



Lindsay J. Starkey

Encountering Water in Early Modern Europe and Beyond

Redefining the Universe through
Natural Philosophy, Religious
Reformations and Sea Voyaging

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Encountering Water
in Early Modern Europe and Beyond



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Encountering Water in Early Modern Europe and Beyond

*Redefining the Universe through Natural Philosophy,
Religious Reformations, and Sea Voyaging*

Lindsay J. Starkey

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Table of Contents

Acknowledgements	7
Introduction: Why Water?	9
1. Athens and Jerusalem on Water	23
Part I Water in Exegetical, Natural Philosophical, Cosmographical, and Geographical Texts of c.1000–1600	
2. Gathering Water in Exegetical Texts	61
3. Defining Water in Natural Philosophical Texts	85
4. Describing and Depicting Water in Cosmographical and Geographical Texts	119
Part II Why Water	
5. Water in Newly Rediscovered Ancient and Medieval Texts	165
6. Exploring the Created Universe through Water	191
7. Sea Voyages and the Water-Earth Relationship	217
Afterword: The Redefinition of the Universe and the Twenty-First-Century Water Crisis	245
General Bibliography	257
Index	271



List of Figures

Fig. 1:	Diagrammatic T-O map in Isidore of Seville's <i>Etymologies</i>	146
Fig. 2:	Zonal map in Macrobius's <i>Commentary on the Dream of Scipio</i>	147
Fig. 3:	Untitled world map in the 1482 Ulm edition of Ptolemy's <i>Geography</i>	149
Fig. 4:	The world map in the 1513 Strasbourg edition of Ptolemy's <i>Geography</i>	150
Fig. 5:	The world map in Sebastian Münster's <i>Cosmography</i>	151
Fig. 6:	The world map in the 1561 Viennese Italian vernacular edition of Ptolemy's <i>Geography</i>	151
Fig. 7:	The world map in Abraham Ortelius's <i>Theater of the World</i>	153
Fig. 8:	The world map from Rumold and Gerard Mercator's <i>Atlas</i>	153
Fig. 9:	The world map in Martin Waldseemüller's <i>Universal Cosmography</i> of 1507	156
Fig. 10:	Detail of the world map in Martin Waldseemüller's <i>Universal Cosmography</i> of 1507	157



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Introduction: Why Water?

Abstract

This introduction presents the work's larger argument that fifteenth- and sixteenth-century European sea voyages caused Europeans to re-examine why water did not flood the earth. This introduction also proposes that the topic of water allows for the investigation of several historiographical questions: how Europeans viewed the relationship between the natural, preternatural, and supernatural from the ancient period into the sixteenth century; how Europeans viewed God's connection to the universe from the ancient period into the sixteenth century; and how these overseas voyages in the fifteenth and sixteenth centuries influenced Europeans' dependency on textual authorities for their worldviews. It also suggests that this study is of interest to those scholars working in blue cultural studies.

Keywords: wonder; blue humanities; history of water; religious reformations; overseas voyages

Dixit vero Deus congregentur aquae quae sub caelo sunt in locum unum
et appareat arida factumque est ita et vocavit Deus aridam terram
congregationesque aquarum appellavit maria at vidit Deus quod esset bonum.

– Genesis 1:9–10, Vulgate

Und Gott sprach: Es samle sich das wasser unter dem himel an sondere örter, das
man das trocken sehe. Und es geschach also. Und Gott nennet das trocken Erde,
und die samlung der wasser nennet er Meere. Und Gott sahe es fur gut an.

– Genesis 1:9–10, Martin Luther, *Biblia/ das ist/ die gantze Heilige Schrift
Deusch* (1534)

God said againe, Let the waters under the heaven be gathered into one place, &
let the drye land appeare. And it was so. And God called the drye land, Earth, &
he called the gathering together of the waters, Seas: & God sawe that it was good.

