

This project connects the evolution of European cartography to the developing culture of objectivity in European knowledge-making communities. Just as the proto-scientists of the Renaissance revived the knowledge-making processes of ancient authors such as Aristotle, cartographers examined the work of second century Roman geographer Claudius Ptolemy, and especially his *Geographia*. The *Geographia* describes the process of creating a projection which relates physical space to its depiction on a map; it was Ptolemy's treatise on the proper representation of space. Just as the knowledge-making community gradually reduced the authority of ancient authors, geographers largely abandoned Ptolemy after the sixteenth century. During the sixteenth century, when Ptolemy's projection reigned supreme, European states scrambled to launch colonial projects. Editions of the *Geographia* began to contain maps of the so-called "New World". These maps often contained depictions of indigenous Americans, which demonstrated imperialist European attitudes towards the people of the Americas and their land. However, the "neutral," objective maps on which they were presented legitimized these depictions. Over the course of the sixteenth century, geography became bound up in the idea of objectivity. The mathematical, objective accuracy of maps legitimized their contents, and thus came to legitimize the colonial project itself.

The *Geographia* was brought to Western Europe in about 1400. During the sixteenth century, editions of the *Geographia* proliferated across Europe as European knowledge makers began to change their approach towards the creation of knowledge, both spatial and otherwise. I evaluate five editions of the *Geographia* published from 1525 to 1599, with particular focus on their maps of the Americas. I analyze the structure of these maps, as well as the atlas paratext which surround them, and I connect these elements to the maps' depictions of indigenous Americans. I consider changes in these components over the course of the sixteenth century. Finally, I attempt to answer the question of why Europeans tried to make their maps "neutral," and its impact on the European understanding of their own relationship with the Americas.

**Ptolemy Comes to America: Cartographic Objectivity  
and European Imperial Ambition, 1500-1630**

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April 25, 2019

An undergraduate thesis submitted to the Department of History of Mount  
Holyoke College, in partial fulfillment of the degree of Bachelor of Arts with  
Honors

## ACKNOWLEDGEMENTS

My profound thanks to Professor Lan Wu, who agreed to take me on as a thesis advisee despite this topic being a bit outside your wheelhouse. Your conversations, advice, and encouragement were instrumental in the success of this project.

I would like to thank Professor Christine DeLucia and Professor Donald Cotter, whose courses *Cartography and Exploration in Early North America* and *Science, Revolution, and Modernity* sparked this project, which grew so much in the writing.

My parents, Elizabeth Byrne and Robert Clinton, who always asked me “why?”

Ana Berthel, my lovely roommate of four years, whose immense patience, kindness, and support – even while dealing with the stress of senior year and grad school applications – helped to keep me sane. I am profoundly grateful for your willingness to ignore my muttering, pass judgement on wording, and listen to more rants about maps than you ever wanted. I even feel the need to thank you for your appalling love of puns, which you have determined you must share with me *ad nauseum*.

To my fellow history thesis writers (and writers of theses-that-weren't), for your comradery, kindness, and helpful comments. Thanks also to Professor Desmond FitzGibbon for organizing the History 395 writing group, which was a vital part of the success of this project.

Many thanks to the late Helene Brosseau Black '31, whose generous gift of six volumes of Ptolemy's *Geographia* made this project possible. Her donations of art and rare books have enriched mine and many others' educations.

Thanks to the Mount Holyoke College Archives, for keeping a ludicrous number of rare books on reserve for me for nearly six months, and for maintaining a wonderful environment for discovery. This project would not have been possible without the time and assistance of the MHC Archives staff.

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## INTRODUCTION

In a beloved and oft-referenced episode of *The West Wing*, an American TV show about a fictional presidential administration, White House press secretary CJ Cregg is shocked to discover, at a meeting with a group of geographers, that the map projection used in schools deeply distorts the relative size of higher and lower latitudes. “So, you’re probably wondering what all this has to do with social equality,” begins a geographer. “No,” says CJ. “I’m wondering where France really is.”<sup>1</sup>

Maps are inherently distortions. However, the genuine shock CJ experiences as she realizes the problems associated with map projection reflect a broad societal ignorance of the influence of map projections on thought. We consider maps to be vehicles through which we may reveal truth about space. With this project, I seek to explore the history of why we think about maps as “neutral” objects imbued with a kind of objective power. Prior to the sixteenth century, European maps were frequently projectionless.<sup>2</sup> Cartographers were simply unconcerned with the mathematics of an absolute space. After the sixteenth century, European maps meant for intellectual (rather than artistic) use,

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<sup>1</sup> *The West Wing*, 2.16, “Somebody’s Going to Emergency, Somebody’s Going to Jail,” directed by Jessica Yu, written by Paul Redford and Aaron Sorkin. Feb. 28, 2001, NBC.

<sup>2</sup> John F. Moffitt, “Ptolemy’s *Chorographia* in the New World: Revelations from the *Relationes Geográficas de la Nueva España* of 1579-1581,” *Art History* 21, no. 3 (1998): 373.

were always projections.<sup>3</sup> The sixteenth century was a period of massive transition for European cartographic conventions.

The concept of the paradigm shift, introduced by Thomas Kuhn in his monumental theoretical text *The Structure of Scientific Revolutions*, describes the process by which one fundamental understanding of the world is replaced by another.<sup>4</sup> In Kuhn's book, this has the highly specific connotation of a broadly accepted basic set of principles used by a scientific community as the basis for normal scientific inquiry.<sup>5</sup> The concept of the paradigm is useful outside of the strict confines of Kuhn's definition, however. As Paul Feyerabend points out in his book *Against Method*, the human mind requires an interpretive framework in order to process the inputs of the senses; it is impossible to comprehend without first imposing a framework of some sort.<sup>6</sup> Feyerabend argues that true objectivity is impossible because the process of viewing a phenomenon and comprehending it through a mental framework are inextricable; "there are not two acts – one, noticing a phenomenon; the other, expressing it with the help of the appropriate statement – *but only one*."<sup>7</sup> The interpretive framework is required for the mind to process the observation. Bacon's idols of the mind cannot be completely stripped away.

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<sup>3</sup> Ibid., 373.

<sup>4</sup> Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 4th ed. Chicago, IL: University of Chicago Press, 2012, 3-4.

<sup>5</sup> Kuhn defines normal science as the knowledge making process which occurs during periods when a paradigm is generally recognized; he contrasts this with periods of "revolution" where paradigms are in upheaval. Ibid., 10-11.

<sup>6</sup> Paul Feyerabend, *Against Method*, 4<sup>th</sup> edition, (London, UK: Verso, 2010), 51.

<sup>7</sup> Ibid., 51.

Feyerabend's work has broad implications for modern understandings of empiricism, but it also suggests that an interpretive framework is required outside of the natural sciences. For example, comprehending space in an abstract sense requires a common framework. Frameworks are paradigmatic in character; they must be shared across communities so that knowledge production may occur. During the sixteenth century a paradigm shift occurred in the knowledge making framework through which Europeans conceptualized space. In order to distinguish Kuhn's idea of paradigm from Feyerabend's frameworks of interpretation, I refer to these frameworks as *modes*. A shift occurred from the medieval period to the renaissance between the medieval "relational" mode and the objective mode. The relational mode considered natural phenomena through the lens of Christian doctrine. During the renaissance, however, the paradigm was reframed; nature was considered God's creation, and as a result became a mechanism for interpreting and understanding God.

I often refer to the transition between "medieval" and "Renaissance" periods. I associate the "medieval" with the "relational" mode, which I define as the Christian framework that dominated European knowledge-making for centuries. The "Renaissance" period, in contrast, is associated with the rise of the "objective" mode, which I define as a change in the mode of engagement with knowledge, towards the idea that knowledge can be gained from direct experience with the world. There was overlap between the medieval period and the Renaissance; southern Europe took up these ideas before northern Europe.<sup>8</sup>

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<sup>8</sup> Richard W. Unger, *Ships on Maps: Pictures of Power in Renaissance Europe*. New York, NY: Palgrave MacMillan, 2010, 124

However, the sixteenth century is a key timeframe for assessing shifting spatial modes. In 1500, much of Europe remained in the relational mode. By 1600, the vast majority of maps conformed to the objective mode.

As spatial frameworks changed, a transition occurred in the way Europeans constructed maps. In addition to being objects imbued with religious meaning, practical devices meant for moving about, a method of representing knowledge about space, and a vehicle for art, maps became a way to represent accurate, supposedly objective knowledge about space. They became mathematically exacting, with a clear relationship between the space on the page and physical reality. Gridded lines of latitude and longitude represented this mathematical relationship. They became markers for the emerging objective mode, representing these maps as reliable sources of information.

As Europeans reframed their understanding of space, they simultaneously confronted the fact that the world was much larger than their medieval predecessors believed. Cartographers handled the disruption of their worldview in large part by turning to the objective mode. Cartographic representation of the Americas was initially varied, but collapsed quickly into repetitive motifs which served to reinforce a developing intellectual narrative of European superiority.<sup>9</sup> These cartographic motifs were a form of chorography, the systematic representation of regions, which was a core part of European cartography. Chorographic motifs came to be legitimized by their association with the

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<sup>9</sup> Surekha Davies, *Renaissance Ethnography and the Invention of the Human: New Worlds, Maps and Monsters*. Cambridge, UK: Cambridge University Press, 2016, 66.

objective mode, which was developing in to the only form of acceptable spatial representation.

Chapter One discusses the intellectual transition which occurred in the late medieval period. This transition reframed how European knowledge-making communities dealt with the natural world. The new objective mode thus came to emphasize observation as the mechanism by which people could come to know God through His creation. Simultaneously, empire came to be seen as a legitimizing element of the state due to the revival of Roman texts. Objective, mathematical elements came to legitimize maps, and these objective maps were thus able to justify new imperial projects.

Chapter One also introduces the central object of examination in this project: Ptolemy's *Geographia*. Just as the works of ancient authors such as Aristotle served as a medium of transition for natural philosophy, the *Geographia* was a medium through which sixteenth-century geographers expressed a changing understanding of spatial representation. The *Geographia* was published many times over the course of the sixteenth century, and examination of the changing modes of interaction with space presented in different editions allows for the elucidation of the broader change of European spatial conceptions.

Chapter Two turns to the examination of two editions of the *Geographia* published in the German lands. The first, a new translation by Willebald Pirckheimer published in Strasbourg in 1525, demonstrates the emerging Renaissance worldview in its map "Oceanus Occidentalis". Secondly, chapter Two examines the 1542 Basel edition of the *Geographia*, with maps by

cartographic celebrity Sebastian Münster. Both sets of maps demonstrate chorographic motifs regarding indigenous Americans: namely, that they were either savages (often cannibalistic) who needed to be subdued, or that they were child-like innocents who needed to be civilized and protected by Europeans. These motifs, legitimized by their association with the emerging objective mode, reinforced a European self-understanding of superiority which helped to justify imperialist projects.

Chapter Three examines three editions of the *Geographia* produced in Venice in 1562, 1574, and 1599. These three editions demonstrate the increasing prominence of the objective mode through their organization, which changes to reflect an interest in objectivity, and the styles and content of their maps, which become more uniform and reflect an increasing interest in colonialism. In addition, Chapter Three also investigates the Mercator projection, which came to replace the projections outlined by Ptolemy in the *Geographia* after the sixteenth century.<sup>10</sup> The Mercator projection is often thought of as a navigational map, but I demonstrate that its original purpose was much more related to the growing dominance of the objective mode in intellectual circles.

In his book “The New Nature of Maps,” cartographic historian JB Harley wrote that “the map is never neutral.” Harley considered maps to be objects with a veneer of neutrality, with inherent perspective. Through this veneer, they shaped the perspectives of those who created and viewed them. In this project, I explore the sixteenth century transformation which created the impression of the “neutral”

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<sup>10</sup> A slightly modified Mercator projection is still in widespread use today – in fact, it is the map which so shocks CJ with its distortion on *The West Wing*.

map, and assess its impact on the ways in which Europeans envisioned their relationships with indigenous Americans, and with the land of the so-called “new world.”

**CHAPTER 1:**  
**Geography in a World of Things**

*“The Things of the World”<sup>11</sup>: Renaissance Knowledge-Making and the  
Objective Mode*

Christianity was the framework medieval society used to understand the world and their place in it. The medieval perspective interpreted the world with the aid of God, through scripture. This framework, the relational mode, differs substantially from the later Renaissance perspective. As a result of the predominance of the relational mode, maps in the medieval period were focused on representing the world in a Christian framework. Representing physical realities, such as the roundness of the Earth, was simply less relevant to medieval scholars than representing what medieval people saw as the key to understanding the human place in God’s plan. According to the objective mode, which developed in the late medieval period and became the accepted process in the Renaissance, humanity could understand God through observation of God’s work; in this case, the natural world. The paradigmatic shift towards the objective mode had a significant influence on the cartography of the Renaissance, which became substantially more interested in representing the physical realities of the universe.

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<sup>11</sup> Rachel Eisendrath, *Poetry in a World of Things: Aesthetics and Empiricism in Renaissance Ekphrasis* (Chicago: University of Chicago Press, 2018), 51.

Medieval intellectuals and authors framed their experiences through their Christian worldview. For example, Faith Wallis demonstrates in her exploration of the monk Bede's book *The Reckoning of Time* that his "'science' reaches deeply into his religious worldview."<sup>12</sup> Willis argues that Bede's use of the word *natura* to refer to the divinely ordered, correct qualities of creation situate his knowledge in a firmly Christian framework – God has crafted the world's objects according to *natura*.<sup>13</sup> The idea of *natura* may be likened to "natural qualities;" Willis gives the example of the births of Ishmael and Isaac as being, respectively, *natura* and not, because Ishmael was born in the "usual way" while Isaac was conceived in his parents' old age.<sup>14</sup> As is demonstrated in the example of Isaac's birth, only God may alter *natura*, in the form of miracles. Bede uses the idea of *natura* to frame his studies of the natural world in the context of Christian cosmology. For example, according to Bede's *natura*, the calendar is connected to both Christian cosmology and mathematical calculation.<sup>15</sup> Bede is emphatic that the leap day must be inserted at the equinox, since according to his understanding of cosmogenesis, the world was created by God at the spring equinox and began accruing the "extra day" at that very moment.<sup>16</sup> For Bede, and other medieval scholars, Christian cosmology was what explained the natural world. This worldview, the relational mode, predominated for much of the medieval period.

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<sup>12</sup> Faith Wallis, "Reframing Bede's 'Science'," in *Innovation and Tradition in the Writings of the Venerable Bede*, ed. Scott DeGregorio (Morgantown, WV: West Virginia University Press, 2006), 93.

<sup>13</sup> *Ibid.*, 98.

<sup>14</sup> *Ibid.*, 96.

<sup>15</sup> *Ibid.*, 89.

<sup>16</sup> *Ibid.*, 84

However, the relational mode began to decline with the rise of Aristotelian philosophy in the late medieval period.

It is difficult to overstate the importance of Aristotelian philosophy in late medieval and early Renaissance scholarship.<sup>17</sup> About two thousand medieval Latin manuscripts of Aristotle's work survive, and given the substantial loss of documentation from the medieval period, it is highly probable that many – perhaps even thousands – more manuscripts existed.<sup>18</sup> In addition, commentaries on Aristotle translated from Greek, and further translations of Arabic treatises from the Muslim world which drew on Aristotle, were available.<sup>19</sup> Given the intense labor associated with medieval manuscript production prior to the development and proliferation of the printing press in the mid-fifteenth century, the breadth of Aristotle's influence is obvious simply from the comparative number of Aristotelian manuscripts. This body of literature profoundly impacted the medieval European intellectual tradition. In fact, its impact is so great that the intellectual community of the late medieval period is commonly called simply “Aristotelianism,” or sometimes “scholasticism.”<sup>20</sup> The objective mode emerged in the context of this tradition.

Late medieval Aristotelian philosophy emphasized the connection between God and nature. Nature was no longer the object of study with God's

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<sup>17</sup> Edward Grant, *The Foundations of Modern Science in the Middle Ages: Their Religious, Institutional, and Intellectual Contexts*, Cambridge History of Science (Cambridge, UK: Cambridge University Press), 1996, 26-27.

<sup>18</sup> Since Aristotle's work was originally written in Greek, the number of translations into Latin, the language of intellectual communities during the period, gives us an idea of the relative circulation of these ideas. *Ibid.*, 27.

<sup>19</sup> *Ibid.*, 27-29.

<sup>20</sup> *Ibid.*, 28.

help; instead, man sought to comprehend God through nature, which was His divine work.<sup>21</sup> The growing primacy of Aristotelian thought caused scholars to reframe the human relationship with the Earth and the divine. This was part of a larger trend towards “objectivity” in thinking – the idea that humans should seek to dispassionately observe the world of natural objects, rather than viewing themselves as essentially one with it. The centrality of the human relationship to God remained, but nature became a vehicle through which they could understand the divine hand of God in the world, rather than something that could be understood through divine assistance. The ultimate object of study had become God through nature, rather than the earlier relational mode, which understood nature through God’s assistance and guidance in a Christian cosmology.

The Renaissance reframing of the triadic relationship between humanity, God, and nature occurred in large part through the context of the late medieval university system. In his book *The Foundations of Modern Science in the Middle Ages*, Edward Grant argues that the knowledge-making system created in the middle ages was instrumental in the development of modern science.<sup>22</sup> The institutionalized nature of the European university system allowed for knowledge-making to become active practice, with engagement from a defined community – that is, a group of people with a shared intellectual foundation who knew, and knew of, one another.<sup>23</sup> The formulation of the institutional knowledge-making community in universities was based on the master-student relationship; students

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<sup>21</sup> Kellie Robertson, *Nature Speaks: Medieval Literature and Aristotelian Philosophy* (Philadelphia, PA: University of Pennsylvania Press), 2017, 45-46.

<sup>22</sup> Grant, xiii.

<sup>23</sup> *Ibid.*, 172-173.

studied under masters within their faculty of interest, and thus formed intellectual relationships with masters and with one another.<sup>24</sup> The curriculum at an early-modern university generally focused on studying and interpreting the works of Aristotle and other classical philosophers.<sup>25</sup> Grant argues that the institutional infrastructure of medieval universities was a key component of the rise of the empirical, scientific knowledge-making communities of the seventeenth and eighteenth centuries. As a result of the university system, Aristotelianism became widespread throughout European knowledge-making communities. Late medieval scholars thus began the process of shifting away from the relational mode and towards the objective mode as a cohesive community through the framework of Aristotelianism. Aristotelianism came to form a bedrock of the objective worldview which paved the way for later empirical practice.

Despite the clear continuity of knowledge-making practices from medieval universities to modern scientific communities, early proponents of science understood themselves to be in stark opposition to the existing system. Late medieval and Renaissance scholars did not use the phrase “scientific revolution;” instead, they spoke of a “new science.”<sup>26</sup> In early modern scholarly writing, it is clear that the authors considered themselves to be developing an entirely new practice. For example, English philosopher and early scientist Francis Bacon described existing knowledge-making systems as “neither prosperous nor well-advanced, and that a quite different way must be opened up for the human

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<sup>24</sup> Ibid., 38-39.

<sup>25</sup> Ibid., 43-45.

<sup>26</sup> Pamela O. Long, *Artisan/Practitioners and the Rise of the New Sciences, 1400-1600* (Corvallis, OR: Oregon State University Press, 2011), 1.

intellect than men have known in the past...”.<sup>27</sup> Bacon is particularly contemptuous of Aristotle, who he accuses of having “utterly enslaved his natural philosophy to his logic...”<sup>28,29</sup> In his book *The New Organon*, published in 1620, Bacon lays out a system of what he describes as objective, empirical knowledge-making. He suggests that knowledge-makers must attempt to observe impartially and objectively in order for knowledge to advance.

Bacon distinguishes sharply between the “idols of the mind” and the “ideas of the divine.” The idols of the mind are “no more than empty opinions” which obscure the “true prints and signatures made upon the creation” of the “divine mind.”<sup>30</sup> The idols of the mind prevent the creation of useful knowledge, because they trick the mind into believing it knows nature. According to Bacon, the ideas of the divine can only be understood through a gradual building up of specific observations into general axioms.<sup>31</sup> While the Baconian empirical system is different from Aristotelianism because it espouses observation and experimentation instead of logic, it retains the core idea of observing the natural world to gain insight into God in the form of Bacon’s “ideas of the divine.” In contrast, Bacon denigrates the core of the relational worldview: the idea that a framework was necessary for the interpretation of nature.

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<sup>27</sup> Francis Bacon, *The New Organon*, ed. Lisa Jardine & Michael Silverthorne, (Cambridge, UK: Cambridge University Press, 2000), 6.

<sup>28</sup> *Ibid.*, 1.54, 46.

<sup>29</sup> The humanists of the fourteenth and fifteenth centuries shared Bacon’s contempt for Aristotle; for a more complete discussion of humanism’s role in map production, see the second section of this chapter, *The “Renaissance of Empire”*.

<sup>30</sup> *Ibid.*, 1.23, 37.

