

John Calvin and Natural Philosophy

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## Abbreviations

- CO *Corpus Reformatorum Ioannis Calvini Opera quae supersunt omnia*. 59 vols. Edited by Guilielmus Baum, Eduardus Cunitz, and Eduardus Reuss. Halle and Braunschweig: C.A. Schwetschke und Söhne, 1863-1900.
- SC *Supplementa Calviniana: Sermons inédits*. Edited by Erwin Mülhaupt *et al.* Neukirchen: Neukirchener Verlag der Buchhandlung des Erziehungsvereins, 1961 – .

## Abstract

This dissertation explores the connections between sixteenth-century natural philosophy and theology, biblical exegesis, religious polemics, and sermons, arguing for deep connections between “religion” and “science.” It does so through an analysis of John Calvin’s works alongside widely circulated, contemporary natural philosophical texts. Sixteenth-century Christians shared a basic assumption that the universe and all things in it were God’s creation. Authors of both theological and natural philosophical texts taught that studying natural phenomena could teach people about this created universe because God had instilled a natural order in it that typically caused these phenomena to occur. Common presuppositions about God’s creation of the world and his instillation of a natural order in it linked sixteenth-century natural philosophy and theology.

Beginning with these shared presuppositions, this dissertation investigates conceptions of the relationship among the created universe, its natural order, and God found in Calvin’s works and sixteenth-century natural philosophical texts. It analyzes their descriptions of the purpose of natural philosophy and their explanations of the causes of celestial motions, celestial influences, meteorological phenomena, and the behavior of water to do so. It argues that the investigation of God’s relationship to the created universe and its natural phenomena connected sixteenth-century natural philosophy and theology even as the boundaries between them remained much debated.

## Introduction

A new and unique approach to matters divine, a secular theology of sorts, emerged in the sixteenth and seventeenth centuries to a short career. It was *secular* in that it was conceived by laymen for laymen. Galileo and Descartes, Leibniz and Newton, Hobbes and Vico were either not clergymen at all or did not acquire an advanced degree in divinity. They were not professional theologians, and yet they treated theological issues at length. Their theology was secular also in the sense that it was oriented toward the world, *ad seculum*. The new sciences and scholarship, they believed, made the traditional modes of theologizing obsolete; a good many professional theologians agreed with them about that. Never before or after were science, philosophy, and theology seen as almost one and the same occupation.<sup>1</sup>

Amos Funkenstein, *Theology and the Scientific Imagination* (1986)

From the thirteenth century, university curricula both connected natural philosophy and theology and drew boundaries between them.<sup>2</sup> Students typically studied natural philosophy while they were candidates for a master's degree. The attainment of a master's degree was also a prerequisite for study in the higher faculties of theology, medicine, and law. This meant that those taking a degree in theology had extensive training in natural philosophy, whereas those masters who lectured on natural philosophy within universities had no official training in theology because they had only taken a master's degree.<sup>3</sup> This training created many of the connections and the boundaries between theology and natural philosophy. Though medieval

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<sup>1</sup>Amos Funkenstein, *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (New Haven: Yale University Press, 1986), 3. The italics are in the original.

<sup>2</sup>On the history of universities and their curricula, see Hastings Rashdall, *The Universities of Europe in the Middle Ages*, 3 vols, ed. Fredrick M. Powicke and A. B. Emden (Oxford: The Clarendon Press, 1936), Lowrie J. Daly, *The Medieval University, 1200-1400* (New York: Sheed and Ward, 1961), Alan B Cobban, *The Medieval Universities: Their Development and Organization* (London: Methuen & Co., 1975), *Science, Medicine, and the University: 1200-1550: Essays in Honor of Pearl Kibre*, ed. Nancy G. Siraisi and Luke Demaitre *Manuscripta* 20, nos. 2 and 3 (1976). *The Universities in the Late Middle Ages*, ed. Josef Ijsewijn and Jacques Paquet, *Mediaevalia Lovaniensia* Series 1, studia 6 (Leuven: Leuven University Press, 1978), and Hilde de Ridder-Symoens, *A History of the University in Europe*, vol. 1-2 (Cambridge: Cambridge University Press, 1992).

<sup>3</sup>On the connections between natural philosophy and theology in the later middle ages see, John E. Murdoch, "From Social into Intellectual Factors: An Aspect of the Unitary Character of Late Medieval Learning," in *The Cultural Context of Medieval Learning*, ed. John E. Murdoch and Edith Dudley Sylla (Dordrecht: D. Reidel, 1975), 271-339.

theologians frequently incorporated natural philosophy in their work, masters did not often address what they considered to be theological questions in their lectures or treatises on natural philosophy because they did not have the proper training to do so.<sup>4</sup>

The relationship between natural philosophy and theology changed in the sixteenth and seventeenth centuries as the previous boundaries between them became more fluid. Though many university curricula continued to mandate that candidates for a theology degree attain a master's degree before pursuing their studies in theology, religious reform movements and the development of new centers of research and communication such as courts, academies, printing workshops, and print itself allowed those who had not taken a degree in theology to participate in contemporary theological debates.<sup>5</sup> This had a direct influence on the practice of sixteenth- and seventeenth-century natural philosophy. It continued to be defined as the study of natural bodies,<sup>6</sup> but some of those masters who had had training in natural philosophy but not in theology began to include theological discussions in their works. These masters often treated theological issues at length, prompting the modern scholar, Amos Funkenstein, to observe that there was not another historical period in which science, philosophy, and theology were seen almost as the same occupation.

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<sup>4</sup>On the relationship between natural philosophy and theology in the late middle ages see Edward Grant, *God and Reason in the Middle Ages* (Cambridge: Cambridge University Press, 2001) and Michael H. Shank, "Natural Knowledge in the Latin Middle Ages," in *Wrestling with Nature: From Omens to Science*, ed. Peter Harrison, Ronald L. Numbers, and Michael H. Shank (Chicago: University of Chicago Press, 2011), 83-115. On the history of natural philosophy more generally, see Edward Grant, *A History of Natural Philosophy: From the Ancient World to the Nineteenth Century* (Cambridge: Cambridge University Press, 2007).

<sup>5</sup>Funkenstein, 3-9.

<sup>6</sup>See Ann Blair, "Natural Philosophy," in *The Cambridge History of Science*, vol. 3, eds. Katharine Park and Lorraine Daston (Cambridge: Cambridge University Press, 2006), 365.

John Calvin's educational background and his works also reveal such shifting boundaries between natural philosophy and theology.<sup>7</sup> Widely regarded as one of the most influential theologians of the sixteenth century,<sup>8</sup> Calvin participated frequently in contemporary theological debates, though he almost certainly had more university training in natural philosophy than he did in theology. He never studied theology officially. Instead, he took both a bachelor's and master's degree at the University of Paris before pursuing a license in law at the Universities of Orléans and Bourges.<sup>9</sup> Calvin's works also addressed the relationship between the study of God and the study of the world. For example, he connected God, the world God created, and the study of this world in the first book of his 1559 *Institutes*, arguing that both the heavens and the earth bore witness to the wisdom with which God had created them and that studying the world through liberal arts such as astrology, medicine, and *tota physica scientia* could help people investigate the world as well as the God who had created it.<sup>10</sup> Calvin's discussion of the world

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<sup>7</sup>On the relationship between Calvin's works and contemporary natural philosophy, see the works of Susan Schreiner and Christopher B. Kaiser. In her *The Theater of His Glory: Nature and the Natural Order in the Thought of John Calvin* (Durham, NC: The Labyrinth Press, 1991), Schreiner commented occasionally on Calvin's use of natural philosophical doctrines in her analysis of his notion of nature and the natural order alongside patristic, medieval, and contemporary exegesis. Kaiser also examined Calvin's knowledge of Aristotelian natural philosophy through an exploration of Calvin's descriptions of natural place, the motions of celestial bodies and spheres, and the earth's immobility in his article, "Calvin's Understanding of Aristotelian Natural Philosophy: Its Extent and Possible Origins," in *Calvin and Science*, vol 12 of *Articles on Calvin and Calvinism*, ed. Richard C. Gamble (New York: Garland Publishing, 1992).

<sup>8</sup>A recent scholarly biography of Calvin provides a good example of this. Bruce Gordon begins his work with the sentence, "John Calvin was the greatest Protestant reformer of the sixteenth century, brilliant, visionary, and iconic," in his *Calvin* (New Haven: Yale University Press, 2009), vi. For a more detailed, recent analysis of Calvin's influence, see Heiko A. Oberman, *John Calvin and the Reformation of the Refugees* (Geneva: Librairie Droz, 2009) and the articles in *Calvin and His Influence, 1509-2009*, ed. Irena Backus and Philip Benedict (New York: Oxford University Press, 2011).

<sup>9</sup>On Calvin's childhood and education, see Abel Lefranc, *La jeunesse de Calvin* (Paris: Librairie Fischbacher, 1888), Quirinus Breen, *John Calvin: A Study in French Humanism*, 2<sup>nd</sup> ed (Hamden, CT: Archon Books, 1968), and Alexandre Ganoczy, *The Young Calvin*, trans. David Foxgrover and Wade Provo (Philadelphia: Westminster Press, 1987).

<sup>10</sup><sup>c</sup>Mirificam eius sapientiam quae testentur, innumera sunt tum in coelo, tum in terris documenta: non illa modo reconditiora, quibus proprius observandis astrologia, medicina, et tota physica scientia destinata est; sed quae rudissimi cuiusque idiotae aspectui se ingerunt, ut aperiri oculi nequeant quin eorum cogantur esse testes. Equidem qui liberales illas artes vel imbiberunt, vel etiam degustarunt earum subsidio adiuti longe altius provehantur ad

and the God who had fashioned it suggest deep sixteenth-century connections between natural philosophy and theology that had not been typical in medieval universities.

This dissertation explores these sixteenth-century connections between natural philosophy and theology. It does so through an analysis of John Calvin's descriptions of the world and his discussions of natural philosophy's ability to teach people about it alongside those found in widely circulated, contemporary natural philosophical texts. As Christians, both Calvin and the masters who wrote these natural philosophical texts shared a conception of the world as God's creation. This common concern with creation linked the study of God and the study of the world. Calvin and these masters explicitly and implicitly explored the connections and the boundaries between theology and natural philosophy when they described and explained this created universe.

Modern scholars have examined Calvin's notions of creation as a way to explore his theologies of revelation and providence. For example, Susan E. Schreiner has argued that Calvin viewed the doctrine of creation as the demonstration of these theological loci.<sup>11</sup> Calvin's comments on the world God had created and natural philosophy in his 1559 *Institutes* lend support to such studies. At the beginning of the fifth chapter in the first book on acquiring knowledge of God, the creator, Calvin argued that God had impressed marks of his glory in the world he had made.<sup>12</sup> Through these marks on the world, God revealed certain aspects of himself to human beings so that people could come to a better knowledge of him. After describing what

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introspecienda divinae sapientiae arcana; nemo tamen earum inscitia impeditur quominus artificii satis superque perveat in Dei operibus, unde in opificis admiratioem prorumpat." CO 2. Col. 42.

<sup>11</sup>See Schreiner, "Creation and Providence," in *The Calvin Handbook*, ed. Herman J. Selderhuis (Grand Rapids, MI: William B. Eerdmans Publishing Company, 2009), 270, for her most recent articulation of this argument. For a discussion of Calvin's views of creation and providence in relationship to the previous Christian tradition, see her, *The Theater of His Glory*.

<sup>12</sup>CO 2 Col. 41.

natural philosophy could teach people about these works of creation, Calvin argued that ultimately this understanding and appreciation of God's works should lead to knowledge of God's providential control of the world, even if human sin had made people unable to perceive God's active government of the universe.<sup>13</sup> This section of the *Institutes* linked the world that God had created and natural philosophy's ability to teach people about it with theological discussions of revelation and providence.

Although there are such discussions in this and other of Calvin's works,<sup>14</sup> there is no agreement among Calvin scholars about his theologies of revelation and providence.<sup>15</sup> Rather than examine Calvin's notions of creation as a way to explore his theology as Schreiner and others have done, this dissertation sets aside this question to focus more narrowly on Calvin's discussions of what God had created in the context of contemporary natural philosophical notions of the cosmos.<sup>16</sup> His descriptions of natural philosophy and the created world in the fifth

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<sup>13</sup>CO 2 Col. 49.

<sup>14</sup>See for example Calvin's commentary on Genesis (1554) in CO 23-24, his sermons on Job (1554-1555) in CO 33-35, and his commentary on the Psalms (1557) in CO 31-32.

<sup>15</sup>On revelation in Calvin's works, see François Wendel, *Calvin: The Origin and Development of His Thought*, trans. Philip Mairet (New York: Harpes & Row, 1963), 150-165 (original French edition, 1950), T.H.L. Parker, *Calvin's Doctrine of the Knowledge of God*, 2<sup>nd</sup> ed. (Grand Rapids, MI: William B. Eerdmans, 1959), 7-13, Edward A. Dowey, *The Knowledge of God in Calvin's Theology*, 3<sup>rd</sup> ed. (Grand Rapids, MI: William B. Eerdmans, 1994), and Cornelis van der Kooi, *As in a Mirror: John Calvin and Karl Barth on Knowing God*, trans. Donald Mader (Leiden: Brill, 2005), 1-221. For an analysis of Calvin's notion of revelation through a trinitarian paradigm, see Philip Walker Butin, *Revelation, Redemption, and Response: Calvin's Trinitarian Understanding of the Divine-Human Relationship* (New York: Oxford University Press, 1995). For a discussion of Calvin's notion of providence, see Josef Bohetec, "Calvins Vorsehungslehre," in *Calvinstudien Festschrift zum 400. Geburtstag Johann Calvins* (Leipzig: Rudolf Haupt, 1909), 339-441, W.J. Torrance Kirby, "Stoic and Epicurean? Calvin's Dialectical Account of Providence in the *Institutes*," *International Journal of Systematic Theology* 5, no. 3 (2003): 309-322, and Pieter C. Potgieter, "Providence in Calvin: Calvin's View of God's Use of Means (*media*) in His Acts of Providence," in *Calvinus Evangelii Propugnator: Calvin, Champion of the Gospel*, ed. David F. Wright *et al* (Grand Rapids, MI: CRC Product Services, 2006), 175-190. For a discussion of Calvin's understanding of providence in relationship to his understanding of creation, see Susan Schreiner, *Theater of His Glory*, and her *Where Shall Wisdom Be Found? Calvin's Exegesis of Job from Medieval and Modern Perspectives* (Chicago: University of Chicago Press, 1994), especially chapter four. Also Richard Stauffer, *Dieu, la création et la Providence dans la prédication de Calvin* (Berne: P Lang, 1978).

<sup>16</sup>Schreiner has argued that such contextual examinations of Calvin's views of creation would contribute to our understanding of his theology of revelation and providence in "Creation and Providence," 268.

chapter of the first book of the 1559 *Institutes* provide the road map for this investigation.<sup>17</sup> After explaining that God reveals himself in the world he had fashioned, Calvin explained how natural philosophy could help people learn about the universe.<sup>18</sup> Natural philosophy could provide people with an understanding and appreciation of the motions, positions, distance, and the properties of heavenly bodies, the structure and complexion of human bodies, human souls, meteorological phenomena, and the behavior of the sea.<sup>19</sup> For Calvin, all of these works of God – celestial bodies, human beings, meteorological phenomena, and even water occurred either through or against the order that God had instilled in the world at its creation.<sup>20</sup>

How Calvin and contemporary masters described the purposes of natural philosophy and the relationship they all depicted among the created universe, the natural order, and God in their descriptions of the heavens, meteorological phenomena, and water are the focus of the following analysis. Though Calvin and contemporary masters wrote about human beings, plants, and animals as part of this created world, this study sets aside these subjects for the sake of clarity. There is much debate among scholars about Calvin's anthropology.<sup>21</sup> Sixteenth- and

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<sup>17</sup>These passages first appeared in the 1539 edition of the *Institutes*, and Calvin only slightly redacted and added to them for the 1559 edition. See CO 1 Col. 286-291. On the importance of the 1539 *Institutes* for understanding Calvin's thought, see Richard A. Muller, *The Unaccommodated Calvin: Studies in the Foundation of a Theological Tradition* (New York: Oxford University Press, 2000). This continued inclusion and redaction of these passages on natural philosophy and the created world within the various editions of the *Institutes* suggest that Calvin was interested in these subjects for the majority of his writing career.

<sup>18</sup>CO 2 Col. 42.

<sup>19</sup>CO 2 Col. 42-46.

<sup>20</sup>CO 2 Col. 46.