– Genesis 1:9–10, *The Geneva Bible* (1559)

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The earth is surrounded by water, just as that is by the sphere of air, and that again by the sphere called that of fire (which is the outermost both on the common view and on ours). Now the sun, moving as it does, sets up processes of change and becoming and decay, and by its agency the finest and sweetest water is every day carried up and is dissolved into vapor and rises to the upper region, where it is condensed again by the cold and so returns to the earth. This, as we have said before, is the regular course of nature.

– Aristotle, *Meteorology* 2.2, 354b23–32¹

These texts provided the foundation through which many Europeans from the patristic period through the sixteenth century understood water's contemporary ontological and spatial relationships to the earth. Both the Book of Genesis and Aristotle's *Meteorology* provided explanations of how water related to the earth, including why water did not currently submerge dry land where it existed in the world. According to Genesis, primordial water had entirely immersed it until God commanded this primordial water to come together in one place on the third day of creation, thereby providing a dry place for people, animals, and plants to live, and fashioning the basis of the current layout of the world's waterways and landmasses. Whereas God is responsible for the ontological and spatial relationships between water and earth in Genesis, Aristotle viewed these relationships as a part of the regular course of nature. In his works on natural philosophy, or *libri naturales*, he divided the sublunary world into four concentric, elemental spheres with earth at the center, surrounded by the spheres of water, air, and fire in that order.² Recognizing that some dry land stuck out above water, Aristotle juxtaposed an assertion of the existence of these four concentric, elemental spheres with an explanation of a hydrologic cycle, implying, though not actually stating, that water's natural process of change from a liquid to a vapor and back to a liquid allowed for earth to emerge above water wherever it did so in the world.³

1 Aristotle, *Complete Works of Aristotle*, 577.

2 Aristotle's *libri naturales* included his *Physics*, *On the Heavens*, *On Generation and Corruption*, *Meteorology*, and *On the Soul* along with some brief treatises that circulated in the medieval and early modern periods under the title, *Parva naturalia*; Grant, *History of Natural Philosophy*, 143–238.

3 For a discussion of Aristotle's conception of water's relationship to the earth and its impact on Europeans through the seventeenth century, see Grant, *In Defense of the Earth's Centrality and Immobility*, 22–27. See also, Goldstein, "Renaissance Concept of the Earth in its Influence upon Copernicus," 29–35.



Whether attributing water's relationship to earth and their spatial arrangement to God or nature, both Genesis and Aristotle's *libri naturales* still left open the possibility that water could and perhaps should currently inundate the dry land, drowning plants, animals, and people alike wherever they existed. Whereas the flood narrative of Genesis 6–9:17 showed what had happened when God ceased to hold water back from the earth to punish people for their sins, Aristotle ultimately wrote very little on the actual relationship between the spheres of water and earth. The ontological status of the dry land's existence and its location vis-à-vis water sparked commentary from and discussion among European exegetes, natural philosophers, geographers, and cosmographers from the patristic period into the sixteenth century. Though this commentary and discussion persisted for more than a millennium, the explanations these European authors gave of the water-earth relationship and their spatial arrangement changed, depending on the time period in which they were written. Though patristic and medieval writers tended to argue that the natural order God had established through creation and the promise he gave to Noah in Genesis 9:11 explained why the dry land currently existed where it did,⁴ sixteenth-century authors of exegetical, natural philosophical, geographical, and cosmographical texts provided a much wider variety of explanations for the water-earth relationship and placement, claiming that this relationship and placement were natural, preternatural, supernatural, a miracle, or even a wonder. The discussion of water vis-à-vis the earth in Augustine of Hippo's (354–430) fourth- and fifth-century works, the *Literal Meaning of Genesis* (*De Genesi ad litteram*) and the *City of God* (*De civitate dei*), and John Calvin's (1509–1564) *Commentaries on the First Book of Moses Called Genesis* (*In primum Mosis librum qui Genesis vulgo dicitur*, 1554) illustrates some of these differences. For Augustine, all processes in the world could be understood as simultaneously miraculous and natural as he claimed that creation itself was a miracle that God had implanted with all possibilities for future natural processes.⁵ His explanation for the contemporary water-earth relationship in *De Genesi ad litteram* focused on this natural order, though. His first explanation posited that water was different before the third day of creation. He argued that before the third day, primordial water could have been a thin vapor,