<sup>31</sup> *Ibid.*, 1.18-19, 36.

Bacon presented his system of objective knowledge creation not simply as practically superior to the relational system of the past, but as morally superior as well. Bacon described the primary object of scientific inquiry as the production of “works,” tangible items that improved society.<sup>32</sup> For Bacon, the knowledge creation process was a moral question: those who chose not to utilize the best system produced few or no works for the betterment of society, and thus were morally bankrupt. Bacon articulates this point most clearly in his unfinished novella “The New Atlantis,” which depicts a new-world utopian society called Bensalem. Bensalem is highly technologically advanced; their system of knowledge-creation rests on Bacon’s idealized university, the House of Solomon, which uses Baconian methods to study the universe and interpret the “Ideas of the Divine.”<sup>33</sup> Bensalem is also somewhat improbably Christian, through a miraculous collective vision of a pillar of light shining out of the sea, and the subsequent appearance of both a Bible (including yet-to-be composed books) and a letter from St. Bartholomew.<sup>34</sup> Through Bensalem, Bacon suggests that a moral society must be Christian, scientifically and empirically rigorous, and productive – through the “good and holy uses” of their knowledge.<sup>35</sup> Bacon articulated the idea that empiricist objectivity represented a method of approaching knowledge which was morally and practically superior to both the relational mode and to Aristotelian logic.

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<sup>32</sup> Ibid., 8, 34

<sup>33</sup> Francis Bacon, *The New Atlantis and the Great Instauration*, ed. Jerry Weinberger (Malden, MA: Wiley Blackwell, 2017), 84-85.

<sup>34</sup> Ibid., 74-76

<sup>35</sup> Lisa Jardine & Michael Silverthorne, Introduction to *The New Organon*, Francis Bacon, ed. Lisa Jardine & Michael Silverthorne (Cambridge, UK: Cambridge University Press, 2000), xix-xx.

Bacon describes the proper methods for experimentation to create knowledge and the subsequent development of new works as his method, which he believes will appropriately build general axioms off of observation. Bacon's articulation of this idea was novel, especially in its clarity. However, in reality, Bacon's philosophy was heavily rooted in the same Aristotelianism which Bacon conceptualized himself as fighting against. Bacon's philosophy, and the early-modern empiricism which took it for a template, could never have been conceptualized without the shift towards the objective mode which resulted from late medieval Aristotelianism.

Though Francis Bacon came to articulate the new pro-objective stance of the European knowledge-making community most clearly in *The New Organon*, it was rooted in a paradigm shift visible in much early Renaissance literature and culture. In her book *Poetry in a World of Things*, Rachel Eisendrath demonstrates that the transition towards objectivity as a superior method was expressed not only through the explicit philosophical writing of natural philosophers like Bacon, but also in art and poetry. For example, Eisendrath shows that the framing of the lady knight Britomart's experiences in the house of the evil sorcerer Busirane in Edmund Spenser's sixteenth-century epic poem *The Faerie Queene* represents a moral judgement on the relational mode. Britomart passes through several rooms in the sorcerer's home as she attempts to rescue the lady Amoret from his clutches. In the first room, Britomart observes works of art through the old mode.<sup>36</sup> Spenser utilizes evocative language which draws the reader into an old

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<sup>36</sup> Eisendrath, 53

tapestry – and Britomart herself is likewise ensnared. “Yet here, and there, and every where vnwares / it shewed it selfe, and shone vnwillingly.”<sup>37</sup> Spenser uses language which simultaneously entices and repels; as Eisendrath points out, “he implicitly questions – even demonizes – the magic’s seductive effect...”<sup>38</sup> This scene occurs in an evil wizard’s home, implying that Britomart is being tempted away from her quest by engaging with the tapestry. The ultimate effect is to frame engagement with art as a moral question – and to present relational, non-objective engagement as morally inferior.

Both Bacon and Spenser frame objective, observational relationships with the world as superior to the relational mode. As Eisendrath points out, “not just botanists and doctors, but also scholars of the humanities were focusing on the *things* of the world.”<sup>39</sup> Over the course of the fifteenth and sixteenth centuries, observation of components of physical reality – the things of the world – came to be the practice in art, literature, and philosophy. It was the fundamental basis upon which early modern Europeans comprehended the world. In essence, because of the development of the objective mode, European knowledge-makers came to consider their work objective. However, in reality they retained a Christian interpretive framework which framed knowledge engagement in moral terms. Despite the problematic nature of the concept of objectivity, during the fifteenth and sixteenth centuries it became a marker for reliable information – knowledge-makers began to consider knowledge obtained through supposedly

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<sup>37</sup> Quoted in Eisendrath, 54.

<sup>38</sup> Eisendrath, 54-55.

<sup>39</sup> *Ibid.*, 51.

objective observation to be superior to the relational knowledge of the previous centuries.

*The “Renaissance of Empire”*

Concurrently with the development of the objective mode, poets and scholars in Northern Italy became interested in revival of classical ideas in moral philosophy. Humanists were interested in the development of human virtue to its fullest possible extent. In the political arena, this meant a precursor to enlightened despotism, in the form of enlightened, virtuous monarchy. As a result of this philosophical shift, states began to change the presentation of their “imperial imaginaries.” The imperial imaginary is essentially a set of ritual and symbolic structures which legitimize and construct the state as an entity.<sup>40</sup> During the medieval era, religion served as the major source of legitimacy for European monarchs. The concept of divine right allowed monarchs to claim legitimacy of their rule from the highest source: God. During the Renaissance, however, a shift occurred in the imperial imaginaries of European states. The simultaneous shift towards the objective mode and the development of “imperial humanism” resulted in imperial expansion becoming a legitimizing force alongside religious authority. As a result, European monarchs began to project imperial power throughout Europe – and beyond.

In medieval discourse, Christian religion was a prerequisite, not only for spiritual authority, but for civil authority as well. For example, in Dante Alighieri’s *Divine Comedy* (published 1320), the Roman pagan figures who

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<sup>40</sup> Nancy Shields Kollmann, *The Russian Empire 1450-1801* (Oxford, UK: Oxford University Press, 2017), 1.

appear are all ultimately unable to enter heaven because of their lack of knowledge about the Christian God: they are placed in Limbo, the first circle of Hell. Unlike the rest of Dante's Hell, Limbo is not a place of torture, rather, it is a pale echo of heaven. There, Dante encounters Julius Caesar, who is depicted as a model general: Dante reports seeing "armored Caesar with his hawklike eyes."<sup>41</sup> He goes on to meet many other highly respected pagans, including both Aristotle and Ptolemy.<sup>42</sup> Despite their accomplishments, in Dante's view no pagan could serve as a perfect model for moral behavior.

In his book *The Renaissance of Empire in Early Modern Europe*, Thomas J. Dandeleet argues that as classical works were translated and began to circulate during the early Renaissance, European states attempted to take up the mantle of the Roman empire. Scholars looked back not only to Greek philosophers like Aristotle, but also to Roman authors, orators, and biographers. In particular, the works of Julius Caesar, Plutarch, and Vitruvius, among others, came to exemplify a model of imperial might. Francesco Petrarch was an early herald of the Renaissance humanists' interest in the Romans. Petrarch's *De Viris Illustribus*, a collection of moral biographies, included a 238-page section on Julius Caesar.<sup>43</sup> Petrarch admired Caesar's courage and leadership; Petrarch's effusive praise makes Caesar's own self-promotional propaganda seem humble.<sup>44</sup> This praise is only tempered when discussing the advent of the Roman civil war; however, even

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<sup>41</sup> Dante Alighieri, *Inferno*, trans. Michael Palma (New York, NY: W.W. Norton and Company, Inc., 2002), Canto IV, line 123, pp 43.

<sup>42</sup> In the *Inferno*, it is indicated that only the patriarchs of Israel – Moses, Abraham, and David, along with Rachel – have been redeemed to heaven.

<sup>43</sup> Thomas J. Dandeleet, *The Renaissance of Empire in Early Modern Europe* (Cambridge, UK: Cambridge University Press, 2014), 20-21.

<sup>44</sup> *Ibid.*, 22. Julius Caesar was an extremely effective propagandist.

here Petrarch refuses to paint Caesar as an antagonist to the state. Instead of blaming him, Petrarch laid the blame equally at the feet of Caesar and Pompey: “And you, reader, what do you think? To what extent do you believe the case of Pompey was greater than that of Caesar?”<sup>45</sup> In his book *Letters on Family Matters*, Petrarch describes himself giving “gold and silver coins bearing the portraits of our ancestors...among them was Caesar Augustus” to Holy Roman Emperor Charles IV, and telling him “here are those whom you must try to imitate and admire, whose ways and character you should emulate.”<sup>46</sup> Imperial ambition became desirable not only because of the power it conferred, but also a moral, positive good for early-modern European states.

The contrast between Dante’s treatment of Caesar (and pagans in general) and Petrarch’s treatment is illustrative in a change in attitude among European intellectuals towards the Roman Empire. Dante’s poem argues that while these people had lived righteous lives, without knowledge of Jesus they must still be condemned to Hell – even one much kinder than the following eight circles. Dante is uninterested in examining the idea of imperial revival; instead, he focuses on Christian role models.<sup>47</sup> In contrast, Petrarch represents the humanist viewpoint that came to dominate later discourse. Religion remained a primary method of engagement with the world, but Renaissance humanists like Petrarch

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<sup>45</sup> Quoted in Dandele, 23. Pompey and Caesar were involved in a civil war, with Pompey initially backed by the Senate and Caesar by his troops; Caesar eventually won but was assassinated soon after.

<sup>46</sup> *Ibid.*, 18.

<sup>47</sup> Not least because he would have considered the Roman empire to still be in existence; the Roman empire did not formally cease to exist as a political entity until the end of the Eastern, or Byzantine, Roman Empire in 1453.

moved away from the idea that pagans could not be fully emulated because of their non-Christian religious confession.

Petrarch was an early advocate for the revival of Roman imperial values, but it became broadly accepted in humanist circles. Renaissance humanists were part of the late medieval and early Renaissance backlash against scholasticism; the Bacon's work, though produced later, also falls into this category. However, unlike Bacon, whose primary interest was in natural philosophy, humanists were interested in moral philosophy, literature, and especially in the development of civic culture. As a result, the Roman empire, and the Caesars in particular, became the model for Renaissance rulers. Under the influence of his teacher, Guarino Guarini, Leonello d'Este of Ferrara promoted humanism through the founding of the University of Ferrara in 1442.<sup>48</sup> Guarino was a proponent of Caesar as a model for Leonello's rulership, and once responded to a letter by a fellow humanist which compared Caesar unfavorably to Roman hero Scipio Africanus with a thirty-three-page screed defending Caesar's actions.<sup>49</sup> Caesar, argued Guarino, was Scipio's superior not only due to Caesar's military genius, but also to his political and literary achievements. Guarino's argument highlights the humanist focus on the importance of civic virtue in addition to military might. From a humanist viewpoint, Caesar was an ideal monarch. They considered him to have been possessed of all the major virtues: military prowess, the ability to govern, and literary acumen.

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<sup>48</sup> Dandalet, 27-28. Scipio led the Roman army to victory against Carthage.

<sup>49</sup> Ibid., 28.

The acceptance of the pagan Roman emperors as models for behavior demonstrates that the literary revival of classical texts had far-reaching political implications. Renaissance humanists had explicitly linked moral behavior with behaving like modern Caesars, and so the act of behaving “imperially” came to confer moral legitimacy. As a result, heads of state began to portray their states as empires, thus implying a continuity with Rome. They promoted connections between themselves and Caesar by using Vetruvian architecture and commissioning art with classical themes, such as triumphs.<sup>50</sup> Most of all, the humanist push towards imperial revival resulted in states openly projecting imperial power. Imperialism came to be associated not only with raw power, but with legitimacy. European states desired not only power and wealth, but also the legitimizing effects of empire. The European discovery of the Americas in the late fifteenth century served as a theatre of this new rush towards imperial legitimacy.

#### *Cartography and Geography in the Medieval Era and the Renaissance*

Both the shift in European natural philosophy from the relational mode to the objective mode and the “renaissance of empire” help to explain the change in mapmaking practices which occurred from the middle ages to the Renaissance. Medieval maps reflected an understanding of geography which rested fundamentally on the medieval relational mode – in essence, nature understood through God’s revelations in scripture. However, after the advent of the ideal of objectivity, these maps no longer sufficiently represented the worldview of the European intellectual community. Medieval maps centered on a relational view of

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<sup>50</sup> Triumphs were essentially victory parades, in which Roman emperors and generals paraded through the streets of the city with the spoils of conquest. *Ibid.*, 13, 78-79.

the world, understood through the Christian cultural framework, and were explicitly nonobjective. During the fifteenth century, mapmakers stopped making medieval maps, and instead shifted to the gridded map style described by the Roman natural philosopher Claudius Ptolemy. Mapmakers for academic atlases in particular utilized Ptolemaic cartography as a way to reflect the emerging objective mode in their maps. Renaissance versions of Ptolemaic maps channeled the idea of God's divine plan reflected in the Earth through the "divine language" of mathematics. In Renaissance Ptolemaic maps, the perspective was theoretically objective – it was meant to be an accurate reflection of the reality of a world written in a mathematical language. Concurrently, as European states began to concern themselves with visions of imperial power, the new Ptolemaic maps legitimized claims motivated by imperial ambitions. In effect, Ptolemaic maps became reflections not of the real world, but rather of the imperial imaginaries of various European states.

Medieval world maps (*mappaemundi*) fell into two broad categories: T-O maps and duplex maps.<sup>51</sup> T-O maps, ubiquitous in medieval manuscripts, represent the world as a disc (*sphera*), with a "T" (*tau*), symbolizing Jerusalem at the crossing point, and three major bodies of water (the Don river to the left, the Nile to the right, and the Mediterranean above) superimposed on the disc.<sup>52</sup> T-O maps showed only those places invested with particular cosmological importance. Significant waterways framed the three regions of the world, with the central

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<sup>51</sup> John F. Moffitt, "Ptolemy's *Chorographia* in the New World: Revelations from the *Relaciones Geográficas de la Nueva España* of 1579-1581," *Art History* 21, no. 3 (1998): 373.

<sup>52</sup> *Ibid.*, 373.

Jerusalem. Frequently, they described the three regions by their association with the sons of Noah, who were thought to have divided the world between their descendants after the Biblical flood. Japheth took Europe, Shem took Asia, and Ham took Africa. It is clear that Europeans envisioned these maps as representations of a Christian cosmology. They reinforced this cosmology through their structure; on a T-O map, Jerusalem is quite literally the center of the world. T-O maps did not have scale, nor did they represent coastlines. The world on a T-O map was a flat plane. They did not represent contemporary European ideas of the physical world, which was understood to be round throughout the medieval period; Bede casually references the globe in *The Reckoning of Time*, which he wrote in 725.<sup>53</sup> Rather, *mappaemundi* instead represented the Christian worldview ubiquitous in the medieval period.

In contrast to the cosmological view of T-O maps, duplex maps provide lavish details of the landscape, and often include precise illustrations of architecture, people, and animals.<sup>54</sup> Though duplex maps were also circular in form, their structure was less well defined than that of the T-O map. Instead, duplex mapping relied upon chorographic representations of the landscape in order to give broad impressions of the land it represented.<sup>55</sup> Chorography, the systematic representation of the qualitative elements of a place through visual or written description, was a significant component of geographic understanding in late-medieval European society. Paolino Veneto, a late medieval writer wrote that

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<sup>53</sup> Bede, *Bede: The Reckoning of Time*, trans. by Faith Wallis, Vol. 29, Translated Texts for Historians. (Liverpool, UK: Liverpool University Press, 1999), 19-20.

<sup>54</sup> Moffitt, 373.

<sup>55</sup> *Ibid.*, 376-377.

‘...painting without writing does not does not indicate regions or nations clearly, [and] writing without the support of painting truly does not mark the boundaries of the provinces of a region sufficiently clearly for them to be seen almost at a glance.’<sup>56</sup> For Veneto, maps relied upon a judicious combination of text and image in order to present a clear picture of the area being represented. Duplex maps served a very different functionality from T-O maps. While T-O maps represented the totality of existence, duplex maps displayed something closer to our vision of a modern map; duplex maps represented real space. However, their purpose was largely illustrative; they used visual and written chorography to craft impressions of far-flung locales. T-O Maps, as the primary world map, represented the regions of the world and their peoples within a Christian framework, while duplex maps served to represent landscapes at the human scale.

Claudius Ptolemy, a second-century Roman mathematician, astronomer, and geographer, was a member of the canon of famous ancient authors admired and studied by European intellectual communities.<sup>57</sup> Several Ptolemaic texts, particularly his book on astronomy, the *Almagast*, were available to Europeans throughout the medieval period.<sup>58</sup> However, Ptolemy’s geographic treatise, the *Geographia*, only reentered European awareness in the fifteenth century when it was brought to Florence by a Byzantine scholar named Manuel Chrysoloras.<sup>59</sup>

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<sup>56</sup> Quoted in Surekha Davies, *Renaissance Ethnography and the Invention of the Human: New Worlds, Maps and Monsters* (Cambridge, UK: Cambridge University Press, 2016), 1.

<sup>57</sup> Margriet Hoogvliet, “The Medieval Texts of the 1486 Ptolemy Edition by Johann Reger of Ulm,” *Imago Mundi*, 54 (2002): 7.

<sup>58</sup> *Ibid.*, 7.

<sup>59</sup> Dario Tessicini, “Definitions of ‘Cosmography’ and ‘Geography’ in the Wake of Fifteenth- and Sixteenth-Century Translations and Editions of Ptolemy’s *Geographia*,” in *Ptolemy’s Geography in the Renaissance*, ed. Zur Shalev (London: The Warburg Institute, 2011), 32.

The *Geographia*'s theory of mapmaking is predicated on the belief that one could use the same mathematical system to plot out the positions of earthbound objects as was then used to describe the celestial spheres; in modern terms, a Ptolemaic map is constructed through a grid system composed of lines of latitude and longitude.<sup>60</sup> For Renaissance intellectuals, it represented a mathematical and philosophical exploration of the relationship between the Earth and the heavens; it was appealing because it fit within the developing Renaissance interest in organizing the universe into a unified, logical expression of God's will.<sup>61</sup> The initial European Latin translation, made by Jacopo Angeli between 1406 and 1409, even mistranslated the title as *Cosmographia*.<sup>62</sup> Angeli's translation was criticized by his contemporaries, but his translation of the title indicates the intertwined understandings of cosmography, Christian cosmology, and physical reality which developed in the Renaissance.

The popularity of the *Geographia* upon its introduction to Renaissance Europe represented a break with medieval understandings of the physical representation of cosmology on maps. Medieval people were aware of the concept of projection for several hundred years preceding the introduction of the *Geographia*. In fact, the *Almegast*, which was singularly popular and influential after its translation in about 1175, introduced the concept of using parallels to project the spherical shape of the Earth.<sup>63</sup> Though the idea of projection had been

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<sup>60</sup> Ibid., 36-37.

<sup>61</sup> Zur Shalev, "Main Themes in the Study of Ptolemy's Geography in the Renaissance," *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London: The Warburg Institute, 2011), 9.

<sup>62</sup> Ibid., 4.

<sup>63</sup> Angelo Cattaneo, "Map Projections and Perspective in the Renaissance," in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London: The Warburg Institute, 2011), 57.

definitively introduced with the *Almagast*, it did not replace the T-O map or duplex mapping as the central method of representing physical space.<sup>64</sup> Medieval people were simply less interested in maps which showed fidelity to physical truth as opposed to representing their religiously rooted understanding of the fundamental nature of the universe.

The introduction of the *Geographia*, however, quickly led to the replacement of the T-O map and the transformation of the duplex map. It was not the concept of using parallels to create map projections which had changed – the *Almagast* and the *Geographia* were, after all, written by the same person with roughly similar ideas, and although the *Geographia* offers more complete instructions in making projections than does the *Almagast*, the concept as describe in the *Almagest* is clear. In reality, the change in European understandings of cosmology and cosmography preceded and influenced the development of cartography. The medieval perspective viewed cosmology and mapmaking as fundamentally linked; the organization of the universe was understood through a Biblical lens.<sup>65</sup> In contrast, the Renaissance view, informed by the shift to the objective mode, considered the representation of physical space to be a form of cosmology. On Renaissance maps there was no longer an explicit representation of Christian cosmology, because when conceptualized using the objective mode, maps should demonstrate God's work by the representation of the physical reality of the Earth.

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<sup>64</sup> Ibid., 57.

<sup>65</sup> Marjo T. Nurminen, *The Mapmaker's World: A Cultural History of the European World Map*, ed. by Juha Nurminen (Oxford, UK: The Pool of London Press, 2015), 29.