<sup>21</sup>See for example, Roy W. Battenhouse, "The Doctrine of Man in Calvin and in Renaissance Platonism," *Journal of the History of Ideas* 9, no. 4 (1948): 447-471, Charles Partee, *Calvin and Classical Philosophy* (Leiden: E.J. Brill, 1977), 51-65, T.F. Torrance, *Calvin's Doctrine of Man* (London: Lutterworth Press, 1949), Mary Potter Engel, *John Calvin's Perspectival Anthropology* (Atlanta: Scholar's Press, 1988), Heiko A. Oberman, "The Pursuit of Happiness: Calvin between Humanism and Reformation," in *Humanity and Divinity in Renaissance and Reformation: Essays in Honor of Charles Trinkaus*, ed. John W O'Malley SJ et al (Leiden: E. J. Brill, 1993), 251-

seventeenth-century masters also argued about the characteristics of the human soul and its similarity to and differences from those souls animals and plants were thought to possess.<sup>22</sup> Such discussions encompassed a wide variety of sources such as biblical exegesis, theological writings, polemical works, and other ancient texts such as Pliny the Elder's *Natural History*. This wide source base and the disagreements these subjects engender even among modern scholars suggest that they warrant a separate study of their own. Focusing on discussions of the heavens, meteorological phenomena, and water in Calvin's and natural philosophical works allows us to examine Calvin's conception of the created world in the context of contemporary views of the cosmos and the relationship between theology and natural philosophy that they depicted more directly.

Despite the explicit discussions of natural philosophy's ability to teach people about the world God had created in every edition of the *Institutes* from 1539, we cannot trace Calvin's specific education or his reading of particular texts to analyze how the natural philosophical texts he definitely read influenced his understanding of the created world or how the authors of these texts conceived of the connections between natural philosophy and theology. He did not often write about his education or his sources, and scholars have yet to discover other evidence that would make an in depth examination of these possible. There is evidence to suggest that Calvin had extensive contact with natural philosophical texts during his life, though. As a prolific author and a university graduate, Calvin lived and worked in environments where natural philosophical

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283, and Barbara Pitkin, "The Protestant Zeno: Calvin and the Development of Melancthon's Anthropology," *The Journal of Religion* 84, no. 3 (2004): 345-378.

<sup>22</sup> For example, the Fifth Lateran Council at its eighth session in 1513 enjoined philosophers to teach the soul's immortality. Despite this injunction, Pietro Pomponazzi published his *Tractatus de immortalitate animae* in 1516 in which he denied the immortality of the individual soul, prompting even further debate on the subject. On these Renaissance debates' relationship to Calvin's thought see Schreiner, *The Theater of His Glory*, 57-60, George H. Tavard, *The Starting Point of Calvin's Theology* (Grand Rapids: William B. Eerdmans, 2000), 20-39, and his "Calvin and the Self," *From Bonaventure to the Reformers* (Milwaukee: Marquette University Press, 2005), 85-101.

texts circulated freely. Brian Stock's notion of textual communities helps us conceptualize the relationship among sixteenth-century natural philosophical texts so that we can analyze Calvin's discussions of the created universe alongside those found in such texts.<sup>23</sup> For Stock, "textual communities" is a phrase that describes both a sociocultural group and how that group is formed and retains its cohesion. Analyzing eleventh- and twelfth-century heretics and religious reformers, Stock argued that these communities organized themselves around a text or a set of texts. These communities formed when a group of people who were viewed as specialists began to explain this text or texts and when the people who heard or read these explanations accepted them as true understandings of the group's texts. Sharing basic assumptions about the importance of these texts and the proper explanations of them bound both specialists and the other group members together in a textual community, even if the members actually had divergent understandings of the group's texts. The continued explanation of this text or texts within the group's parameters ensured that the group retained its cohesiveness.<sup>24</sup>

The heretics and religious reformers Stock examined share a set of similar cultural practices with the masters in northern European universities who wrote many of the surviving natural philosophical texts.<sup>25</sup> A university-mandated set of texts, masters to explain these texts to students, and students to hear or read these explanations and acknowledge them as valid

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<sup>23</sup>Brian Stock, *The Implications of Literacy: Written Language and Models of Interpretation in the Eleventh and Twelfth Centuries* (Princeton: Princeton University Press, 1983), 88-240 also his "Medieval Literacy, Linguistic Theory, and Social Organization," *New Literary History* 16, no. 1 (1984): 13-29.

<sup>24</sup>For a recent discussion of Stock's conception of textual communities in relationship to other scholars' usages of the phrase, see Kirsty Campbell, *The Call to Read: Reginald Pecock's Textual Communities* (North Bend, IN: University of Notre Dame Press, 2010), 18-21.

<sup>25</sup>I restrict my argument in this dissertation explicitly to northern European universities because Italian universities tended to tie natural philosophy more closely to the teaching and the study of medicine. See Nancy Sirasi, *Medicine and the Italian Universities, 1250-1600* (Leiden: Brill, 2001).

comprised the university practice of natural philosophy.<sup>26</sup> Though its textual basis was expanding in the sixteenth century to include an ever-wider range of ancient works, most university curricula mandated that masters lecture and dispute on Aristotle's *libri naturales*.<sup>27</sup> University curricula also required students to hear these lectures and disputations so that they could take their degrees. Certainly no two masters at northern European universities offered exactly the same explanations of the university-mandated texts to their students. Yet, similar institutional and pedagogical organizations and the significance university curricula assigned to Aristotle's *libri naturales* for the structure and content of masters' lectures and disputations suggest that there were many commonalities among the lectures and disputations given on natural philosophy in northern European universities. These lectures and disputations therefore united masters and their students in a textual community centered largely on Aristotle's works.<sup>28</sup>

Applying this conception of textual communities to the university practices of natural philosophy allows us to recognize and to examine the common features that appear in many surviving natural philosophical texts. Masters provided largely oral explanations of the texts

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<sup>26</sup>The investigation of the natural world was not entirely limited to universities. Other sites increasingly emerged throughout the sixteenth and seventeenth-centuries, including noble courts and royal societies, and natural philosophers could participate in more than one site. See the discussion in Michael H. Shank, "Academic Consulting in Late Medieval Vienna: The Case of Astrology," in *Texts and Contexts in Ancient and Medieval Science: Studies on the Occasion of John E. Murdoch's Seventieth Birthday*, ed. Michael McVaugh and Edith Sylla (Leiden: Brill, 1997), 245-270.

<sup>27</sup>In the sixteenth century, Aristotle's *libri naturales* comprised his *Physics*, *On the Heavens*, *Meteorology*, *On the Soul*, *On Generation and Corruption*, the *History of Animals*, the *Parts of Animals*, a collection of smaller texts known as the *Parva Naturalia*, and two works that scholars now consider of dubious legitimacy, *On Causes* and *On Plants*. See the discussion in Blair, "Natural Philosophy," 366-367.

<sup>28</sup>My application of the concept of "textual community" to sixteenth-century natural philosophy differs in one important way from Stock's usage of the phrase. For Stock, the agreement of specialists and group members on texts and the explanations of these texts played a different social role among medieval heretics and religious reformers than university mandates on natural philosophy did for masters and their students. According to Stock, shared explanations drew together eleventh- and twelfth-century heretics and religious reformers into a conscious group. They provided these groups with conventions for their behavior as well as legitimacy in the face of often vicious persecution, solidifying and justifying their social organizations. In contrast, natural philosophical practices largely existed within the social organization of the university. Though the cultural practices of trained specialists explaining texts for students were essential to universities, universities did not draw their legitimacy or social models directly from masters' explanations of Aristotle's *libri naturales* or other ancient natural philosophical texts.

university curricula mandated in the form of lectures and disputations – a practice that did not leave many sources for modern scholars. They also produced manuscript and eventually printed records of their explanations that were distributed both among students and to other, non-university audiences. These works contained masters' explanations of those texts that university curricula indicated were proper subjects for lectures and disputations on natural philosophy. Though each one of these natural philosophical texts contained its own, unique explanation of Aristotle's *libri naturales* and other ancient works, there were many similarities among them because masters wrote them within the institutional and pedagogical organizations of northern European universities and the textual communities to which these organizations gave rise.

This dissertation analyzes Calvin's works alongside some of the most frequently printed natural philosophical texts of the early and mid-sixteenth-century. As nodes of a northern European, natural-philosophical textual community, these texts not only share common features with the lectures and disputations masters gave at universities as well as other natural philosophical texts written in the period. Their frequent printings and wide circulation also make it plausible that Calvin came into contact with them either as a student in Paris or later in his life as an avid reader and frequent author. The following texts provide the focus of the analysis:

Gregor Reisch's *Margarita Philosophica* (original 1503, last author redacted edition, 1517),<sup>29</sup>

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<sup>29</sup>Gregor Reisch, *Margarita Philosophica* (Freiburg Im Breisgau: Johann Schott, 1503). There were at least twelve sixteenth-century editions of Reisch's text. He redacted editions personally until 1517. After that, publishers either reprinted the 1517 version or found other masters to add to it. There was even an Italian version of the work printed in 1599. See *Natural Philosophy Epitomised: A Translation of Books 8-11 of Gregor Reisch's Philosophical Pearl (1503)*, trans. and ed. Andrew Cunningham and Sachiko Kusukawa (Surrey: Ashgate, 2010), xvii-xix, and Charles H. Lohr, "Latin Aristotle Commentaries: Authors Pi-Sm," in *Renaissance Quarterly* 33, no. 4 (1980): 685-686. There is also evidence to suggest the text's circulation in university environments. In a letter to Florentius von Venningen, Jakob Wimpfeling wrote, "Utinam essent, qui in reformando dialectice et relique philosophie studie modum prescriberent. Dialectica R. Agricole nimium subtilis est. Pro tironibus aut excerpta de Aristotele vel Petro Hispano plus forte prodessent. Similiter margarita philosophica Gregorii Carthusiensis et Philippi Melanctonis et Iacobi Fabri. Quid enim opus est tempus terere et ingenia corrumpere cum conversione per contrapositionem, cum equipollenciis modalium et valentia reali aliisque obscuritatibus predicabilium et predicamentorum?" See *Urkundenbuch der Universität Heidelberg*, ed. Eduard Winkelmann, vol 1, no. 163 (Heidelberg: Carl Winter, 1886),

Frans Titelmans' *Compendium philosophiae naturalis* (1530),<sup>30</sup> Simon Brossier's *Totius philosophiae naturalis epitome, seu Enchiridion* (1530, redacted edition, 1536),<sup>31</sup> Johann Velcurio's *Commentarii libri IIII in universam Aristotelis Physicen* (1539),<sup>32</sup> and Philipp Melanchthon's *Initia doctrinae physicae* (1549).<sup>33</sup> This study offers a close reading of Calvin's

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216. See the discussion of this document in Cunningham and Kusukawa, xi. Cunningham and Kusukawa also found evidence of the work's use in the Jesuit college of Ingolstadt.

<sup>30</sup>Frans Titelmans, *Compendium naturalis philosophiae libri duodecim* (Paris: Johannes Roigny, 1540). According to David Lines, Titelmans' work was printed thirty-six times in the sixteenth century alone with distribution centers in Antwerp, Lyon, and Paris, making his work the most widely printed handbook of natural philosophy in the sixteenth century. Lines has found evidence of the work's distribution into Italy, Spain, and France in inventories of Franciscan and secular libraries, and in sales records to Spanish clergy. He also claims the work influenced the teaching of Cornelius Valerius at the University of Louvain, of Ulisse Aldrovandi at the University of Bologna, and numerous teachers at the Jesuit college of Coimbra. See his, "Teaching Physics in Louvain and Bologna: Frans Titelmans and Ulisse Aldrovandi," in *Scholarly Knowledge; Textbooks in Early Modern Europe*, ed. Anthony Grafton *et al* (Geneva: Librairie Droz, 2008), 183-203. Charles H. Lohr lists twenty-seven editions of Titelmans' text in the sixteenth century, noting editions printed in Cologne and Venice as well as Antwerp, Paris, and Lyon. See his "Latin Aristotle Commentaries: Authors So-Z," *Renaissance Quarterly* 35, no. 2 (1982): 196-198.

<sup>31</sup>Simon Brossier, *Totius Philosophiae naturalis epitome seu Enchiridion* (Paris: Simon Colinaeus, 1536). Though Brossier wrote the original work in 1530, Hieronymus Rupeus redacted it in 1536, providing more extensive explanations of each topic than Brossier had initially given. The redacted version of the text seems to have enjoyed some popularity especially from its publication in 1530 and into the 1550s. The original work was printed in Paris in 1530. The redacted version was printed in Paris in 1536 and again in 1552. The redacted edition was also printed in Basil in 1538. See Charles H. Lohr, "Latin Aristotle Commentaries: Authors A-B," *Studies in the Renaissance* 21 (1974): 278.

<sup>32</sup>Johann Velcurio, *Commentarii libri IIII in universam Aristotelis Physicen* (Lausanne: Theobald Paganus, 1558). The publication history of this natural philosophical text was complicated. It was first published posthumously in Basel in 1537 under the title, *In philosophiae naturalis partem omnium praesentissimam, hoc est, Aristotelis de Anima libros, Epitome longe doctissima, per D. Welcurionem, clarissimum quondam philosophiae in Academia Wittenbergensi professorem conscripta, et nunc primum in lucem edita*. In 1538, an enlarged edition of the work appeared in Erfurt under the title, *Epitomae physicae libri quatuor*. Velcurio's student, Caspar Cerameus, appears to have edited the Erfurt edition of the text for publication. A version with the title of *Commentarii libri IIII in universam Aristotelis Physicen* appeared at Tübingen in 1539 that was hardly different from the one that had appeared in Erfurt the year earlier. Velcurio's work was frequently printed, especially in the edition that had been prepared in 1539 in Tübingen. This edition appeared nineteen additional times before 1595. See, Sachiko Kusukawa, *The Transformation of Natural Philosophy: The Case of Philip Melanchthon* (Cambridge: Cambridge University Press, 1995), 109-113 and Charles H. Lohr, "Latin Aristotle Commentaries: Authors So-Z," *Renaissance Quarterly* 35, no. 2 (1982): 212.

<sup>33</sup>Philipp Melanchthon, *Initiae doctrinae physicae* (Wittenberg: Johann Luft, 1550). There were at least nineteen editions of the work printed in the sixteenth century. Though the vast majority of them were printed in Wittenberg, Melanchthon's text was also published in Basel, Frankfurt, Lyon, and Leipzig. See Charles H. Lohr, "Latin Aristotle Commentaries: Authors L-M," *Renaissance Quarterly* 31, no. 4 (1978): 576-582. Kusukawa has argued that Melanchthon's text was particularly influential. She explains that Melanchthon and other lecturers on natural philosophy actively taught his conception of natural philosophy at Wittenberg. She also argues that many of these Wittenberg students later moved to other universities and taught and recommended what they had learned there. See, *The Transformation of Natural Philosophy*, 185-188.

works alongside these natural philosophical texts that ferrets out and analyzes resonances and clashes among their discussions of the world God created.

Exploring these continuities and discontinuities, this dissertation first seeks to place John Calvin within his historical context. The modern scholar, William J. Bouwsma, argued for the importance of viewing Calvin within his own time period. He claimed that Calvin studies tend to respond to and participate in modern religious and political debates rather than situate Calvin within his own historical period.<sup>34</sup> He explained that such studies not only block a clearer knowledge of John Calvin, but they also obscure our understanding of the entire sixteenth century. Instead, he urged scholars to place Calvin back in his own, historical context.<sup>35</sup> Although we now tend to think of him as a theologian, Calvin's education in the liberal arts, philosophy, law, and the *studia humanitas* alone suggests that this label may mask more about Calvin and his time period than it reveals. Examining the convergences and divergences between Calvin's discussions of the created world and those of contemporary masters allows us to view him within his educational milieu.

In addition to contributing to a more historical understanding of John Calvin, this dissertation ultimately seeks to reconnect aspects of sixteenth-century thought that modern scholars typically treat separately. There have been many debates among historians of science about the historical relationships between natural philosophy and theology or even science and religion. These debates tend to emphasize their separation, while arguing for their hostile,

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<sup>34</sup>William J. Bouwsma, *John Calvin: A Sixteenth-Century Portrait* (New York: Oxford University Press, 1988).

<sup>35</sup>Oberman also argued similarly. See the collection of his articles on Calvin and the development of Calvinism in *John Calvin and the Reformation of the Refugees*.

neutral, or positive interactions in particular historical periods.<sup>36</sup> Scholars of Calvin's works have also assumed a basic separation between science and religion in their continued disagreements over whether he believed the natural world could provide people with knowledge of God.<sup>37</sup> The relationship between natural philosophy and theology was certainly much contested.