4 In the Vulgate, Genesis 9:11 reads, “statuam pactum meum vobiscum et nequaquam ultra interficietur omnis caro aquis diluvii neque erit deinceps diluvium dissipans terram.” In the NRSV, Genesis 9:11 reads, “I establish my covenant with you, that never again shall all flesh be cut off by the waters of a flood, and never again shall there be a flood to destroy the earth.”

5 Augustine, *City of God*, 21.6–9. For an explanation of Augustine's views on miracles as they relate to the natural order, see Ward, *Miracles and the Medieval Mind*, 1–4.

much like a cloud, which hovered over the entire earth. It only became the denser, less expansive substance people currently experienced in nature after God commanded it to gather into one place. In his second explanation, Augustine pointed to the earth's natural position to explain why water did not currently submerge it. According to this explanation, the earth settled during creation, providing hollow places within it for the primordial waters to flow. Since the earth rested on solid supports, it naturally extended over the primordial water that filled its caverns and hollow places.⁶ In contrast, John Calvin argued vehemently that water's failure to flood the dry land was an illustrious miracle.⁷ Drawing on Aristotle's notion of concentric, elemental spheres that should nestle inside one another, Calvin argued that water would entirely flood the earth if it were to follow its natural propensity, and he credited God's active and continued intervention into the world to restrain water from the dry land.⁸

This book explores how authors of this wide range of texts from the patristic period into the sixteenth century understood water's ontological and spatial relationships to the earth. It seeks to explain why the relative agreement between patristic and medieval authors about water's relationship to dry land began to break down in the sixteenth century. It argues that the influx of ancient texts, religious reformations, and fifteenth- and sixteenth-century European sea voyages led these authors to reconsider the relationship between the water and earth, including the layout of the world's landmasses and waterways. Though newly perused ancient texts and different understandings of how God related to the universe and to people certainly led these authors to examine their basic understandings of the world, fifteenth- and sixteenth-century sea voyages to sub-Saharan Africa and the Americas led them to conduct this re-examination in the context of water and its relationship to the earth. Discovering that water did not entirely submerge the Southern Hemisphere of the globe as many medieval authors had argued and encountering the people who lived there either directly or through rumors and printed works, these authors focused on the topic of water as a means through which to redefine a universe that experience revealed to be different than they had previously imagined.⁹

6 Augustine, *Literal Meaning of Genesis*, 1.12.26 and 2.1.1–4.

7 "Hoc quoque illustre est miraculum, quod aquae suo discessu habitandi locum hominibus dederunt"; Calvin, *In primum Mosis librum*, 4.

8 Ibid.

9 Though the water of the Southern Hemisphere caught sixteenth-century European authors' attention, they did not write much about water in the far Northern Hemisphere, assuming based on ancient precedent that water there was either iced over or that flowing water surrounded

Water was a significant topic for sixteenth-century authors of the genres of texts of concern to us here. Whereas commentators on Genesis dealt with God's creation of water and his fashioning of its relationship to the earth, authors of natural philosophical texts focused on the relationship between the elements of water and earth, and authors of geographical and cosmographical texts focused on how water related to the earth as they explained the relative positions of bodies of water and landmasses and these positions' relationship to the heavens. The authors of these texts also had much in common. The vast majority were university educated, and most of them tended to write in Latin. Rigid boundaries did not exist between academic disciplines or textual genres in the sixteenth century, and university education was also structured so that those who had degrees in theology also likely had some training in natural philosophy and even cosmography.¹⁰ For example, an author such as Philipp Melanchthon (1497–1560) who had achieved a *baccalaureus biblicus* (bachelor of biblical studies) as well as a master of arts degree could and did write both a commentary on Genesis and a natural philosophical text.¹¹

