle, literally to "compass" the created cosmos.<sup>70</sup> Ficino had included the circle and triangle in his translation of the *Timaeus*, the sole illustration in his *Complete Works* of Plato.  $\Lambda$  and  $\Omega$  in de Holanda's image represent the divine closure of time as well as space, the ends of creation. In the words of de Holanda's contemporary the English cosmographer William Cuningham, "Whatsoever is betwixt the seate of the almighty governour of

all lyving creatures, and the centre of the earth: is called the world, and it is compared to a round ball and globe."<sup>71</sup> De Holanda's second day illustrates the Christ-Apollo as human microcosm creating the concentric transparent orbs of the firmament, again recalling Camões's image. The breath of life is illustrated by a cartographic wind head. The separation of lands and waters on the third day stretches scalloped coastline and islands over the curving surface of the globe under the eye of the Trinity and choirs of angels. The illumination of the planetary firmament on the fourth day draws directly from illustrations of the lunar eclipse in Sacrobosco's text, its tiny central earth turned to reveal a distinctly Portuguese global space: Western Europe, Africa, the Indian Ocean, and the Brazilian land of Santa Cruz.

These cosmogonic images replace an anthropomorphized Father with pure geometry, while the process of creation becomes a play of triangles and globes. Cosmography, "a Science which considereth and describeth the magnitudes and motions of the celestiall or superior bodies,"<sup>72</sup> is here rendered as mystical geometry. The mystery that drew cosmography repeatedly toward speculation was the paradox of planetary motion within an immutable cosmic order. Copernicus's contribution to that question made his simple image of 1543 a pure cosmographic vision (Fig. 5.4).

### The Geographic Globe

To geography is given "knowledge teaching to describe the whole earth and all the places contained therein, whereby universall maps and Cardes of the earth and sea are made."<sup>73</sup> Sixteenth-century geography was a hybrid of textual authority and empirical observation that opened a broad space for imagination and invention in representing the global surface.<sup>74</sup> As for Camões's Vasco da Gama, the Apollonian gaze authorized both an individualist, imperial quest for *Fama* (Fame) and a more structured metaphysics of global order and harmony.<sup>75</sup> Global geographic space is examined here as it appeared in three significant locations in sixteenth-century culture: the princely map gallery, the world landscape painting, and the printed atlas.

#### *The Map Gallery*

More than twenty sixteenth-century galleries of painted map cycles are scattered across Europe, notably in the Italian courts. Popes and princes centered themselves imaginatively on the global stage by commissioning images of cosmography, geography, and chorography for their palaces. The tradition

traces back at least to Augustus's mausoleum complex in imperial Rome. Lorenzetti's work at Siena included the now lost disc referred to by Ghiberti as a "cosmografia," possibly an astronomical or calendrical device but equally likely an image of the ecumene, integrated into the chorographic panoramas of Siena's territories. At Windsor and Winchester in England world maps and tapestries were hung in direct line of sight from the throne as signs of monarchy.

Ptolemaic study, oceanic navigation, and mathematical representation altered the content and form of such schemes, while astrological and allegorical conceits such as those connecting Cosimo de Medici's name to celestial images and Medicean iconographic use of Galileo's discovery of Jupiter's moons further elaborated their meanings.<sup>76</sup> Two of the most elaborate cycles were the inspiration of Egnazio Danti (1536–86), cosmographer to Pope Gregory XIII and adviser on the reform of the Western calendar. Danti held a chair of mathematics at Bologna, where he designed the great gnomon on the floor of San Petronio; he edited Sacrobosco, surveyed, mapped, and engineered fortifications and watercourses for various Italian states, and in 1586 raised the great obelisk in St. Peter's Square as a Christianized gnomon around which global time and space revolved.<sup>77</sup> Danti's first map gallery was a room of fifty-seven Ptolemaic maps commissioned for the Uffizi Palace in 1562 by Cosimo de Medici and based on Girolamo Ruscelli's Ptolemy. Below the maps were paintings of the plants and animals of each region, and above them were portraits of their rulers. From the ceiling, which was decorated with zodiacal signs, a great terrestrial globe could be lowered by windlass, "so that, when fixed, all the pictures and the maps on the cabinet will be reflected therein, each part being thus readily found on the sphere."<sup>78</sup> Cosimo could stand at the very center of space surveying heavenly and earthly globes.