Recognizing that the boundaries between natural philosophy and theology were more fluid in this period and that Calvin and the masters who wrote most of the surviving contemporary natural philosophical texts were Christians who shared basic presuppositions about the created world and the natural occurrences that took place in it allows us to explore the connections as well as the boundaries that each historical actor drew rather than impose modern separations between science and religion on his or her work. Focusing on Calvin and contemporary masters' shared assumptions that God had created the world and that natural philosophy could teach people about it allows us to overcome these artificial separations and seek connections between Calvin's works and contemporary natural philosophical texts.

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<sup>36</sup> On these debates, see *God and Nature: Historical Essays on the Encounter between Christianity and Science*, ed. David C. Lindberg and Ron Numbers (Berkeley: University of California Press, 1986) and David C. Lindberg, "Medieval Science and Religion," In *Science and Religion: A Historical Introduction*, ed. Gary B. Ferngren (Baltimore: The Johns Hopkins University Press, 2002), 57-73. On the complexities and multiplicities of the relationships between religion and science see John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991) and the articles in *Science and Religion*, ed. Thomas Dixon, Geoffrey Cantor, and Stephen Pumfrey (Cambridge: Cambridge University Press, 2010). On the relationship between religion and science in the sixteenth century, see Ann Blair, *The Theater of Nature: Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997). On the mutual influences of theology and scientific inquiry from antiquity into the eighteenth century, see Christopher B. Kaiser, *Creation and the History of Science* (Grand Rapids, MI: William B. Eerdmans, 1991).

<sup>37</sup> This debate began in 1934 with the publication of Emil Brunner's *Natur und Gnade: Zum Gespräch mit Karl Barth* (Tübingen: Mohr Siebeck, 1934) and Karl Barth's answer in his *Nein! Antwort an Emil Brunner* (Munich: Kaiser, 1934). There is a discussion of the debate and an English translation of these texts in *Natural Theology: Comprising "Nature and Grace" by Professor Dr. Emil Brunner and the Reply, "No!" by Dr. Karl Barth* trans. Peter Fraenkel, 2<sup>nd</sup> ed (Eugene, OR: Wipf and Stock, 2002). See also Parker's *Calvin's Doctrine of the Knowledge of God* and Dowey's *The Knowledge of God in Calvin's Theology*. Most recently, Randall C. Zachman has argued something similar to Dowey in his *Image and Word in the Theology of John Calvin* (Notre Dame, IN: University of Notre Dame Press, 2007). He explores the connections between God's manifestations in the world and the Word in Calvin's thought.

The first two chapters of this dissertation explore the purposes both Calvin and the authors of the most widely circulated natural philosophical texts of the early to mid-sixteenth century assigned to the study of natural philosophy. In doing so, they argue that shared presuppositions about God's creation of the world and the natural order he provided connected sixteenth-century theology and natural philosophy. The following three chapters offer case studies of the heavens, meteorological phenomena, and water. These case studies explore further connections and possible tensions between sixteenth-century natural philosophy and theology as they examine what Calvin and these masters wrote about the causes of these particular natural phenomena in detail. They analyze what their discussions of these particular phenomena reveal about their conceptions of the relationship among the created universe, its natural order, and God as well as their notions of the created universe more broadly.

For John Calvin, Gregor Reisch, Frans Titelmans, Simon Brossier, Johann Velcurio, and Philipp Melanchthon, the study of God and the study of the world were intimately connected. Whether people scanned the heavens, attempted to predict meteorological phenomena, or contemplated the water found in lakes, rivers, and seas, all these men argued these were aspects of God's creation that natural philosophy could help people understand better. These presuppositions were fundamental to the connections they drew between natural philosophy and theology as well as basic to their construction of knowledge of the universe.

## Chapter 1: John Calvin and the Purpose of Natural Philosophy

Mirificam eius sapientiam quae testentur, innumera sunt tum in coelo, tum in terris documenta: non illa modo reconditiora, quibus proprius observandis astrologia, medicina, et tota physica scientia destinata est; sed quae rudissimi cuiusque idiotae aspectio se ingerunt, ut aperiri oculi nequeant qui eorum cogantur esse testes. Equidem qui liberales illas artes vel imbiberunt, vel etiam degustarunt, earum subsidio adiuti longe altius provehuntur ad introspicienda divinae sapientiae arcana...<sup>38</sup>

John Calvin, *Institutes of the Christian Religion* (1559)

In the 1559 *Institutes*, John Calvin argued that God had created the universe. Everything in the world from the largest planet to the smallest insect was part of this creation. Everything in the universe, even the universe itself, was one of God's creatures. In the passage above, Calvin claimed that these creatures provided people with evidence of God's creation of the world. These creatures not only surrounded people as they lived in the world God had made. They also forced themselves on human eyes so much so that Calvin argued even those who lacked education should recognize that God created the universe.

Calvin singled out a special role for natural philosophy and other closely related liberal arts such as astrology and medicine in this observation. Though human beings did not require education in the liberal arts to view God's creatures and learn *that* he created the universe, natural philosophy taught people *how* this created universe functioned. Learning how it functioned in turn not only taught masters about the world around them. It also gave them insight into the God who had created it. Calvin provided the example of the heavens to support this claim. All human beings should be able to see the variety of stars and discern the orderliness of the heavens with the naked eye. The endless array of stars and their orderly arrangement should show people that God had fashioned them. Masters' knowledge of celestial bodies' motions, placement, and properties allowed their minds to soar higher and to obtain a better knowledge

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<sup>38</sup>CO 2 Col. 42.

not only of the celestial bodies but also of the wisdom with which God had fashioned the world.<sup>39</sup> One did not need to study natural philosophy exhaustively to benefit from it either. Even a taste of this study was enough. For Calvin, the purpose of natural philosophy was to provide people with a deeper knowledge of God's creatures. In doing so, it gave them insight into the world God had made.<sup>40</sup>

### The Created World

Calvin discussed the universe God had fashioned most extensively in his commentary on Genesis (1554) and in the fourteenth chapter of the first book of the 1559 *Institutes*.<sup>41</sup> In both, he argued God had created the world out of nothing, or *ex nihilo*, over the course of six days. He also claimed that the Book of Genesis recounted this creation process. In the Geneva Bible of 1560, Genesis relates that God created the heavens and the earth *ex nihilo* and the light on the first day (Gen 1:1-5). On the second day, God fashioned a firmament in the middle of the waters and called the firmament, "heaven" (Gen 1:6-8). God gathered together the waters on the third

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<sup>39</sup>Ibid.

<sup>40</sup>The following analyzes the ideal purpose Calvin assigned to natural philosophy – what masters should study and teach. In the various editions of the *Institutes* and in many of his other works, Calvin argued that sin blinded human beings and prevented them from understanding the world as God's creation. Despite this, Calvin also argued that God could repair human vision to a certain degree in the faithful and the humble so that they could once again discern the world as God's creation. God's aid to the faithful and the humble would make the proper study of natural philosophy possible for them. For a discussion of the blindness of sin and God's aid to human perception in Calvin's works, see I.v-vi (CO 2 Col. 41-56), I.xiv (CO 2 Col. 117-134), and I.xvi-xvii (CO 2 Col. 144-167) as well as his commentaries on Romans 1:19-20 (CO 49 Col. 23-24), 1 Corinthians 13:12 (CO. 49 Col. 514), Hebrews 11:3 (CO. 55 Col. 144-146), and Psalm 19:1-6 (CO 31 Col. 194-198) and the *argumentum* to Genesis (CO 23 Col. 5-12). For a discussion of these themes among modern scholars, see David Steinmetz, "Calvin and the Natural Knowledge of God" in *Via Augustini: Augustine in the Later Middle Ages, Renaissance, and Reformation*, ed. Heiko A. Oberman and Frank A. James III (Leiden: E.J. Brill, 1991), 142-156, Barbara Pitkin, *What Pure Eyes Could See: Calvin's Doctrine of Faith in Its Exegetical Context* (New York: Oxford University Press, 1999), and Lee Palmer Wandel, "John Calvin And Michel De Montaigne On The Eye," in *Early Modern Eyes*, ed. W. Melion and L. Palmer Wandel (Leiden: Brill, 2010), 135-155.

<sup>41</sup>Modern scholars have examined Calvin's theology of creation or have investigated his notion of it to examine his theologies of revelation and providence. See especially, Schreiner, *Theater of His Glory* and "Creation and Providence." See also John Murray, "Calvin's Doctrine of Creation," *Westminster Theological Journal* 17 (1954): 21-43 and Herman J. Selderhuis, *Calvin's Theology of the Psalms*, (Grand Rapids, MI: Baker Academic, 2007), 61-118.

day, which caused dry land to appear. He also commanded the earth to bring forth plants and herbs (Gen 1:9-13). God fashioned lights in the firmament on the fourth day and made two great lights to rule the day and the night (Gen 1:14-19). On the fifth day, God commanded the waters to bring forth fish and birds (Gen 1:20-23). God fashioned land animals on the sixth day. He then created people in his image and likeness (Gen 1:24-31). On the seventh day, God rested from all of his works (Gen 2:1-2). For Calvin, the Book of Genesis provided a factual account of the creation process that explained both how the universe his contemporaries inhabited came into existence and why this universe functioned as it did. Creation was both a process and another name for the universe and everything in it that was the result of that process. This creation process fashioned the creatures that masters were meant to explore.

In his commentary on Genesis, Calvin's description of the creation process began with the assertion that God had created the world out of nothing. He strongly disputed against those Christians who had argued that anything in the universe was eternal. According to him, some Christians such as Augustinus Steuchus Eugubinus (1497-1548), the Bishop of Chisamos on the island of Crete, had claimed that there were some eternal materials that God only provided with form and new ornaments to fashion the universe in which human beings now lived.<sup>42</sup> In contrast, Calvin argued that God had created all that existed from nothing and that the very existence of this creation depended entirely on God.<sup>43</sup> God's creation of the universe from nothing and his responsibility for that creation had important consequences for the creatures that God made throughout the creation process. For Calvin, what God created "in the beginning" did not possess

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<sup>42</sup>In addition to his position as Bishop of Chisamos, Augustinus Steuchus Eugubinus served as the director of the Vatican Library and as a legate to the Council of Trent. His *Cosmopoeia, vel de mundano opificio, expositio trium capitum Genesis, in quibus de creatione tractat* (Sebastianus Gryphius: Lyon, 1535) argued that the empyrean was uncreated and eternal. See Arnold Williams, *The Common Expositor: An Account of the Commentaries on Genesis 1527-1633* (Chapel Hill, NC: The University of North Carolina Press, 1948), 48-49.

<sup>43</sup>CO 23. Col. 14-15.

the characteristics they now had in the world in which his contemporaries lived. Instead, the first thing God created was a confused mass that only provided the material out of which God fashioned the world Calvin and his contemporaries now enjoyed.<sup>44</sup> God's first creature was therefore an unformed, disordered chaos that he had to sustain.<sup>45</sup>

The world did not remain a disordered, dependent chaos. Throughout his exegesis of the rest of the first chapter of Genesis, Calvin described God's work over the six days of creation as a process that instilled order in what had initially been chaotic.<sup>46</sup> In his commentary on Genesis 1:2,<sup>47</sup> Calvin contrasted the chaos of what God had created "in the beginning" with the order the world currently exhibited to people after the six days of creation were complete.<sup>48</sup> The universe became more orderly through the step-by-step process that constituted the sequence of creation. For example, on the second day of the creation process recounted in Genesis 1:6,<sup>49</sup> God separated the heavens from the earth. According to Calvin, the proverb, "to mix heaven and earth" denoted extreme disorder. God's distinction of the two on the second day was an important step toward establishing the order of the universe that Calvin and his contemporaries

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<sup>44</sup>CO 23 Col. 15.

<sup>45</sup>CO 23 Col. 15-16.

<sup>46</sup>Calvin emphatically asserted that God had taken six days to create the world to show people that God meant them to contemplate his works throughout the course of their lives. For example, he argued in the 1559 *Institutes*, "Eiusdem rationis est quod narrat Moses, non momento, sed sex diebus absolutum fuisse Dei opus. Nam et hac circumstantia ab omnibus figmentis colligimur ad unicum Deum, qui in sex dies opus suum digessit, ne molestum nobis esset in eius consideratione occupari tota vitae cursus." CO 2 Col. 118.

<sup>47</sup>Genesis 1:2 reads, "And the earth was without forme & voyde, and darkenes was upon the depe, & the Spirit of God moved upon the waters." All biblical quotations are taken from the Geneva Bible of 1560.

<sup>48</sup>CO 23 Col. 16.

<sup>49</sup>Genesis 1:6 reads, "Againe God said, "Let there be a firmament in the middle of the waters: and let it separate the waters from the waters."

now discerned.<sup>50</sup> God ordered the plants and the herbs on the third day of creation in Genesis 1:11.<sup>51</sup> In his commentary on this verse, Calvin explained that God commanded the earth to bring forth plants and herbs to fructify dry and empty land. God's command created the regular pattern whereby plants and herbs would continue to sprout from the earth after the creation process was complete.<sup>52</sup> After God regulated the celestial bodies on the fourth day, his fashioning and blessing of birds and fish during the fifth day of the creation process also implanted a regular pattern in the world much as his creation of plants had done. Genesis 1:22 includes God's blessing of these animals and his injunction to them to be fruitful and multiply.<sup>53</sup> Calvin argued that God's blessing infused these animals with the ability to procreate and that this capacity was now basic to the behavior of animals.<sup>54</sup> He described the final results of this creation process in his commentary on Genesis 2:1.<sup>55</sup> By the seventh day, the heavens were filled with the sun, moon, and stars, and the earth teemed with animals, trees, and plants.<sup>56</sup> God's creation of the world began with chaos, but he imposed an order on that chaos during the six days of creation that people now discerned throughout the heavens and the earth.

Though the creation process infused an order into the universe as God arranged each aspect of the world and gave each creature its proper disposition so that it could continue in this

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<sup>50</sup>“Opus secundi diei est, inane hoc spatium per terrae circumferentiam, ne coelum terrae misceatur. Nam quum hoc proverbio: Coelum terrae miscere, notetur extrema ἀταξία, magni haec distinctio fieri debet.” CO 23 Col. 18.

<sup>51</sup>Genesis 1:11 reads, “Then God said, ‘Let the earth budde for the budde of the herbe, that sedeth sede, the fruteful tre, that beareth frute according to his kinde, which maie have his sede in itself upon the earth’ & it was so.”

<sup>52</sup>CO 23 Col. 19.

<sup>53</sup>Genesis 1:22 reads, “Then God blessed them, saying “Bring forth the frute and multiple, and fil the waters in the seas, & let the foule multiple in the earth.””

<sup>54</sup>CO 23 Col. 24.

<sup>55</sup>Genesis 2:1 reads, “Thus the heavens and the earth were finished, & all the hoste of them.”

<sup>56</sup>CO 23 Col. 31.

natural order, Calvin argued that the orderliness of the universe was still dependent on God much as the initial, confused mass of “in the beginning” had been. In his commentary on Genesis 1:11 Calvin carefully explained the relationship between the order people observed in the universe and God’s ultimate control over it. Genesis 1:11 recounts God’s creation of plants and herbs on the third day. As Calvin pointed out, this seems strange to human beings because the pattern they currently observe in the world shows that plants and herbs require light from the sun and the moon to grow. Yet, God did not make the sun and the moon until the fourth day as recounted in Genesis 1:14 – a day after he had fashioned plants and herbs. Though Calvin acknowledged that the sun’s light was essential for plants to grow in the current order of nature, God’s creation of plants before the sun indicated that people needed to make a distinction between primary and secondary or inferior causes in the universe. God was the primary cause of all things because he had created everything in the world. Sunlight was only an inferior cause. Though it did make plants grow in the current order of nature, God had given the sun this ability to cause plant growth during the creation process. The sequence of creation recounted in the Book of Genesis reminded people of God’s ultimate responsibility for the natural order.<sup>57</sup> Calvin asserted this more directly in his comments on Genesis 1:20.<sup>58</sup> Here he stated that God was the author of the natural order people saw in the world and did not follow nature as a guide when he fashioned the world.<sup>59</sup> God was ultimately responsible for the regular patterns people observed in the world even if he currently worked through the creatures he had made.

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<sup>57</sup>CO 23 Col. 20.

<sup>58</sup>Genesis 1:20 reads, “Afterwarde God said, ‘Let the waters bring forth in abundance everie creeping thing that hath life: & let the foule flie upon the earth in the open firmament of the heaven.’”