The *Geographia* had a significant influence on early-modern mapping. After its recovery, editions of the *Geographia* became ubiquitous, and maps were often made using the Ptolemaic model.<sup>66</sup> The rapid Renaissance adoption of the *Geographia*, contrasted with the previous lukewarm reception of the same concepts in the *Almagast*, points to a major shift in the European understanding of the purpose of mapmaking. Instead of orienting Europe within an exclusively religious context, Renaissance Ptolemaic maps served to connect the Earth to the heavens through a mathematical framework which they perceived as God's perfect design for creation. European Ptolemaic maps retained their religious grounding; they were still deeply rooted in medieval understandings of the world's place in God's universal plan. It was simply that Renaissance Europeans understood that plan to be expressed through a mathematical framework. Lines of latitude and longitude connected the Earth to the celestial spheres through this mathematical framework. Concurrently, the Ptolemaic revolution resulted in a major change – for the first time, large-scale European maps reflected physical reality.

However, despite the popularity of the *Geographia*, it did not completely revolutionize European mapping. In her article “The Medieval Texts of the 1486 Ptolemy Edition by Johann Reger of Ulm”, Margariet Hoogvliet argues that the *Geographia* was understood through the lens of an existing framework of European thought.<sup>67</sup> Ptolemaic mathematical mapping was considered by

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<sup>66</sup> Florian Mittenhuber, “The Tradition of Texts and Maps in Ptolemy’s *Geography*,” in *Ptolemy in Perspective*, ed. A. Jones, Archimedes: New Studies in the History and Philosophy of Science and Technology, vol 23 (Dordrecht, Netherlands: Springer, 2010), 97.

<sup>67</sup> Hoogvliet, 8.

Renaissance thinkers to be a compliment to their chorographic knowledge, not a replacement for it.<sup>68</sup> Chorography had a significant classical pedigree; the famed Greek geographer Strabo had argued for its utility in the representations of lands and peoples.<sup>69</sup> The presentation of chorographic knowledge, considered to be a vital component of the geographic text either in written form or as a part of the maps themselves, remained after the development of Ptolemaic maps.<sup>70</sup> The circular duplex maps found in medieval manuscripts became less common after the introduction of Ptolemaic mapping, but the chorographic information they contained remained a major component of European knowledge about the wider world.

The adoption of the *Geographia* and the concept of projection indicated the European interest in continuity between the past and the present and the Earth and the heavens.<sup>71</sup> During the Renaissance, editions of the *Geographia* was constantly updated with annotations which compared the ancient source with contemporary knowledge about places. The Ethiopian visit to the Council of Florence-Ferrara (1438-1445) was one such pivotal moment: Europeans understood that Ptolemy's description of Ethiopia was incomplete, but still comparisons were affected between the Ptolemaic descriptions and the testimony of the living Ethiopians.<sup>72</sup> Ptolemy's chorography held significant weight, despite

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<sup>68</sup> Ibid., 8.

<sup>69</sup> Jesse Simon, "Chorography Reconsidered: An Alternative Approach to the Ptolemaic Definition," In *Mapping Medieval Geographies*, ed. by Keith Lilley (Cambridge, UK: Cambridge University Press, 2013), 32-33

<sup>70</sup> Hoogvliet, 9.

<sup>71</sup> George Tolias, "Ptolemy's Geography and Early Modern Antiquarian Practices," in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London: The Warburg Institute, 2011), 124.

<sup>72</sup> Ibid., 124.

the dubious veracity of Ptolemy's actual descriptions, given the fact that they were about one thousand years old and that Ptolemy had only rudimentary knowledge of the area.<sup>73</sup>

In his analysis of Juan de la Cosa's *Mappa Mundi* (1500), James L. Smith argues that the map shows the transition between the Christian religious perspective portrayed in medieval maps (especially T-O maps) to the more mathematical, "scientific" Ptolemaic map.<sup>74</sup> The map is rotatable; part of it functions on a Ptolemaic grid on a north-south axis, while the rest of the map is the east-west map mode which would have been familiar to medieval people. The map is a chart; meant to be lain on a table and viewed from all sides.<sup>75</sup> This arrangement allowed the de la Cosa map to serve two functions: the east-west axis situated the Americas within the context of the existing religious framework, making a moral judgement upon the land, while the north-south axis introduced a use which would come to dominate European mapmaking practices during the Renaissance – imperial ambition. The chart includes the Tordesillas line, drawn six years earlier in 1494, which delineated the boundaries of colonial ambition for the Spanish and Portuguese crowns.<sup>76</sup> The map simultaneously reflects a very medieval European self-understanding, and yet serves as a prelude to Renaissance forms of cartography, which began to centralize Europe physically on maps and

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<sup>73</sup> Ibid., 124.

<sup>74</sup> James L. Smith, "Europe's Confused Transmutation: The Realignment of Moral Cartography in Juan de La Cosa's *Mappa Mundi* (1500)," *European Review of History: Revue Européenne d'histoire*, 21, no. 6 (2014): 799. Juan de la Cosa was a navigator who accompanied both Columbus and later Alonso de Ojeda on their transoceanic voyages in the late fifteenth and early sixteenth centuries.

<sup>75</sup> Ibid., 803.

<sup>76</sup> Ibid., 810.

project the imperial ambitions of European states. The de la Cosa map is a freeze-frame of a highly particular moment in cartographic history; it “represents the assimilation of new discovery entangled with historical legacy.”<sup>77</sup>

The de la Cosa map also demonstrated the imperial ambitions of the Spanish crown towards the Americas. Speaking of the de la Cosa map, Smith says “the map and its successors were possessed of diverse social uses beyond their role as prescientific objects”.<sup>78</sup> This assertion is accurate, but Smith fails to convey a key point: the de la Cosa map and its successors were perceived as cutting-edge, accurate representations of physical space by Renaissance scholars. Since European intellectuals wished to envision themselves as the progenitors of a new system of knowledge creation, rooted in classical philosophy and relying only on objective reality and the divine language of mathematics, they failed to comprehend the perspective of their maps. Over the course of the sixteenth century, the rise of Ptolemaic maps and the concurrent turn towards empiricism in European knowledge creation resulted in a shift in the way maps were perceived. As maps became a scientific enterprise, meant to reflect the physical realities of the world, consumers of maps came to expect accuracy.

The abandonment of the T-O map and the adoption of the Ptolemaic model affected the physical form of the map. It also influenced of the chorography as a technique for understanding and representing the world. Chorography retained its value in large part because the means for understanding local space – through the duplex map – did not change; only the conception of

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<sup>77</sup> Ibid., 800.

<sup>78</sup> Ibid., 810.

territorial space as a component of the universe changed. Chorography was simply exported to Ptolemaic maps. In effect, this was a fusion of the separate medieval concepts of the local duplex map and the universal T-O map. Combined, these two effects obscured a map's point of view. Ptolemy himself was deeply skeptical of chorography; in his view, all geographic knowledge should stem from a mathematical source.<sup>79</sup> Knowledge which did not have a mathematical source – chorography in particular – was inferior.<sup>80</sup> However, despite their valorization of classical authors in general and Ptolemy in particular, Renaissance philosophers and humanists did not give up chorography, perhaps due to the strong tradition of Strabo. Paolini Veneto's view that "painting without writing" served little purpose was common to scholars during the period.<sup>81</sup> The combination of Ptolemaic maps with chorography accommodated shifting European understandings of the purpose of map-making.

Chorographic representations of indigenous Americans on maps painted a lurid and violent picture of indigenous life in the Americas. In her book *Renaissance Ethnography and the Invention of the Human*, Surekha Davies argues that depictions of indigenous Americans on maps reconstituted and reinforced European ideas of 'civilization'.<sup>82</sup> Renaissance understandings of human variation were heavily influenced by geography. It was believed that polar and equatorial regions were incapable of sustaining human life, and that the regions of the temperate zone which approached these areas could not sustain

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<sup>79</sup> Simon, 30-31

<sup>80</sup> Ibid., 44

<sup>81</sup> Quoted in Davies, *Renaissance Ethnography and the Invention of the Human*, 1.

<sup>82</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 3.

civilized societies.<sup>83</sup> Davies argues that the very act of placing of representative human figures on a gridded Ptolemaic map made implicit claims about the societies depicted on the map. Map consumers would have understood those claims as “an authoritative selection of information” about far away peoples.<sup>84</sup>

The chorographic representation of indigenous Americans on European maps was not understood as separate from the Ptolemaic elements of those maps. Rather, the chorographic elements were legitimized by their association with the mathematical, objective Ptolemaic model.

The simultaneous “renaissance of empire” and the rise of the objective mode resulted in the creation of maps and atlases which conformed to the details of Ptolemy’s mathematical model. However, the Ptolemaic map served as a method to envision and legitimize various states’ conquests and European expansion more generally. Europe was redefining itself – the simultaneous shift towards objective thinking, the renaissance of empire, and the advent of European contact with the Americas converged to produce a Europe poised to craft a collective justification for European expansion. Through that narrative, Europeans were able to justify their colonization of the Americas and their resulting subjugation of indigenous peoples as bringing civilization to a supposedly benighted people. As a result, tracking the chorographic imagery on Ptolemaic maps will help to illuminate the goals of European mapmakers, their states, and broader European societies as they conceived of new imperial lands in a “new world.”

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<sup>83</sup> Ibid., 3.

<sup>84</sup> Ibid., 57

## CHAPTER TWO:

### Europe Envisions the World: The Intellectual and Political Background of Map Creation in Willebald Pirckheimer's 1525 *Geographia* and Sebastien Münster's 1540 *Geographia*

Though the development of the objective mode is most associated with the scientific revolution of the seventeenth century, it had profound effects not only upon European knowledge-making but also upon how Europeans chose to present their geographic knowledge. Ptolemaic mapping held the seductive appeal of mathematical objectivity, with the added attraction of the ancient authority so prized by renaissance scholars.<sup>85</sup> Despite their supposed objectivity, however, European maps produced in this era reflected and reinforced societal biases and extended the imperial ambitions of various European nations. In *The New Nature of Maps*, JB Harley describes the power of maps to enforce a particular worldview.<sup>86</sup> In particular, he argues that European maps have “anticipated empire,” claiming “lands on paper before they were effectively occupied.”<sup>87</sup> Mapping allowed European nations to envision their power stretching over the

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<sup>85</sup> Edward Grant, *The Foundations of Modern Science in the Middle Ages: Their Religious, Institutional, and Intellectual Contexts* (Cambridge History of Science. Cambridge, UK: Cambridge University Press, 1996), 173.

<sup>86</sup> JB Harley, *The New Nature of Maps: Essays in the History of Cartography* (Baltimore, MD: Johns Hopkins University Press, 2001), 67-73.

<sup>87</sup> *Ibid.*, 57.

vast landscapes of enticingly labeled “terra incognita”, and to place markers (both speculative and real) of the expanding empire.<sup>88</sup> Ptolemaic mapping was well-suited to express these ideas. Unlike medieval T-O maps, the mathematical basis of Ptolemaic mapping meant that it was easily generalizable. When combined with visual and written chorographic descriptions, Ptolemaic maps served as a vehicle for the presentation of the evolving European understanding of the world. As the *Geographia* became prominent in the late fifteenth century, versions of the text presented in academic atlas editions became a significant means through which European intellectual communities communicated geographic knowledge. However, both the intellectual undergirding of the maps and the economic and political realities of the sixteenth century impacted the manner in which European mapmakers represented this information. As a result, these maps presented and reinforced motifs about indigenous Americans and legitimized European colonial enterprises.

Typical Renaissance editions of the *Geographia* included a translation of Ptolemy’s text into Latin, which remained the language of intellectual communication into the seventeenth century. Later, some editions were printed in local languages such as Italian or German. The initial Latin translation of the text of the *Geographia* was by Italian writer Jacopo Angeli. Neither Angeli’s grasp of Greek nor his understanding of mathematical nuance were commensurate with the task presented by the *Geographia*; contemporary commentators and modern

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<sup>88</sup> Ibid., 57.

scholars are united in their disdain for Angeli's poor translation.<sup>89</sup> Nevertheless, as it was the sole Latin translation of the *Geographia* available, Angeli's translation remained in use for most of the fifteenth century. In 1474, German mathematician and scholar Johannes Regiomontus wrote a scathing critique of Angeli's translation, but did not complete a full translation before his death.<sup>90</sup> His work was later taken up by several other translators, all of whom had a superior grasp of the mathematical principles of projection than Angeli. These translations make up the bulk of the sixteenth century editions.

The *Geographia* is organized into two sections. The first is theoretical; it deals with the mathematics of projection, includes Ptolemy's explanations of his three projections. The second section is composed of tables of latitude and longitude coordinates for various cities, islands, and natural features. The tables would have allowed a reader to construct a map without access to the devices needed to measure latitude and longitude themselves.<sup>91</sup> Most Renaissance editions of the *Geographia* also included the coordinate tables which make up the bulk of the *Geographia*'s length, although the actual coordinates varied from edition to edition.<sup>92</sup> It is unknown whether Roman editions of the *Geographia* would have included maps, but they were common in Renaissance editions.<sup>93</sup>

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<sup>89</sup> Zur Shalev, "Main Themes in the Study of Ptolemy's Geography in the Renaissance," in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London, UK: The Warburg Institute, 2011), 4-5.

<sup>90</sup> *Ibid.*, 5

<sup>91</sup> Alexander Jones, "Ptolemy's Geography: A Reform That Failed," in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London, UK: The Warburg Institute, 2011), 21.

<sup>92</sup> *Ibid.*, 22-23. Much of the variation in coordinates is likely due to scribal copying errors.

<sup>93</sup> *Ibid.*, 21.

It was typical for Renaissance Ptolemaic maps to contain two sets of maps, generally labeled *tabulae* (“maps”) and *tabulae modernae* (“modern maps”). The *tabulae* utilized the coordinates from Ptolemy’s text in the construction of maps accurate to Ptolemy’s descriptions of the third century CE, while the *tabulae modernae* used coordinates determined contemporaneously and were intended to portray the world as it was when the atlas was printed. Both the *tabulae* and the *tabulae modernae* were projection maps.<sup>94</sup> However, many sixteenth century maps synthesized Ptolemy’s system of mathematical projection with other forms of geographic knowledge. In particular, chorographic imagery and accompanying text were considered important components of a map.<sup>95</sup> As Jesse Simon demonstrates in “Chorography Reconsidered: An Alternative Approach to the Ptolemaic Definition,” Ptolemy’s influence is highly visible in early modern European geographic practice, but other traditions exerted a more subtle but no less important effect.<sup>96</sup> Alternative perspectives on chorography – particularly that of the first century Greek geographer Strabo, who considered chorography to be incredibly significant in forming accurate geographic knowledge.<sup>97</sup> As a result, most maps in Renaissance Ptolemaic atlases included chorographic imagery. This imagery served a didactic purpose; it was meant to instruct the viewer in European understandings of the places portrayed on the

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<sup>94</sup> In the atlases examined here, each included world maps using one or more of Ptolemy’s three projection techniques, and regional maps using simpler trapezoidal or equirectangular projection techniques.

<sup>95</sup> Although Ptolemy actually disliked chorography, and wrote negatively on it. Jesse Simon, “Chorography Reconsidered: An Alternative Approach to the Ptolemaic Definition,” In *Mapping Medieval Geographies*, ed. Keith Lilley (New York, NY: Cambridge University Press, 2013), 32.

<sup>96</sup> *Ibid.*, 43-44.

<sup>97</sup> *Ibid.*, 32-34.

map. Because the chorographic information was presented either on or alongside Ptolemaic maps, however, it was legitimized by its association with the objective perspective of the map.

What most distinguished the Renaissance *Geographia* from ancient versions of the text was the inclusion of maps – the *Geographia*, originally a treatise on cartography, became the text of an atlas.<sup>98</sup> These atlas editions of the *Geographia* were not intended for navigational use; they were far too large, heavy, and expensive to be practically useful on the deck of a ship.<sup>99</sup> Instead, these atlas editions were for an audience of wealthy intellectuals. As a result, these atlas editions of the *Geographia* were a medium for the exchange of ideas about geography. Their phenomenal popularity – the *Geographia* was printed in various editions 41 times by the end of the sixteenth century, an astonishingly high number – contributed to their efficacy.<sup>100</sup>

However, in early modern Europe, geography did not merely convey ideas about space. As Davies demonstrates, classical ideas popular in the Renaissance linked the physical geography of a place to the social characteristics of the humans who populated it. The humors were four bodily fluids supposedly influenced by geographical location and astral bodies, which in turn influenced behavior.<sup>101</sup> According to humoral theory, living in extreme latitudes thus affected behavior through the humours – many classical humoralists even posited that it

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<sup>98</sup> Shalev, 2, 7.

<sup>99</sup> This is self-evident from the fact that these charts were produced in Latin, the language of intellectual communication. See Richard Unger's "Ships on Maps," esp. 8-10, for a discussion of the limitations of extrapolating from intellectual maps to all maps.

<sup>100</sup> Shalev, 6.

<sup>101</sup> Surekha Davies, *Renaissance Ethnography and the Invention of the Human: New Worlds, Maps and Monsters*. (Cambridge, UK: Cambridge University Press, 2016), 26-27.

was impossible to live at the equator or in arctic regions.<sup>102</sup> Extreme climates were also believed, by those who followed the tradition of Pliny, to lead to monstrosity.<sup>103</sup> Long-standing legend linked Africa with images of men with the heads of dogs, and headless people with their eyes in their chests.<sup>104</sup> Ptolemy himself was an advocate of geohumoral theory, and the increased use of Ptolemaic maps in the era of European colonization made differences in latitude more spatially apparent on maps, allowing for the visualization of human difference by geographic means.<sup>105</sup> Thus, the choices made by mapmakers and atlas-printers in portraying the “new world” not only conveyed imperial ambitions through dubious claims regarding land and space, but also through imagery which portrayed the indigenous people of the Americas as quasi-human monsters.

The 1525 Strasbourg edition of the *Geographia* (the *Claudii Lemaeigeo Geographicae*) produced by Willebald Pirckheimer, and the 1540 Basel edition (the *Geographia Vniversalis*) produced by Sebastien Münster, demonstrate the interwoven nature of chorography and geography during the sixteenth century. Furthermore, both atlases include maps of the Americas which promote images of indigenous Americans as savage or infantile, and reinforced the perception of the world as largely open to European powers for expansion and the realization of their political goals, especially the formation of empires.

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<sup>102</sup> Ibid., 26-27.

<sup>103</sup> Ibid., 30.

<sup>104</sup> Ibid., 32-33.

<sup>105</sup> Ibid., 44-45.

*German Humanism, Cartography, and the Americas*

Both Pirckheimer and Münster's editions of the *Geographia* were produced in the German lands during the height of influence of the German humanist movement. It was with the German humanists that the *Geographia* specifically began to become entwined with the project of imperial revival. German humanism at this time was heavily invested in a proto-nationalist reconstitution of the ancient *Germania*, which was also intertwined with the contemporary Holy Roman Empire.<sup>106</sup> Thus, German humanism had a complex relationship with Roman revival – they considered Rome simultaneously the predecessor state to their own Holy Roman Empire, and an opponent to the ancient German tribes. German humanist Conrad Celtis exemplified both views in a speech in Ingolstadt: “O men of Germany, assume those ancient passions by which you were so often a dread and terror to the Romans...O free and strong people, O noble and brave nation, clearly worthy of the Roman Empire...”<sup>107</sup> Ptolemy's *Geographia* became a way for these men to promote their vision of a greater German empire. The edition of the *Geographia* prepared by Matthias Ringmann and Martin Waldseemüller, published in in Strasbourg in 1513, is best known for being one of the first known uses of the toponym “America,” but Alfred Hiatt argues that its creation was largely a result of an effort to claim areas west of the Rhine for a greater German empire.<sup>108</sup> The antiquarian practice of tracing tribal to modern descent was a significant way in which intellectuals

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<sup>106</sup> Alfred Hiatt, “Mutation and Nation: The 1513 Strasbourg Ptolemy,” in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London, UK: The Warburg Institute, 2011), 149.

<sup>107</sup> Conrad Celtis, *Oratio in gymnasio in Igelstadio*, trans. and quoted in Hiatt, 150.

<sup>108</sup> Hiatt, 160-161.

engaged in political commentary.<sup>109</sup> As a result, German humanists like Ringmann and Waldseemüller drew on both the legitimacy of the Holy Roman Empire's Roman connection as well as the ancient German tribal animosity with Rome in order to build up the historical legitimacy of a modern German empire.

As German humanists used the *Geographia* to engage with imperial visions out of their own past, they also used geographic and chorographic information to make statements regarding the “new world” and its people. Germans had little opportunity for direct engagement with the Americas. There were vanishingly few German explorers, and the lack of a unified German state meant that Germans were not directly involved in early colonial enterprises, which were dominated by large states such as France, England, and especially Spain and Portugal, which had western coasts capable of leveraging the economic power and social force needed to fund successful colonies.<sup>110</sup> However, despite the lack of state interest, Germans became involved with colonization in other ways. Funds from German merchants financed many Iberian expeditions, and these merchants were thus heavily involved in colonial trade. German intellectuals were also engaged in the philosophical response to Europe's changing knowledge about the world. This was particularly true of the humanist communities in cities along the Rhine, especially in the cities of Strasbourg, St.-Dié-des-Vosges (commonly St.-Dié), and Basel.<sup>111</sup> These cities were each

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<sup>109</sup> Ibid., 151.