Even grander in conception was Danti's work between 1577 and 1583 for the Bolognese Gregory XIII, undertaken in the Vatican's Terza Loggia and on the upper floors of the Belvedere, a scheme including mechanical globes, painted planispheres, Ptolemaic tables, and forty geographic maps showing the papal dominions in Italy. A connection between cosmos and globe is made at the Tower of the Winds, whose astronomical instruments fix the equinox and solstice for the longitude of Rome, as towers in Athens and Rome had done in antiquity. Its interior decorative scheme demonstrates the latest theories of light and perspective. An astrolabe depicting the cosmos and a terrestrial globe were incorporated into the scheme, so that the Ptolemaic wall maps in the Terza Loggia were related to the spherical earth—cos-

mography to geography.<sup>79</sup> The vaulted Gallery of Geographical Maps is concerned less with the expansion of faith than with the affirmation of Rome's continued global centrality. Thus Danti's map of *Italia Antiqua* quotes Pliny: "Italy is a land which is at once the foster child and the parent of other lands, chosen by the providence of God to make heaven itself more glorious, to unite scattered empires, to make manners gentle and to become throughout the world the single fatherland of all peoples."<sup>80</sup> The decorative scheme comprises scenes from Old Testament and church history connected to forty regional wall maps of classical and papal Italy in a geohistorical defense of Catholic orthodoxy.

Danti's images lead the eye from a vertical perspective over the territory, through high-angled bird's-eye views, into intimate landscape scenes: the verdant slopes of Etna, the monuments of Rome, the vine-hung terraces of Campania, and then upward toward the infinite emptiness of cosmic horizons. In the Liguria panel, for example, the eye ascends from the two pilgrims following their winding road through an Apennine valley to a panorama of the Gulf of Genoa and the cities along its coast. In the depth of the image the alchemical symbol of angler and stream allegorizes territorial fortune. Passing over the sea toward the Corsican coast, the eye is arrested by two images. On the left a Christian captive aboard a Berber ship signifies Christendom's threats to south and east, while on the right Neptune drives a chariot toward the western Ocean, its gilded seat occupied by Christopher Columbus, son of Genoa, whose fame in discovering a new orb is proclaimed by Neptune's banner (Fig. 5.5). The vignette captures papal globalism a century after Pius II's cosmography pleaded for a crusade against the Ottoman conquest of eastern Christendom.

### *World Landscape Painting*

Danti's images reflect a connection between painting and global mapping found in the key centers of printing and map production in the Renaissance, notably southern Germany, Antwerp, and Venice. It was also in these centers that a genre of "world landscapes" became popular in both the opening and the closing decades of the sixteenth century.<sup>81</sup> Panel painting was held up by humanists such as Pirckheimer as a more appropriate format for cosmographic description than language, and world landscapes appear on panels, small, framed canvases, or etchings. They are portable images, responding to the demands of a bourgeois clientele that might own or be familiar with Apian's handbook or Münster's encyclopedia. As Juan Vives wrote in 1531,



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5.5. Egnazio Danti's chorographic map of Liguria, with a detail showing Columbus riding Neptune's chariot to an imperial destiny in the west. Galleria delle mappe geografiche, Vaticana. © Biblioteca Apostolica Vaticana.

“The whole globe is opened up to the human race, so that no one is so ignorant of events as to think that the wanderings of the ancients (whose fame reached to heaven) are to be compared with the journeys of these travellers [contemporary explorers], either in the magnitude of their journeyings, or in the difficulty of their routes.”<sup>82</sup>

World landscapes appear to illustrate a substantial segment of the globe's surface, a vast panorama with multiple viewpoints, “dazzling the spectator with a rich profusion of natural scenery: mountains, plains, and valleys, rivers and seas, harbours and castles, and villages. . . . The sense of vastness is enhanced by the unnaturally elevated horizons . . . and the clarity with which even remote regions are often shown.”<sup>83</sup> The earliest examples are by Joachim Patinir of Antwerp, Lucas Cranach of Vienna, and Albrecht Altdorfer of Regensburg in the years immediately preceding Magellan's circumnavigation. Patinir's *Martyrdom of St. Catherine* typically removes the narrative content to one side of the frame, allowing the eye to sweep out over a wide estuary with its portolano-style scalloped bays. Like the angel who hovers over the dying saint, the viewpoint is high above an incidental world of locations and events. Patinir's round earth appears as a marvelous, glittering jewel, recalling Erasmus's words, “What spectacle can be more splendid than the sight of this world?”<sup>84</sup>