<sup>59</sup>CO 23 Col. 23

This control God enjoyed over the universe and its natural order had immediate relevance for the world in which Calvin and his contemporaries lived. Though God had instilled an order in the world through the creation process, God modified and even went against this order to punish human beings for their sins after the Fall. As Calvin explained Genesis 2:2,<sup>60</sup> he contrasted what God had made “in the beginning” and over the course of the six days of creation with the state of the universe after the Fall. When God rested from his work on the seventh day, he completed all that counted toward the adorning of the world. Adam’s Fall caused God to modify the order of nature. The current universe had degenerated from God’s original plan. Disorder had crept into the order of nature God had initially provided for the universe to punish people for their sin. Calvin pointed out the existence of fleas and other noxious insects in the world that greatly irritated human beings.<sup>61</sup> God had not intended these insects to be pests during the creation process. God modified their roles after the Fall, and they now annoyed people to remind them of their wickedness. Since God was the first cause of all the mediate or inferior causes that structured the universe, God could actively intervene in the world to change the natural phenomena human beings witnessed and experienced there.

Any disorder the Fall may have caused did not completely destroy the natural order God had given the universe through the process of creation, though. Calvin argued in his commentary on Genesis 2:10 that the world had gone from its natural beauty to miserable squalor when God cursed it because of human sin.<sup>62</sup> Yet, the world Calvin’s contemporaries inhabited remained the

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<sup>60</sup>Genesis 2:2 reads, “For in the seventh day God ended his worke which he had made, & the seventh daye he rested from all his worke, which he had made.”

<sup>61</sup>CO 23 Col. 32.

<sup>62</sup>Genesis 2:10 reads, “And out of Eden went a river to water the garden, and from thence it was devided, and became into foure heades.”

same world as the one God had initially created.<sup>63</sup> Even after the Fall, many features of the original natural order still remained present in the world. People could see this especially in the behavior of crops. As recounted in Genesis 3:18,<sup>64</sup> the earth had been abundantly fruitful immediately after the process of creation, yielding bountiful harvests. The Fall had caused the earth to be much less fertile and to bring forth plants such as thorns and thistles that people could not eat. This degeneration of the earth's fertility did not completely destroy the order of nature that caused plants to grow. God still ensured that sufficient plants grew from the earth even after the Fall so that human beings could survive, even if these plants took more time and effort to cultivate and were less luxurious than they had been prior to the Fall.<sup>65</sup> The universe Calvin's contemporaries inhabited had changed from that which God had initially fashioned during the process of creation. God now actively intervened in the world to punish people for their sin. Still, the world continued to function with some order even after the Fall, and the continuance of this natural order still depended on God's support of it as it had during and after the process of creation. This order and God's direct control over the natural phenomena of the world characterized the universe in which Calvin and his contemporaries dwelled.

Calvin gave a brief summary of the creation process, its natural order, and God's direct involvement in it in the 1559 *Institutes*. He began this section with the statement that there was a natural order in the contemporary world that people could observe to strengthen their faith.<sup>66</sup> Then Calvin explained:

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<sup>63</sup>CO 23 Col. 40.

<sup>64</sup>Genesis 3:18 reads, "Thornes also, and thystles shal it bring forth to thee, and thou shalt eat the herbe of the field."

<sup>65</sup>CO 23 Col. 73-74.

<sup>66</sup>CO 2 Col. 131.

Ex ea discemus, Deum verbi ac spiritus sui potentia ex nihilo creasse coelum et terram; hinc omne genus animalia resque inanimatas produxisse, mirabili serie distinxisse innumeram rerum varietatem, suam unicuique generi naturam indidisse, assignasse officia, loca attribuisse et stationes; et, quum omnia sint corruptioni obnoxia, providisse tamen ut singulae species ad diem extremum salvae conserventur. Proinde alias fovere arcanis modis, et novum subinde vigorem illis quasi instillare; aliis vim propagandi contulisse, ne suo interitu prorsus intereant.<sup>67</sup>

Much as he had in his commentary on Genesis, Calvin began this description of the created universe with an implicit contrast between what God had initially created and the way the universe functioned after the six days of creation. God created the heavens and the earth *ex nihilo*, and God provided an order for what Calvin implied here initially lacked it. This regulating process included fashioning all the aspects of the universe, arranging what had been fashioned, and cherishing what had been fashioned and arranged. First God shaped all the animate and inanimate things that made up the universe out of the materials he had created *ex nihilo*. Then, God assigned each one of the things he had fashioned a proper place and an inherent disposition. This particular description of God's arrangement provides insight into Calvin's conception of the natural order. For him, God assigned each creature a proper position that it was meant to occupy in the universe and gave to each the ability to continue to occupy this place. God's involvement with the universe did not end with this implantation of a natural order. As Calvin indicated here, the order and the things God had fashioned and arranged were liable to corruption perhaps through the disorder the Fall had introduced in the universe. Despite the presence of this corruption, God did not abandon the universe to chaos. Instead, he actively continued to nurture it, providing each species with the ability to generate offspring so that the species would continue its existence and hold its assigned role in the natural order. For Calvin, the contemporary world included the natural order or the set arrangements and characteristics

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<sup>67</sup>CO 2 Col. 131-132.

God had given each aspect of the universe at its creation and continued to uphold. It also included God's active control over natural phenomena in the universe as he punished human sin and upheld the world against the postlapsarian threat of disorder.

### **Studying and Knowing the Created World**

Calvin's notion of this created world had direct influence on his descriptions of the purpose of natural philosophy. As he had claimed in the 1559 *Institutes*, studying the world should provide people with a deeper knowledge of God's creatures. God's process of creation had fashioned these creatures, and this process along with the disorder that human sin had caused in the universe dictated how these creatures behaved in the contemporary world. Masters had to be aware of how this created universe functioned, or they could not know the world around them. Calvin made this argument about the proper way to study and understand this created world first through a critique of certain philosophers in this edition of the *Institutes* and in his exegetical and polemical works. The examples of these philosophers showed people how *not* to study and understand the world God had made. They also begin to reveal how people and masters in particular *should* explore the universe around them so that they could truly understand its natural phenomena.

He critiqued specifically Epicurean and Stoic notions of the universe in the 1559 *Institutes*. This critique incorporated phrases found in his commentary on Genesis 1:14. As we saw above, he argued in his commentary on this biblical verse that people should view God as the first cause of plant growth and the light and heat of the sun as secondary causes of the natural order. According to Calvin, Epicureans studied the world incorrectly because they separated too much between the first and secondary causes. He argued that Epicureans viewed God as

sleeping, idle, and inactive in heaven and left the world to the secondary causes of fortune.<sup>68</sup>

While he granted to them that God had implanted an order in the universe and that creatures now seemed to follow it, Calvin insisted that God controlled each and every thing that occurred in the universe meaning that he actively governed how it functioned.<sup>69</sup> There could be no full knowledge of its functioning without realizing that God as the first cause could work outside secondary causes. He then provided the example of the heavenly motions and their effect on plant growth to explain the actual functioning of the created world. If people understood the world as Epicureans did, then they must attribute all bountiful harvests and all droughts to the natural order and its secondary causes. Calvin argued that this did not provide people with a full explanation of why one harvest was plentiful and another was not. God directly intervened in the world to punish people with dearth and to reward them with bountiful food.<sup>70</sup> A full understanding of the universe people inhabited required Epicureans to know both that the universe had a natural order God continued to sustain and that God was also directly involved in the world in order to provide for and take away food from human beings.

Calvin's critiques of Stoic notions of the universe were similar. For him, the Stoics also focused too narrowly on the natural order as they described how the universe functioned. Unlike the Epicureans who taught that God left the world to manage itself through secondary causes, Stoics did argue that God was actively engaged in the universe. According to Calvin, though, they taught that God was bound to the secondary causes that existed in that world. This meant that the world must behave according to the natural order and that God as the first cause was entirely constrained within this order's secondary causes. In contrast, Calvin argued that God

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<sup>68</sup>CO 2 Col. 147-148.

<sup>69</sup>CO 2 Col. 148.

<sup>70</sup>CO 2 Col. 148-149.

was not limited to this nexus of secondary causes and that God, as the first cause, had power over what happened in the universe.<sup>71</sup> Stoics' emphasis on God's active involvement in the universe made them better able than Epicureans to understand the true workings of the created world. Their restriction of God's activity to the boundaries of the natural order, though, made them incapable of understanding the universe fully.

Calvin had already taken up the question of Epicurean and Stoic understandings of the world in his commentary on Acts (1552). Though his descriptions of their views in this commentary were similar to those later found in the 1559 edition of the *Institutes*, Calvin more fully described the value of Epicurean and Stoic notions of the universe in his commentary on Acts. Calvin discussed this as he explained Luke's descriptions of Paul's preaching in Athens in Acts 17:18.<sup>72</sup> He explained that Epicureans taught the gods lived idly in heaven without directing what occurred in the universe.<sup>73</sup> In contrast, the Stoics argued that God was active in the behavior of the universe but that God's dependence on secondary causes confined his activity to the natural order.<sup>74</sup> Rather than critiquing these views directly, Calvin simply asserted here that these philosophers refused to listen to Paul's preaching of the Gospel. This failure to listen had implications for Epicurean and Stoic teachings about the universe. For Calvin, these philosophers did not have the proper zeal to learn true knowledge. Instead, all they studied was vain curiosity.<sup>75</sup> Their inability to understand that the created world both had a natural order that God

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<sup>71</sup>CO 2 Col. 151.

<sup>72</sup>Acts 17:18 reads, "Then certeine philosophers of the Epicures and of the Stoikes, disputed with him, and some said, "What wil this babler say?" Others said, 'He semeth to be a setter for the of strange gods (because he preached unto them Jesus, & the resurrection.)"

<sup>73</sup>CO 48 Col. 405.

<sup>74</sup>Ibid.

<sup>75</sup>CO 48 Col. 406.

sustained and that God could directly cause natural phenomena meant that Epicureans and Stoics did not actually have knowledge of the universe at all. Instead, what they studied and taught about it amounted to nonsense.<sup>76</sup>

In his discussions of philosophers in his commentary on the Psalms (1557) and in his lectures on Jeremiah (1563), Calvin moved beyond his criticism of Epicureans and Stoics to critique other philosophers who did not understand both of these aspects of the created universe. His commentary on Psalm 65:9-13 included a chastisement of those philosophers who refused to acknowledge God as the cause of all natural occurrences.<sup>77</sup> Arguing that the natural order should provide people with evidence of God's paternal favor toward them, Calvin claimed that these philosophers focused solely on the secondary causes found in the four elements and the air to explain the origin of the rain that fructifies the earth. He then censored these philosophers for turning their eyes away from God.<sup>78</sup> As they busied themselves with earth, water, air, and fire, these philosophers did not properly understand the universe because they did not acknowledge God's direct government of it.

His commentary on Jeremiah 10:12-13 explicitly described such exclusive focus on the natural order as an incomplete way to understand the created universe.<sup>79</sup> Calvin explained:

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<sup>76</sup>Calvin described their understandings of God's relationship to the world thus: "Quid sibi vult spermologus iste? Quia neque audire dignantur Paulum, et contumeliose repudiant, ac si quispiam trivalis esset nugator." Ibid.

<sup>77</sup>Psalm 65:9-13 read, "Thou waterest abundantly the forrowes thereof: thou causest the raine to descend into the valleis thereof: thou makest it soft with showres, & blessest the bud thereof. Thou crownest the yere with thy goodnes, and thy steps drop fatnes. They drop upon the pastures of the wildernes: & the hils shall be compassed with gladnes. The pastures are clad with shepe: the valleis also shal be covered with corne: therefore they showte for joye, and sing."

<sup>78</sup>CO 31 Col. 609.

<sup>79</sup>Jeremiah 10:12-13 read, "He hathe made the earth by his power, and established the worlde by his wisdom, and hathe stretched out the heaven by his discretion. He giveth his voyce the multitude of waters in the heaven, and the causeth the cloudes to ascend from the ends of the earth: he turneth lightnings to raine, and bringeth forth the winde out of his treasures."

Causam etiam reperiunt philosophi, cur venti e terra exsurgant. Nam sol attrahit tam vapores, quam exhalationes: ex vaporibus creantur nebulae, creantur nives, creantur pluviae, prout disposita est media regio aeris. Iam exhalationes etiam creantur, inde tonitrua, inde fulmina, inde etiam cometae, inde venti. Nam exhalationes distant a vaporibus tantum levitate et raritate. Vapor est crassus, deinde gravis. Ergo ex vapore pluvia: exhalatio autem levior est, deinde non adeo densa: ideo exhalationes generant tam fulmina quam ventos, prout scilicet plus est caloris, vel minus. Unde fit, ut eadem exhalatio nunc in ventum erumpat, nunc in fulmina? Nempe quia concipit plus caloris exhalatio: deinde ubi densata est, assurgit in aerem: venti autem evanescent, et ita infimam partem mundi conturbant. Haec dicuntur philosophice: sed interea caput ipsum philosophiae est, respicere in Deum ipsum, *qui ventos educit e thesauris suis*, quia tenet reconditos. Miramur subito oriri ventum ubi est serenitas: quis non agnoscat ventos Dei arbitrio creari: deinde huc et illuc adigi et impelli?<sup>80</sup>

God given the world a natural order at its creation that caused the earth to give off vapors and exhalations and that allowed the sun to attract these vapors and exhalations into the air.

Depending on the amount of heat in the vapors and exhalations and the disposition of the region of the air to which they rose, the result would be rain, clouds, lightening, or winds. People could explore these secondary causes to discover where winds came from and what caused lightning.

Calvin here argued that a singular reliance on these secondary causes could not provide people with a full explanation of the weather, though. Realizing that God could was actively involved in the world explained weather patterns better than a narrow concentration on the natural order. As Calvin pointed out through a rhetorical question, winds often arose suddenly in calm weather.

The natural order could not explain such sudden changes. Only God's direct control of these winds could explain why they had occurred. Philosophers should examine secondary causes such as the sun's heat and the vapors of the earth because these were part of the natural order. They must also be mindful that God as the first cause had direct control over the weather patterns, and that the weather could function outside the secondary causes of the universe. Knowing both, a philosopher could explain the occurrence of meteorological phenomena in the created world.

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<sup>80</sup>CO 38. Col. 78.

In his commentary on Psalm 29:5-8, Calvin was even more scathing about philosophers' abilities to understand the created universe if they focused solely on the natural order. These biblical verses recount how God's voice broke the cedars of Lebanon.<sup>81</sup> Calvin argued that the cedars God's voice broke in these biblical verses actually represent "the proud" and those with "vain confidence" who would not listen to God's voice.<sup>82</sup> Calvin applied the psalmist's warning especially to those who possessed genius and learning such as those philosophers who focused exclusively on the secondary causes in their attempt to explain the world.<sup>83</sup>

Neque enim de causis inferioribus satis argute sibi videntur disserere philosophi, nisi longa distantia Deum a suis operibus separent. Diabolica autem haec scientia est, quae in naturae contemplatione nos retinens a Deo avertit. Si quis hominem cognoscere appetens, praeterita tota facie, intuitum in extremos tantum unguis defigat, merito ridebitur eius stultitia, atqui maiore amentia laborant philosophi, qui ex mediis et propinquis causis vela sibi contexunt, ne manum Dei palam operantem agnoscere cogantur.<sup>84</sup>

"The proud" and the "vain" philosophers of Calvin's commentary on this biblical passage were those who ignored God's ability to cause certain natural phenomena directly. The rhetorical devices Calvin used here to describe what these philosophers actually studied shows how he viewed the knowledge such philosophers claimed to possess. He branded this search for secondary causes as something diabolical that led people away from God. In taking people away from God, this search led people into errors and blindness and away from true knowledge of the world. He first employed the example of how one person recognizes another person to mark this search as utterly laughable. Examining only the natural order was like trying to recognize

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<sup>81</sup>Psalm 29:5-8 read, "The voice of the Lord breaketh the cedres: yea, the Lord breaketh the cedres of Lebanon. He maketh them also to leape like a calfe: Lebanon also and Shirion like a yong unicorn. The voice of the Lord deuideth the flames of fyre. The voice of the Lord maketh the wildernes to tremble: the Lord maketh the wildernes of Kadesh to tremble."

<sup>82</sup>CO 31 Col. 288.

<sup>83</sup>CO 31 Col. 288-289.