Despite similar training and background, the authors of these texts looked to different models for their works and often wrote for different purposes. For instance, whereas a commentator on Genesis often drew on previous exegeses of the biblical text while attempting to explicate the meaning of the entire biblical book,¹² an author of a natural philosophical text typically turned to Aristotelian sources and commentaries on his works to explain the universe and its phenomena.¹³ Therefore, the discussions of water and its relationship to the earth found in these texts cannot be simply equated with one another. Instead of assuming that authors of all these types of texts held the same or even similar conceptions of water, this book analyzes each type in detail, alongside the ancient, patristic, and medieval models on which their authors drew, so that the convergences and divergences between them can all be seen clearly. It begins with the

the northern portions of landmasses there just as it did the western portion of the Europe. On these far northern waters, see, Ginsberg, *Printed Maps of Scandinavia and the Arctic, 1482–1601*, and Van Duzer, “*Hic sunt dracones.*”

10 On the history of universities and their curricula, see Rashdall, *Universities of Europe in the Middle Ages*; Daly, *Medieval University, 1200–1400*; Cobban, *Medieval Universities*; Siraisi and Demaitre, eds., *Science, Medicine, and the University: 1200–1550*; Ijsewijn and Paquet, eds., *Universities in the Late Middle Ages*; and Ridder-Symoens, *History of the University in Europe*.

11 Kusakawa, *Transformation of Natural Philosophy*.

12 Smalley, *Study of the Bible in the Middle Ages*.

13 Grant, *History of Natural Philosophy*, 143–238 and 274–78.



specific discussions of water and its relationship to the earth found in these texts without equating these discussions. It then examines the resonances between these various discussions and what these resonances can show about the assumptions sixteenth-century authors shared when they wrote about water and its relationship to the earth. As Anne Scott argued for the authors of medieval epics, romances, allegories, and fabliaux in her analysis of aqueous moments in these texts, "It is very clear that these stories draw upon an understanding and perception of water and its physical and metaphorical properties common and accessible to all persons."¹⁴ Despite their significant differences, the authors of these texts also shared underlying presuppositions about water, which an analysis of their works will reveal.

Comparing patristic, medieval, and sixteenth-century characterizations of water's relationship to the earth and their understandings of their actual arrangement, we find that authors of exegetical, natural philosophical, geographical, and cosmographical texts both implicitly and explicitly drew on the categories of the natural, preternatural, and supernatural to define this relationship and arrangement. Modern scholars have provided us with some insights into the history of these categories. Lorraine Daston and Katharine Park have argued that there was a tendency from the twelfth century especially among university-trained theologians and philosophers to differentiate between these ontological categories and to define them carefully under the influence of the newly introduced works of Plato and Aristotle. Many of these university-trained theologians and philosophers argued that God had implanted an order of nature during creation that operated in a regular pattern through more or less consistent secondary causes. They tended to consider occurrences that happened according to this pattern and through their usual secondary causes to be natural. For them, preternatural events were those that fell outside the normal pattern of the universe but that still occurred through secondary causes. Many authors classified these preternatural events as wonders. Supernatural events were those that went against the typical order of nature and occurred not through secondary causes but through God's direct intervention into the world. These supernatural events were often seen as miracles. Daston and Park have also argued that these categories began to shift in the sixteenth century as authors expanded the category of the preternatural, thus redefining the boundaries of the natural and the supernatural.¹⁵