<sup>110</sup> Surekha Davies, “America and Amerindians in Sebastian Münster's ‘Cosmographiae Universalis Libri VI’ (1550),” *Renaissance Studies* 25, no. 3 (June 2011): 353.

<sup>111</sup> Ibid., 354. Ironically, despite their significance to German intellectual life in the early modern era, none of these cities are in the modern German state; Strasbourg and St.-Dié are in France, while Basel is in Switzerland.

important centers for German humanists and for early publishing. Ringmann and Waldseemüller, for example, were members of the *Gymnasium Vosagense*, a humanist guild in St-Dié, and they published both out of St.-Dié and Strasbourg. The maps produced by the Gymnasium Vosagense and their contemporaries circulated widely throughout Europe, and were enormously influential. For example, Waldseemüller's decision to name the "fourth part of the world" after Amerigo Vespucci on his 1507 world map cemented the toponym – despite his later repudiation of the name.<sup>112</sup> Later cartographers and translators such as Willebald Pirckheimer and Sebastian Münster also published out of this region: Pirckheimer, who lived in Nuremberg, published in Strasbourg, while Münster published out of Basel.

#### *The 1525 Strasbourg Geographia*

Willebald Pirckheimer was a prominent lawyer in Nuremberg in the early Renaissance.<sup>113</sup> He had been educated in Italy, where he had developed humanist ideas. He entered in to the intellectual community of German humanists after Ringmann and Waldseemüller's deaths (in 1511 and 1520 respectively), but his intellectual work with the *Geographia* was in many ways a continuation of theirs. Ringmann's translation for the 1513 edition was supposedly a re-translation from the original Greek, but it remained extensively based on Angeli's flawed text.<sup>114</sup> Pirckheimer's translation of the *Geographia*, published in Strasbourg in 1525,

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<sup>112</sup> John Hébert, "America," in *Mapping Latin America: A Cartographic Reader*, ed. Jordana Dym and Karl Offen (Chicago, IL: University of Chicago Press, 2011), 32.

<sup>113</sup> Andreas Stolzenburg, "Pirckheimer, Willibald," *Grove Art Online*, Oxford University Press, 2010, <https://doi.org/10.1093/gao/9781884446054.article.T067832>.

<sup>114</sup> Shalev, 6.

included scathing commentary on Angeli's translation by Johannes Regiomontus as well as Pirckheimer's own novel Latin translation.<sup>115</sup> Like many editions of the *Geographia*, it included ancient maps based off Ptolemy's coordinates as well as modern maps based on contemporary knowledge.<sup>116</sup>

The 1525 *Geographia* has a structure typical of Ptolemaic atlases of the period, including *tabulae* and *tabulae modernae*.<sup>117</sup> The *tabulae* use trapezoidal projections, with a Ptolemaic grid spanning the perimeter, and are indexed by place name. Each map includes a one to two-page chorographic discussion of the place it represents. The *tabulae* section includes ten maps of Europe, four maps of Africa, and twelve maps of Asia.<sup>118</sup> The *tabulae modernae* section is not divided into regions, but rather provides a subtitle giving the names of the places depicted in the map. The *tabulae modernae* are also projected, but they use an equirectangular projection as opposed to the trapezoidal projection used in the *tabulae*. Both the *tabulae* and the *tabulae modernae* include extensive chorographic imagery on the map, as well as chorographic descriptions associated with each region (for the *tabulae*) and each individual map (for the *tabulae modernae*).

Pirckheimer's 1525 edition of the *Geographia* is an excellent example of how European maps blended Ptolemy's projection techniques with chorographic imagery, and the resulting reinforcement of a European self-narrative of

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<sup>115</sup> Ibid., 6.

<sup>116</sup> Ibid., 7.

<sup>117</sup> The *Claudii Lemaeigeo Graphicae* is not paginated. As a result, the maps will be referred to and referenced via their titles.

<sup>118</sup> These numbers are identified by the atlas itself and not modern conceptions of place. For example, Armenia is included in the Asia section, though modern convention would generally place it in Europe.

superiority which justified imperial expansion into the Americas. It included a very early map of the Americas, along with a brief introduction of the European ‘discovery’ of the Americas. A rather squished continent labelled “America” also appears on the modern world map. The maps of both the “New World” and of Africa include characteristic elements of Ptolemaic maps, which signaled their objectivity to European scholars. They also include chorographic representation which dehumanizes the indigenous peoples of the Americas. The transformation of humans into monsters in Pirckheimer’s *Geographia* is consistent with other maps of its day, and contributed to a widely-held European worldview that Europe was the exclusive holder of so-called “civilized” society. This image of backwards and monstrous natives contributed towards “the anticipation of empire” by providing European nations with an excuse to invade. According to this line of thinking, Europeans were morally obligated – perhaps even divinely destined – to go forth and bring civilization to the rest of the world, and consequently to develop expansive and wealthy empires.<sup>119</sup>

Pirckheimer’s *Geographia* is deeply enamored with mathematical mapping and Ptolemaic projections. The first word of each section or book in the text is a woodcut illuminated letter instead of the standard print block. Each of the illuminations depicts something related to scientific cartography or projection. The “D” depicts a globe with rings, evoking the spherical model of the Earth and the heavens which many Renaissance writers found so alluring about Ptolemy’s work.<sup>120</sup> The “M” similarly emphasizes the mathematical nature of projection

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<sup>119</sup> Harley, 57.

<sup>120</sup> Figure 2.1

with its labelled lines of latitude and longitude, while the “L” depicts one of Ptolemy’s projections.<sup>121</sup> This use of mathematical objects as decorative elements on the atlas is significant. The projection illustrations draw attention to the mathematical nature of projection, and the illustrations of tools show the connection between the physical reality of the world and the maps within. The use of these motifs for all the illuminations in the atlas suggest that the printers wished to draw the viewers’ attention to the scientific accuracy of the maps. The shift towards Ptolemaic maps occurred in part because of the emergence of the objective mode. In the 1525 *Geographia*, the illustrations of the woodcut illuminations emphasize the supposedly objective nature of the maps, thus legitimizing the chorographic information presented on and with the maps.

The “Oceanus Occidentalis” map in the 1525 *Geographia* provides a useful example of how early-modern European maps legitimized European colonialism. The only map of the Americas included in the atlas, the “Oceanus Occidentalis”, is the first map of the *tabulae modernae*. Like the other maps in the atlas, “Oceanus Occidentalis” prominently displays the lines of latitude and longitude characteristic of projected maps.<sup>122</sup> The upper text inset of the map provides specific information about the latitude and longitude of Hispaniola.<sup>123</sup> The Ptolemaic elements of the map are highly visible; they were meant to be read and used by the atlas’ audience. In contrast, the tiny labels of various coastal areas, which are so small as to be barely readable, provide more of an impression

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<sup>121</sup> Figure 2.1

<sup>122</sup> Figure 2.2

<sup>123</sup> Figure 2.2

of knowledge then any kind of real information. The Ptolemaic elements frame the map. They serve as markers for the reader that the map is a reliable source of information.

The map is centered around European engagement with the “*terra nova*.” The mapmaker asserts Spanish ownership prominently in text placed over modern-day Brazil. “H[a]ec terraam adiacentib[us] insulis inuena est Cristoferum Columbum ianuensem ex mandato Regis Castelle,” casually implies total Spanish control over the area.<sup>124</sup> Indigenous toponyms are ignored in favor of European designations. “Isabella Insul” and “Spagnoha”, as well as the majority of smaller islands and coastal areas, are referred to by European toponyms.<sup>125</sup> For example, along the coast of South America, rivers have been given the names of popular Spanish saints (*Rio de St. Augustine*, *Rio de St. Lucia*, and *Rio de St. Francisco* are all visible).<sup>126</sup> Combined with the blank space inward from the coast, these assertions of unilateral Spanish control suggest to the viewer that the indigenous population was scattered and “uncivilized”, with no towns or names of their own.

This assertion is borne out in the atlas’ chorographic depiction of the indigenous peoples of modern Brazil, which is characteristic of many European chorographic imageries of indigenous people. Cannibalism was a widely used motif in European chorographic depictions of the native peoples of Brazil. In her book *Renaissance Ethnography and the Invention of the Human*, Surekha Davies

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<sup>124</sup> “This land [with] adjacent islands [?] by Christopher Columbus from the mandate of the King of Castille”; Figure 2.2

<sup>125</sup> Figure 2.2

<sup>126</sup> Figure 2.2

asserts that these portrayals were a result of sustained effort by mapmakers to represent indigenous populations as violent.<sup>127</sup> Davies argues that in initial documentation from explorers “peaceful visions of the inhabitants of the circum-Caribbean basin receive far more column-inches in these works...violent activities are buried...”.<sup>128</sup> In Columbus’ voyage documents, for example, these occurrences were noted as outliers.<sup>129</sup> Instead of depicting his native interlocutors, the Taíno, as monsters, he described them as peaceful and quasi-childlike.<sup>130</sup> Initially, Columbus’ only description of cannibalism was second-hand; the Taíno told him about a people they called the Carib, who ate humans and resided along the northeast coast of South America.<sup>131</sup> European written accounts of the indigenous people of the Caribbean thereafter tended to fall in to one of two categories: the peaceful Taíno or the monstrous Carib.<sup>132</sup>

Despite the relatively minor role of “Carib” depictions in early written documents, the monstrous cannibal became commonplace in visual chorographic depictions of South America.<sup>133</sup> Maps especially tended to lean heavily on motifs featuring violence in general and cannibalism in particular.<sup>134</sup> Davies suggests that the use of these motifs was not inevitable; some early maps, such as the John Ruysch 1507 world map, barely note it.<sup>135</sup> However, when mapmakers synthesized and extrapolated from voyage accounts, they sometimes created

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<sup>127</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 66.

<sup>128</sup> *Ibid.*, 73.

<sup>129</sup> *Ibid.*, 73.

<sup>130</sup> *Ibid.*, 74.

<sup>131</sup> *Ibid.*, 74.

<sup>132</sup> *Ibid.*, 83.

<sup>133</sup> *Ibid.*, 83-84.

<sup>134</sup> *Ibid.*, 86-87.

<sup>135</sup> *Ibid.*, 87.

images for effect rather than information. “Carib” depictions were drawn from voyage accounts, particularly those of Amerigo Vespucci, but they frequently took liberties with the details and geographic placement of the illustrations. For example, the Kunstmann II map, one of the earliest known visual representations of Brazilian cannibalism, shows a victim “roasted whole on a stick”, when the mode of cooking mentioned in travel documents involved the dismemberment of the body, not spit roasting.<sup>136</sup> It is notable that maps did not necessarily reflect what Europeans understood from their own documents. Printers, such as the Strasbourg printer of the 1525 *Geographia*, were primarily interested in the commercial viability of their maps, not necessarily in their accuracy.<sup>137</sup> Nevertheless, the imaginary violence of the image from the Kunstmann II map became emblematic of Brazil on European maps of the Americas.

The “Oceanus Occidentalis” includes a fairly typical example of the “Carib” chorographic motif. The illustration features specific elements common to “Carib” depictions, including the spit-roasting technique.<sup>138</sup> The image depicts a grotesque scene of native people, dressed in crude skirts made of leaves, murdering people and eating them. Limbs are roasted over an open fire while hands are cheerfully consumed.<sup>139</sup> Scratched next to it are the words “Anthropophagi hic sunt” (“man-eaters are here”).<sup>140</sup> The image also includes descriptions of limbs hung from trees, found in Vespucci’s documents.<sup>141</sup> Thus,

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<sup>136</sup> Ibid., 84-85.

<sup>137</sup> Ibid., 95.

<sup>138</sup> Figure 2.3

<sup>139</sup> Figure 2.3

<sup>140</sup> Figure 2.3

<sup>141</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 84

both a constructed vignette and the descriptions from eye-witness accounts are simultaneously included, providing the viewer with no indication that there is a difference. Lurid and inaccurate chorographic details, intended to be eye-catching and increase the maps' sales, is the primary feature of the page.<sup>142</sup> Combined with the legitimizing element of its Ptolemaic structure, the map tacitly tells the viewer that its information can be trusted. The chorographic information presented on the map and others of its type became a part of the European viewers' understanding of the "new world". The broad use of these motifs resulted in the dehumanization of indigenous peoples and helped to justify the colonial and empire-building activities of European nations.

In addition to the new Eurocentric cartographic conventions, Europeans turned to artistic representation to assure themselves of Europe's global significance. European mapmakers and artists began to use anthropomorphic depictions of the continents in order to further emphasize supposed European superiority to the rest of the world. The continents began to be depicted as young women, often as 'sisters.'<sup>143</sup> But while Europe was portrayed as a regal, queenly figure, frequently in possession of a crown and scepter and nearly always fully clothed, Africa and America were usually either nearly or fully naked. Michael Wintle suggests that "it is almost as if these young continents were being presented as something to be 'possessed' by the Old World."<sup>144</sup> In some of these depictions, the Americas, Africa, and Asia pay homage to an enthroned Europe,

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<sup>142</sup> Ibid., 95

<sup>143</sup> Michael Wintle, "Renaissance Maps and the Construction of the Idea of Europe," *Journal of Historical Geography*, 25, no. 2 (1999): 149.

<sup>144</sup> Ibid., 150.

explicitly positioning them as inferior subjects to Europe as monarch.<sup>145</sup> More even than chorographic imagery, these allegorical depictions make explicit the exploitative goals of European empires.

In addition to the trappings of Ptolemaic maps, the 1525 *Geographia* includes allegorical illustrations which suggest the “civilizing” influence of Europe on the rest of the world. One page after the “Oceanus Occidentalis”, there is an image which serves as a visual addition to the written chorographic information which accompanies the map.<sup>146</sup> The illustration depicts a European man standing in front of a castle, his arm outstretched with a book held in his hand. Reaching back from the water is a naked person, holding out their own hand to touch the book. Behind the indigenous person is a European ship, including a small European house. The image presents a depiction of Europe bringing the “civilization” of books and knowledge to the people of the Americas, who are depicted as naked and savage.

This image is a somewhat unusual example of depictions of continents; as previously noted, most allegorical illustrations of this period depicted the continents as a group of young women.<sup>147</sup> It is possible that the European man was meant to represent a specific person acting as the allegorical proxy for European civilization, such as Christopher Columbus. Nevertheless, the imagery draws upon common elements of allegorical depictions of continents. The indigenous person’s nakedness played in to the common depiction of the

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<sup>145</sup> Ibid., 156.

<sup>146</sup> Figure 2.4

<sup>147</sup> Wintle, 148-149.

Americas as uncivilized, but unlike the motif of sexual availability held by most of the young and female personifications, the indigenous person in the “Oceanus Occidentalis” material is covered below the waist.<sup>148</sup> The indigenous person is displayed less as an object to be possessed and more as a child to be taught. This depiction provides an interesting contrast to the “Oceanus Occidentalis”, which represents indigenous people as monsters.<sup>149</sup> Instead, the illustration infantilizes indigenous people in order to achieve similar ends: the legitimization of European imperialism.

The book held by the European man is representative of the many forms of European thought held to be superior. European knowledge-making practices and European religion were both considered to be integral elements of civilization. The book therefore serves as a metaphor for the civilizing influence of European nations, through the written word (both religious and secular). The castle behind the European man serves to represent the landscape markers of civilization – chorographic imagery of the state and its power. In contrast, the Americas are not shown, apart from a European boat setting sail off the left edge of the image.<sup>150</sup> As the indigenous person is to the left in the image, it is reasonable to conclude that the boat is sailing to colonize the Americas.<sup>151</sup> The boat, with its little European-style home, sails forth into the unknown to bring European civilization to the “primitive” native peoples.<sup>152</sup> Thus, the image uses

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<sup>148</sup> Figure 2.4

<sup>149</sup> Figure 2.3

<sup>150</sup> Figure 2.4

<sup>151</sup> Figure 2.4

<sup>152</sup> Figure 2.4

visual metaphor to suggest that European colonialism was a positive and civilizing force on the indigenous peoples of the Americas.

*The 1540 Basel Geographia and Sebastian Münster's Cosmographia*

The 1540 Basel version of the *Geographia* was a revised edition of Sebastian Münster's original 1540 edition, using Pirckheimer's translation with maps by Münster. Münster, a former monk and professor at the University of Basel, was in European geographic thought; his *Cosmographia* (published 1544) was the second-most printed book of the sixteenth century, following the Bible.<sup>153</sup> Münster's *Cosmographia* was reprinted thirty-three times between its initial publication in 1544 and 1600, and its text and maps were enormously influential in the development of geography.<sup>154</sup> Pirckheimer's 1525 edition of the *Geographia* presented the Americas as a rich land populated by savage, or at best childlike and uncivilized natives, and Münster's 1540 *Geographia* and his *Cosmographia* reinforce these visions of the Americas. The 1540 *Geographia*'s map of the Americas, the "Novae Insulae XXVI, Nova Tabula," is much the same as the "Oceanus Occidentalis" in its presentation. The associated chorographic information, both on the map and in the text, implicitly justifies European colonization.

Münster was Waldseemüller's successor as the preeminent German mapmaker of his day.<sup>155</sup> Many of Münster's maps were explicitly based on those

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<sup>153</sup> Davies "America and Amerindians in Sebastian Münster's 'Cosmographiae Universalis Libri VI' (1550)," 351, 355.

<sup>154</sup> Ibid., 351.

<sup>155</sup> Ibid., 354-355.

cut by Waldseemüller.<sup>156</sup> However, despite the influence of Waldseemüller on his work, Münster's "Novae Insulae XXVI, Nova Tabula," as well as his world map, break from Waldseemüller in their depiction of the Americas.<sup>157</sup> The Christian worldview which dominated the medieval era divided the world into three *pars*:<sup>158</sup> Africa, Europe, and Asia, which corresponded to the sons of Noah in Christian theology. Waldseemüller, and most of his contemporaries, extended this definition and considered the world to be composed of four *pars*, including America.<sup>159</sup> Münster's maps divide the world into the traditional three *pars*, and instead attach America, the "Nova Insulae" or "New Islands," to Asia.<sup>160</sup> This allowed the devout Münster to retain the traditional Christian three-*pars* view of the world. As a part of merging of America and Asia into one *pars*, Münster attaches "Catigara," the name of a port city believed by Ptolemy and other classical authors to have existed in what is now southeast Asia.<sup>161</sup> Cattigara was replicated on Martin Waldseemüller's 1507 world map, where its location was transposed to China.<sup>162</sup> On the "Novae Insulae XXVI, Nova Tabula," Münster moves Cattigara even further afield – it is located along the western coast of

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<sup>156</sup> Ibid., 355.

<sup>157</sup> Ibid., 359.

<sup>158</sup> *Pars* is a Latin word frequently translated as *parts*, but it held more significance than does part; here, it might better be translated as component, piece, or even faction.

<sup>159</sup> Davies "America and Amerindians in Sebastian Münster's 'Cosmographiae Universalis Libri VI' (1550)," 354.

<sup>160</sup> Ibid., 357-358.

<sup>161</sup> Ian C. Glover, *Oxford Classical Dictionary Online*, s.v. "Cattigara", Oxford, UK: Oxford University Press, Dec. 2015. DOI: 10.1093/acrefore/9780199381135.013.1442.

<sup>162</sup> Martin Waldseemüller, *Universalis cosmographia secundum Ptholomaei traditionem et Americi Vespucii aliorumque lustrationes* [Strasbourg: s.n, 1507], map. <https://www.loc.gov/item/2003626426/>.

North America.<sup>163</sup> If the Americas were indeed a part of the *pars* Asia, then the presence of a classical city of the *pars* Asia in the Americas was simply logical.<sup>164</sup>

Münster's conceptualization of the Americas as part of Asia was ultimately less convincing to contemporary audiences than the alternate view of four *pars* advanced by Waldseemüller, but as Davies points out in her article "America and the Amerindians in Sebastian Münster's 'Cosmographiae Universalis libri VI (1550)," the conceptualization and division of the world was not immediately apparent.<sup>165</sup> At the time, Münster's three *pars* world was just as viable an intellectual solution as the four *pars* world which ultimately prevailed.<sup>166</sup> Its ultimate conceptualization of the world was affected by the political and intellectual contexts in which it occurred. For example, mercantilism was on the rise, and German merchants began to resent their unfavorable position in the spice trade, and thus the three-*pars* cosmography which associated the Americas and Asia became less compelling.<sup>167</sup> The presence of a land bridge between the Americas and Asia was postulated, thus neatly solving the theological problem of the lack of a fourth son of Noah to explain the population of the Americas.

The "Novae Insulae XVI, Nova Tabula" is included in the 1540 Basel edition of the *Geographia* (the *Geographia Vniversalis*) and early editions of the

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<sup>163</sup> Figure 2.6

<sup>164</sup> Whether or not Cattigara actually existed, or was an amalgamation of several other cities which classical Europeans had only vague awareness of is unknown. Several archeological sites in southeast Asia have been proposed as candidates, with the most famous being Oc Eo in modern Vietnam.