<sup>84</sup>CO 31 Col. 289.

someone through the memorization of that person's fingernails when one could just look at the person's face. Failing to look at a person's face was just as foolish as trying to know the universe solely through secondary causes. Calvin's next example was even more damaging. This narrow focus on the natural order was not only laughable. It also left the philosopher ignorant of the created world. Secondary causes "wove a veil" in front of the eyes of such philosophers so that they could not understand what actually occurred in the universe. Knowing about secondary causes was simply not enough for these philosophers if they wished to understand natural occurrences. They needed to acknowledge God's ability to change and work against the natural order if they hoped to comprehend the universe in its entirety, or they would remain blind to the world God had fashioned.

### **The Avoidance of Veils and the Study of the Created World**

Though he critiqued Epicureans, Stoics, and those philosophers who only explored the secondary causes in his works, Calvin did not argue that natural philosophy was a useless study. He continued to maintain throughout his works that it could provide people with a deeper knowledge of the creatures God had fashioned. Instead, his critique of these philosophers reveal that he claimed masters must concern themselves with the world as God created and continued to govern it after the Fall, or they could not understand the universe around them. They should explore both the natural order and those natural phenomena that God directly caused. In doing so, they would avoid the veil of secondary causes that blinded Epicureans, Stoics, and other philosophers to the created universe. Studying both the natural order and those natural phenomena God actively controlled, masters could learn how the various aspects of the created universe actually functioned.

Many of Calvin's discussions of natural philosophy and its utility focused on what its study could teach people about the natural order God had provided the universe. Describing this order, Calvin also wrote about those aspects of the created universe that typically functioned through it. Though he described natural philosophy's ability to teach people about this natural order and these natural occurrences in the 1559 *Institutes*, this was not the first edition in which he had done so. He discussed what he called liberal arts closely related to natural philosophy such as astrology, medicine, and *physionomia* in every edition of the *Institutes* from 1539.<sup>85</sup> The passages in the 1539 *Institutes* that discuss the purpose of these liberal arts are almost identical to those found in the 1559 *Institutes* with one exception. Though Calvin argued specifically in 1559 that *tota physica scientia* could teach people about the world God had created, in 1539 he listed liberal arts such as astrology, medicine, and *physionomia* that were closely related to natural philosophy without mentioning natural philosophy directly.<sup>86</sup> Despite this difference, Calvin argued in all editions of the *Institutes* from 1539 that these liberal arts could provide people with knowledge of the same thing – the disposition of the celestial bodies, their arrangement, their motions, and their properties as well as the symmetry, sequence, and beautiful use of the

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<sup>85</sup>I retain the Latin, *physionomia*, because the English, physiognomy, does not capture the full meaning of Calvin's word usage here. In the middle ages and early modern period, texts on *physionomia* included both physiognomy and the study of astrological influences and the influence of the bodily humors on individual human bodies. These texts contained information on how to determine a person's character based on the external appearance of his or her bodily organs and the analysis of their size, shape, proportion, color, hairiness, and motion. On *physionomia* in the later middle ages, see Joseph Ziegler, "Text and Context: On the Rise of Physiognomic Thought in the Later Middle Ages," in De Sion exhibit lex et verbum domini de Hierusalem: *Essays on Medieval Law, Liturgy, and Literature in Honor of Amnon Linder*, ed. Yitzhak Hen (Turnhout: Brepols, 2001), 159-182. Michael Scotus' *Physionomia* or *Liber physiognomiae* (ca. 1230) was an influential text on the subject that was frequently printed throughout the mid- to late-fifteenth and sixteenth centuries. On Michael Scotus' influence in this period, see Joseph Ziegler, "The Beginning of Medieval Physiognomy: The Case of Michael Scotus," in *Kulturtransfer und Hofgesellschaft*, ed. Gundula Grebner and Johannes Fried (Berlin: Akademie Verlag, 2008), 299-319.

<sup>86</sup>"Mirificam eius sapientiam quae testentur, innumera sunt, tum in coelo tum in terris documenta: non illa reconditiora, quibus propius observandis astrologia, medicina, et tota physionomia destinata est; sed quae rudissimi cuiusque idiotae aspectui se ingerunt, ut aperiri oculi nequeant, quin eorum cogantur esse testes." CO 1 Col. 286-287.

structure of the human body.<sup>87</sup> Calvin also argued that these liberal arts taught people that God was directly responsible for upholding these arrangements. God could cause rain, thunder, and lightening, and both raise and calm winds that disturbed and quieted the sea.<sup>88</sup> In the 1539 *Institutes*, Calvin therefore equated the knowledge that these liberal arts could bring people with what he argued in other passages was basic to the natural order. Astrology, medicine, and *physionomia* taught people about the arrangements and the properties of celestial and human bodies and that God was directly responsible for the maintenance of these. These liberal arts closely related to natural philosophy provided people with a deeper knowledge of the natural order of the universe. Knowledge of the natural order also taught people especially about the planets and stars and the structure of the human body.

Calvin further explored these liberal arts' ability to teach people about the natural order and the celestial bodies in a 1549 treatise, *Advertissement contre l'astrologie judiciaire*. This treatise focused on the proper relationship between Christianity and astrology and therefore did not explore the purpose of natural philosophy directly, but both Calvin and some of his contemporaries closely connected astrology to natural philosophy. In the 1559 *Institutes*, he listed them both as liberal arts that could teach people about the natural order.<sup>89</sup> The subject

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<sup>87</sup>“Equidem qui liberales illas artes vel imbiberunt, vel etiam degustarunt, earum subsidio adiuti longe altius provehuntur ad introspectiendae divinae sapientiae arcana. Nempe ad disquirendos astrorum motus, distribuendas sedes, metienda intervalla, proprietates notandas, arte ac exactiore industria opus est; quibus perspectis, ut Dei providentia explicatius se profert, ita in eius gloriam conspiciendam, animum par est aliquanto sublimius assurgere. Sed quum ne plebei quidem et rudissimi, qui solo oculorum adminiculo instructi sunt, ignorare queant divinae artis excellentiam, ultro se in ista innumerabili, et tamen adeo distincta et disposita coelestis militae varietate exserentem, constat neminem esse cui non abunde sapientiam suam Dominus patefaciat. Similiter in humani corporis structura connexionem, symmetriam, pulchritudinem usum, ea quam Galenus adhibet industria, pensiculare, eximii est acuminis. Sed omnium tamen confessione prae se fert corpus humanum tam ingeniosam compositionem, ut ob eam merito admirabilis opifex iudicetur.” CO 1 Col. 287.

<sup>88</sup>Ibid.

<sup>89</sup>“Mirificam eius sapientiam quae testentur, innumera sunt tum in coelo, tum in terris documenta: non illa modo reconditiora, quibus proprius observandis astrologia, medicina, et tota physica scientia destinata est; sed quae rudissimi cuiusque idiotae aspectio se ingerunt, ut aperiri oculi nequeant qui eorum cogantur esse testes. Equidem

matter of natural philosophy and astrology could also overlapped as both were concerned with causation in the universe. The second book of Aristotle's *libri naturales* focused on the heavens and the earth, and many contemporary natural philosophical treatises included discussions of the properties of celestial bodies. In addition to such discussions of celestial bodies, astrology texts typically included mathematics to describe and explain the motions of these celestial bodies as well as the possible effects these bodies had on meteorological phenomena, human affairs, and individual human lives. These concerns for planets' motions and their effects on the sublunary realm even appeared in some contemporary natural philosophical texts.<sup>90</sup> What Calvin said about astrology's purpose therefore can also shed light on his views of natural philosophy's ability to teach people about the natural order and those aspects of the created world that functioned through it. The modern scholar, Olivier Millet, has suggested that Calvin's *Advertisement contre l'astrologie judiciaire* was likely a direct response to a treatise written in 1546 by Mellin de Saint-Gelais. Written entirely in French and published anonymously, Saint-Gelais' *Advertisement sur les iugemens d'astrologie a une studieuse damoyselle* had argued that the study of many types of astrology was legitimate because such study could teach people about the celestial bodies' effects on the lower realm, including their influence on individual life paths and world events. Millet suggests that Calvin's own *Advertisement* sought to counter Saint-Gelais' arguments and that by writing in French, Calvin hoped to reach a similar audience and reverse the damage that Saint-Gelais had done. After completing the initial text in French, Calvin then

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qui liberales illas artes vel imbiberunt, vel etiam degustarunt, earum subsidio adiuti longe altius provehantur ad intropicienda divinae sapientiae arcana." CO 2 Col. 42.

<sup>90</sup>See for example, Melancthon's *Initia doctrinae physicae*, 1549.

translated it into Latin, probably to reach a broader, non-French speaking audience. The printer, Jean Girard, produced both editions of Calvin's work in Geneva in 1549.<sup>91</sup>

In this treatise, Calvin made a distinction between natural astrology that provided people with knowledge of the natural order, and judicial astrology that tried to predict the future course of human lives. Whereas natural astrology was a legitimate source of study because it could provide people with knowledge of God's providence, judicial astrology was illicit and ultimately led people to damnation. While Calvin made this sharp distinction between natural astrology and judicial astrology, he also explained the purpose of natural astrology. More explicitly than he had in the 1539 *Institutes*, Calvin equated natural astrology with the study of the natural order. The created universe Calvin described here included both the arrangement and disposition of the things God had made during the creation process as well as God's upholding of this natural order.<sup>92</sup> Calvin also described the natural phenomena that this order encompassed. As Moses taught, the planets and stars acted as signs that God had ordained to govern the daylight and the night as well as the days, months, years, and seasons.<sup>93</sup> Offering knowledge of these signs, natural astrology could provide people with the ability to know about meteorological phenomena before their occurrence, which would be extremely beneficial to agriculture. The knowledge of the natural order astrology could provide was not confined to the celestial bodies and the weather because celestial bodies were not the only creatures that exhibited the arrangement and dispositions God established during the process of creation and continued to nurture. This natural order extended from the heavens throughout the terrestrial realm as the common, orderly motions

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<sup>91</sup>Olivier Millet, "Introduction," in Jean Calvin, *Advertissement contre l'astrologie judiciaire*, ed. Olivier Millet (Geneva: Librairie Droz, 1985), 9-43. For a discussion of this treatise, see Christopher McCall Probes, "Calvin on Astrology," *Westminster Theological Journal* 37 (1974-1975): 24-33.

<sup>92</sup> Jean Calvin, *Advertissement contre l'astrologie judiciaire*, ed. Olivier Millet (Geneva: Librairie Droz, 1985), 53-54.

<sup>93</sup>Ibid., 54.

of the planets also had predictable effects on creatures that existed on the earth.<sup>94</sup> The purpose of astrology was to teach people something about the natural order as it functioned throughout the universe. Calvin also carefully noted here that the natural order was not all that the created universe contained. He explained that the ordinary course the world followed was still dependent on God and therefore could not be understood as a perpetual rule.<sup>95</sup> God could change this order, but astrology in particular provided knowledge of the ordinary course of nature as it typically functioned.

Calvin's exegesis of Genesis 1:14-16 in his commentary (1554) and sermons (1559) on Genesis continued his previous close connection between astrology and natural philosophy and their ability to teach people about the natural order that they observed particularly in celestial motions. The biblical verse recounts God's creation of the lights, his placement of them in the heavens, and their roles in bringing light during the day and the night on the fourth day of the creation process.<sup>96</sup> As Calvin began to comment on this passage, he equated these two great lights with the sun and the moon and argued that their creation instituted a new order in the world. Prior to the fourth day, light existed under God's direct control. After the creation of sun and moon, God gave the sun and the moon the responsibility for this light. In the natural order people now observed, they caused light, but the proper understanding of secondary causes must

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<sup>94</sup>Ibid., 56.

<sup>95</sup>"Ce fondement mis, s'ensuyvent les effectz que nous voyons icy bas, lesquelz par l'astrologie on cognoist provenir d'en haut, et non seulement quand ilz sont passex, mais pour en estre advertiz devant le temps. Il n'y a celuy qui ne voye les pluyes, les gresles et neiges, et qui n'oye le bruit des ventz, mais nul ne sait les cause que par le moyen de l'astrologie, l'aquelle, comme j'ay dit, en donne mesme quelque conjectures pour l'advenir, combien qu'on n'en peust pas faire une reigle perpetuelle; je parle donc du cours ordinaire, qui n'est point empesché d'autres accidens survenans d'ailleurs." Ibid., 55-56.

<sup>96</sup>Genesis 1:14-16 read, "And God said, 'Let there be lightes in the firmament of the heaven to separate the daie from the night, & let them be for signes, and for seasons, and for daies and yeares. And let them be for lightes in the firmament of the heaven to give light upon the earth' and it was so. God then made two great lightes: the greater light to rule the daie, & the lesse light to rule the night: he made also the starres."

acknowledge that God as the first cause was ultimately responsible for maintaining it.<sup>97</sup> Calvin then explained the difference between what Moses' account in Genesis taught people about the celestial bodies and what philosophers knew of them, assigning this knowledge variously to "philosophers" as well as to "astrology." He argued that it was only necessary for Christians to know what Moses recounted about the sun and the moon. He praised astrology or natural philosophy as a useful art for its ability to teach people about the arrangement and the motions of the celestial bodies.<sup>98</sup> Once again, Calvin argued that natural philosophy taught people about the natural order God implanted in the world and continued to uphold, especially in the planets and stars. Calvin's sermon on these verses focused specifically on Moses' teaching, condemning those astrologers who attempted to use the sun and the moon to predict the future course of human lives. He again indicated that astrology could provide people with knowledge of the natural order so that people could learn much about the seasons that would be useful for communal life.<sup>99</sup>

Calvin's discussion of natural philosophy's purpose in his commentary on Genesis 1:16 also provides insight into where he thought people could gain knowledge of natural philosophy so that they could learn about God's arrangement of his creatures and his sustaining of this natural order. In this passage, he made a sharp contrast between what Moses taught in the

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<sup>97</sup>CO 23 Col. 20.

<sup>98</sup>"Dixi Mosen non hic subtiliter disserere de naturae arcanis, ut philosophum: quod in his verbis videre est. Primum planetis et stellis in expansione coelorum sedem assignat; astrologi vero sphaerarum distinctionem tradunt, et simul docent stellas fixas proprium habere locum in firmamento. Moses duo facit magna luminaria: atqui astrologi firmis rationibus probant, Saturni sidus, quod omnium minimum propter longinquitatem apparet, lunari esse maius. Hoc interest, quod Moses populariter scripsit quae sine doctrina et literis omnes idiotae communi sensu percipiunt: illi autem magno labore investigant quidquid humani ingenii acumen assequi potest. Nec vero aut studium illud improbandum est, aut damnanda scientia, ut phrenetici quidam solent audacter reiicere quidquid est illis incognitum. Nam astrologia non modo iucunda est cognitu, sed apprime quoque utilis: negari non potest quin admirabilem Dei sapientiam explicet ars illa. Quare ut laudandi sunt ingeniosi homines qui utilem operam hac in parte sumpserunt: ita quibus suppetit otium et facultas, hoc exercitationis genus negligere non debent." CO 23 Col. 22.

<sup>99</sup>SC, XI/1, 33-43. Calvin's discussion of the sun and the moon and what astrology could legitimately teach people about the natural order spans 33-40.

Scriptures and what philosophers or astrologers knew through their studies. As we saw above, Calvin certainly praised natural philosophy and astrology as liberal arts (*liberales artes*) that could provide people with knowledge of the natural order in this passage. He argued that Moses did not speak in detail of the motions and distributions of the celestial bodies because Moses addressed an uneducated audience.<sup>100</sup> For Calvin, the Bible did not teach people natural philosophy. His comments on Moses here also indicate that Calvin did not view the Bible's teaching as opposed to natural philosophy. He argued that Moses' common speech was not meant to detract from the study of natural philosophy or astrology, but rather to educate those who had no knowledge of them.<sup>101</sup> The Bible was neither a repository nor a teacher of natural philosophical or astrological knowledge, but it did not contradict what natural philosophy and astrology taught about the natural order and God's control over it, either. If people wanted to learn natural philosophy or astrology to understand the natural order more deeply, they must turn to sources other than the Bible.

The close equation of astrology and natural philosophy and their mutual purpose of providing people with knowledge about the order God had given the world during the process of creation and that God continued to uphold occurred directly in the 1559 *Institutes*. Though this passage was almost identical to that found in the 1539 *Institutes* and every subsequent edition,

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<sup>100</sup>Scholars have explored this passage in Calvin's works as an example of his thought on divine accommodation – how God accommodated his message to the capacities of his human readers and listeners. On the influence of sixteenth-century rhetoric for Calvin's doctrine of accommodation see, Ford Lewis Battles, "God Was Accommodating Himself to Human Capacity," *Interpretation* 31 (1977): 19-38. For a similar view of Calvin's notion of accommodation, see Stauffer, *Die, la création de la Providence dans la prédication de Calvin*, and Oliver Millet, *Calvin et la dynamique de la parole: Etude de rhétorique réformée* (Geneva: Editions Slatkine, 1992). For a monograph that examines Calvin's notion of accommodation in a wide variety of his works, see Jon Balserak, *Divine Compromised: A Study of Divine Accommodation in the Thought of John Calvin* (Dordrecht: Springer, 2006).