14 Scott, "Come Hell or High Water."

15 Daston and Park, *Wonders and the Order of Nature 1150–1750*.



Comparing sixteenth-century European discussions of water's relationship to the earth to those from the medieval and patristic periods shows, much as Daston and Park have argued, that the ontological categories of the natural, preternatural, wonderful, supernatural, and miraculous were up for debate in the sixteenth and seventeenth centuries in a way that they had not been previously. In addition to confirming that such a shift was occurring in the sixteenth century, a focus on the topic of water allows for an exploration of why the meaning of these categories came into question specifically in this historical context. As Terje Tvedt and Terje Oestigaard have argued, histories of the ideas of water can teach us much about the societies that produced these ideas due to people's biological need for water. "Since human existence and social development have always been dependent on water, people have developed ideas and images of water – from the first myth of Sumer, where Enki brings order and life to the earth by pouring water into the beds of the Tigris and Euphrates, to the present day visions of Armageddon, where global warming is turning frozen water into running water and drowning civilizations."¹⁶ Therefore, as a substance with which people continually interacted, studying the ways in which conceptions of water shifted across time in a particular culture provides insight into changes in that culture, including why Europeans began to rethink the ways in which they categorized the universe's phenomena.

Looking specifically at sixteenth-century European discussions of water in these texts reveals that the impact of religious reformations on conceptions of the universe and its phenomena was one significant aspect of the redefinition of these categories. Debates about Christian theology shaped how contemporaries viewed the universe and people's abilities to sense, investigate, and understand that universe because it was understood to be God's creation through which he communicated with human beings.¹⁷ Modern scholars have typically focused on two aspects of the ways this notion influenced people's understandings of the universe. Whereas some scholars such as Philip M. Soergel have focused on how the particularly Protestant emphasis on God's providential control led people to view the world's phenomena as signs and portents,¹⁸ others such as Peter Harrison in his *The Fall of Man and the Foundations of Science* (2007) have focused on how

16 Tvedt and Oestigaard, *Ideas of Water*, 2–3.

17 Debus and Walton, eds., *Reading the Book of Nature*; Howell, *God's Two Books*; Debus and Walton, eds., *Book of Nature in Antiquity and the Middle Ages*; and Killeen and Forshaw, eds., *Word and the World*.

18 Soergel, *Miracles and the Protestant Reformation*.

Protestant notions of postlapsarian anthropology led to the development of experimental methodologies and inductive epistemologies in the late sixteenth and seventeenth centuries.¹⁹

Focusing on water's relationship to the earth draws together these two strands of investigation that have largely been explored separately in modern scholarship. God's relationship with water as depicted in the account of Genesis 1 made it an ideal topic through which Christian authors explored both God's connection to the universe and the human ability to perceive and understand it. For sixteenth-century authors, God's command to the waters to gather together in Genesis 1:9 was both the determinative moment for its relationship to the earth as well as the moment in which God made the earth habitable for people, plants, and animals.²⁰ As most Christians explicitly or implicitly turned to this Genesis account in their discussions of water, these discussions tended to include both extensive comments on God's providential control over the universe and the human ability to observe this providential control in the universe and to perceive God's revelation there. Examining Christian conceptions of the universe demonstrates the need to consider their notions of creation, revelation, providence, and human anthropology as integral aspects of their understandings of it.

Though the impact of religious reformations on Christian understandings of providence and the impact of original sin might explain why many sixteenth-century authors began to reassess the universe's phenomena, including the layout of the world's landmasses and waterways, and redefine the ontological categories of the natural, preternatural, supernatural, wonderful, and miraculous, it does not explain why such reassessment occurred specifically in the context of discussions of water and water's relationship to the earth. It was ultimately the interaction between the texts meant to explain the universe and fifteenth- and sixteenth-century sea voyages to sub-Saharan Africa and the Americas that led these discussions to take place in the context of the dry land's existence and placement. This context suggests the impact of European overseas voyages and encounters with previously unknown peoples and places on the intellectual history of Europe. J.H. Elliott provided the classical argument for how these voyages began to reshape the ways in which sixteenth- and seventeenth-century Europeans viewed their world in his *The Old World and the New 1492–1650* (1st ed., 1970; rev. ed., 1992).²¹ He claimed that Europeans' interest in an-

