The Worldmakers

Global Imagining in Early Modern Europe

AYESHA RAMACHANDRAN

The University of Chicago Press

CHICAGO AND LONDON

A SHORT HISTORY OF "THE WORLD"

One of the first signs of change is lexical: the words used to designate "world" in both classical and vernacular languages undergo significant reconfiguration over the sixteenth and seventeenth centuries. Derived from two related but distinct classical concepts—the *oikoumene* or *orbis terrarum* (the "circle of lands") and the *kosmos* or *mundus* ("the world" or more amply, universe)—the words for "world" in most European vernaculars (*world, welt, monde, mondo, mundo*) begin to combine both meanings into a single term in the early modern period. This gradual fusion is evident, for instance, in the difference between the expressions of the idea "world" in Cesare Ripa's late sixteenth-century *Iconologia* (1593) and Giambattista Vico's early eighteenth-century *Scienza nuova* (1725). Taken together, they measure the intellectual transformation witnessed by the early moderns; at the same time, they suggest models for the study of such cultural change.

Ripa's influential *Iconologia,* the Renaissance sourcebook of iconography, contains several emblematic representations of the world—or rather, of various aspects of it. Ripa includes detailed instructions on how to represent *Terra* (the element of earth), *Mundus* (the World), the four continents (America, Asia, Europe and Africa), as well as emblems for the disciplines of cosmography, chorography, and geography. Each represents a particular world-picture, and their cataloguing as distinct images and categories marks a process of fragmentation. But Ripa's divisions also reveal how a multifaceted conception of the world was being developed in symbolic form.

The *Iconologia* depicts a distinction that underpins words associated with "world" throughout the early modern period (*weorold, worold, world* in Old English; *kosmos* and *oikoumene* in Greek; *terra, orbis terrarum, mundus* in Latin). On the one hand was the natural world, the bounty of the earth and the glory of human culture and civilization: *terra* signifies the fertile land and all that it sustains, organically or architecturally. At the other extreme was the charged moral field of *mundus,* the world, which retained its medieval associations with vice, corruption, and metaphysical decay (worldliness) even as it came to signify the immensity and beauty of the cosmos.[14]

The emblems for *Terra* and *Mundus* thus present dramatically different, gendered versions of the world. Earth, grouped with the other elements early in the work, is described as "a matron sitting upon a globe, with a cornucopia in one hand, and a sceptre in the other."[15] She is said to wear a "mural crown" or a garland of flowers and fruits, and her typically green garments are decorated with floral motifs. This iconography links *Terra* to *Natura* and *Scientia,* and Ripa explains that her attributes transform her into a figure of both nature and culture: she is the mother of all animals; the globe denotes the sphere of the earth, while the cornucopia and foliage represent the products of the land; the crown "alludes to the buildings for the accommodation of the inhabitants." *Terra* thus signals the conjunction of human and natural worlds, an intersection that produces political and social action as well as scientific inquiry.

Mundus, however, is a pictured as an Atlas-figure, "a strong man, supporting a golden coloured globe on his shoulders with the constellations marked upon it." He is dressed in a garment of haircloth, covered with long bejeweled purple robes. Ripa's exposition moves away from the language of fruitfulness and civilization associated with *Terra* and instead enters the realm of natural and moral philosophy. Strength and support of the globe allude to "endurance of the evils, toils, and labours of this World"; this time, the globe denotes "the splendour, perfection, order, and harmony of the

Universe, and the amazing works of Creation and Providence." The haircloth, however, is a reminder of "the miseries, misfortunes and difficulties of this present state," while the pomp of his robes "signify that the pursuit of riches and worldly grandeur is vain and transitory" (2.160). *Mundus,* the World, figures the lure of knowledge and the transfiguring beauty of universal creation; it also reminds us of the need for metaphysical reflection.

While Ripa's emblems synthesize these differences into intelligible visual wholes, it is only in Vico's mammoth *Scienza nuova* that we get an etymological history of the concept "world" that reflects back on the transformations of the two previous centuries:

> The theological poets felt the earth to be the guardian of boundaries, which is why it was called *terra.* The heroic origin of the word is preserved in the Latin noun *territorium,* territory, meaning a district over which dominion is exercised. . . . The Latin grammarians mistakenly derived territory from *terrere,* to frighten, because the lictors used the terror of the fasces to disperse crowds and make way for the Roman magistrates . . . [but] the true origin of the verb *terrere,* to frighten, derives from the bloody rites by which Vesta guarded the boundaries of the cultivated fields, in which civil dominions were to arise. The Latin goddess Vesta is the same as the Greek Cybele or Berecynthia, who is crowned with towers, *torres,* or strong situated lands, *terrae.* From her crown there began to take shape the so-called *orbis terrarum,* or world of nations, which cosmographers later expanded and called the *orbis mundanus,* mundane world, or simply *mundus,* world, which is the world of nature. . . .
>
> [In] early Latin *mundus* meant a slight slope. . . . Later, everything that trims (*monda*), cleans, and adorns a woman was called *mundus muliebris,* feminine ornament. Eventually, the poets understood that heaven and earth are spherical; that each point of their circumference slopes in all directions; and that the ocean washes the earth on all sides. So when they saw that the whole is adorned with countless various and diverse sensible forms, the poets called the universe *mundus* as a beautiful and sublime metaphor for the ornament with which nature adorns herself.[16]

Vico's creative reconstruction of the concept's evolution from the specificity of the land (*terra*), to civil dominion over a wider region, and eventually to a universal ideal of beautiful order (*mundus*) parallels Ripa's differentiation, and like the iconographer, owes much to a long literary and philosophical tradition. But the categorical differences in Ripa are, in Vico, part of an intellectual-historical continuum.

Isidore of Seville's seventh-century *Etymologiae* had already divided the study of the world into sections on the cosmos ("De mundo et partibus") and on the earth ("De terra et partibus"), noting that the Latin *mundus* was an attempt to translate the meanings of the Greek *kosmos,* a word that presented a distinctly aesthetic understanding of the universe, since it signified order, beauty, form, fashion, and ornament.[17] On the political plane, the Roman historians Livy and Herodian had suggested links between Roman territorial concepts and religious ritual—accounts that were then faithfully reproduced by Renaissance cosmographers and lexicographers. Early modern thinkers, however, added a new term—"the universal world"—a hybrid that marked the integration of land and sea into a single terraqueous planet.[18] By the early eighteenth century, the geographical contours of the world had been reconceived by cartographers such as Ortelius, Mercator, Hondius, and Blaeu; the "world of nations" had been brought into political existence by conquests in the Americas and the Peace of Westphalia; and the "world of nature" seemed continuously to expand as scientific study probed both infinite space and the infinitesimal microbe. Vico's attempt to integrate classical origins and modern reconfigurations into a single seamless narrative reflects a point of culmination, the description of a newly completed event.

The Italian philosopher's "poetic cosmography" differs sharply from earlier compilations in its focus on the unexpected ways in which cultures synthesize meaning and create new conceptual categories. Vico is less interested in establishing what the concept "world" means than in how it comes to have multiple meanings and why it means in these particular ways. Here, as elsewhere, Vico emphasizes the intersection between poetic mythmaking and historical contingency: the *orbis terrarum* (circle of the earth), once derived from the crown of towers worn by the earth goddess Cybele, is now simply a collective term for the world of nations; the beauty of feminine ornament has, over time, become a "sublime metaphor" for the ordered universe.

If such etymologies and emblems are the fragments through which Vico traces a culture's transformation, his interest in the assimilation of poetic naming and narrative into cultural memory offers an unusual model for this book as well. The *Scienza nuova*'s recovery of long-forgotten acts of *poiesis* invites us to reexamine them too from a postmodern stance. *Poiesis,* the act of making, is an epistemological practice for Vico, the only mode of knowing with certainty. If, as he had famously argued, "verum et factum convertuntur" (the true and the made are interchangeable), we can only truly understand what we have made.[19] Full knowledge of any thing involves discovering how it came to be what it is as a product of human ac-

tion.[20] From this perspective, Vico's discussion of the world suggests that it too is humanly made through constructive acts of naming. The centrality of "theological poets" to Vico's method signifies a crucial link between *poiesis* and epistemology, making and knowing, and thereby lays the philosophic foundation for understanding how a plethora of local details may be transmuted into encyclopedic knowledge of the whole. Vico's vision of a poetic epistemology and his history of the term "world" provide inspiration for this project, which tells a previously unexamined cultural and intellectual history of "the world" by excavating its symbolic, ideological, and metaphysical freight.

A PROJECT OF MODERNITY

Few ideas have become so thoroughly associated with the emergence of modernity in Europe as that of a globalized, interconnected, secular world. The phrase "modern world" has in fact become a shorthand for a global environment characterized by scientific rationalism, large-scale economic networks, international realpolitik, and agnostic skepticism. Not surprisingly, then, recent scholarship on globalization and world-systems has emerged primarily from the social sciences, particularly economics, historical sociology, and cultural anthropology, thereby reiterating the basic elements of a familiar historiography despite overt gestures of critique. But to recognize the world as a subject in its own right—rather than as a background for or byproduct of large-scale historical processes—is to rethink traditional narratives about the genesis of the Copernican universe and the making of the modern world.

In its emphasis on human making, *The Worldmakers* tests one of the key shibboleths of modernity: the entwined rise of secularism and scientific empiricism. Contrary to the now-classic Weberian narrative of modernity and disenchantment, I argue that the invention of the modern world owed much to theology and the spiritual practices of imaginative identification; it remained enmeshed in metaphysics and the creative faculties of the "intellectual imagination" even as it drew on the tools of empiricism, mathematics, and the new science. Central to this story is not only a new technological facility and belief in human reason but also an integration of earlier forms of magical thinking—hypothesis, metaphoric association, symbolic correlation, aesthetic formalism—into scientific practice.

The Worldmakers thus seeks to move conversations about globalization and modernity beyond the events and material processes that were its catalysts to the imaginative responses that sought to comprehend them. Philosophical critiques of modernity in the twentieth century from Heidegger to Habermas and Foucault have argued that the modern world was founded upon a rationality that stripped away alternate forms of knowing—speculation, meditation, intellectual intuition—in order to establish the hegemonic universalisms of the Enlightenment. But my inquiry into early modern worldmaking raises fundamental questions about such accounts as it reveals the persistence of those earlier modes of thought. I argue instead for an alternate genealogy for modernity, one that emphasizes the collusion of empiricism and the poetic imagination and highlights the continued significance of metaphysics alongside a supposed "epistemological rupture."[21] If the modern age, for Heidegger, begins when we no longer seek a picture of the world but rather when the world comes to be "conceived and grasped as a picture," the early modern project of worldmaking illustrates how this inversion came about.[22] The making of the modern world, in this book, depends finally on the synoptic energies of the imagination even as its individual elements are produced through rational inquiry and action.

Recognizing modernity's debt to self-conscious worldmakers brings a new perspective to two distinct matters: the question of religion in modern life and the much-debated connection between modernity and empire. Attention to the spiritual and theological roots of worldmaking reminds us that the world's creation and its domination were traditionally the provenance of the deity.[23] The transfer of worldly authority from divine to human hands provided the legitimation for early European imperial ambitions (the title *dominus totius mundi,* once reserved for God, was later appropriated by individual monarchs). It also underwrites a now conventional narrative about the rise of secularism as a condition of post-Enlightenment modernity. And yet, the persistence of theological rhetoric in worldmaking accounts suggests how the skeptical crisis of modernity could also engender a new, more robust faith—a historical insight that is in keeping with Charles Taylor's recent analysis of the persistent place of religion in the modern world.[24]

Consequently, this book argues for the importance of reevaluating the metaphysical foundations of the modern world. These are discernible in the early modern competition between different philosophical systems, particularly the repeated confrontation between Platonic and Epicurean philosophy which epitomized a wider struggle between two kinds of metaphysics: one founded on the (theistic) principle of divine creation and cosmic order, the other based on an (atheistic) belief in worldly contingency, mutabil-

CHAPTER ONE

Mapping the Body, Mapping the World: Mercator's *Atlas*

The 1595 Duisburg edition of Mercator's *Atlas* opens with a now iconic engraving (fig. 4). A muscular man with a white beard and flowing red mantle scrutinizes a globe and a pair of compasses. Another globe rolls between his legs as the sky unfolds behind him. The entire tableau is encased within a classical architectural façade whose Corinthian columns may gesture symbolically toward the Pillars of Hercules. Above, two *putti* support an enormous astrolabe as though imitating the figure below them. *Atlas sive Cosmographicae Meditationes de Fabrica Mundi et Fabricati Figura,* reads the title: "Atlas or Cosmographical Meditations on the Making of the World and the Image of the Made [World]."[1]

The iconographic concision of the image combines technical illustration with the visual rhetoric of contemporary allegorical prints and emblem books, offering a counterpart to the double title that explores representational and conceptual boundaries.[2] For this text simultaneously names a person (Atlas) and a set of spiritual and aesthetic practices (cosmographic meditations). It reflects both on the making of the world itself (*fabrica mundi*) and on the figuration (in maps) of that world understood as an artifact (*figura fabricati*). Presenting a particular individual perspective as well as a universal gaze over global spaces, the frontispiece seeks to bring these opposing scales into relation. But as an allegory of making, it announces a bold new argument: the mapmaker *embodies* the world. In material and metaphorical ways, the human body and the global body become one.

FIGURE 4. Frontispiece from Gerhard Mercator, *Atlas* (Duisburg, 1595). Courtesy of the Library of Congress; reproduced from an original in the Geography and Map Division.

COSMOGRAPHIC DESIRE

This striking visual proclamation identifies the *Atlas,* and its author, Gerhard Mercator, as icons of worldmaking. An innovator in the development of world mapping, Mercator, perhaps more than any other historical figure, is closely associated with a paradigmatic shift in the image of the world. His 1569 navigational projection—the so-called Mercator Projection—produced a vision of global space that remains familiar; it is even the basis of the Web Mercator platform used by Google Maps and in ArcGIS systems today.[3] Beyond this technical breakthrough, his influential *Atlas,* whose title now names the genre, established the form, structure, and organization of world atlases for over two centuries, shaping cultural perceptions about the nature and order of the world itself. Thus, like the quincentennial commemorations of Columbus's first voyage to the Americas in 1992, the five hundredth anniversary of the Flemish mapmaker's birth in 2012 was also an occasion to reflect on the historical emergence of a modern world-picture. "He mapped the world, and we saw ourselves," began one popular tribute, honoring the transformative power of his cartographic achievements, which quite literally "changed the way we see the world."[4]

Endlessly subject to revision, the world and its recognizably "modern" visual representations in maps slowly came into focus over the course of the sixteenth century. If the world map emblematizes a changing world picture, it is also almost synonymous with worldmaking. The history of planispheric images—from Juan de la Cosa's *Mappa mundi* (1500), the earliest extant European map to incorporate the Americas, to the 1599 Wright-Molyneux chart, which popularized the Mercator projection—tells the story of a fluctuating idea of a global totality. Mercator's *Atlas* marks the culmination of this decades-long effort. Its innovation lies in recognizing that the cosmographic challenge was not merely technological or political but rather metaphysical and therefore radically conceptual in scope. Ironically for a work hailed as a cartographic point of origin, most of its maps had already been published in the 1570s and 1580s; even the plates used for the *Atlas* were engraved not by Mercator but mostly by his sons and grandsons. The importance of the *Atlas,* however, lies in its understanding that reimagining the world as a visual whole on a map necessarily demanded a philosophical, theoretical counterpart—a reevaluation of the world's structure and the individual human being's position in relation to it. Moving beyond traditional cosmography's compendious data collection and compilation of maps, the *Atlas* defines an intellectual watershed by seeking to envision the totality of the world.

Cosmopoesis

Capturing the world in a single glance on a map demanded unique skills and a vast network of informants and sources. Mercator's career-long quest to understand and represent the world in its entirety therefore participates in the complex web of relations joining various sixteenth-century communities and interests. Mapping the world depended on a synthesis of information drawn from a heterogeneous group—from cosmographers, craftsmen, and printers, to sailors, diplomats, political patrons, philosophers, and would-be theologians. The mapmaker acted as a synapse, gathering, consolidating, and relaying visions of the world through a mix of technical skill, scientific knowledge, humanistic learning, and a capacious, creative imagination. Eventually settling in Duisburg after leaving volatile Louvain in 1552, Mercator crafted this intermediate professional position—between the anonymous craftspeople in artisanal workshops, the gentlemen-virtuosi of the court, and the orthodox schoolmen of the universities—for himself. As a calligrapher, instrument maker, cartographer, cosmographer, mathematician, astrologer, printer, and would-be philosopher, he was thus uniquely positioned to confront the challenge of worldmaking. In his diverse attempts to map the world—from the *Orbis imago* (1538) to the posthumously published *Atlas*—we see one of most multifaceted early modern attempts to grapple with the integration of new global knowledge into a coherent system.