<sup>101</sup>CO 23 Col. 22. Calvin made a similar argument in his commentar on Acts 14:17 as he explained what Paul and Barnabas preached in Lystra about God's manifestation in the natural order. "Neque tamen intelligo subtiliter et philosophiae more disseruisse ipsos de naturae arcanis. Sermo enim erat apud indoctum vulgus. Ideo simpliciter proponere oportuit, quod rudissimis quibusque notum erat." CO 48 Col. 328. Acts 14 17 reads, "Nevetheles, he left not himself with out wiftnesse in that he did good and gave us raine from heaven, and fruteful seasons, filling our hearts wih foode, and gladnes."

Calvin listed astrology, medicine, and *tota physica scientia* rather than *physionomia* as the liberal arts that provided people with deeper knowledge of the arrangement and motions of the planets and the dispositions of human bodies as well as God's continued support of this natural order.<sup>102</sup> Reading through Calvin's specific mentions of natural philosophy's ability to teach people about the natural order prior to 1559 sheds more light on this passage. One of natural philosophy's main purposes was to teach people about the natural order. In his works, Calvin especially equated such knowledge with the examination of celestial bodies and their effects on the lower realm. Closely relating astrology and natural philosophy in his works, Calvin singled out their special ability to teach people about the arrangement and dispositions of the heavenly bodies and about how these celestial bodies influenced various weather patterns. Propelled by secondary causes God upheld, these celestial bodies had a direct effect on the animals, plants, and human beings who lived on the earth.

Though one of the purposes of natural philosophy was to teach people about these secondary causes, Calvin's critiques of those philosophers who only examined the natural order show that exclusive knowledge of it was not enough if a master wished to understand all the phenomena of the created universe. This is implicit in his own discussions of natural philosophy's relationship to the natural order. Though he repeatedly stressed in these passages that knowledge of secondary causes could teach people about the celestial bodies, he did not mention other natural phenomena consistently. Masters required a broader focus than just the natural order to understand the natural phenomena that God directly caused in the world. Calvin's works provide examples of such natural phenomena that an understanding of secondary causes could not fully explain. We find a general statement about this in the 1559 *Institutes*. Shortly after he had argued that natural philosophy and other related liberal arts could teach

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<sup>102</sup>CO 2 Col. 43-46.

people about the natural order,<sup>103</sup> he stated that there was a second type of God's works that occurred beyond the ordinary course of nature (*praeter ordinarium naturae cursum*).<sup>104</sup> Calvin's description of these works in the *Institutes* did not mention specific natural phenomena. Instead, he equated these works more generally with God's direct protection and blessing of people and his punishment of the wicked.<sup>105</sup> His juxtaposition of these works with those that occurred through secondary causes such as celestial motions and the weather suggests that he believed some natural phenomena could also happen *praeter ordinarium naturae cursum*.

Though the various editions of the *Institutes* did not equate particular natural phenomena with God's modification of the natural order, Calvin wrote of phenomena that did go beyond or even contradict the natural order in many of his other works. One of the earliest discussions of this occurred in a polemical treatise of 1545, *Contre la secte phantastique et furieuse des libertins qui se nomment spirituelz*. Calvin discussed such a phenomenon in the context of his critique of a French group of Libertines and their notion of a single world spirit. For Calvin, this notion contradicted a proper understanding of providence, and he explained the way the created world functioned to refute their arguments.<sup>106</sup> The first example he pointed to was the order of nature that God had implanted in the world. He defined this order as the arrangement God had infused in the universe, while stressing that God alone ruled and moderated all things.<sup>107</sup> He then

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<sup>103</sup>CO 2 Col. 41-46. Calvin's discussion of the human soul in I.v.3-5 (CO 2 Col. 43-45) was new to this addition of the *Institutes*. In editions from 1539, Calvin introduced the notion that God could act outside the order of nature directly after his discussion of celestial bodies, human bodies, the weather, and the sea. See CO 1. Col. 286-288.

<sup>104</sup>"In secundo quoque genere operum eius, quae scilicet praeter ordinarium naturae cursum eveniunt, nihilo obscuriora se proferunt virtutum eius argumenta." CO 2 Col. 46.

<sup>105</sup>Ibid.

<sup>106</sup>CO 7 Col. 183.

<sup>107</sup>CO 7 Col. 186.

cited the examples of the course that the sun, moon, and stars take as well as the ordinary course of the things on earth as examples of it.<sup>108</sup> This order occurred when each creature of the heavens and the earth followed the inclination that God had implanted in it during the process of creation.<sup>109</sup> In his discussion of the second type of God's works as another proof for providence, Calvin included an example of a natural phenomenon. He did not here equate these works specifically with those that occurred outside the ordinary course of nature, but his discussion of them used phrases very similar to those he had employed to describe such works since the 1539 edition of the *Institutes*. Here he again referred to this second type of work as those that serve God's goodness, justice, and judgment, allowing him to punish the wicked and chastise the faithful.<sup>110</sup> For Calvin, the way God related to meteorological phenomena was representative of this second type of work. God could directly send rain to water the earth to provide people with food. He could also withhold the rain and make the earth arid, or he could send other meteorological phenomena such as bad storms or hail that would also cause the earth to be sterile to punish the wicked and chastise the faithful.<sup>111</sup> Calvin's polemics against the Libertines argued that there was a natural order that God supported, but that he could go against this order to cause rain or drought in the world he continued to govern. If philosophers wished to understand the world God had fashioned – the purpose Calvin assigned to natural philosophy, knowledge of secondary causes could teach them about the celestial bodies. They must also be cognizant that

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<sup>108</sup>CO 7 Col. 186-187.

<sup>109</sup>CO 7 Col. 187.

<sup>110</sup>“La seconde espece ou façon par laquelle Dieu opere en ses creatures, est qu’il les faict servir à sa bonté, iustice, et iugement, selon qu’il veut maintenant aider ses serviteurs, maintenant punir les mescheants, maintenat esprouver la patience de ses fideles ou les chastier paternellement.” Ibid.

<sup>111</sup>Ibid.

God as the first cause could cause rain and storms outside the order of nature to understand the world in its entirety.

Despite Calvin's invocation of storms as an example of God's second type of work in his treatise on the Libertines, his sermon on Job 37:1-6 posited a different relationship among God, meteorological phenomena, and the natural order.<sup>112</sup> Calvin began the sermon with the assertion that the natural order reveals God to all human beings, even the uneducated.<sup>113</sup> He then provided his audience with the example of thunderstorms to support this claim. His explanation of them, though, is actually closer to what he had argued about the second type of God's works or those works that occurred beyond the order of nature in other, earlier treatises as Calvin argued here that God directly controlled thunderstorms to chastise the wicked and benefit and provide for the faithful.<sup>114</sup> Despite arguing for God's direct control over these thunderstorms, Calvin then followed this description of God's active involvement in the world with yet another assertion that these storms occurred through the natural order.<sup>115</sup> Reading Calvin's comments on meteorological phenomena in these various works suggest that he classified them differently depending on the circumstances. While the natural order God had given the world at its creation could cause some meteorological phenomena, these phenomena could also occur beyond it when God directly used meteorological phenomena to punish the wicked and provide for the faithful.

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<sup>112</sup>Job 37:1-6 read, "At this also mine heart is astonied, & is moued out of his place. Heare the sounde of his voyce, and the noyse that goeth out of his mouth. He directeth it under the whole heauen, and his light unto the ends of the worlde. After it a noyse soundeth: he thundreth with the voyce of his maiestie, and he wil not stay them when his voyce is heard. God thundreth maruelously with his voyce: he worketh great things, which we know not. For he saith to the snowe, Be thou upon the earth: likewise to the smale raine and to the great raine of his power."

<sup>113</sup>CO 35 Col. 315.

<sup>114</sup>"Mais il y a d'avantage: car quand Dieu envoye la pluye, ce n'est point seulement pour monstrier ce qu'il peut faire: mais quelquesfois il voudra chastier les hommes à cause leurs pechez, quelquesfois il voudra despolyer les thresors de sa bonté et de ses largesses." Ibid.

<sup>115</sup>CO 35 Col. 316.

For Calvin, one needed to understand both the natural order and God's ability to alter it to comprehend the meteorological phenomena that occurred in the world.

There was one phenomenon of the created universe that Calvin frequently described throughout his works as an example of the second type of God's works. For him, water almost always behaved beyond the course of nature. While he may have pointed to celestial bodies to explain the natural order and discussed meteorological phenomena when he wrote or spoke about either the natural order or those works beyond the ordinary course of nature, he described water's behavior in almost all his writings as either a wonder (*miraculum*) or as a preternatural occurrence.<sup>116</sup> His commentary on Genesis 1:9 is a good example. In the Geneva Bible of 1560, Genesis 1:9 recounts, "God said againe, 'Let the waters under the heaven be gathered into one place, & let the drye land appeare.' And it was so." In his commentary on this verse, Calvin pointed out that the gathering together of the waters to expose the dry land actually went against what some philosophers taught about the natural order. These philosophers taught that the four elements of the world – fire, air, water, and earth, were spherical in shape and that heavier spheres should nest inside lighter spheres. According to their teachings then, water, as a lighter element than earth but a heavier element than air, should totally submerge the dry land, leaving no place for human beings to dwell. Genesis 1:9's account of the gathering of the waters therefore showed that water did not behave according to the disposition the natural order dictated. As Calvin explained it here, only God's direct intervention in the world could explain how water behaved "as though" (*quasi*) it were beyond the natural order (*praeter naturam*).<sup>117</sup>

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<sup>116</sup>On the limits of the natural and the multiple meanings and resonances of wonder and wonders from the High Middle Ages through the Enlightenment see Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150-1750* (New York: Zone Books, 1998).

<sup>117</sup>"Hoc quoque illustre est miraculum, quod aquae suo discessu habitandi locum hominibus dederunt. Nam et philosophi concedent naturalem esse situm aquae, qualem initio fuisse tradit Moses, ut totam terram involvat;

Philosophers needed to know that God actively governed the universe to understand the behavior of water and the existence of the dry land.

Water's behavior as though outside the bounds of the natural order did not just occur during the six days of creation. Its failure to comply with the natural order continued to the present day. Calvin's commentary on Psalm 24:1-2 addressed this directly.<sup>118</sup> He again pointed out that philosophers taught the waters should entirely submerge the earth. That there was a dry, habitable place on the earth for human beings meant that water currently behaved beyond the natural order (*praeter naturam*).<sup>119</sup> Much as he had done in his commentary on Genesis 1:9, Calvin attributed waters' ability to behave beyond the natural order to God's active involvement in the world. Citing Genesis 1:9 in his commentary on Psalm 24:1-2, Calvin argued that God actively contained the water from overflowing the earth to provide people with a place to live.<sup>120</sup> Though knowledge of the natural order led people to believe that the waters should overwhelm the earth, water actually behaved beyond the natural order or even as a wonder due to God's total control over it.

In the 1559 *Institutes*, Calvin argued that the purpose of natural philosophy and other closely related liberal arts was to provide people with a deeper knowledge of the creatures God had made. Though this may sound like a relatively uncomplicated task for the master, examining

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primum, quia elementum est, circulare esse oportet, et quia elementum est gravius aere, terra levius, deberet hanc toto circuitu tegere. Quod autem in tumulos redacta maria locum hominibus concedunt, hoc est quasi praeter naturam: atque ideo bonitatem Dei hac in parte scriptura saepe extollit....Sciamus ergo nos in sicco habitare quia Deus mandato suo aquas submovit, ne totam terram submergant." CO 23 Col. 19.

<sup>118</sup>Psalm 24:1-2 read, "The earth is the Lords, and all that therein is: the worlde and they that dwel therein. For he hathe founded it upon the seas: and established it upon the floods."

<sup>119</sup>CO 31 Col. 244.

<sup>120</sup>"Terra quidem elementum quatenus in ordine sphaerico infimum locum occupat, infra aquas subsidit: sed quum pars habitabilis aquis sit superior, unde fieri dicemus ut stabilis maneat haec distinctio, nisi quod aquae divinitus instar fundamenti substratae sunt? Iam si ipsa mundi origine paternam curam Deus ad totum humanum genus extendit, praerogativa honoris qua ceteris praestant Iudaei, ex gratuito delectu nascitur." CO 31 Col. 244-245.

Calvin's conception of the created world in his works reveals that this study of God's creatures was anything but simple. The chief characteristic of the world God had made was that of order. God arranged each creature and gave each its proper disposition so that the universe continued to function in the pattern it had had at its creation. God even cherished and nurtured each one of these creatures so that the world largely functioned in an orderly way even after the Fall had caused disorder in the universe. Despite this, it was not enough for masters to examine secondary causes exclusively as Epicureans, Stoics, and other philosophers did if they wished to know the created world fully. Some natural phenomena occurred because God could directly intervene in the world. For Calvin, the natural order caused some meteorological phenomena, but others could also occur against this order as in the sudden strong wind on a calm day in Jeremiah 10:12-13. Water almost always behaved against the natural order when it did not flood the earth and allowed people to dwell on dry land. If the purpose of natural philosophy was to teach people about the created universe, then masters must explore its natural order and know that God could modify or work beyond it. Otherwise natural occurrences such as meteorological phenomena and even something as common as water would remain a mystery.

## Chapter 2: Sixteenth-Century Masters and the Purpose of Natural Philosophy

Totum hoc pulcherrimum theatrum, Coelum, Lumina, Stellae, Aer, Aqua, Terra, Plantae, Animantia, & caetera mundi corpora ideo tanta arte conditum est, ornatum specie, figura, harmonia, motum, efficacia virium, συμπαθεια & ordine distributum, ut illustre testimonium sit de Deo opifice.<sup>121</sup>

Philipp Melanchthon, *Initia doctrinae physicae* (1549)

Philipp Melanchthon began his 1549 natural philosophical or physics text with the assertion that the world was a beautiful theater. Skillfully made, it was filled with natural bodies that had been arranged in an order according to the connections among them. Its ordered arrangement and its variety provided people with evidence that God was the architect of this theater. As he continued the dedicatory epistle to the *Initia doctrinae physicae*, Melanchthon claimed that natural philosophy taught people about the ordered arrangements of the universe. This order was a vestige God had left in the world during its creation. Learning about it through the study of natural philosophy taught people about the universe God had fashioned and provided insight into the God who had made it. For Melanchthon, this was the purpose of natural philosophy, and he urged his readers to prepare themselves to read his book in which God, the architect of the world himself, would show to them the world he had made.<sup>122</sup>

This description of natural philosophy's purpose in the dedicatory epistle of the *Initia doctrinae physicae* both resonates and clashes with that found in John Calvin's works. As we saw in the last chapter, Calvin stressed that the world and everything in it was God's creation.

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<sup>121</sup>Melanchthon, sig. Aiv.

<sup>122</sup> Melanchthon described the purpose of natural philosophy thus: "Cum igitur manifestum sit, a Deo ita conditos esse homines, ut naturam aspiciant, doctrina de Elementis & corporum ordine, motibus & qualitatibus seu viribus, amanda & colenda est. Nec profecto quidquam homini non monstroso hac ipsa consideratione dulcius est. Haec ita esse cum sit notissimum, tamen multi hoc studium considerandae naturae vituperant, alii aliter. Aliqui aspernantur universam physicen, ut incertam, aut non satis firmas causas monstrantem, ut non ostendi possunt illustres cause, cur non certis intervallis inflammentur Cometae. Sed de certitudine infra respondebimus. Non enim propterea abiicienda est doctrina certa & utilis vitae de multis rebus, etiamsi multa ignoramus. Imo sciamus vere Dei voluntatem esse, ut in mundi opificio vestigia ipsius aspiciamus, & res nobis utiles ad vitam tuendam eligamus. Praeparemus etiam nos ad illam aeternam Academiam, in qua integram physicen discemus, cum ideam Mundi nobis architectus ipse monstrabit." Ibid., sigs. Aiiiv-Aiiir.