<sup>165</sup> Davies "America and Amerindians in Sebastian Münster's 'Cosmographiae Universalis Libri VI' (1550)," 372.

<sup>166</sup> *Ibid.*, 359.

<sup>167</sup> *Ibid.*, 373.

*Cosmographia*.<sup>168</sup> It includes a striking illustration of a ship, sailing across the Atlantic towards the newly discovered continents. In his book *Ships on Maps: Pictures of Power in Renaissance Europe*, Richard Unger analyzes the emergence of ship motifs on European maps.<sup>169</sup> Prior to the late fifteenth century, ships were rare or nonexistent – by the end of the sixteenth century, they were ubiquitous.<sup>170</sup> The proliferation of ships occurred in order to present a particular image – “men poised to discover, explore, conquer, and exploit” lands beyond Europe.<sup>171</sup> The ship on the “*Novae Insulae XVI, Nova Tabula*” exemplifies the glorification of conquest. The ship is not a strictly accurate representation of contemporary sailing ships.<sup>172</sup> However, it includes iconographic elements such as its high aftercastle and its shield-lined deck which make it obviously European; an image of Europeans reaching out into the furthest reaches of the world.<sup>173</sup> There are ships on several other maps in the atlas, including the map of Africa. These ships are not fanciful, and they gestured forward to a period from the late sixteenth century to the early nineteenth century where detailed and accurate images of ships sailed on nearly all maps.<sup>174</sup> Unger writes “that map makers tried to represent ships consistent with life suggests something about what they thought they were doing.”<sup>175</sup> These ships were not solely decorative, intended to fill up the empty

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<sup>168</sup> The map is cited in Davies, “America and Amerindians in Sebastian Münster’s ‘*Cosmographiae Universalis Libri VI*’ (1550),” 358, and Unger, 137, as occurring in 1540s and 1550s editions of the *Cosmographia*. The map is also included in the 1540 *Geographia*.

<sup>169</sup> Richard W. Unger, *Ships on Maps: Pictures of Power in Renaissance Europe* (New York, NY: Palgrave MacMillan, 2010), 10.

<sup>170</sup> *Ibid.*, 11

<sup>171</sup> *Ibid.*, 14.

<sup>172</sup> *Ibid.*, 137

<sup>173</sup> *Ibid.*, 137

<sup>174</sup> *Ibid.*, 11-13.

<sup>175</sup> *Ibid.*, 12.

spaces on maps. Instead, they made implicit statements about the accessibility of the world to European explorers. The proliferation of ships on maps suggests that Europeans began to view themselves as a sole subject, with the rest of the world the object of exploration. This is certainly the case on the “Novae Insulae XVI, Nova Tabula,” where the ship sails out into the exotic Pacific.

Iconographic elements of European expansion crept their way onto the “Novae Insulae XVI, Nova Tabula” even more explicitly than in the “Oceanus Occidentalis;” the European ship is set in the Pacific Ocean, displaying confidence of the European ability to penetrate these areas. Knowledge about the Pacific was essentially nonexistent in Europe until just before the publication of the 1525 *Geographia*. Magellan’s initial voyages, which brought Europe its first ideas about the Pacific, did not conclude until 1522.<sup>176</sup> The “Oceanus Occidentalis” includes no information on the Pacific. In contrast, the Pacific is well represented on “Novae Insulae XVI, Nova Tabula.” The straits of Magellan are labelled as a significant geographic marker.<sup>177</sup> Japan appears on the map as “Zipangri” (an old name derived from the writings of Marco Polo), and Münster confidently names several islands and archipelagos in the Pacific.<sup>178</sup> Münster’s map suggests that knowledge of the Pacific was simply waiting for intrepid European voyagers to go forth and penetrate the unknown, thus glorifying European efforts towards discovery.

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<sup>176</sup> Ricardo Padrón, “Charting Shores,” in *Mapping Latin America: A Cartographic Reader*, ed. Jordana Dym and Karl Offen (Chicago, IL: University of Chicago Press, 2011), 34.

<sup>177</sup> Figure 2.5

<sup>178</sup> Figure 2.5

Similarly to the “Oceanus Occidentalis,” the “Novae Insulae XVI, Nova Tabula” also includes an image of Brazilian cannibalism. It depicts the myth that cannibals hacked their victims to pieces and hung them in trees and bushes.<sup>179</sup> Münster writes “regio gigantum,” or “the region of giants” over what is now southern Brazil.<sup>180</sup> In his accompanying chorographic text, Münster describes the violence and barbarity of cannibalism.<sup>181</sup> In the 1572 edition of the *Cosmographia*, Münster again uses illustrations and chorographic text to repeat well-trodden tropes regarding Brazilian cannibalism, including the use of tree-top hanging locations and spit-roasting.<sup>182</sup> Davies writes that cartographers were unwilling to place images on maps which were not supported by the accounts of explorers.<sup>183</sup> While it is true that few cartographers simply made things up, the common repetition of motifs such as that of the Brazilian cannibal and the wandering city of Catigara suggest that with repetition, these motifs became further magnified. As Davies shows in her work with the motif of Brazilian cannibalism, the repetition and magnification of these motifs had far-reaching effects on European conceptualization of the Americas as uncivilized.

Münster provides text-based chorographic comments regarding places on the map. The land is described as both fruitful and savage. In modern central America he writes that “parias abundat auro & margaritis”, “bringing forth abundant gold and pearls”.<sup>184</sup> The economic rationale for colonization was

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<sup>179</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 91.

<sup>180</sup> Figure 2.5

<sup>181</sup> Davies “America and Amerindians in Sebastian Münster’s ‘Cosmographiae Universalis Libri VI’ (1550),” 361.

<sup>182</sup> Figure 2.8

<sup>183</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 101.

<sup>184</sup> Figure 2.5

significant. The Spanish empire's financial stake in its colonial holdings quickly grew to be phenomenal; but the expense of creating and managing colonies was recouped in extractive industries, particularly silver mining.<sup>185</sup> The map also includes several illustrations of forests scattered across the continents, giving an image of a lush land waiting to be inhabited. As many Europeans believed that land needed to be cultivated in order to be owned, it followed that most indigenous Americans did not validly own their land, and thus it was, essentially, free for the taking.

In the 1572 *Chorographia*, a map of the capitol of the Spanish province of Peru projects an attitude of total Spanish control over the land. The city is laid out in a regular grid, emphasizing the orderly and tidy streets.<sup>186</sup> Soldiers patrol the roads surrounding the city, projecting a sense of security. The only inkling of indigenous people is a small sketch in the bottom left-hand corner. There, a man dressed only in a loincloth shakes a spear at two Spanish soldiers.<sup>187</sup> They are mounted on horseback, and look down at him contemptuously. This lone individual presents no threat to them. The picture presented by this map is propagandistic; its vision of a far-flung provincial capital reinforces the imperial authority of the Spanish crown. However, Münster was not Spanish, but German – at first it seems odd that his work would reinforce the political will of the Spanish crown.

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<sup>185</sup> Jordana Dym and Karl Offen, "Introduction to Part 1," in *Mapping Latin America: A Cartographic Reader*, ed. Jordana Dym and Karl Offen (Chicago, IL: University of Chicago Press, 2011), 21.

<sup>186</sup> Figure 2.9

<sup>187</sup> Figure 2.9

The answer can be discerned by comparing Münster's maps to those produced elsewhere. The contrast between this map and English maps of the late seventeenth century are stark; English-made maps, such as William Hubbard's "Map of New-England" portray indigenous people wandering the forests with guns, threatening settlements.<sup>188</sup> There are major differences between the English colonial enterprises and those of the Spanish over a hundred years prior, but one point of contrast is particularly significant. The Spanish approach to colonization was top-down; the Spanish crown had direct control over the colonies and the information coming out of them.<sup>189</sup> The English tended to grant deeds to companies and other private groups who financed the colonial operation themselves.<sup>190</sup> This was cheaper for the English crown, but meant that it was more difficult for the English state to fully control the governance of the colonies, or the information which came out of them.<sup>191</sup> After King Philip's war and the Pequot war, two military conflicts between the indigenous peoples of modern New England and the colonial settlers in the area, colonists expressed concern regarding their safety.<sup>192</sup> The "Map of New-England" was originally commissioned to accompany a text by on King Philip's war Willian Hubbard, which was distributed in England, and thus emphasized to the public and to the

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<sup>188</sup> Figure 2.10

<sup>189</sup> Padrón, "Charting Shores," 33.

<sup>190</sup> Christopher Tomlins, "The Legal Cartography of Colonization, the Legal Polyphony of Settlement: English Intrusions on the American Mainland in the Seventeenth Century," *Law and Social Inquiry* 26, no. 2 (2001): 316-317.

<sup>191</sup> *Ibid.*, 327

<sup>192</sup> DeLucia, Christine M. *Memory Lands: King Philip's War and the Place of Violence in the Northeast* (New Haven, CT: Yale University Press, 2018), 1.

crown the concerns of the settlers.<sup>193</sup> In contrast, the Spanish crown wished to promote German investment in their shipping and trade, and so the information which came from the Spanish government de-emphasized the tensions of the conflict in order to downplay any German concerns regarding the safety of their investments in Spanish enterprises.<sup>194</sup> This lack of access to information accounts for Münster's portrayal of indigenous Americans in the map of the capitol of Peru. The political needs of the Spanish state thus impacted the views of indigenous Americans held by Germans.

The *Chorographia* also includes an illustration of indigenous Americans interacting with Europeans, captioned "Insulani homines." These "people of the islands" are naked except for strategically placed leaves and lengths of cloth, while the Europeans are fully dressed and armored.<sup>195</sup> This illustration evokes the "Europe meeting America" image from the "Oceanus Occidentalis," but crucially, while "Europe meeting America" is metaphorical, "Insulani homines" is ethnographic. It purports to show the culture of the indigenous Americans encountered by European explorers, and closely resembles the engraved ethnographies of the late sixteenth century, most famously those of Theodor de Bry.<sup>196</sup> An interest in compiling knowledge in order to understand the world was common in many disciplines during the sixteenth century, including geography.

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<sup>193</sup> Matthew H. Edney and Susan Cimburek, "Telling the Traumatic Truth: William Hubbard's 'Narrative' of King Philip's War and His 'Map of New-England,'" *The William and Mary Quarterly* 61, no. 2 (April 2004): 322

<sup>194</sup> Christine R. Johnson, *The German Discovery of the World: Renaissance Encounters with the Strange and Marvelous* (Charlottesville: University of Virginia Press, 2008), 93.

<sup>195</sup> Figure 2.11

<sup>196</sup> Shankar Raman, "Learning from De Bry: Lessons in Seeing and Writing the Heathen," *Journal of Medieval and Early Modern Studies* 41, no. 1 (2011): 13.

This impulse was extended to information about people, which Davies describes as “spatial thinking”.<sup>197</sup> Europeans understood people “through observations of their bodies, behaviors, and environments,” through geohumoral theory.<sup>198</sup> The geography of a person’s birthplace and bloodline, to a sixteenth-century European, would thus inform their behavior.<sup>199</sup> These ideas were used to justify slavery and the genesis of caste systems in early colonies, where indigenous individuals, ‘creole’ (partly indigenous and partly European) individuals, fully European individuals born in the colonies, and fully European individuals born in Europe each held a different status. This caste structure was legally enmeshed in the Spanish colonial government, and existed in the French and Portuguese colonial systems as well. The caste system demonstrates that the geohumoral thinking which undergirded images like the “Insulani homines” had practical effects. As images like “Insulani homines” reinforced these conceptions of space and humanity, they simultaneously contributed to the legitimacy of these state policies.

In artistic and chorographic representations of the continents and their peoples, European intellectuals reinforced the idea that Europe was the exclusive holder of “civilization”. According to Michael Wintle, “Europe came to be not simply an equal part of the world, but to dominate it, to reach out its powerful tentacles and control the globe.”<sup>200</sup> After their discovery of the Americas, Europeans had to contend with a massive shift in the size of Europe in relation to

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<sup>197</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 44.

<sup>198</sup> *Ibid.*, 44.

<sup>199</sup> *Ibid.*, 44-45.

<sup>200</sup> Wintle, 139.

the rest of the world.<sup>201</sup> As opposed to filling a full quarter of the map, as it did in T-O maps, Europe as represented on Ptolemaic maps was tiny (although not as tiny as it is in reality – Ptolemy’s overestimate of the longitude of the Mediterranean meant that Europe was elongated by a third of its actual area in most renaissance Ptolemaic maps).<sup>202</sup> This was uncomfortable for European intellectuals, who were used to seeing Europe, if not always at the center of the world, then at least as an immensely significant part of it; European cartographers ultimately developed conventions which minimized this uncomfortable truth.<sup>203</sup> The decision to split the world at the Pacific, rather than the Atlantic, physically centered Europe on maps and simultaneously centered the European experience.<sup>204</sup>

### *Conclusion*

Mapmakers such as Pirckheimer and Münster were not creating monsters and ships in isolation from one another. What to a modern eye appears to be sets of fantastical images of monsters, murderous natives, and ships beset on all sides would not have seemed fantastical in the least to the audience for whom these maps were made. Rather, given the context of geohumoral thinking about human variance and the Renaissance philosophical and political love affair with empire, the choices they made regarding representation of the Americas were logical. The economic and political concerns of empire caused mapmakers – even those enmeshed largely in intellectual communities and states not directly involved in

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<sup>201</sup> Ibid., 143.

<sup>202</sup> Ibid., 143.

<sup>203</sup> Ibid., 143, 145.

<sup>204</sup> Ibid., 145.

colonization – to create chorographies in both text and image which presented indigenous Americans as fundamentally uncivilized and even subhuman. These portrayals were legitimized by their association with Ptolemaic maps. Motifs regarding the Americas – for example, wild, untamed spaces full of riches, and the concept of Brazilian cannibalism – gained ground through repetition. The popularity of these motifs meant that they reinforced a European self-understanding which justified economically profitable and politically advantageous exploitation of the Americas.

**CHAPTER 3:**  
**The Triumph of the Objective in the 1562, 1574, and 1599 Venice Editions of  
the *Geographia***

The growth in popularity of Ptolemaic maps is directly linked to the emergence of the objective mode in the fifteenth century. The Ptolemaic style of gridded maps gained primacy over the T-O and duplex forms used during the medieval period in large part as a result of the fact that Ptolemaic maps were objective, in that they linked the map to the reality of the physical world. As observation of the physical world was a key component of the objective mode, the rise of Ptolemaic maps was a logical expression of its increasing prominence. In the early Renaissance, maps were regarded as pieces of art; they portrayed the world, but the men who created them were as much interested in the aesthetics of a map as in its accuracy.<sup>205</sup> Over the course of the sixteenth century, the primary association of maps changed; some were still pieces of art, but aesthetics became secondary to accuracy as defined by mathematical relationships between latitude and longitude. The impetus towards geographic objectivity is reflected in the changed between editions of the *Geographia* published over the course of the sixteenth century. Three editions of the *Geographia* published in Venice in the

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<sup>205</sup> Richard W. Unger, *Ships on Maps: Pictures of Power in Renaissance Europe* (New York, NY: Palgrave MacMillan, 2010), 62

second half of the sixteenth century elucidate these changing attitudes in European intellectual communities towards the significance of accuracy in geographic knowledge, and its effect on views of the Americas.

Through their paratext and map images, the 1562, 1574, and 1599 Venetian editions of the *Geographia* trace the solidification of the paradigm of objectivity in European geography. Changes in the arrangement of maps and text, inclusion in the latter editions of epilogues devoted to the mathematics of projection, and the general decline of chorographic imagery (with the notable exception of ship motifs, which persisted well into the seventeenth century), all demonstrate this change. The German atlases discussed in the previous chapter were published by Pirckheimer and Münster, members of the knowledge-making community. In contrast, these Venetian atlases, published for export, reflected the changing desires of the intellectual specialist market. As a result, they can also be used to analyze the desires of the knowledge-making community, despite their more commercial production.

The earlier editions of the *Geographia* produced in the German lands demonstrate the transition towards the objective mode. These Italian editions demonstrate the emergence of objective, mathematical geography as a scientific discipline as a result of the precedent established by works like the 1525 and 1540 atlases. The structure of the 1574 and especially the 1599 editions, the use of maritime maps, and the increasing focus on the mathematical methodology all suggest the emerging dominance of the objective mode. Additionally, they gestured towards the geography of Gerard Mercator (1512-1594). Mercator's

projection, popularized after his death by Dutch cartographer Jodocus Hondius, replaced Ptolemy's as the default for European maps in the seventeenth and eighteenth centuries.<sup>206</sup> Ptolemaic projections fell out of favor for a variety of reasons, but one significant point is that the projections, including Mercator's, which were developed in the mid to late sixteenth century were more mathematically exacting.<sup>207</sup> The decline of the of Ptolemy's projections and the rise of the Mercator projection demonstrates the increasing dominance the objective mode had on geographic thought at the end of the sixteenth century.

### *Marketing the Objective*

As a result of the turn towards objectivity, cartographers and publishers used the forms associated with objective Ptolemaic cartography in order to make their books more commercially viable. As Neil Harris points out in his chapter "Poetic Gymnasium and Bibliographical Maze: Publishing Petrarch in Renaissance Venice," in *Specialist Markets in the Early Modern Book World*, publishing for a specialist market – in this case, the relatively small and cohesive communities of European knowledge-makers – involves catering to the particular needs and desires of that market.<sup>208</sup> The ubiquity of the *Geographia* in print, and its evolution into an atlas text, accompanied by Ptolemaic maps, suggests that these types of maps fulfilled a need in the specialist market of knowledge-makers. One requirement of the specialist market as the objective mode gained

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<sup>206</sup> John Snyder, *Flattening the Earth: Two Thousand Years of Map Projections* (Chicago, IL: University of Chicago Press, 1993), 27.

<sup>207</sup> *Ibid.*, 43.

<sup>208</sup> Neil Harris, "Poetic Gymnasium and Bibliographical Maze: Publishing Petrarch in Renaissance Venice," in *Specialist Markets in the Early Modern Book World*, edited by Richard Kirwan and Sophie Mullins (Leiden, the Netherlands: Kkoninklijke Brill, 2015), 145-146.

prominence was a source of technical geographic information. As a result, the objective interests of these three Venetian editions demonstrate the growing prominence of the objective mode in European knowledge-making communities.

As a result of this market requirement, maps in published editions of the *Geographia* used technical projections, although many did not use the more exacting Ptolemaic projection for every map. Most regional maps in published editions of the *Geographia* used the simple equirectangular projection, although some used a trapezoidal projection.<sup>209</sup> The trapezoidal projection was used for star maps in both late antiquity and the Renaissance, but was later adapted by the German cartographer Donnus Nicolaus Germanus, who began using it in editions of the *Geographia* in 1466.<sup>210</sup> Most editions of the *Geographia* used Ptolemy's projections for world maps, and simpler trapezoidal or equirectangular projections for the regional maps which were included in Renaissance versions of the text. The globular projection, which divided the world into a front half and a back half on spherical plane in order to emulate the shape of the globe itself, became popular in the latter half of the sixteenth century, especially in Italy. A globular projection is used as the world map in the 1562, 1574, and 1599 Venice editions of the *Geographia*.<sup>211</sup> The globular projection demonstrates the increased interest in objectivity; for the first time, maps attempted to physically emulate the shape of the world.

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<sup>209</sup> Snyder, 8-9.

<sup>210</sup> Ibid., 9.

<sup>211</sup> Ibid., 15; Figure 3.1

This increased interest in objectivity can also be observed through the translations used for Ptolemy's text. The 1562 edition of the *Geographia* is in Latin and uses Pirckheimer's translation of the Greek text, while the 1574 and 1599 *Geographia* use Girolamo Ruscelli's translation to Italian, except for the maps, which are labelled in Latin and include Latin inscriptions. Ruscelli (born c.1500) was a well-known writer and humanist in the sixteenth century.<sup>212</sup> Little is known about his early life and career, but he was active in Venice from 1548 until his death in 1565 or 1566.<sup>213</sup> He was a humanist polymath, as were most intellectuals of the day, with an interest in natural philosophy as well as literature and language.<sup>214</sup> In addition to his translation of the *Geographia*, he also wrote commentaries on the works of famous Italians such as Petrarch, and a "book of secrets" on alchemical and proto-scientific experiments.<sup>215</sup> Ruscelli's position as both an alchemical knowledge-maker and a geographer-translator demonstrates the interconnected nature of knowledge-making during the Renaissance, and the emergence of geography as a discipline which demanded the same kind of experimentation.

The growing prominence of the objective mode is also demonstrated in the changing structures of the Venetian atlases. The double set of ancient maps and modern maps characteristic of earlier editions of the *Geographia* are still present in the Venetian editions, but the 1525, 1545, and 1562 editions all label the two

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<sup>212</sup> William Eamon and Françoise Paheau, "The Academia Segeta of Girolamo Ruscelli: A Sixteenth-Century Italian Scientific Society," *Isis* 75, no. 2 (1984): 329.

<sup>213</sup> *Ibid.*, 329.