The development of this lifelong experiment emerges clearly in Mercator's writing, for unlike many contemporary cosmographers, he returned repeatedly to questions of cosmic scope, rarely engaging in regional or national mapping projects. When he did focus on regional maps—such as his detailed atlas of Europe (1585)—they were conceived as part of an *opus magnus* on the whole world. In the late 1530s and 1540s, while still in Louvain and part of the circle around the Flemish physician, cosmographer, and mathematician Gemma Frisius, Mercator worked on terrestrial and celestial globes and dabbled in astrological questions. A recently discovered astrological disc made by him attests to an early interest in astral and cosmic matters by 1551.[5] As early as 1563, his edited lecture notes on cosmography published by his son, Bartholomeo, gesture toward an ample understanding of the mapmaker's task: a marginal keyword describes his project as a "cosmopoeia"—literally, a world-making.[6]

By the late 1560s, Mercator seems to have already envisioned a place for the *Atlas* outside the bounds of geography and within the broader realms

of philosophy and theology.[7] The introduction to the *Chronologia* (1569), his work on universal chronology published the same year as his famous map projection, describes what he intends to pursue:

> At first, I had intended a work in two volumes, the description of the heavens and that of the earth. As, however, in philosophic study history takes the first place, I recognized that to cosmography and geography also belong the origin and the history of the heavens and of the earth and of their parts.[8]

These lines connect the map, *Nova et Aucta Orbis Descriptio* (1569), to a larger philosophical project and also anticipate the *Atlas*'s grander frame by placing both works beyond the typical scope of cosmographies, such as those of Apian or Münster, or of a largely geographic atlas, such as Abraham Ortelius's *Theatrum orbis terrarum* (1570). Mercator notes that the task of description leads to philosophic and historical questions of origin and order, of the temporal as well as spatial connections between the earth, the heavens, and their parts. A similar sentiment, articulated as a biographical narrative, emerges in the dedicatory letter to his 1578 edition of Ptolemy:

> In my youth, geography first became my field of study, in which as I progressed, by using natural and geometrical speculation. . . . I found marvels, not only in geography, but in the constitution of the whole machine of the world, much of which has until now been explored by no one.[9]

Mercator traces the development of his own fascination with the "constitution of the machine of the world" (*mundanae machinae constitutione*), that is, the entire structure of the universe itself, to his early interest in geography. Pursuing interests in geometry and natural philosophy, he moves beyond the confines of geography and casts himself as an intellectual explorer who seeks what "has until now been explored by no one." Shifting from the earthly plane to a cosmic vision, these passages chart a movement from the act of representation to a reflection on the process and consequences of representation, from a technical mapping of the world to a theoretical meditation on cosmographic themes.

In his *Life* of Mercator (1595), included in all versions of the *Atlas*, Walter Ghim also traces these ideas to the dedicatory letter prefixed to Mercator's maps of France and Germany, published in 1585:

> The arrangement and order of the work demanded that I first treat of the making of the world and the arrangement of its parts generally; then of the order and motion of the celestial bodies; thirdly of their nature, radiation, and conflict in their workings, in order to inquire more truthfully into astrology; fourthly, of the elements; fifthly, of the description of kingdoms and the whole earth; sixthly, of the genealogies of princes from the beginning of the world, in order to investigate the migration of peoples and the first inhabitants of the earth and the times of inventions and antiquities. For this is the natural order of things, which easily demonstrates their causes and origins and is the best guide to true science and knowledge.[10]

Almost twenty years after the *Chronologia,* Mercator's project has crystallized in form, but what he envisions bears little resemblance to contemporary map books. It might best be described as a world-systems theory, a comprehensive exposition of a vision of world order, a structuring of all knowledge that moves systematically from a macrocosmic, celestial, and planetary plane to a microcosmic, socio-political, and individual plane. While this vision was never completely executed, its shape seems clear. It was to be in five parts: a treatise on the creation of the world; a description of the heavens; the description of the earth; the genealogy and the history of states; and finally, a universal chronology, from the Bible to the present. When thinking of representing the world, what Mercator has in mind is a new *organon*.

Mapping and Mimesis

The posthumous publication of the *Atlas* marks the final form of Mercator's lifelong ambition, whose evolution spans most of the sixteenth century and bears its imprint. From a literary historical perspective, the volume's title is striking and strange. It introduces a new nomenclature for the map book, replacing the conventional "theater" or "mirror" metaphors with the materiality of a human body. It therefore effectively interrogates and reimagines the mimetic claims of the mapping enterprise. The *Atlas* troubles the illusion of the map as a transparently mimetic object—a "mirror of the world"—by highlighting the function of the human mapmaker as a mediator; it is through his particular perspective and technical gaze that we see the world visualized on the page. The title's strategic balancing of two terms, *Atlas sive* ("or") *cosmographicae meditationes,* joins the external spatiality of the material world with the internal spaces of the corporeal body and the imagining self, exploring the favorite early modern trope of the "great body of the world."

Mercator's intuition that the task of mapping the world was intimately linked to knowledge of the self is clearly on display in the *Atlas*. It touches on a fundamental dilemma that underlies the cartographic enterprise: to

represent the world, the mapmaker must first create it. At the opening of the *Geography*, Ptolemy describes the discipline as a *mimesis*: "*Geographia* is an imitation [*mimesis*] through drawing of the entire known part of the world together with the things that are, broadly speaking, connected with it."[11] But describing the practice of world mapping as *mimesis* is at once deeply intuitive and utterly counterintuitive. Though we imagine that the map represents the 'real' world with all its particularities, the world map has no external referent because a simultaneous view of the globe's convexity cannot be captured. Opening the three-dimensional sphere onto a two dimensional plane is a heuristic exercise forged through the union of art and number, the synthetic imagination of the mapmaker and his grasp of mathematical geometry. As Christian Jacob argues, the map is "the materialization of an abstract intellectual order extracted from the empirical universe" so that "without the map, the world has no contour, neither limit, form, nor dimension"; it creates "the world" as a clear concept and field of inquiry in the very act of representing it.[12] "The world" as a visual object comes into existence only *through* its representation on a map; it is always posterior to its supposed imitation. In world mapping, creation and imitation become indistinguishable.

This understanding of the cartographic task invests the individual mapmaker and atlas-compiler with tremendous power. He is no mere copyist who mechanically reproduces a finite object from life. Instead, he becomes a worldmaker—one who creates in the very act of representing. As the world is known and produced through the body of the artisan-cartographer, from the intellectual processes of abstraction to the manual skill of drawing and engraving, the particular and the universal interpenetrate. From this perspective, the mapmaker mimics the creative deity, activating a complex analogy between human and divine making. By reframing the map book as a "cosmographical meditation," Mercator emphasizes its place within a spiritual context of meditative contemplation even as he celebrates its scientific mastery. Eventually, the cartographer will threaten to displace the theologian: Mercator's final work, published as the first part of the *Atlas*, is a commentary on Genesis entitled "De mundi creatione ac fabrica" ("On the Creation and Making of the World").

The *Atlas* rests on a fusion of the technical, the theological, and the poetic, self-consciously asserted in its subtitle, "de fabrica mundi et fabricati figura." *Fabrica* and *figura* are key terms here, derived from quite different (though related) discourses. Associated with technical manuals in the early modern period, *fabrica*, from the Latin *fabricare* (to make), refers to the

artisan's workshop, and in a transferred sense to his art, trade, or profession, or to the products of his craftsmanship. *Figura*, on the other hand, draws on a lexical history that derives primarily from rhetoric and aesthetics, and then becomes linked to biblical hermeneutics. Concerned with "plastic form," with artistic or poetic figuration, it confronts the problem of mimesis—the relation between original and copy. As Erich Auerbach has famously shown, *figura* also acquires a historical dimension, as a term that mediates different but related historical events.[13] Deploying these terms in tandem, Mercator suggests that worldmaking through a map book requires the union of technical craft and aesthetic criteria to make historical connections between past, present, and future. Worldmaking in this view demands the skills of artisan, poet, and prophet.

These analogies between making and representing in the *Atlas* explain why the growth of world atlases as a genre is so central to the world's emergence as a distinct object of inquiry in the early modern period. The term "world" acquired a stable meaning only when it had acquired visual form in images that were rapidly canonized as *typus orbis terrarum*—the ideal type or image of the world. If, as Lorraine Daston and Peter Galison have noted, scientific atlases register an outbreak of epistemic anxiety, then the signs of global redefinition should be legible in the outpouring of cosmographies and cosmographic atlases in the sixteenth century—a process recorded in the conceptual leap from Ortelius's *Theatrum orbis terrarum* (1570), considered the first world atlas, to Merctaor's *Atlas* (1595), the first map book to bear that name.[14] The crystallization of the geographic atlas as a genre occurs in tandem with the crystallization of "the world" as a visually recognizable "working object."[15]

The *Atlas* emphasizes the process and stakes of global representation as much as the maps that are its final products. In the symmetry of *fabrica* and *figura* lies a question about the world and its image. The body of Atlas on the frontispiece celebrates that interplay between a particular self and the world as a whole. The vision of a modern world produced by would-be worldmakers such as Mercator thus claims mimetic transparency even as it acknowledges ideological opacity. It is a world discovered and invented, a world charted and a world made-up.

FABRICATING THE WORLD

Mercator's *Atlas* is the only map book in the sixteenth century to claim that it is about the making of the world—*de fabrica mundi*. Of all the published

books in Europe with the word "fabrica" in their titles, almost all are either technical manuals (with the generic title, "de fabrica et usu"—on the making and use) or anatomical treatises.[16] As Jackie Pigeaud notes, "fabrica" becomes an integral term in the technical lexicon of medicine in the Renaissance, particularly of human anatomy.[17] From Theophilus Protospatharius's epitome and commentary on Galen's *De usu partium,* which was entitled *De corporis humani fabrica,* to Vesalius's groundbreaking anatomical atlas, *De humani corporis fabrica* (1543; 1555) and its many imitators, by the late sixteenth century the term "fabrica" was almost synonymous with studies on the structure of the human body. Why then does Mercator use it in his *Atlas,* connecting his subject—the world—with a human body on its title page?

The claim that "man is the image of the world" belongs of course to an ancient tradition of microcosmic thinking, which persisted through the early modern period and connected the human body to the cosmos in material, spiritual, and metaphorical ways.[18] An essential part of the cosmographic literature, it is enshrined in the opening definitions of Ptolemy's *Geography,* which uses an anatomical analogy to differentiate between cosmography and chorography: "The goal of *chorographia* is an impression of a part as when one makes an image of just an ear or an eye; but [the goal] of [*geographia*] is a general view, analogous to making a portrait of the whole head."[19] Peter Apian's now much-discussed illustrations (fig. 5) of this contrast in his popular *Cosmographia* (1524) ensured its place in the canon of texts used by geographers of all stripes, but they also exploited a deeper disciplinary connection between anatomy and geography.[20] In the *Geography,* Ptolemy presents chorography as a kind of surgical operation, a process of cutting the body of the whole (cosmographic) world into pieces in order to better investigate the individual part. The verb he uses (*apotemnomai*) signifies an act of dissection, a cutting off, severing, or dividing up a body or an area.[21]

By the mid-sixteenth century, however, Ptolemy's language of geographic dissection would have found its closest analogue in another "new" discipline and genre—the anatomy, epitomized by Vesalius's *De humani corporis fabrica,* a book with its own claim to be the first "atlas." The chorographic cutting of the world into pieces for closer scrutiny paralleled the study of anatomy with its practice of dissection—the cutting open of the human body for closer scrutiny—which became widely practiced over the sixteenth century. Anatomy is frequently juxtaposed alongside cartography as a key harbinger of empiricism and modernity: in both cases, new techniques of gathering information produced new knowledge and necessitated new the-

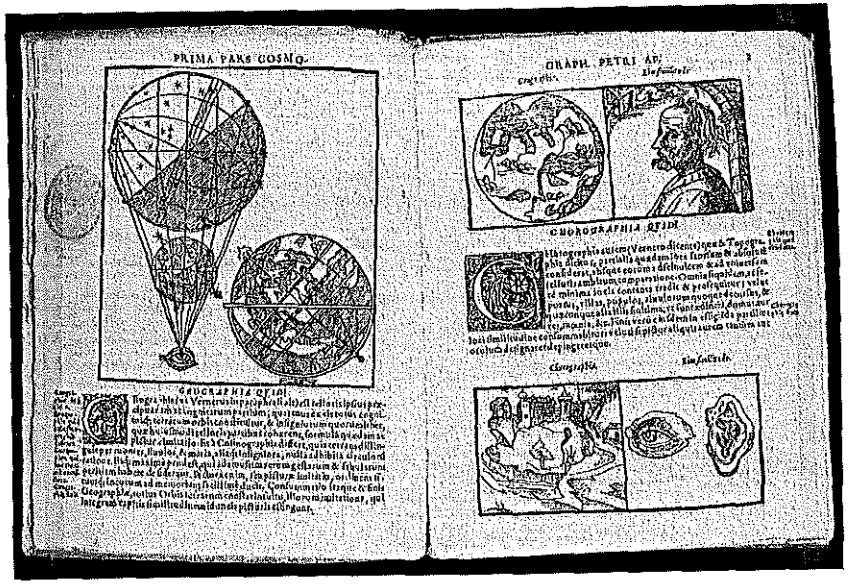


FIGURE 5. From Peter Apian, *Cosmographicus liber* (Landshut, 1574). Courtesy of the Beinecke Rare Book and Manuscript Library, Yale University.

oretical accounts of entire systems.[22] But as the frontispiece to Mercator's *Atlas* suggests, the two discourses did not proceed merely along parallel, analogous tracks. They were closely related in their epistemologies, their histories, their metaphorics, and their representational strategies, so much so that both disciplines produced similar textual genres that attempted to gather and systematize a comprehensive body of knowledge.

This conjunction signals how strongly interconnected was the development of the modern notions of self and world, as the mapping of the world and the "mapping" of the body seemed to take place through similar means. Rhetorically, the materialities of geographic and bodily space become powerfully fused in the early modern period, paving the way for subsequent analogies between the individual human body and the great body of the world. This was not only the consequence of a normative application of maps' geometric rationalization of space to the depiction of human bodies, as Valerie Traub has argued. The conjunctions between anatomy and cartography reveal a profound, almost subterranean set of images, metaphors, and vocabularies that helped join together the experience of simultaneously inhabiting both a particular body and the world at large.[23]

Medicine and geography overlapped on a practical level, since many

cartographers had been trained as physicians—a partial list includes such notable figures as Gemma Frisius, Thomas Geminus, Wolfgang Lazius, Oronce Finé, Lorenz Fries, Charles de l'Escluse, Johannes Mellinger, and Johannes Sambucus. Resemblances between territorial and corporeal spaces were frequently made: the similarity between the circulation of blood and the earth's hydrography, for instance, was almost commonplace, while mathematical grids were used for anatomical drawing as well as for cartographic representation.[24] Theories about the relationship between the humoral body and the physical environment (*klimata*)—whether and why bodies were affected by place—would have been familiar from Ptolemy and Hippocrates and were hotly debated especially in the wake of travel to the torrid zones of Africa, Asia, and the New World.[25] The late seventeenth-century naming of the brain's hemispheres for the two halves of the earth may be a linguistic trace of these habits of analogy.[26] Other tropes, such as the figuration of uncharted lands as female, or analogies between land and ruler (or later, nation and national character) were conventional and exploited long-established medieval conceptions of the body politic. Classical theories of microcosm and macrocosm as well as the tradition of anthropomorphic geography in writers such as Strabo and Pliny all helped to construct powerful rhetorical links between body and world.