Albrecht Altdorfer achieved even more dramatic effects in a series of heroic scenes from antiquity commissioned by Wilhelm IV of Bavaria. *The Battle of Issus* of 1529 illustrates Alexander's defeat of Darius in 334 B.C.E., which opened Asia to European empire (Fig. 5.6). From the foreground details of combat, the eye passes mountains and cities, ascending across the Levantine coast and a foreshortened Cyprus to a vision of three continents meeting in the eastern Mediterranean, the Isthmus of Suez, and the Nile Delta. The Red Sea stretches to the horizon, while above the cosmic swirl of cloud, sun and moon occupy opposite corners of the firmament.<sup>85</sup> In *The Conquest of Tunis*, a set of tapestries commissioned to celebrate Charles V's African campaign of 1535, a similar perspective over the Mediterranean reworks Rome's defeat of Carthage in a much more explicitly cartographic rendering of a transhistorical struggle for global empire.<sup>86</sup>

World landscape painting peaked in the work of Pieter Bruegel the Elder (1528–69) in the 1560s, losing appeal by the time of Peter Paul Rubens, the last great painter to follow the genre. Bruegel's world landscapes, such as *The Tower of Babel* and *Magpie on the Gallows*, are characteristically vast in conception yet jewel-like in detail, visual equivalents of contemporary cosmographies in their search to frame both the scale of an ordered globe and the

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5.6. *The Battle of Issus*, oil painting by Albrecht Altdorfer, 1529, a world landscape view of a foundational moment of the European imperial imagination. Alte Pinakothek, Munich.

fragmentary and contingent nature of its contents. *Landscape with the Fall of Icarus* (1558) adopts the most appropriate of all themes for representing global landscape, incorporating Ovid's story within a single, curving horizon. The image captures the moment when Icarus, his waxen wings melted by Apollonian fire, disappears below the waves, falling unnoticed as the globe turns, the plowman marks the changing seasons, and the galleon slips out into the gulf.<sup>87</sup> The scalloped lines of promontories and bays are echoed in the forms of the setting sun, the plow lines, and the lateen rigging of the ship. And the cycle of cultural time is captured within the frame by the movement from fisherman to shepherd to plowman to mercantile city.<sup>88</sup>

### *Printed Atlas*

Among Pieter Bruegel's closest associates was Abraham Ortelius (1527–98), an Antwerp antiquarian and map publisher at the center of a European "republic of letters."<sup>89</sup> Ortelius's *Theatrum orbis terrarum* of 1570, a collection of fifty-three maps engraved to a uniform format by Franz Hogenberg, synthesized the printed cosmography and Ptolemaic *Geography* to produce a "theater," *conspectus*, or mirror of the whole earth. Its inspirational sources were Ptolemy's *Geography*, now thoroughly superseded as an image of known geography, popular cosmographies such as Schedel's and Münster's, and the bound but unsystematic collections of printed maps sold by printers such as Bertelli, Forlani, and Camoccio.<sup>90</sup> The *Theatrum* was predominantly graphic, Latin text being located to the left of the maps, whose order followed a rigorous geographical logic: from globe to continents to countries and regions. It was hugely successful commercially, reprinted four times in its first year, regularly updated and translated into six languages by 1612, and continued by Mercator; its lineage is traceable through the seventeenth-century Dutch atlases of Jodocus Hondius and the Blaeu family. Ortelius's work encouraged the idea of private, vicarious enjoyment of geographic discovery, which had become a common feature of mapping rhetoric.<sup>91</sup> The individual could master the globe at a single glance. The Apollonian dream was domesticated, a point emphasized in the laudatory poems that introduce Ortelius's venture. Adolphus Mekerchus, for example, describes the editor seated with Phoebus Apollo, witness to the world ("qui conspicit omni"), himself a discoverer of unknown places and peoples hidden in the remotenesses of the globe:

Ortelius, whom Phoebus Apollo has allowed to be conveyed with himself in the four-horsed chariot over the air, from where he may

circle the lands that lie below and the [Ocean] depths that flow around. Let men say that to him [Ortelius], Phoebus—who sees all things—has shown regions utterly unknown and situated far below the vault of Heaven, formerly known only to natives, and disclosed a new orb, and races and peoples and the secrets of a new world.<sup>92</sup>