For him, God had instilled a natural order in the universe through the creation process that he continued to uphold, though Calvin claimed God could directly intervene in the world and circumvent this order, especially after the Fall. He argued that natural philosophy's purpose was to explore its secondary causes and acknowledge that God as the first cause could cause natural phenomena directly so that people could better understand the created universe and the God who had fashioned it. Melanchthon did not share Calvin's focus on God's direct involvement in the world in the passage above. His description of the universe does resonate with Calvin's, though, as he argued that the world was God's creation, that it had an inherent order, and that natural philosophy could teach people about this created world. These resonances and clashes raise questions about potential continuities and discontinuities between Calvin's descriptions of natural philosophy's purpose and those found in contemporary natural philosophical texts. They also suggest that there were connections between these masters' natural philosophical texts and John Calvin's works – connections that had a direct influence on how they all explained the natural phenomena of the world in which they lived.

### **The Purpose of Natural Philosophy in Sixteenth-Century Natural Philosophical Texts**

Melanchthon was not the only author of a natural philosophical text to discuss the purposes of natural philosophy at length. Such descriptions often occurred in the dedicatory epistles, letters to the reader, and introductions that began these texts or in their first few chapters as an author described the subject matter and the utility of natural philosophy or physics for readers. Whereas the first few chapters of these texts addressed the question of natural philosophy's identity more specifically, paratexts proposed frameworks within which readers could interpret an author's work even as they justified its writing and attempted to attract and

repay patronage for the author and his work.<sup>123</sup> The paratextual materials and the first few chapters of sixteenth-century natural philosophical texts therefore contain a great deal of information about the purposes their authors assigned to the study of natural philosophy or physics. Examining these in contemporary, widely circulated natural philosophical texts such as Gregor Reisch's *Margarita Philosophica*, Frans Titelmans' *Compendium philosophiae naturalis*, Simon Brossier's *Totius philosophiae naturalis epitome, seu Enchiridion*, Johann Velcurio's *Commentarii libri IIII in universam Aristotelis Physicen*, and Philipp Melanchthon's *Initia doctrinae physicae*, we discover that they, too, argued the purpose of natural philosophy was to teach people about the universe that God had created, even as they elucidated this purpose somewhat differently.

Gregor Reisch's *Margarita Philosophica* (original 1503, last author redacted edition, 1517) was written in the contexts of the University of Freiburg and the Carthusian order. Reisch (ca. 1467-1525) was educated and eventually taught as a master at the University of Freiburg. Joining the Carthusian order there, he wrote the *Margarita Philosophica* during his time at Freiburg-im-Breisgau likely to educate younger members of his order.<sup>124</sup> In the 1503 edition, Reisch claimed to offer them an epitome or a compendium of the whole of philosophy. His work included discussions of grammar, dialectic, rhetoric, arithmetic, music, geometry, astronomy, natural philosophy, and moral philosophy. In the peroration that began the first edition of his text, Reisch himself claimed to take information from a large variety of unspecified

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<sup>123</sup>On the notion of paratexts as guides to a reader into the contents of texts, see Gérard Genette, *Paratexts: Thresholds of Interpretation*, trans. Jane E. Lewin (Cambridge: Cambridge University Press, 1997). For a critique and an extension of his arguments that stress the importance of historical context for understanding paratextual conventions, see the articles in *Renaissance Paratexts*, ed. Helen Smith and Louise Wilson (Cambridge: Cambridge University Press, 2011). For a recent discussion of dedications letters and their ability to act as prefaces, see Jan Bloemendal, "Topical Matters in Dedicatory Letters of Latin Plays in the Early Modern Netherlands," in *Between Scylla and Charybdis: Learned Letter Writers Navigating the Reefs of Religious and Political Controversy in Early Modern Europe*, ed. Jeanine de Landsheer and Henk Nellen (Leiden: Brill, 2011), 203-215.

<sup>124</sup>See the discussion in Cunningham and Kusukawa, xvii-xix.

philosophers, theologians, and Church Fathers to compose his compendium.<sup>125</sup> His text took the form of a conversation between a master and his student. Dividing the discussion into a series of *quaestiones*, the master discussed the answers to each *quaestio* with the student through the course of the dialogue. Reisch divided his discussion of natural philosophy in particular into four books that largely drew on Aristotle's *libri naturales*. The first covered the principles of natural philosophy. The second described the origin of natural things. The third explored the vegetative and sensitive souls. The fourth explained the immortal, rational soul.

Reisch addressed the purpose of natural philosophy as he began his book on the principle or foundation of natural things.<sup>126</sup> Reading through his descriptions of natural philosophy and the origin of these first principles in the first several chapters of this book, we discover that the purpose of natural philosophy for him was to learn about the world God had created. He claimed that the goal of natural philosophy was to attain true knowledge of the world. This knowledge could come when people knew the causes and the first principles of all natural things. Reisch assumed that the way in which God had made the world had fashioned these principles and causes that masters should investigate. Knowing about these first principles and causes God had fashioned, masters would learn why each natural thing behaved as it did. This would ultimately allow them to deduce what effect each natural thing had on the world, providing an explanation for the natural phenomena that took place there. Natural philosophy's goal made it necessary for masters and their students to study the world as a created universe.

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<sup>125</sup>Gregor Reisch, *Margarita Philosophica* (Freiburg-Im-Breisgau: Johann Schott, 1503), Peroration. Cunningham and Kusukawa have argued that Reisch likely quoted Aristotle, the Bible, Augustine of Hippo, Peter Lombard, Gratian, John Pecham, and Duns Scotus from original Latin texts available to him. They do not speculate about the other secondary sources from which Reisch may have taken his information. See, Cunningham and Kusukawa, xlv. Though we do not know where he received his information about them, Reisch also cited many other authors including Plato, Seneca, and Hermes Trismegistus in addition to those authors that Cunningham and Kusukawa named.

<sup>126</sup>This was the eighth book of the whole work and the first on natural philosophy.

Reisch's understanding of Moses and the Book of Genesis further reveals the significance he assigned God's creation of the world for the study of natural philosophy. He viewed Moses as a well-informed philosopher whose creation account in the Book of Genesis could best teach people about the origin of the principles and causes of all natural things.<sup>127</sup> Building on Aristotle, Reisch understood matter and form to be basic to the principles and causes of natural things, and he assumed that the creation account in Genesis explained how God had fashioned this matter and form. The Book of Genesis was so significant for understanding these principles and causes that Reisch described the fashioning of matter and form at length through a verse-by-verse exegesis of Genesis 1:1-5. This exegesis focused on God's creation of matter, the initial absence of form (privation) in this matter, and the implantation of forms in it. According to Reisch, the first verse of Genesis taught people that God was the creator of all natural things because he had created the world *ex nihilo*. The second verse's description of the "void and empty earth" was a depiction of the prime matter that God would later provide with forms throughout the process of creation, even as this verse's claim that "the darkness was upon the deep" signified prime matter's privation of form. This prime matter could not exist on its own. When Moses claimed in this verse that the Spirit moved upon the waters, he showed that the triune God was responsible for maintaining this prime matter and providing it with forms. The third verse recounted God's instillation of forms in this prime matter as he commanded, "let there be light." This command for light banished the darkness of privation and brought form to the matter God had created. When God divided the day from the night in the fourth and fifth verses, he separated form from privation. For Reisch, this introduction of form in prime matter

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<sup>127</sup>Ibid., sigs. yiiiiv-yiiiir.

and the continued threat of privation were the origins of the first principles and causes of all natural things.<sup>128</sup>

Even though the Book of Genesis focused on God's initial creation of matter and form, Reisch also argued that God's fashioning of the world in this particular manner had consequences for the ways in which the natural phenomena of the created universe currently occurred. When masters investigated the principles and causes of natural things in the contemporary universe, they examined the world as God had fashioned it during the process of creation because matter, form, and privation were still largely responsible for how each natural thing currently behaved. Reisch again referenced the Book of Genesis to make this claim. Though he did not explore this in detail in these chapters of his text, Reisch claimed that Genesis taught people how these first principles that God had made through his creation of the universe resulted in the distinction, nature, and order of the elements and mixed bodies that his contemporaries now observed in the world.<sup>129</sup> God's creation of the world from nothing and his fashioning of these principles of matter, form, and privation structured a natural order for the world that continued in the present day. Reisch's conception of God's creation of the world and the importance he assigned to the Book of Genesis as a philosophical text meant that masters must explore a universe that was divinely created.

Frans Titelmans (1502-1537) offered a similar description of natural philosophy's purpose in his *Compendium philosophiae naturalis* (1530), even though he offered different explanations for this purpose than Reisch had. Born in Hasselt, Titelmans studied at the University of Louvain. After taking his master's degree there in 1521, he was invited to teach in the "De Varken," the college at Louvain in which he had studied. He joined the Franciscan order

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<sup>128</sup>Ibid., sigs. yiiiir-yiiiiv.

<sup>129</sup>Ibid., sig, yiiiiv.

shortly thereafter. After studying Scripture and theology at the Franciscan *studium*, he was asked to teach Scripture as well as dialectic and natural philosophy there.<sup>130</sup> The *Compendium* likely grew out of and aided this teaching experience. In its paratext, Titelmans claimed to write specifically for the members of his Franciscan house. He explained that he wrote his work for his brothers who spent much of the day and night singing hymns, meditating on sacred mysteries, and performing acts among their neighbors that were part of their holy authority. These obligations left them little time to study philosophy, and Titelmans claimed that his work would teach them natural philosophy more quickly than verbose and difficult commentaries.<sup>131</sup> Drawing on Aristotle's *libri naturales*, He divided his work into twelve books that covered the principles of natural things, the causes of natural things, motion, infinity, place, vacua and time, generation and corruption, meteorology, the heavens and the earth, the soul, the exterior senses, the interior senses, the intellect, and the sensitive appetite and the will. Each book included a number of *quaestiones* through which he explored that chapter's theme. Titelmans also ended each book with a psalm that offered praise to God.

Titelmans discussed the purpose of natural philosophy especially in three aspects of the *Compendium*'s paratext. After providing his readers with a directory of subject matter in each chapter, he included an original psalm to God, the creator of all things, a dedicatory epistle to his teachers in the arts faculty at the University of Louvain, and, following an alphabetical index of its subjects, a preface to the whole work.<sup>132</sup> Much as Reisch had claimed, Titelmans argued in these items of the paratext that the purpose of natural philosophy was to study the world God had

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<sup>130</sup>On Titelmans' life, see David A. Lines, "Teaching Physics in Louvain and Bologna," 183-185.

<sup>131</sup>"Sic enim fratrum conditioni iudicavi utilius, utpote quibus bona diei noctisque pars divinis hymnis decantandis sacris peragendis mysteriis et circa proximos exercendis hierarchicis actibus, foret impendenda, ita ut ad Philosophiae studia minimum temporis superesset, neque vacaret eorum qui plenius illa tractarunt prolixos et difficiles commentarios evolvere." Titelmans, sig. AAiiiir.

<sup>132</sup>Ibid., sigs. AAiv-BBviiiv.

created because the world currently behaved the way God had fashioned it to behave. His description of this purpose began with the assertion that God was the creator of the world. He then employed a rhetorical device to describe the significance God's creation of the universe had for the natural phenomena of that universe. Drawing on the common contemporary image of the book of nature,<sup>133</sup> Titelmans likened God's creation of the universe to an author's writing of a book.<sup>134</sup> Extending this similitude, he explained that God transcribed his immense power, incomprehensible wisdom, inestimable goodness, and his perfection in this book. People could discover these attributes in every creature, on every page of the book of nature. Just like the author of a book, God had provided the world with a structure or a natural order that they should be able to discern as he had set this created world in front of all eyes to be read.<sup>135</sup> Titelmans then proposed that the natural philosophy his text taught would enable people to read this book and discover the created world's structure. This description of his own text again shows that Titelmans understood natural philosophy's purpose to be the study of the universe God had created. For him, there were proper and improper ways of reading the book of nature, and the natural philosophy his work offered could actually teach people about the world God had created precisely because it took God's fashioning of the world into account. Innumerable magi, wise men, and philosophers had all discovered something about the world's structure, but they did not

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<sup>133</sup>For a discussion of this image, see the articles in *The Book of Nature in Antiquity and the Middle Ages*, ed. Arjo Vanderjagt and Klaas van Berkel, vol. 16 of *Groningen Studies in Cultural Change*, ed. M. Gosman (Leuven: Peeters, 2005). For a discussion of this metaphor's impact on sixteenth- and seventeenth-century chemistry, see Michael T. Walton, "Genesis and Chemistry in the Sixteenth Century," in *Reading the Book of Nature: The Other Side of the Scientific Revolution*, ed. Allen G. Debus and Michael T. Walton (Kirksville, Missouri: Thomas Jefferson University Press, 1998), 1-14. See also Peter Harrison's *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge: Cambridge University Press, 1998) and Peter J. Forshaw and Kevin Killeen's Introduction and Peter Harrison's "Reinterpreting Nature in Early Modern Europe: Natural Philosophy, Biblical Exegesis, and the Contemplative Life," in *The Word and the World: Biblical Exegesis and Early Modern Science*, ed. Kevin Killeen and Peter J. Forshaw (New York: Palgrave Macmillan, 2007), 1-44.

<sup>134</sup>Titelmans, sigs. AAiir-AAiiv.

<sup>135</sup>Ibid., sig. AAiiv.

know about God's creation of it.<sup>136</sup> Nevertheless, these philosophers had not worked in vain. Though they lived before God had manifested himself in the world in Jesus Christ, Titelmans and his readers now lived after this time. Philosophy had been sanctified and purified for them now that they understood God had created the world, and therefore, they could use natural philosophy to read the book of nature and discover this book's underlying structure.<sup>137</sup> In this original psalm, Titelmans claimed that the purpose of natural philosophy was to explore the created universe because God had inscribed the world with a natural order that human beings were meant to explore.

Relying less on rhetorical devices, his dedicatory epistle to his teachers proposed another reason why the purpose of natural philosophy was to investigate the world God had made. He here implicitly argued that studying the universe would bring people knowledge of God. He did so by separating between the honest and dishonest study of the universe. After explaining that he wrote his work to provide his fellow Franciscans with a brief, clear compendium of natural philosophy to take the place of prolix, time-consuming commentaries, he argued that studying physics would be helpful for those interested in philosophy and would bring people to a better knowledge and more love of God. Knowledge and love of God were the goal of all honest study. Therefore the study of natural philosophy should not only bring people erudition about the natural world, but also piety.<sup>138</sup> It was for this reason that Titelmans had taken the trouble to write the work in the first place. It was a Christian work, and he expressed the hope that his former teachers would use it to nourish the minds of their current students.<sup>139</sup> This dedicatory

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<sup>136</sup>Ibid.

<sup>137</sup>Ibid., sigs. AAiiir.

<sup>138</sup>Ibid., sig. AAiiiiv.

<sup>139</sup>Ibid., sigs. AAiiiiv-AAvr.

epistle extended the claims that Titelmans had made in his psalm to God, the creator. Here natural philosophy as Titelmans and his readers practiced it would not only teach people about the structured world God through the process of creation. It would also bring them to knowledge and love of God.

The preface to the work returned directly to these themes. Titelmans once again argued here that his work would provide a succinct compendium of natural philosophy for those who wanted more and better knowledge of the creator as they considered God's creatures.<sup>140</sup> He then cited Romans 1:19-20 to explain the purpose of natural philosophy directly.<sup>141</sup> As this biblical verse related, God had manifested himself in the creatures he had made from his creation of the world. It would be inexcusable for people not to study these creatures and refer their dignity to the grace of their creator. The great number of species and creatures made God's wonderful work more knowable.<sup>142</sup> People had to study natural philosophy so that they could know God through his revelation in the world. Titelmans made this argument even clearer in the last few sentences of his introduction. He argued that this was not purely a work of philosophy, but rather one of philosophy and theology mixed together.<sup>143</sup> Though Titelmans argued that the purpose of natural philosophy was to know the world God had provided with a natural order as Reisch had done, he also added that this knowledge could teach people about God because he argued that God had revealed himself to human beings in his works.

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<sup>140</sup>Ibid., sig. BBviii.

<sup>141</sup>In the Vulgate, Romans 1:19-20 read, "Quia quod notum est Dei manifestum est in illis Deus enim illis manifestavit. Invisibilia enim ipsius a creatura mundi per ea quae facta sunt intellecta conspiciuntur sempiterna quoque eius virtus et divinitas ut sint inexcusabiles."

<sup>142</sup>Titelmans, sig. BBviii.

<sup>143</sup>Ibid., sig. BBviii.