In this light, Mercator's implicit association of his book with Vesalius's anatomy deserves more attention since it reveals the *Atlas*'s desire to unite the human sphere of action with a new vision of the cosmos. It underscores the ways in which the redefinition of the world as a conceptual field was inextricable from the parallel reimagining of the human body and the self.[27] Anatomy was a powerful disciplinary analogue for geography since the anatomist displayed and described parts of the body that had hitherto never been observed, much as the mapmaker revealed parts of the world that had hitherto never been readily available for visual scrutiny.[28] Though still inspired by ancient analogies, these connections between body and world were increasingly based on empirical experience and observation: both Vesalius and Mercator claimed to surpass classical authorities (Galen, Ptolemy) and to forge new knowledge by resorting to autopsy and artisanal skill, typically neglected by learned schoolmen.[29] Similarly, both sought to transform their respective fields by aiming for a kind of universal synthesis. For Vesalius, *De . . . fabrica* represented an attempt to gather up and unite the scattered body of medical knowledge, much as Mercator would seek to unite all knowledge of the world in the *Atlas*.[30]

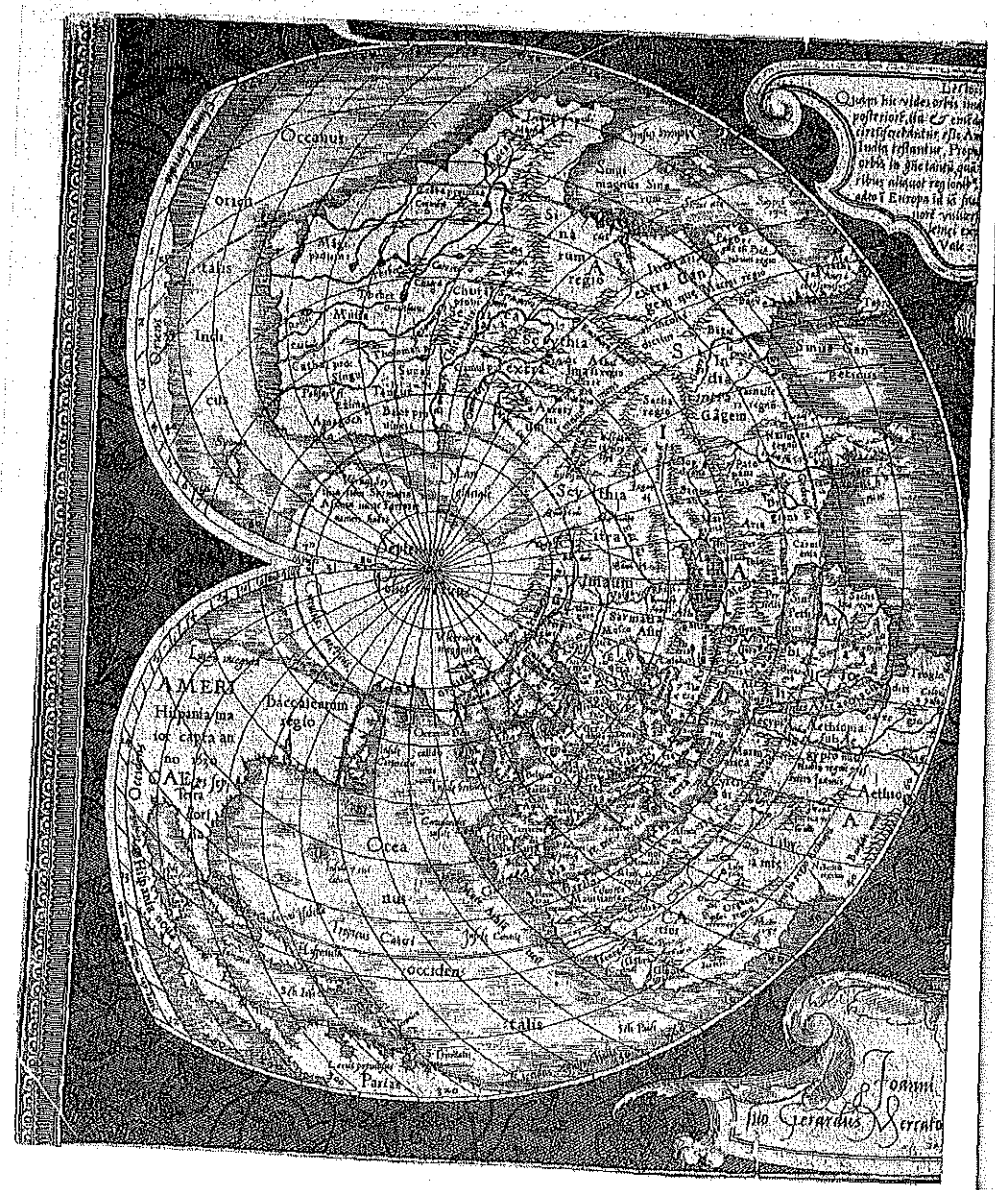
These parallels may even point to a specific link between the anatomist

and mapmaker. Both were close associates of Gemma Frisius and may even have encountered each other in Louvain between 1535 and 1540. In *De . . . fabrica,* Vesalius tells the grisly tale of how Gemma helped him rob a corpse from the gallows outside Louvain, thus launching his career in dissection, an event that has been dated to 1535–37. At this time, the young Mercator, a part of Gemma's "familia" of students, was also in Louvain, working with him on a set of globes. It is through Gemma too that Mercator may have become exposed to the exciting contemporary developments in anatomy in the years right before the publication of Vesalius's groundbreaking book in 1543: in 1540, Gemma was appointed a professor of medicine at the University of Louvain, where, along with his friend Jeremy Thriverius, he was keenly involved in reforming medical education, most notably by enhancing the importance of anatomy; he may even have assisted Thriverius in public dissections.[31] To what extent Mercator himself may have been interested in these activities is unclear, but his second published map provides a clue.

Orbis imago: *The World Is a Heart*

Mercator's first world map, *Orbis imago* (fig. 6), was published in 1538 and features a bi-cordiform projection based on Oronce Finé's 1532 map, *Nova et integra universi orbis descriptio* (fig. 7). The heart-shaped double hemispheric map is the first trace of the analogy between body and world in Mercator's oeuvre, connecting him to a cosmographic-medical tradition, since both Johannes Stabius and Finé, the projection's originators, were trained as physicians. One of a handful of true cordiform maps, it remains something of an anomaly eluding interpretation, since the circumstances of its production and its intended audience remain obscure, though it was commercially successful.[32] However, when considered alongside the emerging interconnections between body and world, the map takes on a richer meaning.

The cordiform maps of the early sixteenth century might be seen as participating in a symbolic economy of the heart, which was associated with a range of medical, political, and spiritual discourses.[33] As the primary seat of perception and organ of knowledge, the main receptor of sensory images and the seat of memory, the heart was the governor of the microcosm of the human body. Cosmologically it represented the center of the world and had long been associated with the sun; as late as 1628, William Harvey would open his *Exercitatio anatomica de motu cordis* by invoking the heart as "fundamentum . . . vitae, princeps omnium, microcosmi sol" (the basis of life, its chief organ, the sun of its microcosm).[34] These terms were already astrological



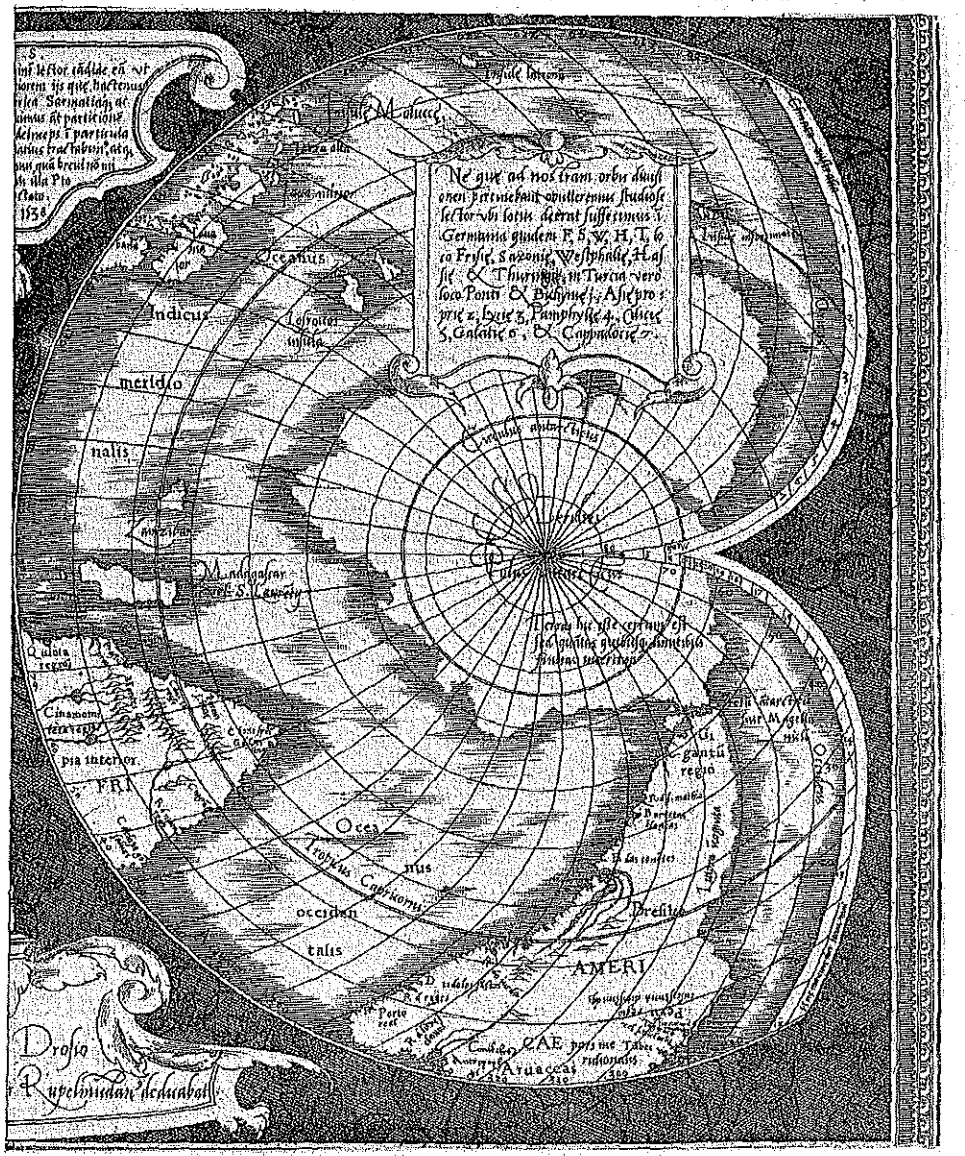


FIGURE 6. Gerhard Mercator, *Orbis imago* (1538). Courtesy of the Rare Books Division, the New York Public Library, Astor, Lenox and Tilden Foundations.

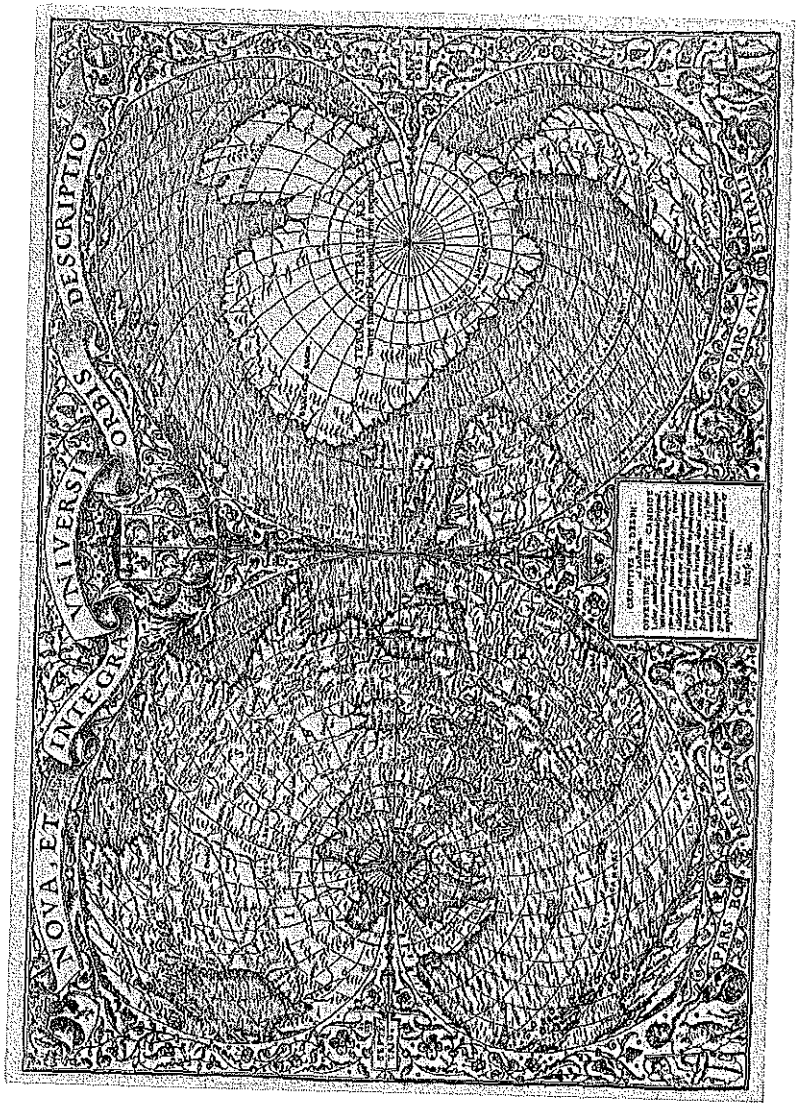


FIGURE 7. Oronce Finé, *Nova et integra universi orbis descriptio* (Paris, 1532). Map reproduction courtesy of the Norman B. Leventhal Map Center at the Boston Public Library.

commonplaces a century before: in 1550, the physician Antoine Mizauld, who dedicated his dialogue between Urania, the muse of astronomy, and Aesculapius, the god of medicine, to Oronce Finé, devoted an entire chapter to "the analogy or correspondence between the sun and the heart."[35]

Recent scholarship on medical humanism in the Renaissance has turned the spotlight once again on the deep affinities between astrology and medicine that underlies such an iconography.[36] The medicine-astrology connection was easily extended to cosmography, since most cosmographers and mathematicians of the period, including Stabius, Finé, Gemma, and Mizauld, dabbled in astrology as a sister art. The recent discovery of Mercator's astrological interests, and Steven van den Broecke's studies on the importance of Louvain in astrological debates in the sixteenth century, suggests that Mercator too was involved in such inquiries.[37] He may even have known Mizauld, a friend of Gemma's, while his later correspondence with John Dee attests to his sustained interest in the cosmic dimensions of the human body.[38]

Against this background, *Orbis imago* arguably looks like an initial attempt to take on questions of cosmic scope through a multilayered approach that combined mathematics, geographic reportage, and cosmographic theory with an astrological-medical angle. From a cartographic perspective, the map stands out for its mathematical skill, its precision engraving, and its bold insertion into a contemporary conversation on the nature and disposition of the continents—and by extension, the materiality of the earthly sphere as a whole. It is one of the first maps to connect North and South America into a single continent and to separate it from Asia, claiming a place among early attempts to solve the cartographic puzzle of the New World's boundaries.[39] The projection, which divides the earth at the equator, also depicts a vast austral continent whose exact boundaries are "incertum."[40] Mercator's departure here from the spatial configurations he had engraved on Gemma Frisius's globes just a few years before reveals the practical challenges of world mapping. His choices reflect theoretical debates on the nature of continents and the balance between land and water masses on the planet rather than any new empirical observations, and they foreground his interest in cosmographic speculations that were increasingly the realm of physics rather than geography.[41]

These are early intimations of Mercator's self-fashioning as a worldmaker: he grapples with the problem of integrating Old and New Worlds into a single mathematical frame, experiments with and updates Ptolematic projections, and through the map's symbolic form connects geographic matters to human

and spiritual realms. *Orbis imago* is a flashy beginning to a cosmographic career. Mercator asserts as much in the cartouche describing the map, which explains the scope of his project as a "division of the world along broad lines" that would be followed by individual maps of "particular regions."[42] *Orbis imago* may in fact be Mercator's earliest explicit statement about his plan for the great cosmographic project that would become the *Atlas*.

Like the *Atlas*, which explores connections between the body and the world through its iconographic frame, the form of *Orbis imago* signals cosmic interconnections between the image of a newly expanded globe and the most intimate core (*cor*, heart) of an individual.[43] Placing the heart at the emblematic center of such correspondences emphasized the harmony of the universe, for the Sacred Heart was a mystical symbol for Christ's compassion and love for humanity.[44] A corporeal organ endowed with divine meaning, the heart also alluded to the Incarnation, the manifestation of the divine in human form, and may even recall the superimposition of the body of Jesus upon the world in medieval *mappaemundi*.[45]

Even as the map glorifies the world as the supreme product of a divine maker, it also celebrates the cartographer's creative ability: Karrow notes that the map envisions the cartographer as "*homo faber;* he can split the world in unfamiliar and uncomfortable ways, but he also has the means, through mathematical reasoning, to bind it up so that it approaches once more the divine unity."[46] The implicit analogy to anatomical dissections, which were driven by the "claim that fragmentation is a means of getting at a unified truth," is once again present here.[47] Cutting open specimen bodies ultimately enabled the reconstruction of an idealized (universal) body by reconciling and integrating the range of human diversity.[48] Mercator's *Orbis imago* presents a kind of cartographic anatomy: the Americas seem flayed out, spread across three lobes of the map's two hearts; Asia and Africa are likewise spliced at their southern extremities. The logic of representation, driven by the power of geometric analysis, enables an opening up: it reveals a defamiliarized world, forcing us to look more closely.