The totality of Ortelius's vision is illustrated in his frontispiece. A Doric arch supports a crowned Europa robed in imperial purple and seated below a vine-entangled pergola. She holds the orb and scepter of universal rule.<sup>93</sup> At her sides are celestial and terrestrial globes, while below stand female personifications of the other two ancient continents and their value to Europe: Asia in bejeweled silks, holding an urn of smoking myrrh, and black Africa, seminaked under the sun of the torrid zone, holding a branch of balsam. Below and between the columns of this arched entrance to the printed earth sits nude America, decorated only with feathers, holding bow and arrows in one hand and the medicinal wood *guanacum*, supposedly a cure for syphilis. She carries a severed European head, signifying the monstrous nature of her peoples. A fifth head emerges from a block of stone: *terra incognita* of the undiscovered southern continent, heir to the classical antipodes, which Ortelius's world map marks as a vast extension of Tierra del Fuego (Fig 5.7). Ortelius explains that the map shows the earth given by God to the sons of Noah, as well as a fourth continent and a fifth yet to be fully known. The ethnological assumptions of his sexualized iconography reveal both the continued resonance of humanist, "Mediterranean" spatiality and the desires and fears of a patriarchal culture. This image and the opening *Typus orbis terrarum* (see Fig. 1.2) construct a spatial dialogue between a narrative of surface discovery—through a proscenium arch or the Pillars of Hercules—and a cosmographic synopsis from which the eye swoops to examine selected locations in greater detail.<sup>94</sup>

If Ortelius's frontispiece emphasizes a European global territoriality, *Typus orbis terrarum*, which colors continents distinctly, makes Europe's diminished continental size and northerly location on a globe of 360 degrees instantly apparent, prompting for the critical reader those moral questions of European normalcy and superiority raised in Montaigne's precisely contemporary essay on cannibals.<sup>95</sup> The cylindrical globe projects from encircling clouds within a rectangular frame. It is a predominantly terrestrial space; the ship-filled ocean occupies no more than a quarter of its surface. The Stoic theme so consistent in humanist global images is stressed by Cicero's epigrammatic question, "What in human affairs can appear great to him who

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5.7. Frontispiece to the German edition of Abraham Ortelius's *Theatrum orbis terrarum* with figural images of the continents. Harry Ransom Humanities Research Center, The University of Texas at Austin.

is familiar with all eternity and the size of the whole world?"<sup>96</sup> The revised *Typus* of 1587 carries further epigrams from Cicero and Seneca dignifying contemplation of the earth as a defining feature of humanity while mocking human pride and folly, such as the following from Seneca: "Is this that pinpoint divided by sword and fire between so many peoples? How ridiculous are the boundaries of mortals."<sup>97</sup>

Ortelius's humanist commitment structures the *Parergon*, a companion volume to the *Theatrum*, which maps an antiquity now disconnected in textual space and time from the modern globe but still its guiding moral influence. This volume constructs an image of ancient empire, Ulysses' and St. Paul's Mediterranean odysseys, and the Holy Land. Together Ortelius's two collections consummate a global vision of Christendom, transcending profound religious and political divides in the republic of images produced by Catholic, Lutheran, and Calvinist mapmakers. Like Oronce Fine's cordiform world projection, overseen in Apian's 1539 *Cosmographicus* by Apollo and the Habsburg emperor (Fig. 5.8), Ortelius's Christian humanism deploys the authority of antiquity to create a moralized geopolitical globe. Mercator's 1595 *Atlas* further developed Ortelius's concept into his cosmographic *oculus mundi*. Mercator's preface outlines a "planetary strategy" for a Europe diminished only in geographical scale to realize its historical *telos* in imperial conquest: "Here [Europe] wee have the right of Lawes, the dignity of the Christian religion, the forces of Armes . . . Moreover, Europe manageth all Arts and sciences with such dexterity, that for the invention of manie things shee may be truely called a Mother . . . she hath . . . all manner of learning, whereas other Countries are all of them, overspread with Barbarisme."<sup>98</sup> Despite this triumphalist rhetoric, however, sixteenth-century atlas makers—those of Flanders above all—could scarcely ignore Christian Europe's own doctrinal barbarism. The Stoic marginalia to their maps should be read in the light of Ortelius's pietism and Mercator's hermeticism and his 1544 arrest for heresy. The vision of a unitary globe, graphically revealed by the map and atlas makers, was intellectually appealing to humanist scholars in the context of Calvinist and Tridentine Catholic fundamentalism. Jodocus Hondius's heart-shaped projection, based on Ortelius's 1564 map and suspended from the hand of God, became a common emblem of universal love at the end of the century (Fig. 5.9).<sup>99</sup>

The global territoriality envisioned by Ortelius and Mercator was complemented by the six-volume *Civitates orbis terrarum* (1572–1617), edited by Georg Braun and Franz Hogenberg, whose selection of city images mapped Europe's claims as the location of *civis* and thus civilization. While Braun



Image not available.