<sup>214</sup> *Ibid.*, 329

<sup>215</sup> *Ibid.*, 328

sections *tabulae*, or “maps” and *tabulae modernae* or “modern maps” (or, in the case of the 1562 edition, *tabulae novae*, or “new maps”). The lack of adjective emphasizes the importance and interest of the ancient maps based on Ptolemy’s text, and demonstrates the Renaissance interest in the classical period. Ptolemy’s work was important to Renaissance scholars not just because of its applications to contemporary mapping, but also because of the knowledge it afforded about the ancient world.<sup>216</sup> The 1525 and 1540 editions structure their maps in two blocks after Ptolemy’s text, one block for the *tabulae* and one for the *tabulae modernae*, and both include only one map of the Americas which appears after the regular blocks of maps.<sup>217</sup> The 1562 edition’s maps are all located at the end of the volume, after the index.<sup>218</sup> Additionally, the 1562 edition structures its maps in pairs based on location – the first two maps are a paired *tabula* and *tabula nova* of England, for example.<sup>219</sup> The final six maps are devoted to places in the Americas, and are not separated from the main blocks of maps.<sup>220</sup> The 1525 and 1545 editions clearly emphasize the importance of the ancient maps over the modern maps, while the 1562 edition serves as a transition: the labelling follows the same convention of emphasizing the older maps, but the structure of pairing the maps based on their location draws a clear connection between the ancient and modern maps.

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<sup>216</sup> George Tolias, “Ptolemy’s Geography and Early Modern Antiquarian Practices,” in *Ptolemy’s Geography in the Renaissance*, ed. Zur Shalev (London: The Warburg Institute, 2011), 136-137

<sup>217</sup> 1525 *Geographia*, 1542 *Geographia*

<sup>218</sup> 1562 *Geographia*

<sup>219</sup> 1562 *Geographia*

<sup>220</sup> 1562 *Geographia*

Conversely, in the 1574 and 1599 editions the maps are labelled “tavola antiqua” and “tavola nova” (“ancient maps” and “new maps”), equalizing the importance of the two sets of maps.<sup>221</sup> In particular, the 1599 *Geographia* uses the unusual tactic of interspersing its *tavola antiqua* throughout the text, instead of compiling them at the end.<sup>222</sup> This gives the text a much more atlas-like function, and the index and pagination allow for easier functionality of the text as a reference work, with the *tavola antiqua* functioning as examples of the process of Ptolemaic mapping. The 1599 edition keeps the practice of compiling the *tavola nova* at the end of the work, thus retaining a reader’s ability to page through the modern maps to give a sense of the contemporary world.<sup>223</sup> As a result, the 1599 edition essentially reframes the relative importance of the two sets of maps, away from the *tavola antiqua* – now merely interesting examples of Ptolemy’s process – and towards the *tavola nova*, which serve to frame the contemporary world through the lens of European objectivity.

The rise of the objective mode coincided with a change in the role of chorography on maps. While these later Italian editions of the *Geographia* include chorographic imagery, they are less interested in chorographic information than their German predecessors. While chorographic imagery still exists to some extent on the maps, it is less present overall. The focus is on the mathematical practice of projection, which is detailed in each atlas in extensive epilogues which explain and elaborate on Ptolemy’s methodology.<sup>224</sup> These epilogues include

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<sup>221</sup> 1574 *Geographia*, 1599 *Geographia*

<sup>222</sup> 1599 *Geographia*

<sup>223</sup> 1599 *Geographia*

<sup>224</sup> 1562 *Geographia*, 1574 *Geographia*, 1599 *Geographia*

descriptive illustrations of the globe and the mathematics involved in projecting a spherical shape on a flat surface. This increased interest in methodology and decreased interest in chorography reflects the growing primacy of the objective mode.

As a result of the shift towards objectivity and the resulting emphasis on technical and information in the specialist market, publishers created editions of the *Geographia* which emphasized the mathematical and nature of its projections. They achieved this via the inclusion of technical epilogues and, in the 1599 edition, the explicit separation between Ptolemy's text and the *tavola antiqua*, and the *tavola nova* and the modern commentaries of translators. The antiquarian emphasis of the 1525 and 1545 editions suggest a Renaissance mode of engagement with the past, with an interest in objectivity and a deep engagement with the ideas of ancient authors.<sup>225</sup> The 1574 and 1599 editions are not an explicit rejection of the authority of ancient authors in the style of Bacon. However, the increasing predominance of the objective mode indicated by the presence of technical epilogues, and the clear delineation in the 1599 edition between the *tavola antiqua* and Ptolemy's text, and the *tavola nova* and the modern text, are indications of movement in knowledge making communities away from ancient authority and towards supposedly objective observation.

The maps in the 1599 *Geographia* use the 1562 and 1575 edition's maps as a base, but include additional content. Each of the maps included in the 1562, 1574 and 1599 editions includes a full Ptolemaic grid, indicating lines of latitude

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<sup>225</sup> Tolias, 136-137

and longitude marked off by fives, with a checkered subgrid indicating each individual line.<sup>226</sup> The corners are marked with a decorative capitol “G,” possibly for “Geographia,” or perhaps for the name of the publisher. The maps used in the 1562 and 1574 editions, however, are fairly spare, while the same maps in the 1599 edition are lush with decoratively calligraphed labels and some chorographic imagery.<sup>227</sup> The maps of the 1562 and 1574 editions include extremely limited chorographic imagery; the only illustrations are small round hills depicting the rough locations of mountain ranges, and depictions of trees to mark the locations of heavily jungled areas in South America.<sup>228</sup> Areas of European colonial settlement are marked by a uniform city symbol, indicating the presence of European civilization.<sup>229</sup> While the 1525 and 1540 atlases envisioned the Americas as areas of colonial exploration, the 1562 and 1574 editions instead present colonial control as a *fait accompli*.

The re-use of maps between different editions of the *Geographia* and other geographic texts was common practice across Europe during the early modern period.<sup>230</sup> This was partly a matter of economic expedience; commissioning woodcuts was expensive, and it made financial sense for publishers to re-use the woodcuts for maps when printing new editions, if new discoveries had not rendered the old maps egregiously out of date.<sup>231</sup> The maps of the original edition of Münster’s *Cosmographia* in 1544 were re-used in his 1545

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<sup>226</sup> Figure 3.2. This map is typical of those found in the Italian editions. Most of these are simple equirectangular projections.

<sup>227</sup> Figure 3.2

<sup>228</sup> Figure 3.2

<sup>229</sup> Figure 3.2

<sup>230</sup> Harris, 146-147

<sup>231</sup> Ibid., 146-147

edition of the *Geographia*. Even when maps were reused over significant timescales, the maps could be altered by recutting or printing over. For example, the maps of the 1562 Venice edition of the *Geographia* were reused in the 1574 edition, and again in the 1599 edition, where the maps were overprinted with additional flourishes. These same maps thus appeared, in slightly different forms, in atlases published by at least three separate publishing houses over nearly forty years. This re-use had the effect of limiting the perspective expressed on maps. The number of unique maps was low in comparison to the total volume of maps in circulation. Maps thus presented only a limited set of chorographic motifs. In effect, the repetition of maps reified the motifs they presented, making them an accepted part of the European intellectual landscape.

The 1562, 1574, and 1599 editions were published in the context of the thriving book markets of Venice. The Venetian publishing industry did not produce books primarily for local markets; rather, they were created for export.<sup>232</sup> The publishing of books for specialist markets, including knowledge-making communities, required the publisher to cater to the needs of that market.<sup>233</sup> As a result, it is possible to utilize these Venetian atlases as a litmus for the state of knowledge production regarding geography across Europe in the latter half of the sixteenth century. The 1562, 1574 and especially the 1599 editions display a marked increase in their interest in objective forms as compared both German editions examined in Chapter 2. It is evident that over the course of the sixteenth-century, European knowledge-making communities moved to fully embrace the

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<sup>232</sup> Ibid., 146.

<sup>233</sup> Ibid., 147.

objective mode, not only in the physical structure of maps but in how scholars conceived of the mapping process, and its ultimate purpose.

### *Projecting Empire*

Understanding space in a *geographic* sense – in terms of the physical features of the land at a particular place, and in the mathematical forms of latitude and longitude – allowed for a description of space which Ricardo Padrón describes as “totalizing...reducing ‘the whole mass of the Earth and the sea’ to the primacy of the degree.”<sup>234</sup> The primacy of the objective mode was far from a true objectivity; as Padrón points out in his article “Charting Empire, Charting Difference: Gómara’s *Historia general de las Indias* and Spanish Maritime Cartography,” the supposedly rational Ptolemaic grid existed alongside decidedly non-objective systems of understanding the world. He argues that while the Ptolemaic grid predominated among humanists and intellectuals, that absolute space had not wholly prevailed over relative space by the mid sixteenth century.<sup>235</sup> However, as the objective mode came to predominate in the latter half of the century, the grid subsumed many of these systems of knowledge making and understandings of space and human difference. Assumptions regarding “civilization” and the spaces inhabited by indigenous people, which were often highly political, were instead made implicit.

The 1562, 1574, and 1599 Italian editions display strikingly different attitudes to the Americas than the 1525 and 1545 editions. No longer do the maps

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<sup>234</sup> Ricardo Padrón, “Charting Empire, Charting Difference: Gómara’s *Historia General de Las Indias* and Spanish Maritime Cartography,” *Colonial Latin American Review* 11, no. 1 (2002): 50.

<sup>235</sup> *Ibid.*, 48.

contain wide unknown blank spaces, inviting colonial exploration. Instead, the Italian atlases include neatly labelled islands and cities.<sup>236</sup> On the “Tierra Nova Sud,” a map of South America, the Amazon river confidently snakes down the continent.<sup>237</sup> Rather than an impression of territory open for exploration, the map instead projects an image of spatial control. It asserts European knowledge of South America through the detailed lines of river and labels and simultaneously claims them. Simultaneously, the absolute space of the Ptolemaic grid provides legitimization of that control. The map purports real, objective knowledge of the places it represents. The map’s assertions of knowledge are themselves political. They display the fruits of empire, useful not only for material benefit but also for their contributions to the imperial imaginaries of the empires whose lands they show, and more generally to the European state system itself.

In contrast to the relatively bare maps from the 1562 and 1574 editions, the 1599 versions of the maps have new toponym labels, updated in the twenty years between the atlas’ publications, and decorative touches, including elaborately scripted labels for continents and major bodies of water, as well as the addition of accurate renderings of ships and small amounts of chorographic imagery. On their map of southern Brazil, the 1562 and 1575 editions include an inscription which describes the myth of Brazilian cannibalism, informing the viewer that individuals who “eat human meat” live in the area.<sup>238</sup> The 1599 version of the same map includes an additional chorographic illustration of the

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<sup>236</sup> Figure 3.3

<sup>237</sup> Figure 3.3

<sup>238</sup> Figure 3.2

imaginary “spit-roasting limbs” imagery popularized on earlier sixteenth-century maps such as the Kunstmann II map.<sup>239</sup> The myth of “Carib” cannibalism has already been extensively discussed, but its ubiquity on maps of this era is difficult to overstate, and demonstrates the power of repetition in chorographic imagery.

The 1599 edition of the *Geographia* also projects empire through the presence of European ships on its maps of the Americas. Unger suggests that the proliferation of ships on maps took place later in northern Europe than in the Mediterranean, where it was common from the mid sixteenth century after its introduction by the Portuguese.<sup>240</sup> However, of the atlases examined here only the 1545 Basel edition and 1599 Venice edition use ship motifs on their maps. The 1545 edition’s ships are less accurate and more fantastical than those on the 1599 edition.<sup>241</sup> This may reflect the different levels of material knowledge held by the mapmakers for the two editions; as Unger points out, mapmakers in the Mediterranean came into more frequent contact with ships than those in most of northern Europe.<sup>242</sup> Sebastian Münster lived his entire life in the Rhineland and may never have seen the ocean; his direct familiarity with oceangoing ships must have been limited.<sup>243</sup> In contrast, the unnamed Venetian cartographer who edited the maps of the 1599 edition likely saw oceangoing ships every day, and clearly used his knowledge when creating the motifs which appear on the revised versions.

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<sup>239</sup> Surekha Davies, *Renaissance Ethnography and the Invention of the Human: New Worlds, Maps and Monsters*, (Cambridge, UK: Cambridge University Press, 2016), 84-85; Figure 3.2

<sup>240</sup> Unger, 125

<sup>241</sup> *Ibid.*, 137

<sup>242</sup> *Ibid.*, 124

<sup>243</sup> Surekha Davies, “America and Amerindians in Sebastian Münster’s ‘Cosmographiae Universalis Libri VI’ (1550),” *Renaissance Studies* 25, no. 3 (June 2011): 355.

The accuracy of the ships depicted on the 1599 edition, in comparison to those of Münster's 1545 edition, demonstrates the tendency of late sixteenth century southern European maps to prioritize accuracy in their ship motifs.<sup>244</sup> In particular, the ships on the maps of New Spain (modern Mexico) and South America display the full-rigging and high aftercastles typical of ships used in the Mediterranean.<sup>245</sup> The ships placed on the maps of Hispaniola and Cuba resemble galleys, with long rows of oars, pointed bows, and distinctive aftercastles.<sup>246</sup> Galleys were used extensively in the Mediterranean from the classical period until the seventeenth century.<sup>247</sup> Large, many oared galleys with backup sails, called 'great galleys,' were the backbone of the Venetian trading empire.<sup>248</sup> Woodcuts dated from the fifteenth century, such as one from Bernhard von Braydenbach's *Peregrinatio in Terram Sanctam* (1486) bear a striking resemblance to the ships on the maps of the 1599 edition of the *Geographia*.<sup>249</sup> In contrast to their ubiquity in the Mediterranean, galleys were used only in a limited capacity in the Caribbean.<sup>250</sup> The maps where the galley motif occurs are of Hispaniola and Cuba, two islands which quickly became extraordinarily profitable colonial holdings of the Spanish empire as a result of the labor of enslaved indigenous people and later enslaved Africans. The use of the galley motif, so heavily

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<sup>244</sup> Unger, 124

<sup>245</sup> Figure 3.4

<sup>246</sup> Figure 3.5

<sup>247</sup> Lionel Casson, "Merchant Galleys," In *The Age of the Galley: Mediterranean Oared Vessels since Pre-Classical Times*, edited by Robert Gardiner, Conway's History of the Ship (Annapolis, MD: Naval Institute Press, 1995), 126.

<sup>248</sup> Ibid., 123.

<sup>249</sup> Ibid., 124.

<sup>250</sup> "Galley Warfare", *Encyclopædia Britannica, inc*, July 29, 2013, Accessed March 4, 2019, <https://www.britannica.com/topic/galley-warfare>

associated with Venice's trade empire, on the maps of Hispaniola and Cuba indicates that the Venetian mapmaker associated these islands with trade. These maps represent Hispaniola and Cuba in the context of their financial importance to European powers; thus, they implicitly claim control and ownership over the space of the map, and by extension, the land.

European imperial ambitions were also aided through the increasing standardization of map structure. Prior to the popularization of projection-based maps, European *mappaemundi* tended to use east as their orienting direction, while duplex maps used whatever direction was convenient. In Münster's *Geographia*, of the nineteen modern maps, four have west at the top, one has east, and two have the south, while the remaining twelve have north.<sup>251</sup> While north predominates, it is not the exclusive orienting direction. In contrast, in all the Venetian editions of the *Geographia*, every map uses north as the orienting direction.<sup>252</sup> This shift towards a uniform use of north demonstrates the standardization of certain map features, which occurred throughout the sixteenth century. Consolidations of this type helped to make spatial assumptions implicit; the lack of variation itself makes it easier to forget that orienting direction is a choice made by a cartographer. The convention of splitting world maps and large regional maps at the Pacific evolved concurrently; in Münster's map of the New World, his choice to depict the Americas as part of *pars Asia* meant that it made sense for him to include the entire Pacific Ocean.<sup>253</sup> In contrast, the map set used

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<sup>251</sup> 1542 *Geographia* (Münster)

<sup>252</sup> 1562 *Geographia*, 1574 *Geographia*, 1599 *Geographia*

<sup>253</sup> Davies "America and Amerindians in Sebastian Münster's 'Cosmographiae Universalis Libri VI' (1550)," 357-358.

by the later Venetian atlases represent America as a separate entity, and the world map splits at the Pacific. As north became the default and the Pacific became the natural place to split maps – it involved less boring blank ocean space for the cartographer to fill – Europe became centered, not only on maps but in the European imagination.

Even as commercial and political factors influenced the development of conventions in European cartography, the increasingly monolithic objective mode meant that those influences were less apparent. Cartographers made decisions, such as splitting world maps over the Pacific, which minimized blank space and made maps visually appealing. Gradually, many of them – the Pacific split and the use of North as the orienting direction – became standard among cartographers. Standardization of these conventions meant that maps were easier to read, and that it was possible to flip between maps without pausing to reorient. That same standardization, however, contributed to the growing invisibility of cartographic conventions. When a particular set of conventions becomes standardized, the active choice to participate and utilize those conventions becomes less obvious. Through the standardization of these cartographic conventions, the dominance of the objective mode allowed Europeans to consider their maps objective. This resulted in the implicit reification of the idea that Europeans were the exclusive holders of civilization.

Another significant element in the narrative of civilization was the production of academic maritime maps. We find few academic maritime maps prior to the late sixteenth century; they do not appear in either Pirckheimer or

Münster's atlases. The 1562, 1574, and 1599 editions each include a maritime map in their sections of modern maps. This map, the "Carta Marina Nova" was common to both editions. It has networks of lines, which radiate out from a point in the ocean.<sup>254</sup> These "rhumb lines" were placed on charts in such a way so as to intersect every meridian at a constant angle, allowing navigators to determine which direction to sail in.<sup>255</sup> Rhumb lines were exports from older maritime mapping traditions, particularly those of the late medieval and Renaissance Mediterranean world.<sup>256</sup> Rhumb lines functioned as aids in navigation, since they corresponded to lines of compass bearing.<sup>257</sup> Coastal toponymy, the practice of densely labelling the coasts of landmasses on maritime maps with the names of villages and other locations along the coast, gave mariners the ability to locate themselves along a coast even when blown off course.<sup>258</sup> These practices of maritime cartography were, much like the chorographic practices of medieval *mappaemundi* and duplex maps, grafted on to Ptolemaic maps once Ptolemaic mapping became ubiquitous.

Ptolemaic portolan charts, or "plane charts" were, quite literally, non-objective. Unlike Ptolemaic maps, which were built off of measurements of latitude and longitude – what Padrón calls "absolute space" – plane charts like the "Carta Marina Nova" were centered on a measurement of latitude relative to the voyage's point of origin.<sup>259</sup> The plane chart was thus, like its portolan

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<sup>254</sup> Padrón, "Charting Empire, Charting Difference," 51. Figure 3.6

<sup>255</sup> Mark Monmonier, *Rhumb Lines and Map Wars: A Social History of the Mercator Projection*, Chicago, IL: University of Chicago Press, 2004, 1-2.

<sup>256</sup> Padrón, 51-53.

<sup>257</sup> *Ibid.*, 51-53.

<sup>258</sup> *Ibid.*, 53.

<sup>259</sup> *Ibid.*, 53.

predecessor, built into “relative space,” based on proximity to a European port. The synthesis of the ultimately relative measurements and practices of the Mediterranean portolan chart onto the absolute space of the Ptolemaic grid demonstrates the utility of the Ptolemaic grid in legitimizing relative knowledge. As Padrón argues, relativistic space was not inherently anti-colonialist – far from it; the very first portolan charts were developed to aid northern European sailors ferrying Crusaders to Palestine.<sup>260</sup> However, the absolute space of projection maps helped to obscure the fact that European understandings of space were relative, and thus helped to legitimize the colonial project.

Some of the practices of portolan charts were built into early Ptolemaic maps; costal toponymy is a feature on the “Oceanus Occidentalis” in the 1525 *Geographia*, for example. Others, like rhumb lines, were left off. Rhumb lines had a practical purpose on functioning maritime charts; they were specifically used to orient sailors and help them chart courses.<sup>261</sup> The rhumb lines present on the plane chart in the 1574 and 1599 editions would not have been used for this; these atlases were produced for the specialist market of knowledge-makers, not for sailors. Their weight and expense would have made them impractical for voyaging. The atlas plane chart did not serve a practical purpose. Instead, rhumb lines created an impression of knowledge and control and the plane chart itself reminded readers of the global scope of colonial ambitions.

The combination of portolan charts with Ptolemy’s methods is akin to the use of chorography on Ptolemaic maps. Though portolan charts and chorography

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<sup>260</sup> Unger, 40.