This distortion, which makes it useless as a working tool, also makes *Orbis imago* a "mapmaker's map," a commentary on the craft of its maker.[49] Unlike Finé's map, which claims epistemic authority as a "new and complete description of the entire world," Mercator's map calls attention only to the task of representation—it is, simply, "an image of the world." The Latin *imago* aligns the map object with an aesthetic and poetic discourse of imitation usually associated with statues, busts, or portraits. It draws attention to the artist's hand, a particularly important matter to Mercator, since the

map showed off not only his scholarly claims to cosmographic knowledge but also his artisanal skill: as a copperplate engraving in his own hand, *Orbis imago* surpassed Finé's woodcut map through the double mastery of its maker. The beautiful italic hand and fine shadings on display here would become the basis of Mercator's first technical publication, a treatise on calligraphy for maps, as well as the gold standard for subsequent cartographic lettering.[50] *Orbis imago* thus reflects a profound material connection between the body of the artisan and his physical reconstruction of the world. By replicating Finé's map, Mercator physically retraced, learned, and reinscribed a vision of the world that was, in a crucial sense, a product of his own body. As Pamela Smith has suggested, such an experiential artisanal epistemology, gleaned by copying a master, becomes an act of cognition in itself.[51] The process of making a world map—measuring, drawing, naming, and integrating partial pieces of knowledge into a global framework—produces a comprehensive understanding of the world through the very act of reconstruction.

Atlas: The World Is a Man

These synergies between body and world find their fullest expression in the framing of the *Atlas*, whose paratexts diverge from contemporary cosmographies. The title page, followed by a portrait of Mercator, introduces three distinct sections before getting to the maps: a long eulogizing section featuring Ghim's biography of Mercator and various dedicatory poems, epitaphs, and letters; Mercator's exegesis of the Atlas figure and Johannes Mercator's poem on his grandfather's admiration for Atlas; and finally, a hexameral treatise on the creation of the world (the first part of the book). A second title page entitled "Atlantis pars altera. Geographia nova totius mundi" (The next part of Atlas. A New Geography of the Entire World) precedes the maps themselves and once again prominently identifies Mercator as the "Authore." This arrangement accentuates the mapmaker's role and casts the figure of Atlas as both his prime product and his surrogate.

Despite this textual insistence, Mercator's association of his book with Atlas has frequently been dismissed as conventional classical allusion since the Titan who holds up the world is a fairly frequent emblem for the disciplines of astronomy and cosmography.[52] Several scholars have argued that there was no particular significance to Mercator's naming and it is largely due to chance that a book of maps is today called an "atlas" rather than a "theater."[53] Yet, Mercator seems to disavow this interpretation. The muscu-

lar man on the title page is utterly unlike conventional allegorical depictions of Atlas, which typically show an old man bent over, straining under the weight he carries on his back. Indeed, the book's context and paratexts suggest that this historical choice may actually reflect an important conceptual shift rather than mere accident.

Ortelius's *Theatrum orbis terrarum,* which set the standard for geographic atlases, exploits the favorite early modern metaphor of the world as a theater, a stage for human action, and envisions the map book—and by extension, the world—as a space of representation and performance.[54] But where for Ortelius the mapping of the world is a narrative enumeration or collection of worldly knowledge which invites contemplation of historical and political action, Mercator's book places the accent on the technical craft of making the world. The *Atlas* displays the world's underlying structure, much as Vesalius's *De . . . fabrica* sought to reveal the making and structure of the human body. For Mercator, the mapping of the world is a revelation that makes the invisible whole visible to human eyes at a glance; it is a meditation on form, order, and the act of making itself.

The *Atlas*'s Atlas is a maker and measurer—his fingers imitate the shape of a compass—and he towers over puny replicas of the great world. He sits on a large rock, which may represent the hilltop of contemplation, and controls the globe with effortless authority.[55] The finger-compass, a rich trope in sixteenth century paintings, prints, and illustrations, symbolizes intellectual exploration and technical expertise, political dominion, creative power, and moral salvation. Visually, the dynamic energy of his pose suggests depictions of the creator God in medieval and Renaissance painting; his gestures activate a rhetoric that recalls classical and Christian evocations of God as a *deus faber,* an *artifex maximus.*[56]

The composition of the title page suggests that the figure may also refer to the mapmaker himself, since the marble plinth proclaims the name of the author: Gerardus Mercator of Rupelmonde, Cosmographer to the Most Illustrious Duke of Jülich and Cleve. This identification is enhanced by the book's next image, a portrait of Mercator (fig. 8), also holding compasses and a globe, in a gesture that imitates both the Titan who challenged divine authority and the divine creator himself.[57] If the visual associations were not sufficiently explicit, Johannes Mercator's poem, "On *Atlas* / by his grandfather, Gerardus Mercator," which follows some pages later, claims that Mercator saw himself as an Atlas-figure: "And because the virtue of the loftiest men is to be imitated, / my grandfather took this man [Atlas] as an example for himself."[58]

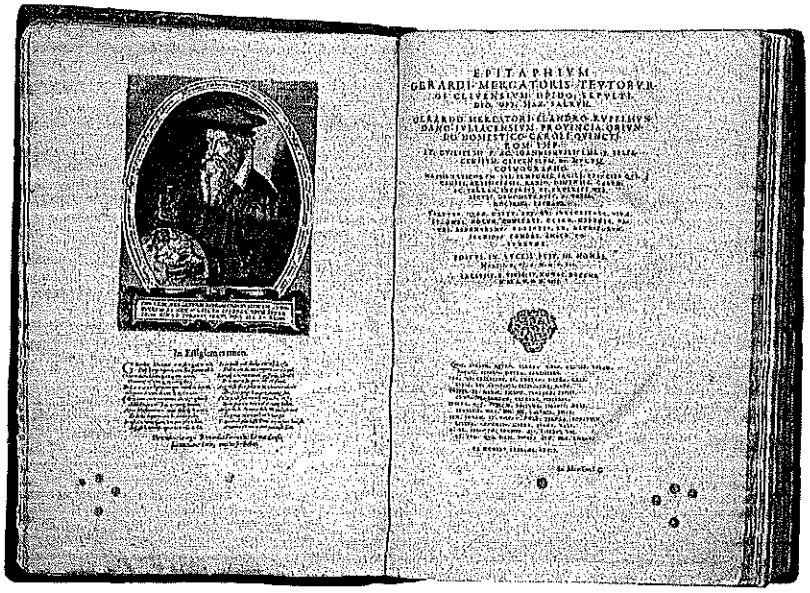


FIGURE 8. [Portrait] (after Frans Hogenberg), from Gerhard Mercator, *Atlas* (Duisburg, 1595). Courtesy of the Library of Congress; reproduced from an original in the Geography and Map Division.

This triple association of the body on the title page with classical mythology, creative (Christian) divinity, and the mapmaker's own craft suggests Mercator's quest for an emblem that would effectively represent the ambition of his book. Mercator's Atlas stands for all would-be worldmakers by emphasizing the centrality of the human body in attempts to comprehend the world—a world that can only be known through the partial vision and particular materiality of an individual. But that body also represents the knowing self who stands in the image of an all-knowing God, seeking to capture in a single cartographic gaze an omniscient consciousness of the whole. Here, the artisan-mapmaker is closest to the *deus artifex* in his physical task of recreating an image of the world since he too is a maker: the artisan's knowledge is elevated by analogy to the creative deity.

The history of scientific epistemology is also a history of the self, suggest Daston and Galison in their monumental account of the making of scientific objectivity.[59] The authority of the scientific atlas before 1800 and its claims to truth and epistemic legitimacy, they argue, depend on the mediation of a sagacious scientific practitioner who takes on an instrumental role in mak-

ing the knowledge displayed in the book's representative images. Such a figure guaranteed the work's truth-value by virtue of his own skill and stature as a knower; the book and the body of the knowledge it put forth drew their power from the body of their maker. Though Daston and Galison focus on the eighteenth century as a distinctive moment in the development of this epistemic ideal, Mercator's shaping of a precise textual presence—his crafting of Atlas as a mythic doppelganger and "scientific self"—suggests how, at its very inception, the genre of the atlas relied on an epistemic bond between self and world. Far from eliminating the hand of the artist-scientist in the making of knowledge, Mercator flaunts it.[60] For the earliest atlases were anatomical and geographic, and, by the nature of their subjects, were forced into metaphoric and metaphysical territory: to open up a human body or to reveal the harmonious structure of the world demanded a god's-eye view, an imitation of the creator in the act of reconstruction.

Mercator's Atlas is therefore situated at the threshold between mortals and immortals, a "dieu homme" who literally embraces the cosmos even as he measures and contemplates it.[61] Following mythographers such as Conti and historians such as Diodorus Siculus, Mercator adopts a euhemeristic interpretation of classical myth, identifying Atlas as a Phoenician king, though the genealogy he deduces owes much to Hesiod, Homer, and Ovid.[62] Mercator's iconography rationalizes the task of holding up the world as a metaphor for the intellectual grasp of its structure: Diodorus explains the mythic depiction of Atlas as an expression of his command of astrology and knowledge of the spheres.[63] This naturalization of Atlas also opens the possibility for the deification of a heroic human—here, heroism associated with knowledge-making—and Mercator's adoption of the Titan as a model might suggest his own claim to such a transformative achievement.[64] Mythography and humanist letters here enhance and legitimate empirical science.

Significantly, while Mercator emphasizes the learning, skill, and nobility of Atlas in his explication, he strategically glosses over the best-known classical tale associated with him: his participation in the Titans' rebellion against Zeus, a tale of gigantomachy that in the Renaissance had become a charged allegory for challenges to divine and divinely sanctioned political authority. But the story lurks in his stated sources, Diodorus and Eusebius, and its conspicuous absence signals the dangers that a self-consciously *human* worldmaker posed to theological, political, and social orthodoxies. Mercator—an irenicist and an Erasmian—may have perceived, exploited, but shied away from an aggressive exploration of these potentials. To claim

that humans, even modestly born artisans, could be worldmakers was to raise the dizzying possibility that access to cosmic form and global structure was not the privilege of an elite few but was attainable by the dint of reason and experience. More insidiously, it was to suggest a fluidity between—perhaps a substitution of—the divine by the human: the world's shape was perhaps ultimately knowable only through artificial human fabrications.

In God's Image

In his own lifetime, Mercator became a symbol for the triumph of the moderns over the ancients and a scientific model for future generations. But he was most celebrated as a seer who held the universe in his mind's eye, a prophet who could reveal the true relations between the earth and the heavens. The prefatory matter of the *Atlas* emphasizes these aspects of Mercator's achievement. "With heaven as auspice I espied all the earth, / reconciling things below with those above. / Through me, the stars of heaven shine in maps," claims Mercator ventriloquized by Johann Metellus. More prosaically, Lambert Lithocomos insists on the totality of Mercator's reach, which "revealed the breadth of the universal orb, / and everything there was in the universal orb."[104] But it is the humanist Bernardus Furmerius who offers a striking poetic counterpart to the title image of the worldmaking Atlas:

> He joined the stars to the earth and added the sacred to the profane,
> rectifying both at once,
> As a mathematician, he described the stars with his cunning rod,
> and gave them to be observed in a little globe.
> He brought together the broad orb of the earth into maps . . .
> . . . . . .
> He uncovered the sacred mysteries of the prophets
> and commanded Christ's four heralds to march in step.

> And he did these things so as to surpass all past
> artists, on his own, and by his own hand.[105]

Mythic Titan and mortal cosmographer merge in this invocation. The task of worldmaking, its unprecedented achievement and its all-encompassing scope, cut beyond traditional disciplinary boundaries, merging science, art, philosophy, and theology, as Mercator simultaneously analyzes details and brings them into synthesis and universal harmony.

The quest to describe the world as a whole and attain a complete understanding of its parts demands superhuman capacity and precipitates an implicit confrontation between human and divine makers. In Fumerius's epigraph, Mercator is no mere mapmaker. He joins the stars to the earth, combines the sacred and the profane, displays an entire vision of the world, demarcates the boundaries of its kingdoms, and establishes with certainty the progression of historical time. Mercator even uncovers the mysteries of the prophets and reconciles the four Gospels. The hymnic quality of these images, drawn in part from the Psalms, accentuates the implicit comparison to divine power and places the *Atlas* in a tradition that draws on Ptolemaic cosmography but transcends it. Where cosmographers such as Münster, Thevet, and Ananio carefully dissociate themselves from divine analogy, subordinating cosmography to theology, Furmerius's vision of Mercator suggests that the two disciplines may ultimately be inseparable in their scope.

The "Praefatio in Atlantis," presumably written by Mercator himself, further strengthens such a claim:

> I have set this man Atlas, so notable for his erudition, humaneness, and wisdom, as a model for my imitation, so far as my genius and strength suffice, as I begin to contemplate cosmography as though in the lofty mirror of the mind. . . . Beginning from the creation, I shall enumerate all its parts and contemplate them naturally so that the causes of things shall be evident. . . . Thus I shall lay out the whole world as though in a mirror, so that there shall be certain rudiments for finding the causes of things and attaining wisdom and prudence, sufficient to lead the reader to higher speculations.[106]

Mercator's language here echoes Paul to the Corinthians, particularly the famous image of seeing through a mirror darkly (1 Cor. 13:12): he imagines his own mind as a "lofty mirror," which finds a counterpart in the world whose contents will be laid out in his book, "as though in a mirror." Knowing self, world, and the book of cosmic knowledge become coextensive and inseparable; they are self-reflecting mirrors and images of each other. Mercator's vision is suffused with a rhetoric of revelation. He becomes a prophet-scientist of the cosmos enumerating "all its parts" and uncovering "the causes of things."

Significantly, his goal is not the accumulation of knowledge as an end in itself. Knowledge of the world is a means to moral knowledge ("good ends"); it begets "wisdom and prudence" and leads to "higher speculations." Mercator's emphasis on knowledge in the service of the good life reminds us that for much of the medieval and early modern periods, the world (*mundus*) was also associated with evils of worldliness that threatened to take humanity further away from salvation. By placing the world within a powerfully moral scheme and subordinating universal knowledge to individual ethical action, Mercator rewrites an ancient moralistic discourse that opposed knowledge of the world to a (much-desired) knowledge of God.

This recourse to divine omniscience also links world maps to the tradition of *geographia sacra* (sacred geography). Cosmographers, like the natural philosophers, tended to follow Saint Paul's dictum that individuals reach toward divine intelligence through the contemplation of nature. Even when the world is subject to a mathematical graticule, the fact of measure, proportion, and calculation belongs to an invisible and higher order of things. European cosmography from the ninth to the seventeenth century thus overtly mobilizes Christian ideology, promoting readings of the "book of the world" that are intended to assure the viewer that nature reflects the genius of creation. Maps become aids to contemplation, used to apprehend divine intervention in the phenomenal world.[107] This is the explicit purpose of the cartographic program in the *Biblia Regia* (the Antwerp Royal Polyglot Bible), produced by Benito Arias Montanus at the Plantin Press between 1568 and 1573, the same period during which Ortelius published the *Theatrum* (also with Plantin) and Mercator produced his famous navigational world map projection, *Nova et aucta orbis terrae descriptio*. Studies of maps and religion in the early modern world have, however, been largely confined to explicitly biblical maps or those that overtly depict ecclesiastical power, thereby excluding connections between overtly religious and seemingly secular maps.[108] Though the sheer number of maps of the Holy Land produced in this period make it the most popular region to be depicted, almost as many world maps were made as maps of the Holy Land—a fact that highlights the theological dimensions of the cosmographic project.[109]

There is an important and repeated insistence throughout the sixteenth century on the relationship between cosmography and theology as an expression of the analogy between human and divine worldmaking. By 1595, Mercator was drawing on an established set of tropes that would continue

FIGURE 15. Portrait of André Thevet (ca. 1550). Courtesy of the Bibliothèque nationale de France.

to be used well into the seventeenth century. An early portrait of the French royal cosmographer André Thevet (fig. 15), for instance, shows the author holding a compass poised over a globe. The image finds a counterpart in the preface to the *Cosmographie universelle* (1575), where Thevet describes God holding the world in his hands and turning it between two or three fingers.[110] Acutely aware of the parallel between himself and the Creator, he qualifies this connection at some length in the preface:

> This discipline of Cosmography, therefore, serves to reveal the vanity of that with which we stop ourselves; then, bending our pride, it directs our mind toward that which is great and no longer permits it [our mind] to stop itself over trivialities. And for this reason I think that there is no science, after Theology, that has a greater virtue in making us understand grandeur and divine power, and to hold these in admiration, than this one.[111]

This doubling of theology and cosmology, creator and cosmographer, emerges once again through the iconography of the finger-compass poised

over a globe. Mercator's portrait and the figure of Atlas both evoke the image, which derives from a long medieval tradition that depicts God as a geometer (fig. 16).[112] The pose in fact is reproduced for a range of figures in the period, from Ptolemy to Hondius: a subsequent image in the *Atlas*, first used in the 1613 edition, shows a doubled version of the same *topos* as Mercator sits beside the printer Hondius and both hover over globes within an expanded cartouche (fig. 17).