5.8. Oroncé Fine's  
cordiform world map,  
1534. Photograph  
from Bibliothèque  
nationale de France,  
Paris.

and Hogenberg's collection, like Ortelius's, offers ample graphic testimony to trans-Danubian, non-Latin territorialities, Mediterranean antiquity is still privileged as the source of civilization. Thus *Civitates orbis terrarum* includes a set of images by Georg Hoefnagel (1542–1600) illustrating his journey with Abraham Ortelius from Salzburg to southern Italy.<sup>100</sup> The northern humanists visit landscapes, ruins, and natural wonders of antiquity. From Rome the Appian Way leads them to the Bay of Naples and the Straits of Messina with views of Etna. Wide panoramas record Hadrian's Tivoli, the festooned vineyards of the Campania, Scylla and Charybdis. Ortelius's presence as a traveler in these images provides eyewitness authentication for the vicarious explorer in library or study of a historical narrative that reaches into the heart of the Mediterranean, paralleling the geographical narrative of Ortelius's *Theatrum* images, extending the eye to *terra incognita* at the edges of the earth.<sup>101</sup>

### Envisioning Global Humanity

Petrus de Turre's *De locis et mirabilis mundi*, a medieval corruption of Herodotus and Pliny summarizing the marvels and monsters to be found at the edges of the earth was bound into many early printed editions of Ptolemy's *Geography*.<sup>102</sup> Petrus described the monstrous races, the earthly paradise with its four rivers and angelic guards, Taprobane's elephants, gold, jewels, and trees that never shed their leaves, India's variety of serpents, Arabia's phoenix, and Central Asia's cannibals. Descriptions of the Fortunate Isles to the west anticipate the ambiguities of New World landscapes, at once Edenic gardens and howling wildernesses.<sup>103</sup> As the true dimensions of the globe, America's continental size, and oceanic space became recognized, Europe's spatiotemporal centrality, implicit in Ortelius's frontispiece, figured Asia in terms of an exotic past and the transoceanic West as an unformed future.<sup>104</sup> Hybrid human-animal creatures are more explicitly territorialized. Some, like the *kunokephaloi* and the *sciopedes*, remained outside empirical known space, while others, most dramatically the *anthropophagi*, threateningly within it.

The expansion of Ptolemy's ecumene raised immediate and insistent questions about how those creatures—who were physically human and capable of speech but whose appearance, cultures, languages, and practices appeared utterly alien—might fit within the scheme of salvation through which Europeans had normalized their humanity. From the time of Aristotle language and evidence of a settled “community” had signified humanity, while such signs as nakedness, body hair, “nomadism,” and lack of agriculture or per-

Image not available.

5.9. Emblematic use of the cordiform map: map by Jodocus Hondius in Pieter de Hondt's *Album amicorum*, 1589 (KBR, II 2254). Copyright Brussels, Royal Library.

manent settlement revealed proximity to animal nature. Christianity had added monotheism and rejected divinity in nature as pagan. Renaissance concepts of selfhood and human dignity emphasized conscious distancing from “animal nature,” shaping responses to other peoples. At the extreme, New World observers such as the Spanish colonizer Genesim Sepulveda argued that Americans had no souls, conveniently excluding them from redemption and placing them in the category of animals. Others, such as Bartolomé Las Casas, whose observations were eagerly seized upon in Protestant Europe as evidence of Spanish brutality, adopted the inclusive view of humanity adopted by the papal bull *Sublimis Deus*, of 1537, which pronounced all such peoples capable of redemption, guaranteeing their humanity even as it legit-

imated for some the infliction of unspeakable brutalities on fallen bodies for the sake of saving souls.<sup>105</sup>