19 Harrison, *Fall of Man and the Foundations of Science*.

20 Williams, *Common Expositor*.

21 Elliott, *Old World and the New: 1492–1650*, 1970, and the revised edition, 1992.



cient texts initially retarded their ability to perceive the novelty of the new discoveries. According to him, as information about these discoveries continued to accumulate to an extent that these traditional sources could not accommodate, this overwhelming amount of information eventually ended the European dependence on books, opening up more intellectual possibilities. More recently, authors such as Anthony Grafton, April Shelford, and Nancy Siraisi, along with Christine R. Johnson, have challenged this interpretation. In their *New Worlds, Ancient Texts: The Power of Tradition and the Shock of Discovery* (1992), Grafton et al. argued that Europeans' reliance on a traditional canon of books had more to do with reshaping European intellectual trends than the discovery of and encounters with new people and places.²² They claimed that as Europeans started to rediscover a broader range of ancient texts during the course of the Renaissance, they also encountered the many disagreements between the authors of these texts. For Grafton et al., these disagreements both shaped European conceptions of the new worlds they now interacted with and caused the cracks in this bookish culture because Europeans could not reconcile these competing ancient authorities. Grafton et al. even go so far as to argue that many Europeans "would have reached a newfound historical land even if no one had reached America."²³ Johnson has continued this revisionist trend in her *German Discovery of the World: Renaissance Encounters with the Strange and the Marvelous* (2008). Focusing specifically on the case of Germany and how Germans responded to Spanish and Portuguese voyages of discovery and conquest, she has argued that these Germans "persistently and successfully used existing techniques of knowledge and established areas of expertise to make sense of the overseas world."²⁴ As she does so, she emphasizes the flexibility of traditional structures of Renaissance thought, which allowed Germans to perceive and understand overseas environments in ways that made these places familiar and comprehensible to them.

Sixteenth-century European discussions of the ontological and spatial relationships between water and earth suggest a slightly different way in which to understand the impact of European voyages on their scholarship and intellectual history. Much as Grafton et al. and Johnson have emphasized, sixteenth-century discussions of water did draw on ancient texts, whether of long-standing authority such as the Christian scriptures, the *libri naturales* of Aristotle, and medieval commentaries on these books, or more recently

22 Grafton et al., *New Worlds, Ancient Texts*.

23 *Ibid.*, 242.

24 Johnson, *German Discovery of the World*, 3.



translated works such as Ptolemy's *Geography*. For example, when an author classified the dry land's existence as a miracle, they tended to use God's command to the waters located in Genesis 1:9 to support his argument.²⁵ When an author classified the water-earth relationship as natural, they tended to point to a thirteenth- or fourteenth-century interpretation of Aristotle's works to explain how the earth could stick out from the water's sphere.²⁶ Though European bookish culture continued to reign when it came to explaining this relationship, this bookish culture cannot explain why particularly sixteenth-century European authors were interested in it, when previous authors were not. Much as Elliot has claimed, discussions of water suggest that the experience of sailing across oceans and seas that were difficult and dangerous led to a focus on the topic. The experience of sea voyages piqued European interest in water and its relationship to the earth, but they also continued to explore these topics through the bookish culture Grafton et al. and Johnson have outlined. In other words, though encounters with sub-Saharan Africa and the Americas did not cause an immediate change in the methods of comprehending the world, this experience did influence which questions many Europeans asked about that world and to which they applied their bookish methods. Asking different questions about water likely also had implications for how Europeans in the period viewed and interacted with peoples of the Americas, Asia, and Africa – topics, which fall outside the scope of this book, but which deserve further study.²⁷

In addition to addressing questions of interest to historians of early modern Europe, this study is also cognizant of the rising interest among current literary scholars in what has been called, "blue cultural studies" and "blue humanities." Conceptualized originally by modern scholar, Steve Mentz, the "blue humanities" seek to shift scholars' attention from land to sea in order to explore how people and water as well as the environment have interacted in the past, do interact in the present, and could interact in the future.²⁸ Though not engaging directly with such works, focusing on shifting conceptions of water and earth's ontological and spatial relationships in Europe in the ancient, patristic, medieval, and beginning of the early modern periods as this study does can provide those scholars interested in