Too often, these images of worldmaking have been reduced to expressions of conquest—whether intellectual dominion of the natural world or political dominion in the name of empire. They are also, however, images of contemplation, reflecting on the world as the product of divine handiwork. World maps and atlases were certainly implicated in shaping national identity, imperial desires, and international commercial enterprises—chapters 3

FIGURE 16. Codex Vindobonensis 2554 (ca. 1220s). Cod. 2554, fol. 1v. Courtesy of the Österreichische Nationalbibliothek, Vienna.

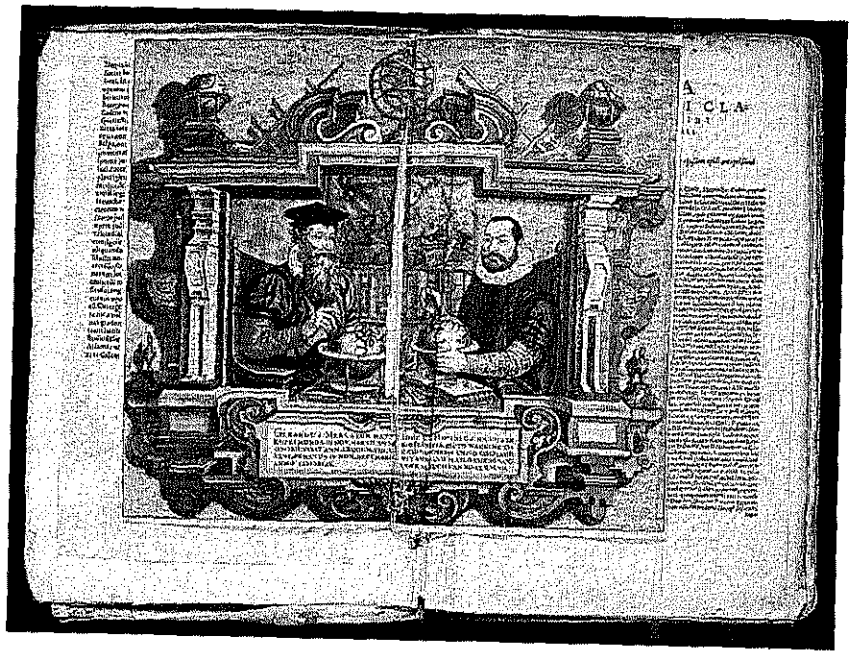


FIGURE 17. Gerhard Mercator and Jodocus Hondius, *Atlas* (Amsterdam, 1613). Courtesy of the Beinecke Rare Book and Manuscript Library, Yale University.

and 4 explore these aspects of cartography and worldmaking in greater detail. But, the philosophical contexts of such images reveal how cosmographers could also negotiate a position between two extremes. A celebration of scientific progress and the human intellect, mapmaking also sought to mimic God, the Original Maker, with appropriate deference. By displaying the symmetries underlying the world's creation, maps provided a metaphysical, and not merely geographic, orientation.

Spiritual Navigation

Mercator's *Atlas* was placed on the Index in 1603 for its intellectual and doctrinal over-reaching. Prime among the reasons for this decision was the inclusion of a short treatise on the creation of the world, "De mundi creatione ac fabrica" (On the Creation and Making of the World), which opens the volume, positioning the *Atlas* at the junction of cosmography, theology, and natural philosophy. Given Furmerius's quasi-divine presentation of Mercator and his own self-conscious worldmaking ambitions, it is not difficult to see why the book would run afoul of religious orthodoxies. Mercator's work, like that of several contemporaries, was shaped against the clamor of religious conflict in post-Reformation Europe and as a direct response to it. Cosmography was not, and perhaps could not be, morally disinterested, and its practice throws a refracted light onto the spiritual contexts that gave the discipline its most profound questions. Recent studies have sought to name the complex beliefs of Mercator, Ortelius, and other members of the Plantin circle as Lutheran, Erasmian, Melanchthonian, as "spirituals," or secret members of the Family of Love.[113] But such identifications are less important than the practical impact of the religious wars on the early modern reimagining of the world. The use of maps as propaganda in national and confessional battles has been well documented, but what of their spiritual and meditative power?

In a world whose religious center seemed to have fallen apart—the fall of Constantinople on 1453, the sack of Rome in 1527, the fragmentation of Christendom into small warring centers—geography, particularly the synoptic, unifying practice of world-mapping, was imbued with particular symbolic power. To bind up the fragmented world and give it coherent form provided a vision of harmony, a goal for spiritual contemplation that sought to counteract the chaos of ordinary experience. Mercator's biography registers the impact of such tensions: in 1544, he was accused of "lutherye" and narrowly escaped a death sentence. This early brush with the intolerance of religious authorities would profoundly mark his life and career. His first two maps—*Terra sancta* (a map of the Holy Land showing the Exodus) and *Orbis imago* (the cordiform world map)—both evoke Reformation symbolism and locate the mapping enterprise within a religious matrix.[114] But his near execution for heresy seems to have muted this audacious beginning.

This relation between mapping and religion in Mercator's work surfaces almost unexpectedly in 1569, which saw the publication of both the *Chronologia* and the *Nova et aucta orbis terrae descriptio*. Jerry Brotton has argued that this wall map, which launches the so-called Mercator projection, must also be seen as a call for religious toleration. A spatial counterpart to the temporal project of establishing a universal chronology, which required reconciling seemingly incompatible historical data, *Nova et aucta orbis* demanded a similar reconciliation of the spherical earth onto a rectangular, two-dimensional plane. Brotton suggests that the mathematics behind Mercator's straightened loxodromes celebrate a spiritual *cursus obliquus*, an oblique course through a worldly existence: "instead of exhibiting a confident Eurocentrism, Mercator's world map would provide an oblique rejec-

tion of such values and a search for a larger picture of harmony across universal space and time."[115] Whether or not one accepts his allegorical reading of the rhumb line, Brotton's intuition that the "navigational use" for which Mercator intended his great wall map was spiritual rather than imperial is utterly convincing.

For Mercator also dabbled in theological commentary, though he kept his work out of public view, given his brush with religious persecution. Walter Ghim speaks of a compilation of the Gospels to produce a "continuous evangelical history," commentaries on Paul's Letter to the Romans that attempt "to solve . . . several controversies of our time concerning divine providence, predestination and free will" and also "several chapters on Ezekiel, on the Apocalypse and others."[116] These reflections culminate in the posthumously published "De mundi creatione," an extended commentary on Genesis that opens the *Atlas* by returning to origins and imagining the material fabrication of man and world. In a striking departure from all previous mapbooks and would-be atlases, the first part of the *Atlas* is thus not a world map but rather an extended meditation on the Creation.

Mercator completed this treatise in the final years of his life, considering it his greatest achievement. In a letter from 1583, he writes, "Although this is the last part of my work, it will nonetheless be the most important, indeed the very base and summit of the whole. . . . This will be the goal of my labor, this will mark the end of my work."[117] "De mundi" begins with a rumination on "the scope of all cosmography," a claim that recalls the opening lines of Ptolemy's *Geographia* with its attempt to establish the scope of the discipline. But rather than technical definition, the reader is invited into a celebration of divinity: "For any mind considering . . . the construction of this earthly machine, it is axiomatic that God, its author, is of immeasurable power, wisdom, and goodness. . . . For this is our goal while we treat of cosmography: that from the marvelous harmony of all things toward God's sole end, and the unfathomable providence in their composition, God's wisdom will be seen to be infinite, and his goodness inexhaustible."[118] Neo-Stoic rhetoric and the worldmaking iconography of the book's prefatory material are crystallized here, as Mercator places the cosmographer's art in the shadow of divine creation. To witness the "frame of the world" is to witness the power of the deity. The atlas thus becomes a revelatory "book of nature."

The historical significance of "De mundi creatione" lies in its generic fluidity and unique position. Despite the theological pretensions of other geographers, no one had presumed to write a treatise on Genesis and incorporate it into a cosmography. To do so was to argue that mapping derived from a worldview based on the Bible and that it had an instrumental role in enhancing human understanding of the cosmos. Cosmographic works such as the *Atlas* were no mere imitations of the world; they were explications of it. If the figure of Atlas points to the humanistic learning of the Renaissance, "De mundi" indicates a close allegiance with post-Reformation commentaries and annotations on the Bible. The work rightly takes its place within the tradition of hexameral writing—texts in prose or poetry that celebrated God's creation of the world in six days. Though often considered a medieval genre, hexamera enjoyed a revival in the late sixteenth century; Mercator's treatise belongs alongside such works as Guillaume Du Bartas's *La sepmaine* and Torquato Tasso's *Sette giorni del mondo creato*.[119] It is also the intellectual and bibliographic heir to Hartmann Schedel's *Liber chronicarum* (Nuremberg, 1493), which offered a historic and geographic account of the world from the creation to the present. Ostensibly affirmations of the marvels of creation, these hexamera are poignant responses to a crisis of world order: they record apprehensions over the nature of the world and seek to allay intellectual fears with new, often ingenious interpretations of scriptural texts.

Mercator's prose hexameron is no exception. It reconciles new geographic discoveries with the account in Genesis and effectively reinterprets Biblical texts to explain the observations of explorers, mathematicians, and natural philosophers. If new knowledge of the world had fractured the intellectual consensus of the ancients, it also affected post-Reformation debates profoundly. Mercator's purpose is to reestablish the order and harmony of all things within a providential scheme: "For this is our goal . . . that from the marvelous harmony of all things . . . God's wisdom will be seen to be infinite, and his goodness inexhaustible." As the belief in marvelous harmony was being assaulted from all sides, Mercator's impossible worldmaking mission contains the seeds of the Enlightenment craving to catalogue the whole as well as the old mystical desire for unity and transcendence.

The philosophic interest of "De mundi creatione," like that of Du Bartas's *La sepmaine,* lies in its attempt to grapple with the nature of matter, specifically its origin and properties, without succumbing to Lucretian atheism. Mercator seeks to reconcile the classical idea of chaos and the doctrine of the creation ex nihilo; rejecting the Platonists' division between form and matter, he seems to suggest—quite heretically in some quarters—that the origin of all things is a divinely created "first matter" that suspiciously resembles chaos. This original, divine matter then becomes the basis for a theory of unity despite the immense diversity observed in all earthly forms.

Though the treatise has been dismissed as a Neoplatonizing account of creation, it participates in a complex pan-European meditation on the nature of the cosmos, its materiality and structure, as well as the place of human beings within that universal frame. Filled with catalogues of places, plants, animals, and even a miniature theory of the origin of human culture, the treatise deserves greater attention for the ways in which its philosophical underpinnings frame the compendious "description of the world" in the maps that follow.

Mercator's ambitions demand that the *Atlas* be read alongside such late sixteenth-century writers as Postel, Du Bartas, Lefèvre de la Boderie, Louis le Roy, Dee, and Spenser. Like these figures who fought to cut through masses of new information, see beyond diversity, and uncover the harmony of the cosmos, "De mundi" aims to transform how we see the world, penetrating into its originary mysteries even as the *Atlas* reveals the structure of the world to the mortal human gaze. Mercator delicately balances the desire for omniscience with the limits of human knowing as he calibrates the mapmaker's representational ability with creative speculation. The informal title he used for the treatise that would become "De mundi" captures this doubleness—"cosmopoeia," the creative making of the world.[120]

CHAPTER TWO

On Cosmographic Autobiography: Montaigne's *Essais*

"Our world has just discovered another world," writes Michel de Montaigne in the late 1580s, "and who will guarantee us that it is the last of its brothers, since the daemons, the Sibyls, and we ourselves have up to now been ignorant of this one?"[1] In "Des coches," the *Essais*'s long meditation on the Spanish discovery and conquest of the New World, the "very image of the world which glides along as we live in it" is like a mirage beyond the grasp of human knowledge, perpetually multiple in its many forms.[2] New knowledge had opened a wound, both spatial and temporal, from which the very conception of the world had yet to recover. As the euphoria of discovery gave way to conquest, commerce, and the scrutiny of long-cherished intellectual certainties, early modern Europe was faced with a teeming multiplicity that threatened to destroy traditional structures of authority and understanding. Montaigne captures this *esprit du temps* with an elegiac quotation from Lucretius: "This age is broken down, and broken down is the earth."[3]

SELF AND WORLD

Recording and reacting to this upheaval of historical and geographic proportions, Montaigne makes "the world" one of his primary subjects alongside the relentless self-exploration that is his professed theme. *Monde* [world] is a keyword for the *Essais*—an all-encompassing category that barely contains the plethora of customs, cultures, peoples, beliefs, opinions, attitudes, and anecdotes that fill the work's pages. The proliferating fullness of the world is the great bulwark against which Montaigne interrogates the self.[4] *Monde*

Littleness and Lastingness of Bodies Are Freely Handled (London, 1674), 138. On Fairfax's pamphlet, see Michael Cyril William Hunter, *Science and the Shape of Orthodoxy: Intellectual Change in Late Seventeenth-Century Britain* (London: Boydell & Brewer, 1995), 116. Fairfax's use is one of the oldest; the only earlier instance of the word "worldemaker" noted by the OED is from the dedication to Thomas Blenerhasset's *A Revelation of the True Minerva* (1582): "a man may esteeme that his which the great worldemaker . . . conuaieth into him" (sig. *3).

11. Matthew Prior, *The Poetical Works of Matthew Prior* (London: George Bell, 1907), 2.267. On Prior's attitude toward the new natural philosophy, see Monroe K. Spears, "Matthew Prior's Attitude toward Natural Science," *PMLA* 63, no. 2 (1948): 485–507.

12. David Hume, *Dialogues Concerning Natural Religion, the Posthumous Essays, Of the Immortality of the Soul, and of Suicide, from An Enquiry Concerning Human Understanding of Miracles* (New York: Hackett, 1986), 35–36.

13. I draw on Hannah Arendt's analysis of *homo faber* in modernity: see *The Human Condition* (Chicago: University of Chicago Press, 1998), chap. 42.

14. For detailed discussion of the meaning of "world" in English, see C. S. Lewis, *Studies in Words* (Cambridge: Cambridge University Press, 1990), 214–68. See also the discussions in Leo Spitzer, *Classical and Christian Ideas of World Harmony: Prolegomena to an Interpretation of the Word "Stimmung"* (Baltimore: Johns Hopkins University Press, 1963) and Roland Greene, *Five Words: Critical Semantics in the Age of Shakespeare and Cervantes* (Chicago: University of Chicago Press, 2013).

15. I cite from the eighteenth-century English edition, which contains a selection of emblems: see Cesare Ripa, *Iconology*, trans. George Richardson (New York: Garland, 1979), 1.3. Yassu Okayama, *The Ripa Index: Personifications and Their Attributes in Five Editions of the Iconologia* (Doornspijk: Davaco, 1992) collates all the emblems.

16. Giambattista Vico, *New Science: Principles of the New Science Concerning the Common Nature of Nations*, trans. Dave Marsh (London: Penguin Books, 1999), sections 722, 725.

17. Isidore of Seville, *The Etymologies of Isidore of Seville*, trans. Stephen A. Barney (Cambridge: Cambridge University Press, 2006).

18. Jean-Marc Besse, *Les grandeurs de la terre: aspects du savoir géographique à la Renaissance* (Lyon: ENS, 2003), 2.

19. Giambattista Vico, *On the Most Ancient Wisdom of the Italians*, trans. L. M. Palmer (Ithaca: Cornell University Press, 1988), 40–64.

20. See Vico's outline of the "Idea of the Work" in the *New Science*, section 2.3. On Vico's poetic epistemology, see Giuseppe Mazzotta, *The New Map of the World: The Poetic Philosophy of Giambattista Vico* (Princeton: Princeton University Press, 1999), and James Robert Goetsch, *Vico's Axioms: The Geometry and the Human World* (New Haven: Yale University Press, 1995).

21. I follow recent work that connects modernity to enchantment; for contemporary philosophical meditations on the topic, see Jane Bennett, *The Enchantment of Modern Life: Attachments, Crossings, and Ethics* (Princeton: Princeton University Press, 2001) and David L. Martin, *Curious Visions of Modernity: Enchantment, Magic, and the Sacred* (Cambridge, Mass.: MIT Press, 2011); Michael T. Saler, *As If: Modern Enchantment and the Literary Prehistory of Virtual Reality* (New York: Oxford University Press, 2012) and Eric Hayot, *On Literary Worlds* (Oxford: Oxford University Press, 2012) discuss the literary significance of modernity's enchantments.