<sup>261</sup> Padrón, “Charting Empire, Charting Difference,” 51-53.

were of quite different origins – the rhumb lines and costal toponymy used in portolan charts originated in Mediterranean navigation in the late medieval period, while chorography originated in the ancient world and was used throughout antiquity and the medieval period – they both dealt in relative understandings of space. European intellectuals syncretized the relational and relative knowledge of space used in portolan charts and chorography with the “objective” Ptolemaic forms, and thus allowed for an interplay of “objective” and relative forms. The use of the “objective” Ptolemaic base legitimized the presence of relative forms of knowledge in both plane charts and chorographic Ptolemaic maps. As a result, as the objective mode came to dominate European knowledge-making during the sixteenth century, Ptolemaic maps were more commercially viable than their non-objective alternatives. In essence, the political needs of European states converged with the emerging consensus among European knowledge-making communities that an objective relationship with space would increase their ability to produce knowledge.<sup>262</sup> Simultaneously, these knowledge making communities reinforced conceptions of space which promoted and reinforced the interests of European empires.

*The 1569 Mercator Projection and its Afterlives*

Gerard Mercator (1512-1594) was a sixteenth-century Flemish cartographer, scientific instrument maker, and author.<sup>263</sup> His primary innovation was the development of his own projection, which eventually came to replace the Ptolemaic projection as the primary projection used for maps. Mercator’s

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<sup>262</sup> See Chapter 1

<sup>263</sup> Snyder, 43.

projection utilized a mathematical model based on angles which used elements of portolan chart construction.<sup>264</sup> Essentially, it used rhumb lines as the map's gridlines, instead of the latitude and longitude used in the classical Ptolemaic projection, in order to create a usable scale map for navigation.<sup>265</sup> Like most prominent cartographers of the day, Mercator created many Ptolemaic maps; he even published an edition of the *Geographia* in 1578. He published four other atlases, seven large engraved maps, and four books on such diverse topics as theology, geography, and handwriting. Mercator was clearly deeply enmeshed in the community of geographic knowledge makers; he was an avid reader of the work of mathematician Pedro Nunes, who turned his attention to the mathematics of the globe in 1537 and 1566.<sup>266</sup>

The Mercator projection was built explicitly to minimize distortion of ocean distances and coastlines, which theoretically would have allowed navigators to more easily measure distance and chart courses. However, Mercator's projection found its widest use not in navigation but as another intellectual map. Mercator's projection gradually replaced the Ptolemaic projection as the most widely utilized projection type in European atlases. Mercator's *Atlas sive Cosmographicae medatationes* was expanded, popularized and published by Jodocus Hondius in 1606 after Mercator's death.<sup>267</sup> Mercator's projection was thus cemented as the standard projection used by Europeans for

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<sup>264</sup> Monmonier, 3-5.

<sup>265</sup> *Ibid.*, 3-5.

<sup>266</sup> Joaquim Alves Gaspar, "Revisiting the Mercator World Map of 1569: An Assessment of Navigational Accuracy," *The Journal of Navigation* 69 (2016): 1193.

<sup>267</sup> Cornelis Koeman, Günter Schilder, Marco van Egmond, and Peter van der Krogt, "Commercial Cartography and Map Production in the Low Countries, 1500–ca. 1672," In *History of Cartography*, 3 (Chicago, IL: University of Chicago Press, 2007), 1325

nearly two hundred years, and it remains popular up to the present.<sup>268</sup> The projection's common use in non-navigational cartography is controversial today because of its extreme distortion of the upper latitudes caused by fidelity to ocean distances. As a result, the sizes of Europe and North America are expanded relative to Africa, southern Asia, and South America.

In his book *Rhumb Lines and Map Wars*, Mark Monmonier argues that the Mercator projection was a great advance in the scientific discipline of cartography, and that the current backlash against the Mercator projection is largely the result of modern misuse of the projection to portray non-navigational information.<sup>269</sup> However, Monmonier misses several key points in his analysis. Mercator was not a navigator, and modern reassessments suggest that in developing his projection's forms Mercator fundamentally misunderstood the purpose of a rhumb line, rendering the projection functionally useless for contemporary navigators. Monmonier also fails to account for the clear fact that Mercator's projection was not meant to be exclusively presented to an audience of navigators, but was rather a part of the developing paradigm of objectivity within Mercator's own intellectual community. Though Monmonier effectively analyzes the mathematically innovative nature of the projection, he errs by taking Mercator's written interest in revolutionizing navigation at face value. It is, of course, impossible to divine the intentions of historical figures. However, the choices Mercator made when presenting his new projection, combined with many of its fundamental features, suggest that his work was not responding to the true

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<sup>268</sup> Snyder, 27.

<sup>269</sup> Monmonier, 14-15.

problems faced by sixteenth century navigators. In contrast, Mercator's presentation, his written material, and most of all the features of the map itself suggest that his work responded not to navigational needs but to the increasing prominence of the objective mode in European intellectual circles. What Monmonier argues is *misuse* of Mercator's projection is in fact a perfectly logical continuation of the tradition of academic maps. Like its predecessors, Mercator's projection dealt in abstractions which combined to justify a colonialist worldview.

Modern scholarship has drawn attention to Mercator's lack of understanding of contemporary navigational methods. In his article "Revisiting the Mercator World Map of 1569: An Assessment of Navigational Accuracy," Joaquim Gaspar argues that, even had the Mercator projection of 1569 been published in a usable format, it would have been functionally useless for navigators. Despite Mercator's mathematical work, the printed meridians are shaky and uneven.<sup>270</sup> Gaspar postulates that some of these issues were the result of lack of data; Mercator had limited access to geographic information on South America, which was heavily protected by the Spanish and Portuguese governments, and even less information on the far Northern Atlantic, where the ships of European explorers rarely passed.<sup>271</sup> Gaspar points out that the high error values in regions, in particular the eastern Mediterranean, for which geographic information was more readily available suggests that Mercator reproduced the errors of his sources. For example, he duplicated an odd cosmetic alteration to the

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<sup>270</sup> Gaspar, 1190.

<sup>271</sup> *Ibid.*, 1191.

size of the Suez isthmus which resulted in an almost fourfold increase in the size of Europe.<sup>272</sup>

Furthermore, even had Mercator's map been accurate, it would have been incompatible with existing navigational practices. Sixteenth century navigators used charts and plotted courses not based on the theoretical concept of a geographic north pole, but rather on magnetic north, which was concretely measurable at sea.<sup>273</sup> Conversion of geographic north to magnetic north and vice versa would have required a systematic rendering of the magnetic delineation across the ocean, an unfeasible prospect during an era when transatlantic travel was still extremely dangerous.<sup>274</sup> Monmonier points out that Mercator was aware of magnetic north, and marked its possible location in two places on his map, one with a shape that resembles "a fried egg with a very small yoke" and the other with a small rocky island, and highlighted its ambiguity.<sup>275</sup> It was an interesting intellectual problem for Mercator, but a practical issue for contemporary navigators. The incompatibility of Mercator's map with navigational methods indicates once again that his projection was more intellectual exercise, stimulated by a growing interest in mathematical representations of geography. The projection remained in the intellectual and political realms for two hundred years. Navigators did not adopt the Mercator projection as a part of their repertoire until

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<sup>272</sup> Ibid., 1193.

<sup>273</sup> Ibid., 1195.

<sup>274</sup> Ibid., 1195.

<sup>275</sup> Monmonier, 9.

the end of the eighteenth century, precisely because it was highly impractical and incompatible with existing navigational methods.<sup>276</sup>

Mercator was not creating a map which was meant to be used exclusively by sailors. When it debuted in 1569, the Mercator projection was printed as a composite of eighteen engraved sheets; the extant versions of the map each measure an enormous 202 cm by 124 cm (2.5 square meters, or 26 square feet).<sup>277</sup> While large maps had academic precedent, clearly, this map was not meant to accompany sailors on long sea voyages.<sup>278</sup> Furthermore, in his accompanying text, Mercator spends space detailing the faults he perceives in prior projection methods in addition to his comments regarding navigation.

Mercator's projection was created within an intellectual context which was rapidly coming to use the objective mode as a functional paradigm. Mercator's projection was clearly created within that paradigm, and he meant it to be seen and disseminated through the broader European knowledge-making community. His map's initial publication – as a huge, meticulously engraved, and extensively commented scientific tool, akin to his previously published globes – was not meant to aid navigators, but rather to speak to an audience of Mercator's fellow geographic knowledge-makers. It projects mathematical authority through its gridlines and Mercator's accompanying text, where he meticulously details the problems with existing methods. Clearly, any revolutionizing of navigational methods was a secondary objective for Mercator.

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<sup>276</sup> Gaspar, 1195.

<sup>277</sup> Snyder, 45.

<sup>278</sup> Alexander Jones, "Ptolemy's Geography: A Reform That Failed," in *Ptolemy's Geography in the Renaissance*, ed. Zur Shalev (London, UK: The Warburg Institute, 2011), 18.

The Mercator projection's rise was not the result of a revolution in navigational cartography. In fact, it became popular largely because it aided in the endeavor to inflate European importance.<sup>279</sup> Despite its mathematical underpinnings, the Mercator projection provides a false impression of Europe's size – it stretches the northern latitudes in order to make the map lay flat while preserving the integrity of the coastline. Additionally, some of Mercator's coordinate errors, copied over from his sources, actually increased the size of Europe still further. The Mercator projection conveys a sense of objectivity which belies its biases. The supposed objectivity of the Mercator projection provided a sense of security for European intellectuals; they remained able to place Europe as a central part of the world. The prominence of the Mercator projection and the conventional Pacific split helped to maintain this view of European significance.

### *Conclusion*

The 1562, 1574, and 1599 editions of the *Geographia* demonstrate the increasing prominence of objectivity in European cartography. These editions, produced for the specialist market of the knowledge-making community, are increasingly interested in exploring the objective map mode for contemporary maps. The antiquarian practices described by Tolias and used in the 1525 and 1540 atlases are substantially less pronounced. The use of different structures to organize the map sections eventually culminated in the 1599 edition, which intersperses the ancient maps with Ptolemy's text and saves the modern maps for the easily perusable final chapter. These texts each include commentaries, not just

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<sup>279</sup> Michael Wintle, "Renaissance Maps and the Construction of the Idea of Europe," *Journal of Historical Geography*, 25, no. 2 (1999): 145.

on the translation of Ptolemy's text but on his methods. This suggests that the objective mode gained prominence in European geographic circles long before these ideas were explicitly discussed by Bacon in his *New Organon*.

In particular, the growing prominence of plane charts indicated a subjugation of relativistic space to objective space. Plane charts superimposed the relativistic space of the portolan chart onto an objective, Ptolemaic grid. While relativistic space was by no means anti-colonialist, its subsumption into objective space in the plane chart allowed for space to become, in European maps, inherently colonialist. Space was represented on a map as objective fact, but in reality, it was often quite literally relative, as plane charts were created using single reference points and not the mathematics of the grid.

The grid itself gained prominence throughout the sixteenth century. By the time of the publication of the Mercator map of 1569, dozens of competing projections were in use in European intellectual circles.<sup>280</sup> Mercator's projection, often portrayed by modern scholarship as a navigational map, was in truth part of the growing emphasis on the objective mode as the primary and exclusive means of relating to space. The prominence and ultimate dominance of Mercator's projection can be attributed, not its role in any kind of revolution in navigational technique, which it did not in fact precipitate, but rather to its implicit rhetoric of European centrality.

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<sup>280</sup> Snyder, 29-34.

## CODA:

### Indigenous Mapping in Colonial Systems

This thesis has primarily focused on the development of the objective mode and its contributions to the production of European maps and atlases, and especially their contributions to European imagery of the Americas. However, it would be remiss of this work to ignore indigenous mapping. To do so would be to contribute to an academic culture which frequently objectifies indigenous Americans and ignores the existence of indigenous resistance. This work focuses on the culture and communication modes of the colonizers, but here I wish to point to scholarship that centers indigenous responses to colonization. *The Mapping of New Spain* by Barbara Mundy describes the contested space of early colonial Mexico, and responses to colonialism in Aztec mapping. In her article “Circles of Creation: The Invention of Maya Cartography in the Early Colonial Yucatán”, Amara Solari suggests that the cosmological significance of the circular *k’atun* wheel allowed Maya cartographers to retain connections with pre-Columbian ideas even in colonial documents. Finally, in her book *Maya Ideologies of the Sacred*, Solari uses the colonial-era Book of Chilam Balam of Chumayel – a rare instance of a surviving document created by and for colonial-era indigenous people – to discuss the ways in which syncretic religious ideas

contributed to similarly syncretic Maya cartographies. By pointing to these works of scholarship, I hope to make clear that indigenous Americans were not mere objects of European colonial projects, but that they responded to and resisted colonialism with maps and new spatial understandings of their own.

In Barbara Mundy's book *The Mapping of New Spain*, she describes two maps created of the same place – the city of Tenochtitlan, later known as Mexico City – one by an Aztec artist who likely resided in the city, and one by a Spanish draftsman.<sup>281</sup> The Spanish map contains many aspects of European mapping which this project has discussed – like projected maps, it is based on a mathematical distortion. The map of the city uses a Euclidian grid, reducing the size of objects geometrically to create a complete image of a city which could, due to the limitations of space, never be seen as a whole.<sup>282</sup> It was printed to accompany a letter written by the Spanish conquistador Hernán Cortés, and includes visualizations of the lurid descriptions in his letter, including human sacrifice. In contrast, the indigenous map portrays the city without a projection. Where the European map includes the context of the whole lake in which the city-island sits, in the Aztec map it is distilled to a simple blue border around the outside of the map.<sup>283</sup> The four major canals are distilled into a clear x-shape across the map. As Mundy says, “This Aztec artist’s view of reality did not distill into a planimetric map.”<sup>284</sup> However, the map has deep geometry and symbology

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<sup>281</sup> Barbara E. Mundy, *The Mapping of New Spain*, Chicago, IL: University of Chicago Press, 1996, xiii-xiv.

<sup>282</sup> *Ibid.*, xiii. “Birds-eye views” of cityscapes such as this were common in European mapping.

<sup>283</sup> *Ibid.*, xiv.

<sup>284</sup> *Ibid.*, xiv.

relating to traditional Aztec mapping methods.<sup>285</sup> The ten founders of the city are represented, each in the major quadrants of the city in which they lived.<sup>286</sup> Mundy describes this as a “humanistic or social projection,” as opposed to the Euclidian projection used by the European map.<sup>287</sup> It would have been highly legible amongst Mesoamerican communities.<sup>288</sup> This map, created in 1542, demonstrates that colonized indigenous societies such as the Aztec could and did retain traditional structures.

Despite European efforts, American indigenous people were able to use both Native and European cartographies in order to reclaim, at least in part, control over the narrative of land ownership in the Americas. European colonial actors did not recognize or understand the complexities of indigenous societies; for example, they tended to assume that indigenous groups had no governmental structures because those governments functioned differently from European governments.<sup>289</sup> Similarly, Europeans failed to recognize the validity of indigenous conceptions of space.<sup>290</sup> In “Circles of Creation: The Invention of Maya Cartography in the Early Colonial Yucatán”, Amara Solari describes the synthesis of traditional ideas about space and European cartographic practices which occurred among the Maya during early Spanish colonial rule.<sup>291</sup> Solari focuses on the maps of the Maní land treaty, a document produced by the Yucatec

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<sup>285</sup> Ibid., xiv.

<sup>286</sup> Ibid., xvi.

<sup>287</sup> Ibid., xvi.

<sup>288</sup> Ibid., xvi.

<sup>289</sup> Davies, *Renaissance Ethnography and the Invention of the Human*, 80-81.

<sup>290</sup> Amara L. Solari, “Circles of Creation: The Invention of Maya Cartography in the Early Colonial Yucatán,” *Art Bulletin* 92:3 (September 2010), 156.

<sup>291</sup> Ibid., 156

Maya linages in 1557.<sup>292</sup> The Maní land treaty was demanded by the Spanish colonial authority in order to ease the process of imperial absorption, and it includes borders marking out the territory controlled by individual families.<sup>293</sup> Interestingly, it also show Mayan conceptions of space through the prominence of circular forms. Time and space were deeply intertwined in Mayan culture; *k'atun* wheels served simultaneously as calendars and locators in space.<sup>294</sup> Colonial-era Maya cartographers relied on these circular forms for the construction of maps which only explicitly represented physical space. However, the historical connection of the circular form with *k'atun* wheels allowed the Maya to retain connections to their older methods of conceptualizing space and time even in the face of Spanish colonial demands.<sup>295</sup> Solari says that “the circular form retained a deeper level of historical significance, allowing native agents to maintain – in pictorial form – schematized accounts of cosmogenic beginnings.”<sup>296</sup> To the Spanish colonizers, the Maní land treaty was recognizably a map, but it lacked the Ptolemaic structure which was becoming the only form accepted by European political .<sup>297</sup> However, the map’s form allowed the Maya audience to retain “community identity during the cultural and physical chaos of colonization”.<sup>298</sup>

Both Mundy’s book and Solari’s article focus on documents produced by indigenous people at the behest of colonial governments. As the Maní Land treaty and the Codex Mendoza were both produced for colonizers, they necessarily

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<sup>292</sup> Ibid., 156.

<sup>293</sup> Ibid., 156.

<sup>294</sup> Ibid., 155.

<sup>295</sup> Ibid.,” 156.

<sup>296</sup> Ibid., 156.

<sup>297</sup> Ibid., 163.

<sup>298</sup> Ibid., 163.

provide a limited perspective, as it is doubtful that indigenous peoples would have been open about all aspects of their societies. In Solari's book *Maya Ideologies of the Sacred*, she examines a set of manuscripts, including maps, which were created to maintain traditional Maya knowledge and were hidden and passed down in Yucatec villages. In particular, the Book of Chilam Balam of Chumayel recounts the histories and mythologies of the Maya.<sup>299</sup> However, the book also includes adaptations of Christian ideas a Ptolemaic conception of the cosmos.<sup>300</sup> It remains a colonial document; the book reflects the "perception of the Maya living amid the physical, psychological, and ideological chaos of the early colonial period."<sup>301</sup> However, unlike the Maní Land Treaty and the Codex Mendoza, the Book of Chilam Balam of Chumayel directly demonstrates how indigenous people dealt with that chaos, through their own words and images. The book's recounting of the Izta invasion of the Yucatec peninsula describes the God who created the land and the Izta, who named and inhabited the land, a syncretic image drawing both from Christian ideas about the creator and distinctly Mayan ideas about space.<sup>302</sup> Solari describes Izta invasion narrative as fundamentally "cartographic in nature; space, not time, is its organizing principle."<sup>303</sup> Solari compares this post-Columbian narrative with pre-Columbian versions of the same story, and suggests that this cartographic organization represents a point for continuity between the pre- and post- Columbian narratives.<sup>304</sup> The continuity of

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<sup>299</sup> Amara Solari, *Maya Ideologies of the Sacred: The Transfiguration of Space in Colonial Yucatan*, Austin, TX: University of Texas Press, 2013, 20.

<sup>300</sup> *Ibid.*, 20-21.

<sup>301</sup> *Ibid.*, 21.

<sup>302</sup> *Ibid.*, 81.

<sup>303</sup> *Ibid.*, 81.

<sup>304</sup> *Ibid.*, 86.

narrative style and spatial awareness in the Izta invasion narrative between these sources demonstrates that the Maya retained and used of traditional forms of spatial consciousness. Colonization changed much for indigenous Americans, but they retained an active effort to maintain cultural consciousness.

The social projection of the map of Tenochtitlan from the Codex Mendoza, the Maní Land Treaty, and the Izta invasion narrative from the Book of Chilam Balam of Chumayel each demonstrate the resilience of indigenous spatial conceptions and resulting cartographic customs. It is vital that these indigenous cartographies be acknowledged. Native peoples did not passively allow themselves to be erased from their own land. Indigenous people were not merely the objects of European cartographic concern; they actively developed novel conceptions of space in response to colonialism which incorporated indigenous perspectives. Though this work in particular focuses on the perspectives of colonizers, this should not be taken as an assessment of the actual efficacy of European colonizers on the erasure of indigenous cartographies. On the contrary, indigenous peoples were far from passive, but actively maintained and adapted their cartographies to respond to colonization.

## CONCLUSION

The rise of the objective mode in geographic thinking was deeply interconnected with European colonial projects, and as a result with their catastrophic consequences for indigenous Americans. This is not to say that the objective mode is inherently tied to colonial thought and practice. However, too often we fail to acknowledge or recognize the existence of the objective mode, or to comprehend the fact that for much of human history, it was not the mode through which people engaged with their world. Understanding that objectivity is a mode, a framework for comprehension, grants perspective which is vital both for historical analysis and anticolonialist projects. It is impossible to write history if you cannot understand the systems and frameworks for belief which inform the actions of historical figures. Anticolonialism seeks to deconstruct the oppressive systems of colonialism, not only in geopolitics but in thought. In order to decolonialize history, we must acknowledge that both indigenous peoples of the Americas and medieval Europeans engaged in non-objective modes of thought – and that those different modes were not primitive. The objective mode is not the ultimate advancement of human society; rather, it came about due to a particular set of circumstances specific to late medieval European society.