25 See, for example, Zwingli, *Farrago annotationum in Genesim*, sig. aiiiiv, and Luther, *Genesisvorlesung*, 25–26.

26 See, for example, Zabarella, *De rebus naturalibus libri XXX*, sigs. V1r–X2v.

27 See, for example, Greenblatt, *Marvelous Possessions*; Campbell, *Wonder and Science*; and Wey Gómez, *Tropics of Empire*.

28 Mentz, *At the Bottom of Shakespeare's Ocean*, and his *Shipwreck Modernity*, as well as Brayton, *Shakespeare's Ocean*, and Gillis, "Blue Humanities."



the blue humanities with a historically specific analysis of how Europeans interpreted water and its relationship to the earth, as they explored what James L. Smith has called “the broad polyvalence of water.”²⁹

This book begins with a chapter that provides an analysis of how Europeans conceived of water’s relationship to the earth in the ancient, patristic, and early medieval periods. The rest of the book is divided into two sections. The first section includes the specific analyses of how authors of medieval and sixteenth-century exegetical, natural philosophical, geographical, and cosmographical texts conceptualized the ontological and spatial relationships between water and the dry land. Each type of text is examined in detail to explore how its authors tended to categorize the dry land’s existence – whether natural, preternatural, or supernatural – and how they understood the layout of the world’s landmasses and waterways. This analysis reveals that discussions of water and its ontological and actual relationship to the earth occurred on an unprecedented scale in all these types of works during the sixteenth century especially. It also shows that the possibilities for the classification of this relationship expanded greatly during this period. Tracing the resonances in these texts, this section ultimately makes the argument that sixteenth-century Europe did witness an unprecedented re-examination of the world’s constituent parts as well as the ontological categories of the natural, preternatural, and the miraculous much as Daston and Park have argued. It also raises the question of why this re-examination occurred specifically in the context of discussions of water and its relationship to the earth.

To answer this question, the second section explores the basic assumptions that undergirded these texts. It argues that three different trends contributed to this particularly sixteenth-century interest in water and its relationship to the earth: the influx and wider distribution of ancient texts not known to previous generations of Europeans, shifting conceptions of God and his providence in the wake of the debates accompanying religious reformations, and sea voyages and encounters with people living in the Southern Hemisphere. Whereas the influx of ancient texts and shifting conceptions of God and his providence certainly contributed to sixteenth-century re-examinations of the universe, sea voyages to the Americas, Africa, and Asia, places Europeans had previously thought uninhabitable, and encounters with people who lived there made the topics of water and its relationship to the earth of particular significance in the redefinition of these ontological categories and the universe, as water provided the pathway to these travels and encounters.

29 Smith, *Water in Medieval Intellectual Culture*, 32.



Sixteenth-century European intellectuals encountered a world that was different than the one they had conceptualized in earlier periods. Turning to texts such as the Bible and the works of Aristotle which had long held cultural prestige in Europe, sixteenth-century Europeans continued to rely on bookish methods to understand the world in which they lived. However, their conceptions of the universe and notions of water's relationship to the earth existed alongside increasingly many reports of significantly different spatial relationships between landmasses and waterways in the Southern and Western Hemispheres. These voyages ultimately led the authors of sixteenth-century water texts to reinterpret their canonical works so that they could conceive of an altered relationship between water and earth, even as they also attempted to incorporate recently discovered ancient works into this canon and debated God's connection to the universe and the human perception of that connection. As they reconciled their interpretations of texts with these new discoveries and developments in religious practice and doctrine, their discussions of water and its relationship to the dry land ultimately provided Europeans with new models of the universe, drawing them to understand and eventually dominate its seas and oceans and having implications for how we view the relationship between water, earth, and people in the twenty-first century.

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