22. Martin Heidegger, "The Age of the World-Picture," in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper Torchbooks, 1977), 127.

23. On the rhetoric of "lord of the world" and its theological resonance, see Anthony Pagden, *Lords of All the Worlds: Ideologies of Empire in Spain, Britain and France, 1500–1850* (New Haven: Yale University Press, 1995), especially 23ff.

24. Charles Taylor, *A Secular Age* (Cambridge, Mass.: Harvard University Press, 2007).

25. Laura Doyle, "Notes Toward a Dialectical Method: Modernities, Modernisms, and the Crossings of Empire," *Literature Compass* 7, no. 3 (2010): 197.

26. Walter Mignolo, *The Darker Side of the Renaissance: Literacy, Territoriality, and Colonization* (Ann Arbor: University of Michigan Press, 1995).

27. See Doyle's analysis in "Dialectical Method."

28. Sanjay Subrahmanyam, "Holding the World in Balance: The Connected Histories of the Iberian Overseas Empires, 1500–1640," *The American Historical Review* 112, no. 5 (December 2007): 1359–85.

29. See especially Martha C. Nussbaum, "Compassion & Terror," *Daedalus* 132, no. 1 (January 1, 2003): 10–26; Anthony Appiah, *Cosmopolitanism: Ethics in a World of Strangers* (New York: W. W. Norton, 2007); and Seyla Benhabib, *Another Cosmopolitanism* (Oxford: Oxford University Press, 2006).

30. On its earliest usages, see Paul Hazard, "Cosmopolite," in *Mélanges d'histoire littéraire générale et comparée offerts à Fernand Baldensperger* (Paris: Champion, 1930), 1:354–64.

31. Martin W. Lewis, *The Myth of Continents: A Critique of Metageography* (Berkeley and Los Angeles: University of California Press, 1997), 16.

32. I refer to Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference* (Princeton: Princeton University Press, 2000). See also Chakrabarty's critique in "The Muddle of Modernity," *The American Historical Review* 116, no. 3 (June 2011): 663–75. I explore what such an analysis in a non-European context might look like in "A War of Worlds: Becoming 'Early Modern' and the Challenge of Comparison," in *Comparative Early Modernities: 1100–1800*, ed. David Porter (New York: Palgrave, 2012), 15–46.

33. *De Constantia* 1.9; cited from Justus Lipsius, "The First Book on Constancy," trans. John Stradling, *Philosophical Forum* 37, no. 4 (2006): 389–426.

34. Archibald MacLeish, "A Reflection: Riders on Earth Together, Brothers in Eternal Cold," *New York Times*, December 25, 1968.

35. Robert K. Poole, *Earthrise: How Man First Saw the Earth* (New Haven: Yale University Press, 2008), 3.

CHAPTER ONE

1. Mercator's title is notoriously difficult to translate because of the Latin wordplay ("fabrica mundi et fabricati figura"). Most English translations follow the pirated 1635 London edition by rendering the title as "cosmographical description of the fabric and figure of the world." Even the multimedia CD based on the Library of Congress copy renders the title as "Atlas or Cosmographic Meditations on the Fabric of the World and the Figure of the Fabrick'd": Gerhard Mercator, *Atlas Sive Cosmographicae Meditationes de Fabrica Mundi et Fabricati Figura Duisburg, 1595*, ed. Robert W. Karrow, trans. David Sullivan (Oakland, Calif.: Octavo, 2000); for the LC digital facsimile, see http://hdl.loc.gov/loc.rbc/rosenwald.0730.2. All subsequent citations and translations from the *Atlas* will be from this edition and noted as "Mercator, *Atlas*." I give citations to both a physical copy at the John Carter Brown Library, indicated as "JCB," and the digital copy published by Octavo and based on the Library of Congress copy, indicated as "LC." Citations of the JCB copy refer to signature, page, and verso or recto, as in 2r; citations of the LC digital edition refer to image number and verso or recto. Different copies contain different paratextual matter and some (such as JCB) are bound with other texts.

2. On the influence of emblem books on the visual rhetoric of maps, see Lucia Nuti, "The World Map as an Emblem: Abraham Ortelius and the Stoic Contemplation," *Imago Mundi* 55, no. 1 (2003): 38–55. Also useful is Francesca Fiorani, *The Marvel of Maps: Art, Cartography and Politics in Renaissance Italy* (New Haven: Yale University Press, 2005).

3. Muki Haklay, Alex Singleton, and Chris Parker, "Web Mapping 2.0: The Neogeography of the GeoWeb," *Geography Compass* 2, no. 6 (2008): 2011–39.

4. See transcript of Scott Simon segment on NPR at: http://www.npr.org/2012/04/28/

151583081/a-way-to-see-the-world-and-ourselves#commentBlock. On critiques of the Mercator projection and the "map wars," see Mark S. Monmonier, *Rhumb Lines and Map Wars* (Chicago: University of Chicago Press, 2004) and Sumathi Ramaswamy, "Conceit of the Globe in Mughal Visual Practice," *Comparative Studies in Society and History* 49, no. 4 (2007): 751–82. On maps and ideology, see J. B. Harley, "Silences and Secrecy: The Hidden Agenda of Cartography in Early Modern Europe," *Imago Mundi* 40, (1988) 57–76, and "Maps, Knowledge and Power," in *The Iconography of Landscape: Essays on the Symbolic Representation, Design, and Use of Past Environments* (Cambridge: Cambridge University Press, 1988), 277–312.

5. Steven Van den Broecke, "Dee, Mercator, and Louvain Instrument Making: An Undescribed Astrological Disc by Gerard Mercator (1551)," *Annals of Science* 58, no. 3 (2001): 219–40; and Gerard Le Turner, "The Three Astrolabes of Gerard Mercator," *Annals of Science* 51, no. 4 (July 1994): 329.

6. Bartholomaeus Mercator, *Breves in Sphaeram meditatiunculae, includentes methodum et isagogen in universam cosmographiam . . .* (Colonia, 1563), fol. B7v. See discussion in Steven Van den Broecke, *The Limits of Influence: Pico, Louvain, and the Crisis of Renaissance Astrology* (Amsterdam: Brill, 2003), 211. The term might refer to Mercator's projected treatise on the creation of the world, "De mundi creatione ac fabrica," eventually published in the *Atlas*.

7. This may explain a repeatedly dismissed anecdote in Walter Ghim's biography that Mercator conceived the idea of a world atlas before Ortelius (Mercator, *Atlas*, ✠ v [JCB]; 10v [LC]). The suggestion that Mercator withheld his atlas until Ortelius profited from sales of the *Theatrum* has struck critics as preposterous. The comment is especially strange if we consider that Mercator did publish several maps in 1585, before the completion of the *Atlas*. But the comment and publication history appear more coherent if we believe, along with Jean-Marc Besse (*Les grandeurs de la terre*), that the idea for the *Theatrum* originated in the 1560s during Ortelius and Mercator's travels together in France, and that Ghim's account of their friendship is reasonably accurate.

8. Gerhard Mercator, *Chronologia* (Coloniae Agrippinae: Birckmannus, 1569), p. 3.

9. "Primum ab adolescentia studium mihi fuit Geographia, in quo dum progrederer, adhibita naturali & geometrica speculatione . . . admiranda inveni, non in geographia tantum, sed in universae huius mundanae machinae constitutione, quorum multa hactenus a nemine perspecta sunt." Dedication to Wilhelm, Duke of Julich and Cleve, in Gerhard Mercator, *Tabvlae Geographicae Cl: Ptolomei Ad Mentem Autoris Restitutae & Emendate Per Gerardum Mercatorem* (Cologne: Godfried von Kempen, 1578). On this passage, see Van den Broecke, *Limits of Influence*, 210–11, and Mike A. Zuber, "The Armchair Discovery of the Unknown Southern Continent: Gerardus Mercator, Philosophical Pretensions and a Competitive Trade," *Early Science and Medicine* 16, no. 6 (2011): 516.

10. "exigebat operis distributio & ordo, ut primum de mundi fabrica & distributione partium in universum: deinde coelestium corporum ordine & motu: tertio de eorundem natura, radiatione & operantium conflexu, ad veriorem Astrologiam inquirendam: Quarto de Elementis: Quinto de regnorum, & totius terrae descriptione: Sexto de Principium à [sic] condito mundo genealogiis, ad emigrationes gentium, & primas terrarum habitationes, rerumque iuventarum tempora, & antiquitates indagandas tractarem. Hic enim rerum naturalis est ordo, qui causas & origines eurundem facile commonstrat & ad verum scientiam sapientiamque optimus dux est &c." Mercator, *Atlas*, ✠ 2r (JCB), 10r (LC); translation, 15 (slightly modified).

11. "Geographia designatrix imitatio e[st] totius cogniti orbis cum his quae fere universaliter sibi iunguntur." *In Hoc Opere Haec Continentur Geographiae Cl. Ptolemaei a Plurimis Uiris Utriusq[ue] Linguae Doctiss. Eme[n]data* (Rome: Bernardinus Venetus de Vitalibus, 1508), [E6r].

12. Christian Jacob, *The Sovereign Map: Theoretical Approaches in Cartography Throughout History*, ed. Edward H. Dahl, trans. Tom Conley (Chicago: University of Chicago Press, 2006), 29–30.

13. Erich Auerbach, "Figura," in *Scenes from the Drama of European Literature* (New York: Meridian Books, 1959), 11–76.

14. Lorraine J. Daston and Peter Galison, *Objectivity* (Brooklyn: Zone Books, 2007), 49.

15. Daston and Galison define a "working object" in science as "any manageable, communal representative of the sector of nature under investigation" (*Objectivity*, 19), and understand atlases as "systematic compilations of working objects" (22). At its inception, the world atlas sought to capture *the* paradigmatic working object as whole—the world itself.

16. A digital search of books published between 1470 and 1600, currently held in European libraries, yields over one thousand items with many duplicates; there is a striking increase of books with this title between 1540 and 1560. The main popular exceptions to anatomical texts with the word 'fabrica' in the title are Francesco Alunno's compendium of quotations from well-known Italian authors, *La fabrica del mondo* (first published in Vicenza, 1548) and Giovanni Lorenzo d'Anania's cosmographic text, *Le universal fabrica del mondo* (first published in Naples, 1573). Other texts that use 'fabrica' in their titles are primarily technical manuals ranging from architectural design to the making of astrolabes and medicines.

17. Andreas Vesalius, *De humani corporis fabrica*, ed. Jackie Pigeaud (Paris: Belles lettres, 2001), xviii–xxi.

18. For an overview of the trope's history, see Leonard Barkan, *Nature's Work of Art: The Human Body as Image of the World* (New Haven: Yale University Press, 1975).

19. *Ptolemy's Geography*, 57.

20. Peter Apian, *Cosmographicus liber Petri Apiani Mathematici studiose collectus* (Landshut, 1524), fols. 3–4. Subsequent editions throughout the sixteenth century retain these images.

21. Christian Jacob, "La mimesis géographique en Grèce antique," in *Espace et Représentation: Sémiotique de l'architecture: actes du colloque international tenu à Albi du 20 au 24 Juillet 1981*, ed. Alain Renier (Paris: Editions de la Villette, 1982), 57.

22. There is considerable recent work on the theory and practice of early modern anatomy from a variety of angles. See especially Andrea Carlino, *Books of the Body: Anatomical Ritual and Renaissance Learning* (Chicago: University of Chicago Press, 1999); Devon L. Hodges, *Renaissance Fictions of Anatomy* (Amherst: University of Massachusetts Press, 1985); and Jonathan Sawday, *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture* (London: Routledge, 1995). On the overlap between medicine and history, pertinent to the discursive and conceptual overlaps between medicine and geography, see Nancy G. Siraisi, *History, Medicine, and the Traditions of Renaissance Learning* (Ann Arbor: University of Michigan Press, 2007).

23. See Valerie Traub, "The Nature of Norms in Early Modern England: Anatomy, Cartography, King Lear," *South Central Review* 26, no. 1–2 (2009): 42–81, and "Mapping the Global Body," in *Early Modern Visual Culture: Representation, Race and Empire in Renaissance England*, ed. Peter Erickson and Clark Hulse (Philadelphia: University of Pennsylvania Press, 2000), 44–97. Traub's essays discuss the discursive relations between anatomy and cartography in the sixteenth century, though she does not argue for particular historical connections between the two disciplines.

24. These shared relations are noted by Robert Karrow, "Intellectual Foundations of the Cartographic Revolution" (Ph.D. diss., Loyola University, 1999), 64–65. For the use of the earth-body analogy, see Matthew H. Edney, "Mapping Empires, Mapping Bodies: Reflections on the Use and Abuse of Cartography," *Treballs de la Societat Catalana de Geografia* 63 (2007): 83–104.

25. On this topic see Jean-François Staszak, *La géographie d'avant la géographie: le climat chez Aristote et Hippocrate* (Paris: Ed. L'Harmattan, 1995) and Jorge Cañizares-Esguerra, "New World, New Stars: Patriotic Astrology and the Invention of Indian and Creole Bodies in Colonial Spanish America, 1600–1650," *American Historical Review* 104, no. 1 (February 1, 1999): 33–68.

26. The use of the term "hemisphere" for the lobes of the brain first occurs in Thomas Willis, *Cerebri anatome* (London, 1664), 67.

27. Despite the development of new interdisciplinary fields in medical humanism and medical geography, the still operative disciplinary divisions between histories of medicine and cartography obscure seemingly important connections between the development of medical and geographic thought and their expression in printed books in the sixteenth century. On the early modern conjunction between medicine and geography, see Hiro Hirai, ed., *Cornelius Gemma: Cosmology, Medi-*

cine, and Natural Philosophy in Renaissance Louvain (Pisa: Serra, 2008) and C. B. Valencius, "Histories of Medical Geography," *Medical History Supplement*, no. 20 (2000): 3–28. Studies on scientific illustration and prints rarely consider map books alongside books on instrument making, botany, or anatomy, though they were frequently printed at the same presses and involved overlapping networks of artisans, authors, and publishers; for books that do explore these connections, see Volker Remmert, *Picturing the Scientific Revolution* (Philadelphia: Saint Joseph's University Press, 2011), an abridged English translation of *Widmung, Welterklärung und Wissenschaftslegitimierung: Titelbilder Und Ihre Funktionen in Der Wissenschaftlichen Revolution* (Wiesbaden: Harrassowitz in Kommission, 2005); and Sachiko Kusukawa and Ian Maclean, eds., *Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe* (Oxford: Oxford University Press, 2006).

28. On tropes of anatomical discovery, see Florence Bourbon and Roberto Lo Presti, "Introduction," *Renaissance and Reformation/Renaissance et Réforme* 33, no. 3 (July 28, 2011): 5.

29. On the importance of autopsy as a mode of knowing for Vesalius, see Sachiko Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago: University of Chicago Press, 2012). On autopsy in cosmography and travel narratives, see Frank Lestringant, *Mapping the Renaissance World: The Geographical Imagination in the Age of Discovery* (Berkeley and Los Angeles: University of California Press, 1994) and Andrea Frisch, *The Invention of the Eyewitness: Witnessing and Testimony in Early Modern France*, (Chapel Hill: University of North Carolina Press, 2004).

30. For an analysis of the epistemological basis of anatomy, see Roberto Lo Presti, "Anatomy as Epistemology: The Body of Man and the Body of Medicine in Vesalius and His Ancient Sources (Celsus, Galen)," *Renaissance and Reformation/Renaissance et Réforme* 33, no. 3 (July 28, 2011): 27–60. For a geographic analysis, see Besse, *Les grandeurs de la terre.*

31. For Vesalius's reference to Gemma, see Andreas Vesalius, *De Humani Corporis Fabrica: Basel, 1543*, facsimile on CD-ROM (Palo Alto, Calif: Octavo, 2003), 161. On Gemma Frisius's students and his interest in medicine/anatomy, see Van den Broecke, *Limits of Influence*; Fernand Hallyn, *Gemma Frisius, arpenteur de la terre et du ciel* (Paris: Champion, 2008); and Hirai, *Cornelius Gemma.*

32. Mercator's "Orbis imago," as an imitation of Finé's cordiform map has recently attracted scholarly attention. Key essays that discuss cordiform maps are Ruth Watson, "Cordiform Maps Since the Sixteenth Century: The Legacy of Nineteenth-Century Classificatory Systems," *Imago Mundi* 60, no. 2 (2008): 182–94, and "The Decorated Hearts of Oronce Fine: The 1531 Double Cordiform Map of the World," *The Portolan: Journal of the Washington Map Society* 65 (2006): 13–27; George Kish, "The Cosmographic Heart: Cordiform Maps of the 16th Century," *Imago Mundi* 19 (1965): 13–21; and Monique Pelletier, "Le monde dans un coeur: Les deux mappemondes d'Oronce Finé," *Cartographica Helvetica* 12 (1995): 27–37.