Feyerabend argued that engagement with the world is only possible with a framework; the human mind requires it in order to process events.<sup>305</sup> In effect, one cannot simply *understand*, one must *understand through*. Projection maps allow

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<sup>305</sup> Paul Feyerabend, *Against Method*, 4<sup>th</sup> edition, (London, UK: Verso, 2010), 51.

us to visualize and comprehend the world – but only through a particular framework. For both history and science, a reckoning with the

These frameworks impact the production of knowledge – the kinds of knowledge which are considered worthwhile. Knowledge, especially knowledge of space, is inherently political, not only in its production but in its dissemination. The depictions of indigenous Americans on supposedly objective European maps served a particular political purpose, and modern cartography has inherited many of the conventions which erased indigenous people from the landscape and presented European colonial control as an absolute, “objective” fact. Decolonization requires a reckoning with the history of these cartographic practices.

The objective mode is not truly objective. Modern mathematical, scientific maps are not neutral objects. Harley wrote that “maps are a graphic language to be decoded. They are a construction of reality, images laden with intentions and consequences that can be studied in the societies of their time.”<sup>306</sup> When we read modern maps, we should consider them in the context of the society of our own time, and those societies which formed the modern world itself. The underpinnings of many cartographic conventions have become invisible – but they still inform how we read maps. It is not simply that particular map projections hold colonial perspectives. The problem of false neutrality will not be solved by removing the Mercator projection and replacing it with a slightly different projection. Instead, the concept of the map projection itself must be

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<sup>306</sup> JB Harley, *The New Nature of Maps: Essays in the History of Cartography* (Baltimore, MD: Johns Hopkins University Press, 2001), 36.

interrogated. A truly decolonizing geography must abandon the idea that projected maps are the only valid method with which to display space, and instead elevate maps which utilize indigenous knowledge systems. No map may ever be “neutral,” but through an effort to decolonize geography, we may remove the veneer of neutrality under which projected maps operate, and critically consider how we evaluate space.

## FIGURES

All photos by the author unless otherwise noted.

### Chapter 2



Figure 2.1: Various illuminated letters in 1525 *Geographia*, each portraying an element of Ptolemaic mapping.

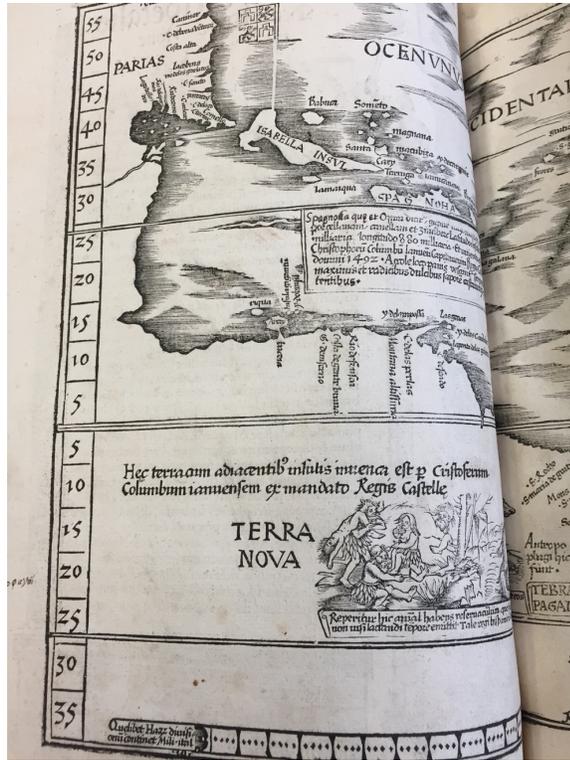


Figure 2.2: “Oceanus Occidentalis” map from the *tabulae modernae* in the 1525 *Geographia*

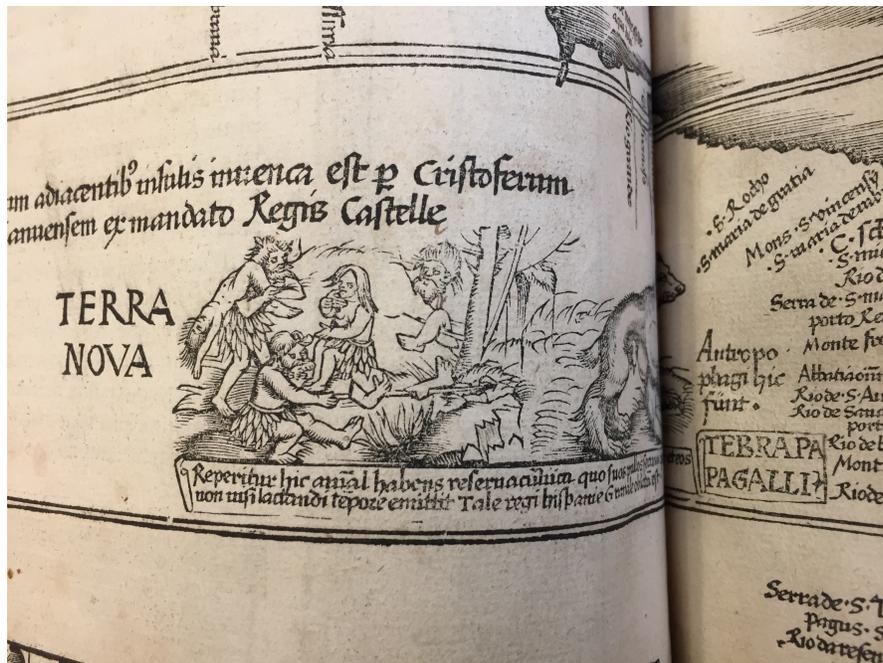


Figure 2.3: Detail of cannibal depiction on the “Oceanus Occidentalis”



Figure 2.4: Allegorical image of Europe ‘civilizing’ an indigenous American, referred to for convenience as “Europe meeting America”.

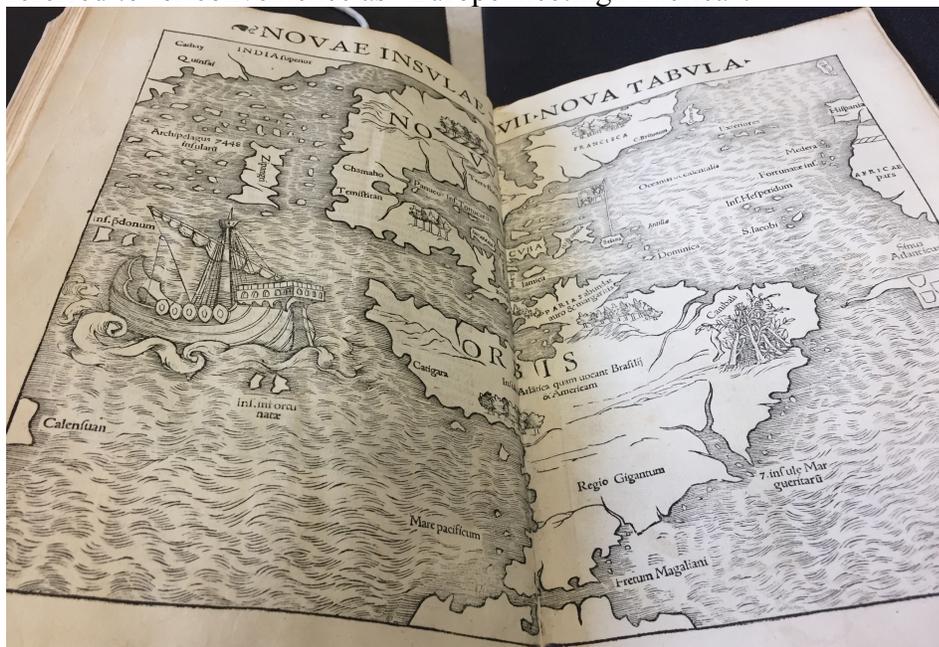


Figure 2.5: “Novae Insulae XXVI, Nova Tabula” from the 1545 *Geographia*

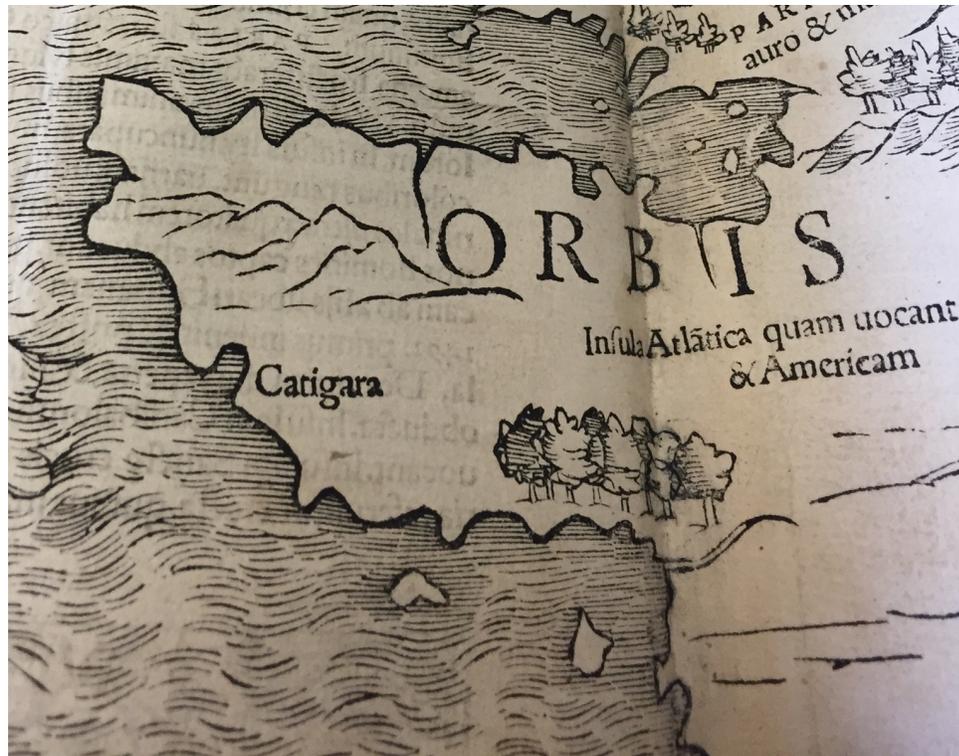


Figure 2.6: Close up of “Catigara” in the “*Novae Insulae XXVI, Nova Tabula*”



Figure 2.7: Close up of ship on the “*Novae Insulae XXVI, Nova Tabula*”

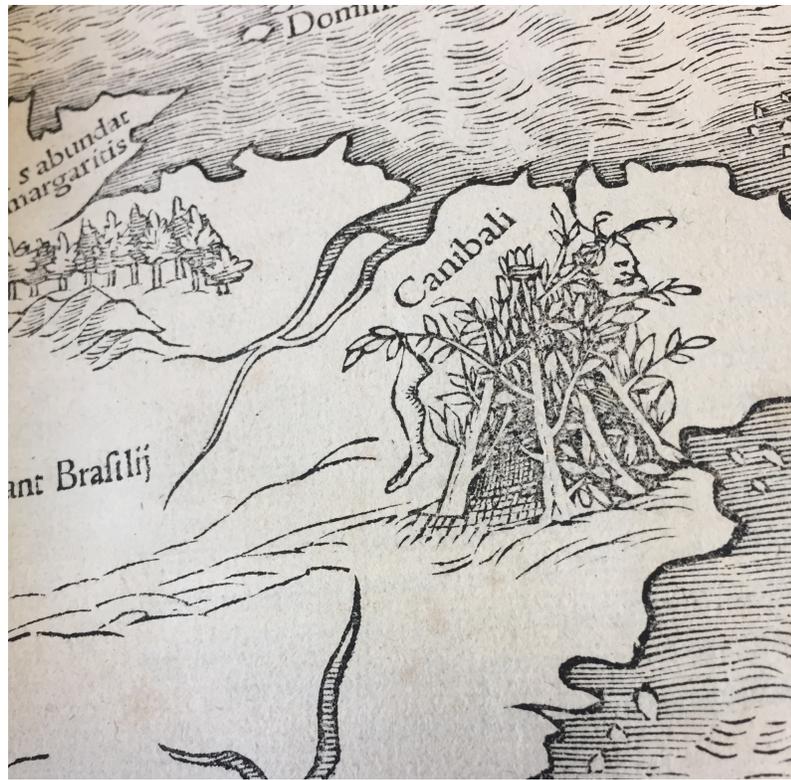
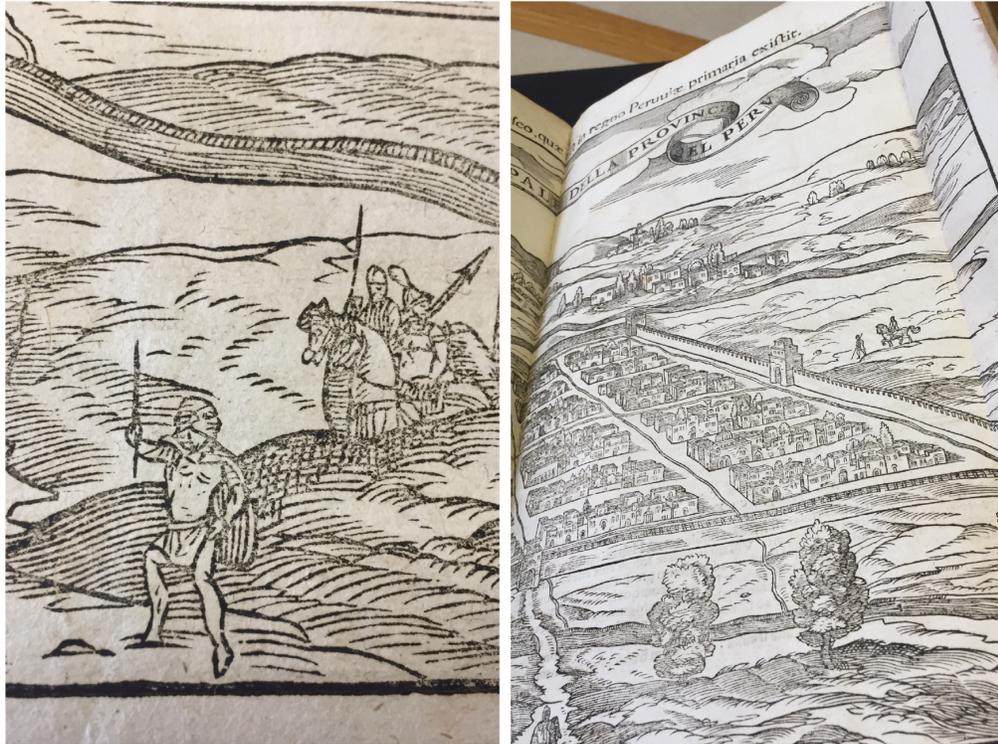
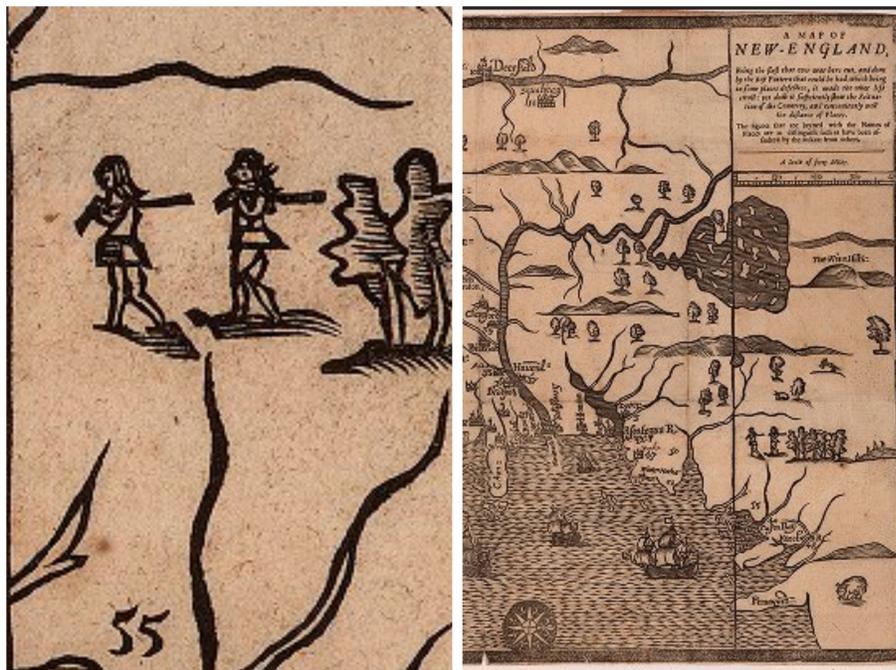


Figure 2.8: Close up of tree on the “Novae Insulae XXVI, Nova Tabula”



2.9: Right, map of the capitol of Peru, 1572 *Chorographia*, left, closeup of depiction of indigenous person.



2.10: Closeup of indigenous individuals; larger view "Map of New-England," from the John Carter Brown Map Collection at Brown University



2.11: "Insulani Homines" from the from the 1545 *Geographia*

### Chapter 3

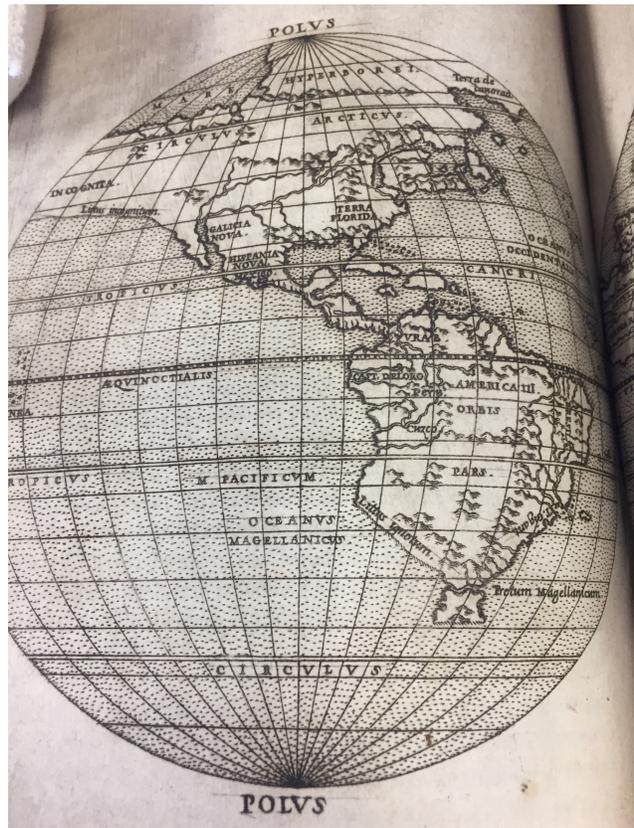


Figure 3.1: Globular Projection from the 1562 *Geographia*



Figure 3.2: Chorographic Depiction of Cannibalism on the map of Brazil from the 1599 *Geographia*

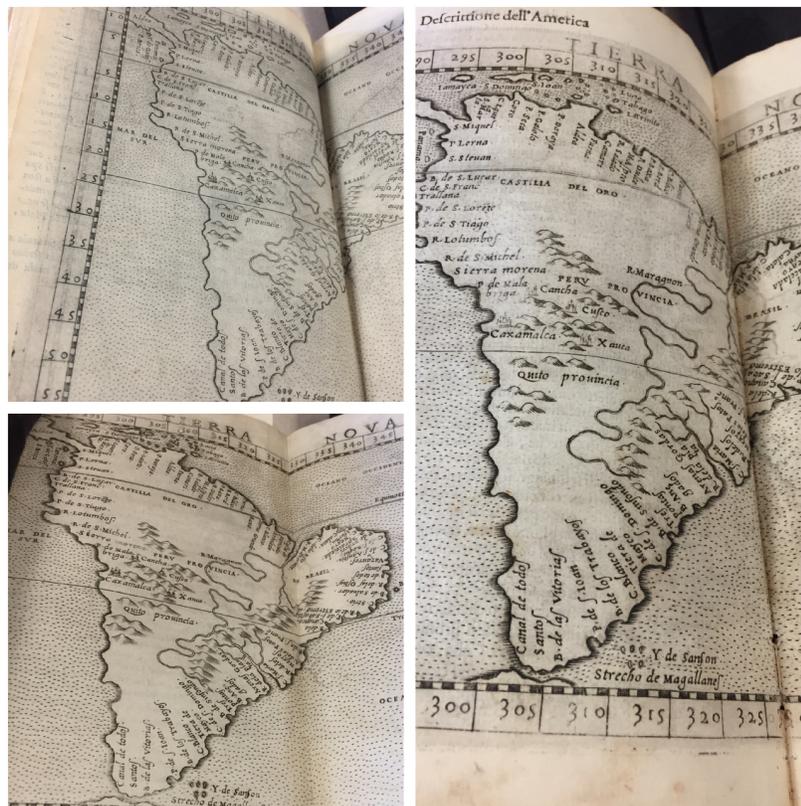


Figure 3.3: Comparison of the South America map between the 1562, 1574, and 1599 Atlases (clockwise from left: 1599, 1574, 1562)



Figure 3.4: Illustration of a Typical Sixteenth Century Ship (1599 Atlas)



Figure 3.5: Illustration of a Galley Ship (1599 Atlas)



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