Attitudes toward the humanity of newly discovered peoples were neither simple nor consistent. The inheritance of Greek ethnocentrism was pervasive. No longer were Europeans presented only with images of other beings against whom to define their own humanity; in American and later oceanic discoveries they were presented with physical people. Resolving the complex tensions between image and embodiment has since remained a central ethical issue for Western culture. "The problem, then," according to Anthony Pagden, "was precisely how to understand 'otherness' in terms which made sense both as an account of 'their' lives or beliefs, and as an account of the lives and beliefs of beings who were still sufficiently like 'us' to be clearly recognizable as part of what all contemporary Europeans understood to be the 'brotherhood of man.'"<sup>106</sup> The Stoic epigrams commonly attached to sixteenth-century global images normalized brotherhood along Christianized Platonic lines. Inevitably, globe images neglect the atomistic Epicurean tradition associated with Lucretius's *De rerum naturum* (actually condemned by Ficino in 1470), with its historical account of chance human separation from animals. Amerigo Vespucci himself referred to South Americans as Epicureans rather than Stoics, thus placing them *ex leges*, sharing the natural morality of beasts. Confronting the moral challenge of cultural difference in new worlds, writers such as Montaigne embraced the relativist position, refusing to pass judgment on unfamiliar conduct and accepting the domestic primitivism of New World peoples.

In practice, the European response to global difference was to domesticate nature by colonization and cultivation. Even though Columbus reported his discoveries in the language of marvel and monster, the seventeen ships of his second voyage bore people, plants, and animals to settle Hispaniola.<sup>107</sup> His own name plays are instructive: he signed himself "Christian ferrens" (Christ-bearer) and acknowledged *Colón*, his family name, as meaning "someone who settles a land for the first time." By his fourth voyage, the eschatological themes of Columbus's letters reveal his self-image as embodying the *telos* of Christendom.<sup>108</sup> By 1513 Spain had codified the *Requirimiento*, an authenticating sign of linguistic colonization to be delivered within the hearing of aboriginal inhabitants. Like Schedel's chronicle, the *Requirimiento* narrated the history of the world up to the time of the first pope and required the listeners' submission to the king of Spain. It was a "cosmogonic" speech, bringing new space into Christendom's temporal framework and justifying a physical colonization that would translate nature to culture and redeem

fallen peoples. For Las Casas, it would introduce a second Fall to the globe's other Eden.<sup>109</sup>

The confusion of experience and representation that shaped the European global vision in the sixteenth century is graphically evident in the Frankfurt engraver and publisher Theodore de Bry's fourteen-volume *Grands voyages—historia Americae* (1590–1634).<sup>110</sup> Gianbattista Ramusio's earlier *Navigazioni et viaggi* narratives of the Atlantic discoveries had lacked illustrations, partly because their maps were destroyed by fire, and the impact of de Bry's copper-engraved illustrations was considerable. Opening with an image of Adam and Eve under the tree of knowledge, de Bry locates the New World within Christian space and time. His characteristic mode of geographic representation resembles Danti's Vatican chorographies in its synoptic view over a mapped coastline, sweeping down to details of topography, ecology, and ethnography. Recognizably human and far removed from the monstrous races, the peoples of the New World—naked, exotic, ornamented, dignified in posture and conduct—often assume the pose and stature of classical figures. A questioning of normative European humanity similar to Montaigne's is suggested by de Bry's inclusion of ancient peoples drawn from beyond the classical Mediterranean ecumene, for example, Picts and ancient Britons. Their savage posture and painted bodies place a question mark over the European reader's own cultural inheritance.<sup>111</sup>

Not only Europe's past offered challenges to the image of global harmony implicit in the Apollonian vision. An extraordinary mid-sixteenth-century engraving by Pierre Eskrich accompanying a cosmographic text by Jean Baptiste Trento uses the Ptolemaic picture in a devastating Calvinist parody of papal claims to global mission. The *Mappe-monde nouvelle papistique* illustrates the whole earth contained within Satan's gaping maw, the wind heads not angels but fire-spitting devils.<sup>112</sup> Papal imperialism is a lust for power, the New World's spices are the opium of Catholic superstition, the Mass itself a conflation of cannibalism and theophagy. Habsburg geopolitics circle the globe in a belt of human destruction. The map adopts even as it subverts the principles of cosmographic science, its fanaticism shaping the image of the world into a labyrinthine representation of Rome's urban topography.

The papist world map's emblematic use of the global image exemplifies an important feature of late Renaissance cosmographic discourse. In his *New Atlantis* of 1637 Francis Bacon wrote that "the end of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire."<sup>113</sup> Bacon's triad would find graphic expression in the emblematic globe.