33. Watson, "Decorated Hearts," and Tom Conley, *The Self-made Map: Cartographic Writing in Early Modern France* (Minneapolis: University of Minnesota Press, 1996), 88–134.

34. William Harvey, *Exercitatio anatomica de motu cordis et sanguinis in animalibus* (Frankfurt, 1628), 3. On the astrological significance of the sun and heart, see Eugenio Garin, *Astrology in the Renaissance: The Zodiac of Life* (London: Routledge and Kegan Paul, 1983), 11.

35. Antoine Mizauld, *Aesculapii et uraniae medicum simul & astronomicum ex colloquio conjugium harmoniam microcosmi cum macrocosmo: sive humani corporis cum caelo, paucis figurans, & perspicue demonstrans* (Lyons, 1550).

36. On medical astrology in the Renaissance see especially, Anthony Grafton and Nancy G. Siraisi, "Between the Election and My Hopes: Girolamo Cardano and Medical Astrology," in *Secrets of Nature: Astrology and Alchemy in Early Modern Europe*, ed. William R. Newman and Anthony Grafton (Cambridge, Mass.: MIT Press, 2001), 69–132; and Nancy G. Siraisi, *The Clock and the Mirror: Girolamo Cardano and Renaissance Medicine* (Princeton: Princeton University Press, 1997).

37. On astrology in Louvain, and Mercator's involvement in the field, see Van den Broecke, *Limits of Influence*; and Annelies van Gijsen, "L'astrologie," in *Gérard Mercator Cosmographe: Le temps et l'espace* (Antwerp: Fonds Mercator Paribas, 1994), 220–33.

38. On Mercator's correspondence with Dee, and Dee's dedication of his *Propaedeumata aphoristica* (1558) to Mercator, see Van den Broecke, *Limits of Influence*, 168–71. On Mizauld's friendship with Gemma, see Hiro Hirai, "'Prisca Theologia' and Neoplatonic Reading of Hippocrates in Fernel, Cardano and Gemma," in *Cornelius Gemma: Cosmology, Medicine and Natural Philosophy in Renaissance Louvain*, ed. Hiro Hirai (Pisa: Serra, 2008), 91–104.

39. On the geographic particularities of the map vis-à-vis its contemporaries, see Gilbert A. Cam, "Gerard Mercator: His 'Orbis Imago' of 1538," *Bulletin of the New York Public Library* 41, no. 5 (May 1937): 376–77.

40. The full text reads: "Terras hic esse certum est, sed quantas quibusque limitibus finitas incertum."

41. For a discussion of Mercator's view on the distribution of continents see Zuber, "Armchair Discovery."

42. "Proposuimus aut partitionem orbis in gene tantum quam deinceps in particularibus aliquot regionibus. . . ." Crane, *Mercator*, 94, discusses the map's ambition.

43. The point is noted by Cosgrove, *Geographical Imagination*, and Crane, *Mercator*, 96. Both gesture toward the symbolism of interiority associated with the heart but do not develop its implications for the philosophical underpinnings of world-mapping.

44. On the iconography of the heart see Louis Gougaud, *Dévotions et pratiques ascétiques du Moyen Âge* (Paris: Desclée de Brouwer, 1925); Anne Sauvy, *Le miroir du coeur: quatre siècles d'images savantes et populaires* (Paris: Editions du Cerf, 1989); and Eric Jager, *The Book of the Heart* (Chicago: University of Chicago Press, 2000).

45. For possible Lutheran aspects of the heart image, see Crane, *Mercator*, 96–98, who notes the importance of the heart image to Melanchthon and the map's dedication to J. Drosius, who may have also been implicated in the Louvain heresy trials of 1543–44. Jerry Brotton reiterates these points in "A 'Devious Course': Projecting Toleration on Mercator's 'Map of the World', 1569," *The Cartographic Journal* 49, no. 2 (May 2012): 101–6.

46. Robert Karrow, "Commentary" in LC facsimile of Mercator, *Atlas*, 7–8.

47. Hodges, *Renaissance Fictions*, 5.

48. On this challenge in Vesalius's anatomy, see Nancy G. Siraisi, "Vesalius and Human Diversity in *De Humani Corporis Fabrica*," *Journal of the Warburg and Courtauld Institutes* 57 (January 1, 1994): 60–88.

49. This is how Nicholas Crane describes Finé's map in *The Man Who Mapped the Planet* (London: Weidenfeld & Nicolson, 2002), 96.

50. For Mercator's innovations in calligraphy, see A. S. Osley, *Mercator: A Monograph on the Lettering of Maps, Etc. in the 16th Century Netherlands with a Facsimile and Translation of His Treatise on the Italic Hand and a Translation of Ghim's Vita Mercatoris* (London: Faber, 1969); and Ton Croiset van Uchelen, "L'écriture et la calligraphie," in *Gérard Mercator Cosmographe: Le temps et l'espace*, ed. Marcel Watelet (Antwerp: Fonds Mercator Paribas, 1994), 150–61.

51. Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution* (Chicago: University of Chicago Press, 2004). For discussion of Mercator's attempt to define himself outside the class-status of "artisan," see Zuber, "Armchair Discovery."

52. On the iconography of Atlas, see James R. Akerman, "Atlas, la genèse d'un titre," in *Gerardi Mercatoris Atlas Europae: facsimilé des cartes de Gérard Mercator contenues dans l'Atlas de l'Europe vers 1570–1572*, ed. Marcel Watelet (Antwerp: Fonds Mercator, 1994), 15–29, and Volker R. Remmert, "Visual Legitimisation of Astronomy in the Sixteenth and Seventeenth Centuries: Atlas, Hercules and Tycho's Nose," *Studies in History and Philosophy of Science, Part A* 38, no. 2 (June 2007): 327–62.

53. See Peter van der Krogt, "Mercators Atlas: Geschichte, Editionen, Inhalt," in *Gerhard Mercator und die geistigen Strömungen des 16. und 17. Jahrhunderts*, ed. Hans H. Blotevogel and Rienk Vermij (Bochum: Brockmeyer, 1995), 49–64, at 55. For a contrary view, see Akerman, "La genèse d'un titre."

54. Much has been written on the mapbook as a theater: see especially Besse, *Les grandeurs*

de la terre; Peter van der Krogt, "The *Theatrum Orbis Terrarum*: The First Atlas?" in *Abraham Ortelius and the First Atlas: Essays Commemorating the Quadricentennial of His Death, 1598–1998*, ed. Martin van der Broecke, Peter van der Krogt, and Peter Meurer ('t Goy-Houten, the Netherlands: HES Publishers, 1998), 55–78; W. Waterschoot, "The Title Page of Ortelius's *Theatrum Orbis Terrarum*," *Quaerendo* 9 (1979): 43–68; John Gillies, *Shakespeare and the Geography of Difference* (Cambridge: Cambridge University Press, 1994); and Ann Blair, *The Theater of Nature: Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997).

55. One strain of the visual iconography of Atlas/astronomy emphasizes the contemplative mode: see Dürer's print of the astronomer and Jacques de Gheyn's print of Saturn.

56. For an analysis of the Renaissance significance of the divine artifex figure, see Alexandre Koyré, *From the Closed World to the Infinite Universe* (Baltimore: Johns Hopkins University Press, 1968), 274–76.

57. Zuber suggests that the impressive beard that distinguishes both Atlas and Mercator (in his portrait) further offers a visual connection: see "Armchair Discovery," 526–27.

58. "Et quia summorum virtus imitanda virorum est, / Hunc avus exemplo credidit esse sibi" from "In Atlantem / Gerardi Mercatoris Avi sui." Mercator, *Atlas*, ✻ 4v (JCB), 13v (LC); translation, 34.

59. Daston and Galison, *Objectivity*, 37.

60. On the complex relationship between science and art in the making of knowledge, see Lorraine Daston, "Fear and Loathing of the Imagination in Science," *Daedalus* 127, no. 1 (January 1, 1998): 73–95; Daston and Galison, *Objectivity*, specifically chap. 2; Alexander Marr, *Between Raphael and Galileo: Mutio Oddi and the Mathematical Culture of Late Renaissance Italy* (Chicago: University of Chicago Press, 2011), 168–74; and Smith, *Body of the Artisan*. Bernardus Furmerius notes Mercator's evident pride in his own hand ("manuque sua") in a poem prefacing the *Atlas*.

61. Akerman, "La genèse d'un titre," 15.

62. Mercator's apparent rejection of the Titanic genealogy puzzles scholars. Keuning suggests that Mercator's recreation of a human genealogy for Atlas suggests his desire to come up with a new name for his project ("The History of an Atlas: Mercator-Hondius," *Imago Mundi* 4 [1947] 37–62, at 38). Akerman argues there is no confusion ("La genèse d'un titre," 23).

63. Diodorus Siculus, *Bibliotheca Historica* (Cambridge, Mass.: Harvard University Press, 1961), 4.27.5.

64. Akerman, "La genèse d'un titre," 24, who credits an unpublished manuscript by Robert Karrow (see note 33).

65. James Akerman, "From Books with Maps to Books as Maps: The Editor in the Creation of the Atlas Idea," in *Editing Early and Historical Atlases*, ed. Joan Winnearls (Toronto: University of Toronto Press, 1995), 4–48, at 34.

66. For a historical overview of atlas structure before and after Mercator, see James Akerman, "On the Shoulders of a Titan: Viewing the World of the Past in Atlas Structure" (Ph.D. diss., Pennsylvania State University, 1991).

67. Daston and Galison, *Objectivity*, 17.

68. Ibid., 25–26. Also see Mi Gyung Kim's critique, "A Historical Atlas of Objectvity," *Modern Intellectual History* 6, no. 3 (2009) 569–96, at 571.

69. Mapping still remains a powerfully aesthetic endeavor: see Jacob, *Sovereign Map*; David Woodward, *Art and Cartography: Six Historical Essays* (Chicago: University of Chicago Press, 1987); and Denis E. Cosgrove, *Geography and Vision: Seeing, Imagining and Representing the World* (London and New York: Palgrave Macmillan, 2008).

70. The OED notes that "cosmos" derives from the Greek κόσμος, meaning "order, ornament, world or universe (so called by Pythagoras or his disciples 'from its perfect order and arrangement')." Several Renaissance cosmographers allude to this etymology, including Jacopo d'Angelo, Simon Grynaeus, Ortelius, Hondius and Blaeu; even Alexander von Humboldt names his geographic synthesis *Kosmos* in a nod toward the aesthetic dimensions of the term (Cosgrove, *Geography and Vision*, 34–39).

71. Indeed, while defending his choice to translate the title of Ptolemy's *Geography* as *Cosmographia*, Jacopo d'Angelo, the first translator of the text into Latin, celebrated the term as an equivalent to the Latin *mundus*. See the dedicatory epistle to Pope Alexander V, in *Cosmographia*, ed. Filippo Beroaldo, trans. Jacopo D'Angelo (Bologna, 1477), Ar.

72. The interest classical rhetorical and poetic theory takes in the harmonious integration of parts into wholes offers cosmographers a well-developed vocabulary for discussing their own integrative challenge. Particularly relevant is Aristotle's *Poetics* 7–8; Horace's dictum that the beautiful whole was "simplex . . . et unum" (*Ars Poetica* 24) is also relevant.

73. On *eusunopton*, see Jacob, "La mimesis géographique," 53–79; and Christian Jacob, "L'oeil et la mémoire: sur la périégèse de la terre habitée de Denys," in *Arts et légendes d'espaces: figures du voyage et rhétoriques du monde*, eds. Christian Jacob and Frank Lestringant (Paris: Presses de l'Ecole normale supérieure, 1981), 21–97, at 34–37.

74. On the convergence of art and science in pre-1800 scientific atlases, see Daston and Galison, *Objectivity*, 79.

75. On the importance of Mercator's Ptolemy for the development of the historical atlas as a genre, see W. A. Goffart, *Historical Atlases: The First Three Hundred Years, 1570–1870* (Chicago: University of Chicago Press, 2003). Mercator's historicized Ptolemy may also have influenced Ortelius's *Parergon*, which is often identified as the first historical atlas. Significantly, Mercator's Ptolemy is combined into a single volume with Ortelius's *Parergon* by Petrus Bertius entitled *Theatri geographiae veteris* in 1618.

76. Henry Newton Stevens and Edward Everett Ayer, *Ptolemy's Geography: A Brief Account of All the Printed Editions down to 1730* (London: H. Stevens, Son and Stiles, 1908), 22.

77. There were two different Greek versions of "Ptolemy" circulating in the thirteenth and fourteenth centuries, the A-recension, having a corpus of twenty-seven maps, and the B-recension, covering the same territory in sixty-five or more smaller maps; 38 of the 51 recorded Greek manuscripts had no maps at all. However, 41 of 58 Latin manuscripts included maps, all of which were based on the A-recension. Of the 222 maps printed in the fifteenth century recorded by Campbell, 117 were versions of Ptolemy's twenty-seven maps; 32 editions of Ptolemy with maps were published between 1477 and 1600 (Akerman, "From Books with Maps," 8–9). These figures are based on O.A.W. Dilke, J. B. Harley, and David Woodward, "Cartography in the Byzantine Empire," in *The History of Cartography*, vol. 1, *Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987), 267–74; and Tony Campbell, *The Earliest Printed Maps, 1472–1500* (London: British Library, 1987).

78. Girolamo Ruscelli, ed., *La geografia di Claudio Tolomeo Alessandrino* (Venice: Vincenzo Valgrisi, 1561).

79. The printed notes to the binder at the end of this edition include specific directions to bind the "Tavola universale nuova" (the new map of the world) before the "Tavola prima universale antica di tutta la Terra fin' a' tempi di Tolomeo" ("the first universal, ancient map of the entire world known since Ptolemaic times"), suggesting a self-consciousness about the book's organization and its effect. See pages ✻ r, A1r.

80. Bruno Latour, "Visualization and Cognition: Thinking with Eyes and Hands," *Knowledge and Society* 6 (1986): 1–40. Latour notes how the gathering of old and new in one place makes visible contradictions that in turn produce new knowledge (12).

81. See text accompanying the map which includes a list of sources.

82. Jean Paul Richter, ed., *The Notebooks of Leonardo da Vinci* (New York: Dover, 1970), 2:111.

83. See the useful 'map index' of text and graphics in Akerman, "From Books with Maps," 21.

84. Nicolas Sanson, *Atlas nouveau: contenant toutes les parties du monde* (Paris, 1696); and Gilles Robert de Vaugondy, *Atlas universel* (Paris, 1757). Sanson's frontispiece even retains the Atlas image: this figure is a hybrid between Mercator's Atlas with his athletic, classical body and older versions showing an old man holding the world on his shoulders. Sanson's enormous atlas is notable for its detailed "tables geographiques" which preface each section of maps, while Vau-

gondy's, in a throwback to older Ptolemaic editions, contains a long prefatorial "essai" on the development of geography followed by the maps. The "Orbis vetus" in this edition corresponds not to the Ptolemaic world but to the world as it was known in the seventeenth century.

85. A characteristic feature of Dutch mapbooks, including Mercator's, is an emphasis on maps of the Low Countries in utter disproportion to other parts of even Europe.

86. "Cum . . . necessitate ordo semper requirat generalia particularibus anteponere, totumque parti . . ; ego devinctus lege huic primo . . . tomo, universalem orbis terrae typum, euisque quatuor partes . . . & singulis quoque deinceps tomis consequentibus, ut is etiam perfectum semper habeat opus, ac totius universi descriptionem, nec hac utili speculatione privetur, qui vel suae tantum patriae delineationem sibi comparaverit. Iucunda etenim est & maximopere necessaria generalium contemplatio, ei qui vel minimam mundi . . . cognitionem habere cupit." Mercator, *Atlas,* "Orbis Terrae Typus," [A3r] JCB), 32r (LC); translation, 152–53.

87. Akerman, citing Dirk de Vries, notes that much of Mercator's coverage of Europe was compiled as larger, wall-sized maps, which had apparently been broken into constituent atlas-sized sheets. Some of Mercator's sheets could thus be taken out of the atlas and assembled into single wall-sized maps: de Vries identifies nine such multi-sheet maps for various parts of Europe. See Akerman, "From Books with Maps," 32; and Dirk de Vries, "The 'Helvetia' Wall-map by Gerhard Mercator," *Cartographica Helvetica* 5 (1992): 3–10.

88. For discussion of the 'narrative' aspects of atlases, see Denis Wood, "Pleasure in the Idea: The Atlas as Narrative Form," *Cartographica: The International Journal for Geographic Information and Geovisualization* 24, no. 1 (1987): 24–46.

89. Blaeu, *Atlas Maior, siue, Cosmographia Blauiana,* 6 (following "Orbis Terrarum" section). Sanson's detailed "tables geographiques" for the world and each of its regions in the *Atlas nouveau* may derive from this kind of schematic diagram in Blaeu's atlas. The publication success of the plates of Mercator's *Atlas* in the seventeenth century, when the principal Dutch publishing houses of Hondius, Jansson, and Blaeu purchased and used them, also ensured that the formal structure of the 1595 *Atlas* set the standard for understanding the order of the world.

90. Abraham Ortelius, *Theatre de l'univers: contenant les cartes de tout le monde: avec une brieve declaration d'icelles* (Antwerp: Plantin, 1572), epigraph.

91. Cicero, *De natura deorum,* 2.37: ". . . ipse autem homo ortus est ad mundum contemplandum et imitandum—nullo modo perfectus, sed est quaedam particula perfecti. Sed mundus quoniam omnia conplexus est neque est quicquam, quod non insit in eo, perfectus undique est" (Marcus Tullius Cicero, *De natura deorum; Academica,* trans. H. Rackham [Cambridge, Mass.: Harvard University Press, 1956]). Besse, *Les grandeurs de la terre,* 335, discusses the passage's significance for Ortelius and Neo-Stoicism.

92. See Nuti, "World Map"; Giorgio Mangani, *Il "mondo" di Abramo Ortelio: misticismo, geografia e collezionismo nel Rinascimento dei Paesi Bassi* (Modena: Franco Cosimo Panini, 1998); Denis Cosgrove, "Globalism and Tolerance in Early Modern Geography," *Annals of the Association of American Geographers* 93, no. 4 (2003): 852–70; and Brotton, "A 'Devious Course.'"

93. On the genre of the cosmographic meditation, see the essays collected in Frank Lestringant, ed., *Les méditations cosmographiques à la renaissance,* Cahiers V. L. Saulnier 26 (Paris: Presses de l'Université Paris-Sorbonne, 2009). On the relationship between meditations and scientific practice, see Pierre Hadot, *Philosophy as a Way of Life: Spiritual Exercises from Socrates to Foucault* (Oxford and New York: Blackwell, 1995).

94. For reflections on the relationship between geography and "sense of place," see Yi-fu Tuan, *Cosmos and Hearth: A Cosmopolite's Viewpoint* (Minneapolis: University of Minnesota Press, 1996).

95. Lestringant, *Mapping the Renaissance World,* 5.

96. On the literary and philosophical traditions of *kataskopos,* see Patrick Gautier Dalché, "Les antécédents médiévaux de la méditation géo-cartographique," in *Les méditations cosmographiques,* ed. Frank Lestringant, Cahiers V. L. Saulnier 26 (Paris: Presses de l'Université Paris-Sorbonne, 2009), 19–40.

97. "Huic operi titulum imposuit: Atlas sive cosmographicae speculationis libri quinque" [He titled this work: Atlas or Cosmographical speculations in five books]. Mercator, *Atlas,* * 2r (JCB); 10r (LC); translation, 16.

98. Christian Jacob, "Quand les cartes reflechissent," *Espaces temps* 62–63 (1996): 36–49, at 46.

99. Besse, *Les grandeurs de la terre,* 336; Cosgrove, "Globalism and Tolerance," 862.

100. Seneca *Naturales Quaestiones* 1, pref. 7–11.

101. "Tu interim Lector vale & fruere, ac huius tuae habitationis ac tibi ad tempus tantum concessae gloriam cum Poeta Buchanano diligenter considera, qui sic eam caelestibus comparat, ut animos terrestribus ac rebus hisce caducis immersos extrahat, & ad altiora ac aeterna viam ostendat." Mercator, *Atlas,* "Orbis Terrae Typus," 32r (LC); translation, 154–55.

102. "Percipias rerum sit quantula portio, verbis / Quam nos magnificis in regna superba secamus / Partimur ferro, mercamur sanguine fuso / Ducimus exiguae glebae de parte triumphos. / . . . si cum stellati tegamine caeli / Componas puncti instar erit, vel *seminis,* unde / Condidit innumeros senior Gargetius orbes. / [. . .] Quantula pars rerum est, in qua se gloria tollit, / Ira fremit, metus *exanimeat,* dolor urit, egestas / Cogit opes ferro, insidus flamma atque veneno? / Scilicet & trepido ferment humana tumultu." Mercator, *Atlas,* "Orbis Terrae Typus," 32r (LC); translation, 154–55.

103. Noting the geographical root of "ethos," Denis Cosgrove argues that the principle purpose of world-mapping in a pre-secular age was ethical, for it concerned the place of human life in an ordered creation (*Geography and Vision Seeing,* 38). He connects this idea to Plato *Timaeus* 3.38 and its legacies in Aristotle's *Metaphysics* and *De anima.*

104. "Qui quantum patet universus Orbis, / & quicquid fuit universe in Orbe . . ." in Mercator, *Atlas,* [no sign, leaf 2v] (JCB); 8v (LC), translation, 5.

105. "Sidera cum terris coniunxit, sacra prophanis / Addidit, at rectem fecit utrumque tamen. / Astra Mathematicus radio descripsit acuto, / Et dedit in parvo conspicienda globo. / In tabulas terrae spaciosum contulit orbem, / [. . .] Sacraque detexit vatum mysteria, Christem / Praecones iussit quattuor ire simul. / Atque ea sic fecit superos ut vinceret omnes / Artifices, proprio marte, manuque sua" in Mercator, *Atlas,* [no sign, leaf 4v] (JCB); 7v (LC); translation, 2.

106. "Hunc Atlantem tam insignem eruditione, humanitate ac sapientia virum mihi imitandum proposui, quo ad ingenium & vires suppetunt, Cosmographiam veluti ex alta animi specula contemplaturus . . . à [*sic*] creatione incipiens, partes eius omnes, quatenus methodica ratio postulat, iuxta creationis ordinem enumerabo, & physicem contemplabor, quò causae rerum innotescant . . . sic totum mundum tanquam in speculo proponam, ut ad inveniendas rerum causas, sapientiam & prudentiam assequendam, sint aliqualia rudimenta, & lectorem ad altiores speculationes ducere possint." Mercator, *Atlas,* A1r (JCB); 14r (LC); translation, 37.

107. For studies of the relationship between cartography and theology, see Pauline Moffitt Watts, "The European Religious Worldview and Its Influence on Mapping," in *The History of Cartography,* vol. 3, *Cartography in the European Renaissance,* ed. David Woodward, (Chicago: University of Chicago Press, 2007), 382–400, at 397–98.

108. See Catherine Delano-Smith and Elizabeth Morley Ingram, *Maps in Bibles, 1500–1600* (Geneva: Droz, 1991); Fiorani, *Marvel of Maps;* and Kenneth Nebenzahl, *Maps of the Holy Land* (New York: Abbeville Press, 1986). Most mapmakers in the sixteenth and seventeenth centuries appear to have had Reformist leanings: it is a striking fact that the production and use of maps seems more firmly associated with Protestant regions than with Catholic ones. Delano Smith and Ingram's study decisively shows that this practice was a Reformist one, as maps began to appear in Bibles in the 1520s, coinciding with Luther's break from the Catholic Church. The great cycle of maps in the Vatican Galleria may in fact be a post-Tridentine response to the widespread Protestant use of maps in the service of religious contemplation (Fiorani, *Marvel of Maps*).

109. David Woodward, "Cartography in the Renaissance: Continuity and Change," in *The History of Cartography,* vol. 3.1, *Cartography in the European Renaissance,* ed. David Woodward (Chicago: University of Chicago Press, 2007), 3–24, at 10. See also figure 6.2 in Robert Karrow, "Intellectual Foundations," 241.

110. ". . . toutesfois il n'est rien au pris de l'aucteur, qui a les mains si grandes, qu'en une il contient tout le monde, & entre deux ou trois doigts il tourne toute la terre." André Thevet, *La cosmographie universelle* (Paris, 1575), ā5r (copy in Beinecke library).

111. "Ceste discipline Cosmographique donques sert pour descouvrir la vanité de ce en quoy nous nous arrestons, puis abaissant nostre orgeuil, elle adresse nostre esprit à ce qui est grand, & ne le permect plus s'arrester à ce qui n'est rien. Et pour ceste cause ie pense qu'il n'y a science, après la Theologie, qui ayt plus grande vertu de nous faire cognoistre la grandeur & puissance divine, & l'avoir en admiration que celle la." Thevet, *La cosmographie*, a4v–5r (copy in Beinecke library).

112. See for instance fig. 16: God as geometer in the Codex Vindobonensis 2554.

113. See the studies by Crane, *Mercator*; Brotton, "A 'Devious Course'"; Marcel Watelet, ed., *Gérard Mercator Cosmographe: le temps et l'espace* (Antwerp: Fonds Mercator Paribas, 1994); Rienk Vermij, "Mercator and the Reformation," in *Mercator und Wandlungen der Wissenschaften im 16. und 17. Jahrhundert* (Bochum: Brockmeyer, 1993), 77–90; and Alastair Hamilton, *The Family of Love* (Cambridge: J. Clarke, 1981), 65–82.

114. Some suggest that Mercator's arrest may have in fact been linked to the Reformation symbolism in his first two maps: see Crane, *Mercator* and Brotton, "A 'Devious Course'."

115. Brotton, "A 'Devious Course,'" 104.

116. Mercator, *Atlas*, ✻ v–2r (JCB); 10 (LC); translation, 13–14.

117. Letter of March 24, 1583 to Heresbach, in Maurice Van Durme, *Correspondence Mercatorienne* (Antwerp: Nederlandsche Boekhandel, 1959).

118. "Axioma est omni menti opificium huius mundane machinae aliquomodo inspicienti, Deum ipsius autorem immensae potentiae, sapientiae & bonitatis esse. . . . Id enim molimur, dum Cosmographiam tradimus, ut ex mirabili omnium rerum in unum Dei finem Concordia, & ex inperscrutabili in compositione providentia, infinita Dei sapientia, & inexhausta eius bonitas conspiciantur . . ." Mercator, *Atlas*, A2r (JCB), 14r (LC); translation, 38–39.

119. The *Atlas*'s English translator (1635) adds frequent quotations from Josuah Sylvester's *The Divine Weeks*, a translation of *La Sepmaine*, to amplify Mercator's commentary.

120. Bartholomaeus Mercator, *Breves in Sphaeram meditatiunculae*.

CHAPTER TWO

1. "Nostre monde vient d'en trouver un autre (et qui nous respond si c'est le dernier de ses freres, puis que les Daemons, les Sibylles et nous, avons ignoré cettuy-cy jusqu'asture?) . . ." All citations from Montaigne's *Essais* refer to Michel de Montaigne, *Les essais*, ed. Pierre Villey, Verdun L. Saulnier, and Marcel Conche (Paris: Quadrige/PUF, 2004). Translations are from *The Complete Essays of Michel de Montaigne*, trans. Donald Frame (Stanford: Stanford University Press, 1958). Text and translations will be cited as "Montaigne" followed by volume and essay number, and page numbers from the Villey and Frame editions: Montaigne, 3.6; 908/693.

2. "Et de cette mesme image du monde qui coule pendant que nous y sommes, combien chetive et racourcie est la cognoissance des plus curieux!" Montaigne, 3.6; 908/693.

3. Montaigne, 3.6; 908/693: "Iamque adeo affecta est aetas, affectaque tellus." The reference is to *De rerum natura* 2.1.136; all translations of Lucretius are from Titus Lucretius Carus, *De rerum natura*, trans. W. H. D. Rouse (Cambridge, Mass.: Harvard University Press, 1967).

4. "Monde" appears 380 times in the *Essais*, while "univers" appears 16 times.

5. Montaigne, "Au lecteur," 3/2: "je suis moy-mesmes la matiere de mon livre."

6. Montaigne, 2.17; 657/499.

7. See Philip Ford, *The Montaigne Library of Gilbert de Botton at Cambridge University Library* (Cambridge: Cambridge University Library, 2008). Montaigne's copies of the 1562 edition of Strabo's geography and the 1551 edition of Apian's *Cosmographia* both survive, as does his heavily annotated copy of Lucretius's *De rerum natura*.

8. On connections between the three essays, see Tom Conley, "Mapping Montaigne: The 'Apologie' as Diagram and Discourse," *Montaigne Studies* 6 (1994): 79; Michel de Certeau, *Heterologies: Discourse on the Other* (Minneapolis: University of Minnesota Press, 1986), 68; Giuliano Gliozzi, *Adamo e il nuovo mondo: la nascita dell'antropologia come ideologia coloniale: dalle genealogie bibliche alle teorie razziali (1500–1700)* (Firenze: La nuova Italia, 1977); and Géralde Nakam, *Les Essais de Montaigne, miroir et procès de leur temps: témoignage historique et création littéraire* (Paris: Nizet, 1984)—though none discuss them from the perspective of the *Essais*'s overall structure.

9. Montaigne, "Au lecteur," 3/2.

10. Montaigne, 1.26; 157/116; this passage is famously echoed by Descartes in the *Discours de la méthode*.

11. On the book of nature as a trope, see Ernst Robert Curtius, *European Literature and the Latin Middle Ages*, trans. Willard R. Trask (Princeton: Princeton University Press, 1990), 319–25; William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994); and James J. Bono, *The Word of God and the Languages of Man: Interpreting Nature in Early Modern Science and Medicine* (Madison: University of Wisconsin Press, 1995). On the *speculum mundi* and its relevance for self-portraiture, see Michel Beaujour, *Miroirs d'encre: rhétorique de l'autoportrait* (Paris: Seuil, 1980), 29–41.

12. Noting this shift of metaphors, Timothy Hampton claims that the world's function as book is subverted by its function as mirror, because in the latter analogy individuals learn how to judge healthily only by recognizing their own infirmity (*Writing from History*, 146). His observation suggests how the function of the book itself was changing: for writers such as Montaigne, the book was no longer a final and finite epistemic authority but itself a shifting, partial, and inevitably flawed representation; for Montaigne, as for Mercator, the conception of the book-as-object had to be reimagined in order to reflect and contain a shifting world.

13. Maurice Merleau-Ponty, *Signs* (Evanston: Northwestern University Press, 1964), 199.

14. Montaigne, 1.26; 146/107.

15. For related discussion of this trope see Colin Dickson, "Geographic Imagination in the *Essais* and Geomorphism in Montaigne Criticism," in *Geo/Graphies: Mapping the Imagination in French and Francophone Literature and Film* (Amsterdam: Rodopi, 2003), 29–58.

16. Montaigne, 3.2; 804–5/610–11.

17. Montaigne, 1.31; 204/151.

18. Montaigne, 2.12; 572/430.

19. On the vision of the world as a body, see George Tucker, "Déchets, déchéance et recyclage-corps, corps du monde et corps-texte chez Joachim Du Bellay et Michel de Montaigne," in *Strategic Rewriting*, ed. David Lee Rubin, (Charlottesville, Va.: Rookwood, 2002).

20. Montaigne, 1.21; 99–100/70.

21. On the Ebstorf map, see Evelyn Edson, *Mapping Time and Space: How Medieval Mapmakers Viewed Their World* (London: British Library, 1997).

22. Charles Taylor, *Sources of the Self: The Making of Modern Identity* (Cambridge: Cambridge University Press, 1992), 182.

23. Montaigne, 3.13; 1072/821.

24. The literature on this essay is vast; influential essays in this vein include: Certeau, *Heterologies*; Gérard Defaux, "A propos 'Des coches' de Montaigne (III, 6): de l'écriture de l'histoire à la représentation du moi," *Montaigne Studies* 6 (1994), and "Un cannibale en haut de chausses: Montaigne, la différence et la logique de l'identité," *MLN* 97, no. 4 (1982); Frank Lestringant, "Le Cannibalisme des 'Cannibales,' I," *Bulletin de la Société des Amis de Montaigne* 9–10 (1982), and "Le Cannibalisme des 'Cannibales,' II: De Montaigne à Malthus," *Bulletin de la Société des Amis de Montaigne* 11–12 (1982); Daniel Martin, "Cannibals and Kings: Montaigne and the Valladolid Hearings of 1550–1551," *History of European Ideas* 20, no. 1–3 (1995); Peter Eubanks, "Montaigne's Cannibalistic Communion," *Montaigne Studies* 22 (2010): 53–60; and Edward Tilson, "Le discours sauvage: cannibalisme et autres rites barbares dans les *Essais* de Montaigne," *Montaigne Studies* 22, *Montaigne et le Nouveau Monde* (2010): 137–58.