Simon Brossier's *Totius philosophiae naturalis epitome, seu Enchiridion* (1530, redacted edition, 1536) also claimed that the purpose of natural philosophy was to teach people about the world that God had created, offering some of the same arguments for this as Reisch and Titelmans had. The circumstances of Brossier's life and the composition of his epitome are unknown, though his composition of a natural philosophical text makes it likely that he took a master's degree at a university. Though Brossier produced the original work in 1530, Hieronymus Rupeus redacted it in 1536, providing more extensive explanations of each topic than Brossier had initially given. The circumstances of Rupeus' life and his relationship to Brossier are also unknown. Rupeus' redacted edition did contain a dedicatory epistle from Brossier, dated 1536, which indicates that Brossier may have had some involvement with its publication.<sup>144</sup> This edition of the text used type size to separate Brossier's original work from Rupeus' comments. Brossier's original statements appear in larger type. Rupeus' further explications appear underneath them in a smaller type. Printed most frequently, this redacted edition contained twelve books that built on Aristotle's *libri naturales*. These twelve books explored natural principles, the causes of natural things, motion, the infinite, place, vacua and time, generation and corruption, meteorology, the heavens, the soul and the brevity and longevity of life, the exterior senses, the interior senses, the intellect, and the sensual and intellectual appetites. Each book was divided into chapters, and each chapter discussed one subject included under the topic of the larger book.

Brossier's 1536 dedication letter to his cousin, Andreas Brossier, a doctor of theology, and Rupeus' dedicatory epistle to Jean Morin, specifically stated the focus of the work. The purpose they assigned to the study of natural philosophy resonated with Titelmans' claims in the paratexts to his *Compendium*. Brossier claimed that he wrote a total account of natural

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<sup>144</sup>See Brossier, sigs. aviiiv-bir for this dedicatory epistle.

philosophy in a compendium format. This compendium not only was meant to convey delightful and useful things to his readers, but it also showed that human beings were meant to explore God, the builder of the world, in his works.<sup>145</sup> Assuming God's revelation in the world much as Titelmans had, Brossier claimed that natural philosophy allowed people to explore the world God had made so that they could investigate his manifestation in this created universe. Describing the work to Morin, Rupeus also praised the study of nature that Brossier taught as a way for people to contemplate the God who made the world.<sup>146</sup>

Masters should not only explore the world as God's creation because it provided them with knowledge about him. Brossier's remarks in the first chapter on natural principles also show that understanding the world as God's creation was basic to any understanding of how that world functioned much as both Reisch and Titelmans had claimed. In Brossier's discussion of matter and form, he explained that God alone had created matter *ex nihilo* and that matter could only act as God had created it to behave.<sup>147</sup> Understanding matter required people to know that God had fashioned it to function in a certain way, after a natural order. Brossier also emphasized how important knowledge of the world as God's creation was to the study of natural philosophy in his second book on the causes of natural things. For him, God had made the universe and implanted a sequence of secondary causation that structured a natural order for the world. He argued in general that a cause is something from which something else follows. He used the example of the created world to explain causation. Since the universe existed, something must have caused it to exist. He argued that God was the highest and first cause of all things because he initially created

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<sup>145</sup>Ibid., sigs. aviiiiv-bir.

<sup>146</sup>Hieronymus Rupeus, "Dignitissimo, atque apud Parisios non minus aequo, quam vigilanti Propraetori Domino Ioanni Morino, Hieronymus Rupeus Metinensis," in Simon Brossier, *Totius Philosophiae naturalis epitome seu Enchiridion* (Paris: Simon Colinaeus, 1536), sigs. aiiiv-aiiir.

<sup>147</sup>Brossier, sigs. bviiiiv-cir.

the world for his own purposes as well as created the matter and form responsible for causing the behaviors of all substances. God was therefore the first efficient and final cause of all things that occurred. All material and formal causes served God as he had created them to do.<sup>148</sup> Recalling that God was the ultimate cause, people could discover how this natural order functioned through focusing on the material, formal, efficient, and final causes of changes in natural substances.<sup>149</sup> In the paratext to his work and in the first few chapters where he described the proper subject matter of natural philosophy, Brossier argued that its purpose was to learn about the world as God's creation both because this knowledge taught people about God through his revelation in the world and because it was basic to an understanding of the natural order that people currently observed in the universe.

Indicating both of these reasons, Johann Velcurio (ca. 1490-1534) also argued that the purpose of natural philosophy was to learn about the world God had created in his *Commentarii libri IIII in universam Aristotelis Physicen* (1539). His education and the writing of his natural philosophical work occurred at the University of Wittenberg. He began his education there in 1512 where he became an early supporter of Martin Luther. He took his bachelor's degree in 1515 and his master's degree in 1519. He later went on to study theology under Philipp Melanchthon. During his studies with Melanchthon, he taught natural philosophy and oratory in the arts faculty, becoming rector of that faculty in 1530. Much like Reisch and Titelmans, Velcurio's textbook likely also grew out of his activity as a teacher of natural philosophy.<sup>150</sup> He divided his commentary into four books. Building on Aristotle's *libri naturales*, these four books

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<sup>148</sup>Ibid., sig. ciiir.

<sup>149</sup>Ibid., sig. ciiiv.

<sup>150</sup>On Velcurio's life, see Kusakawa, *The Transformation of Natural Philosophy*, 109-113 and Charles H. Lohr, "Latin Aristotle Commentaries: Authors So-Z," *Renaissance Quarterly* 35, no. 2 (1982): 212.

covered the principle of natural things and their causes, the elements that make up the world and their qualities, mixed bodies, and the nature of the soul. Each book was further subdivided into chapters. Each chapter of each book listed a topic, and Velcurio then broke the explanation of each chapter's topic into numbered parts.

Velcurio described the utility of physics in the preface to the text. For him, physics had a dual purpose. It provided crucial basic knowledge for other study, and it could lead people to knowledge of God. He argued that knowledge of natural philosophy did not just prepare people for the study of medicine. It also taught people knowledge they would need to understand the writings of any authors fully, whether these authors wrote poetry or philosophy. As the examples of Augustine, Ambrose, and Basil taught, it could also be beneficial to theologians. Velcurio argued that there were many parts of Scripture that knowledge of nature helped people decode.<sup>151</sup> This emphasis on the ability of physics to teach people about God was different from that found in Titelmans' and Brossier's works. Rather than focusing here on natural philosophy's ability to teach people about God's revelation in the world as they had done, he argued that knowledge of natural philosophy trained people to better understand other texts, including Scripture. Velcurio's text echoed their claims that physics could teach people about this revelation as he discussed the second purpose of physics in his introduction. Claiming to pass over this second use in silence, he asserted that the study of physics provided people with knowledge of God. People could learn about God, the creator, from his revelation in his creatures as the Psalms and the prophets explained.<sup>152</sup> When people learned natural philosophy from his work, they received training to enable the study of a variety of other texts as well as some knowledge about God because God had created the world that Velcurio's readers examined.

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<sup>151</sup>Velcurio, sig. \*4v.

<sup>152</sup>Ibid., sig. \*5r.

The importance Velcurio assigned to God's creation of the world for the purpose of natural philosophy comes out most clearly in his descriptions of physics and its subject matter. Describing philosophy in general, he argued that it was about the knowledge of cause and effect.<sup>153</sup> In the context of natural philosophy in particular, this knowledge took the form of knowing about the causes and the effects of the motions and changes of natural things.<sup>154</sup> For Velcurio as well as for Brossier, God was responsible for the series of causes and the effects that human beings viewed in the world and that structured its natural order. He made this argument through a separation between the way masters and theologians wrote and spoke about God. Whereas theologians focused on God's revelation of his goodness, mercy, and benefits in the world, masters focused on God as the first cause of all things in the universe. All secondary causes such as natural principles, natural causes, and natural effects depended directly on God.<sup>155</sup> Leaving discussions of revelation to theologians, Velcurio still asserted here that God as the creator of the world was the first cause of all the secondary causes in the universe. Together, God and these secondary causes were responsible for a natural order through which the universe functioned. When the readers of Velcurio's work focused on the causes and effects of natural bodies' motions and changes within this natural order, they therefore explored the world God had created.

In making these claims, Velcurio's discussion of natural philosophy's purpose both resonated and clashed with Titelmans and Brossier's descriptions. He shared with them and also with Reisch the emphasis on masters' need to know that God had created the world so that they could understand why the world behaved as it did. God had provided a natural order for the

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<sup>153</sup>Ibid. sig. B1r.

<sup>154</sup>Ibid., sig. B5r.

<sup>155</sup>Ibid., sig. B7v.

world he fashioned, and masters needed to know about this natural order before they could understand the universe. He also acknowledged along with Titelmans and Brossier that this knowledge could lead people to knowledge of God because of his revelation in the world he had created. Velcurio carefully separated between natural philosophy and theology, arguing that theologians should concern themselves with this revelation while masters focused on the natural order of the created universe.

An admirer of Velcurio's *Commentarii*, Melanchthon eventually wrote his own work of natural philosophy entitled, *Initia doctrinae physicae* (1549) that offered readers his understanding of the purposes of natural philosophy. It was a reworked edition of his manuscript, *Physicae seu naturalis philosophiae compendium* (1543).<sup>156</sup> Though Melanchthon lived and worked in the same university as Velcurio, the circumstances of his work's composition were different. First, Melanchthon had a more varied educational background than Velcurio had had. Melanchthon first studied at grammar schools in Bretten and Pforzheim before entering the University of Heidelberg in 1509. In 1511, he took his bachelor's degree there, and in 1512, he moved to the University of Tübingen to continue his studies. He took his master's degree there in 1514. In 1518, Melanchthon was hired to teach Greek at the University of Wittenberg where he completed his *baccalaureus biblicus* in 1519. From 1519 until 1560, Melanchthon was a professor of both Greek and theology. Therefore, Melanchthon's work likely did not develop only out of the occasional lectures on natural philosophy he gave to students in the arts faculty as those of Reisch, Titelmans, Velcurio, and perhaps even Brossier probably had. Instead, it was likely a result of the personal interest Melanchthon took in the arts faculty and its teaching methods. In his capacity as rector for the University of Wittenberg in 1545, he composed a new set of statutes for this faculty. These regulations stipulated that there should be at least two

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<sup>156</sup>Kusukawa, *The Transformation of Natural Philosophy*, 145.

lectures on natural philosophy and astronomy. He also frequently composed works to aid the teaching in this faculty. For example, he wrote numerous works on dialectic and rhetoric and prefaces for mathematical works in addition to this text on natural philosophy.<sup>157</sup> Drawing on Aristotle's *libri naturales* as well as other ancient sources, the three books of the *Initia doctrinae physicae* cover physics, materials and the qualities in materials, the elements, and their qualities, alterations, and mixtures. Melanchthon's text is structured most similarly to Velcurio's. He also gave a list of *loci communes* or topics that each book would treat. Under each topic heading, Melanchthon arranged his discussion in a question-and-answer format. He also included more subjects in his interpretation of natural philosophy than these other authors had. In his discussion of the heavens in the first book of his text, Melanchthon included a long discussion of astrology and medicine as he described the planetary motions and their effects on the earthly realm and on human bodies.

As we saw above, Melanchthon began his text with the assertion that the world was a theater that could reveal God, its creator, to human beings.<sup>158</sup> Melanchthon therefore began his work with a theme that also appeared in Titelmans, Brossier, and Velcurio's texts. He, too, asserted that the world was God's creation and that one of natural philosophy's purposes was to teach people about God who revealed himself in the world. He also argued here much as they and Reisch had done that God was responsible for the orderly behavior that people observed in the universe and that masters should explore.<sup>159</sup> Natural philosophy should both teach people about this natural order of the universe and about the God who revealed himself to people in that universe. Melanchthon also added a third reason why the purpose of natural philosophy must be

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<sup>157</sup>On Melanchthon and natural philosophy at the University of Wittenberg, see Ibid., 144-188.

<sup>158</sup>Melanchthon, sig. Aiv.

<sup>159</sup>Ibid., sigs. Aiiv-Aiiir.

to teach people about the world God had created. He did so in the first book of his text where he described the subject matter of physics as the investigation of the series, qualities, and motions of all bodies and species in nature as well as the generation, corruption or motion in either the elements or in those bodies that had been made through a mixture of elements.<sup>160</sup> Focusing specially on the series or relationship among natural things, physics investigated the natural order of the created universe. Melanchthon then proposed to answer critics who claimed that the knowledge gained from such inquiry could never be firm. He cited Romans 1:19-20 to claim that God's creation of the world and manifestation in it guaranteed that the knowledge people could learn about the world was certain.<sup>161</sup> The certain and firm knowledge that people could have about the universe occurred only because God had made the world and willed people to have knowledge of it. In addition to learning about the behavior of the universe's natural order and God's revelation of himself in his creatures, Melanchthon added that masters must also examine the world as God's creation, or they could gain no knowledge of it at all.

Reading through the paratexts and the initial descriptions of the content of natural philosophy or physics in the most widely circulated natural philosophical texts of the early to mid-sixteenth century show that their authors all claimed the purpose of natural philosophy was to study the world that God created. The explanation as to why this was the purpose of natural philosophy varied based on the author. Of this group, Melanchthon's connection of the purpose of natural philosophy with his interest in its ability to provide certain knowledge of the world was unique. Reisch, Titelmans, Brossier, and Velcurio appear to have assumed that human

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<sup>160</sup>Ibid., sig. B1r.

<sup>161</sup>“Vult enim Deus aliquas esse certas, firmas & immotas noticias vitae rectrices. Sicut & Paulus ad Romanos ait, Deum monstrasse hominibus hanc noticiam, quae sit Deus aeterna mens, architectatrix & conditrix totius opificii mundi, sapiens, bona, iusta, casta, flagitans iusta & puniens iniusta, monstrasse & has noticias, quae discernunt honesta & turpia. Hae noticia complectuntur alias multas physicas & numerorum & figurarum noticias.” Ibid., sig. B2v.

beings could gain some knowledge of the universe. In contrast, Melanchthon grounded the certainty of the human knowledge of the universe in God's creation of it. Though they did not share Melanchthon's concern with certainty, most of these authors at least asserted if not explained in detail that studying the created world could teach people something about God. They typically claimed that God had created the world and that therefore, the way the world functioned manifested God to human beings. This was the main theme of the various elements of Titelmans' paratext. Brossier also argued this to his cousin as he explained the utility of his own work. Melanchthon's usage of the image of the theater of nature stressed the world's capacity to manifest God to human beings and to masters in particular. Though he separated carefully what theologians and masters should study, Velcurio even claimed that natural philosophy could teach people about God through his revelation in the created universe.

There was one reason why all these authors claimed that the purpose of natural philosophy was to teach people about the world God created, though. Sharing the presupposition that God had created the world, they all argued that the world behaved in the way God had fashioned it to behave. God had instilled a natural order in the world during its creation. Masters had to examine this order and the implications of God's continued relationship to the created universe if they wished to gain knowledge of the universe around them. Titelmans and Melanchthon expressed this through rhetorical tropes. Likening the created world to a book, Titelmans intimated that the world had a structure that God, its author, had given it. Melanchthon analogized the world to a theater in which human beings were called to act as spectators of the natural order God had implanted in the universe. Both men claimed their texts could train their readers in natural philosophy so that they could read and view this order and God's relationship to the world in the book and the theater of nature. Reisch, Brossier, and Velcurio described this

natural order and God's relationship to the created universe through their descriptions of the principles of natural things as well as their explanations of causation. For Reisch, Moses was an exceptional philosopher, and the Book of Genesis provided people with a detailed account of the origins of matter, form, and privation. Knowing about these natural principles God had created opened up the possibility for masters to understand the way every natural body in the universe functioned because matter and a form composed them. In addition to crediting God with the creation of all matter, Brossier argued that people needed to recognize God as the first cause before they could understand why things in the world occurred as they did. God as the first cause had created the universe and the secondary causes that structured the natural order. Velcurio, too, argued that masters must view God as the first cause if they hope to understand how the secondary causes structured the natural order human beings witnessed in the world. For all these authors, the behavior of the created universe hinged on the natural order God had given the universe at its creation and the God who oversaw it. It was the purpose of natural philosophy to investigate the causes of natural phenomena by exploring this natural order and God's relationship to the created universe more broadly.

### **The Created World and Its Natural Phenomena in Natural Philosophical Texts**

After these authors had described the purpose of natural philosophy or physics in their paratexts or in the first few chapters of their works, they devoted the rest of their texts to explaining how the natural phenomena of the created universe occurred. According to all these philosophers, God had implanted dispositions in each creature and arranged each in a certain, set relationship to all the other creatures in the universe during the process of creation so that the world and its natural phenomena tended to function according to these dispositions and arrangements. Their explanations of natural phenomena focused on how they occurred through

and occasionally beyond or against this natural order God had initiated at creation. Melanchthon described this order as he offered a rational proof for God. He asserted that there was a perpetual order in the universe as seen in the motions of the heavens and species, in human beings giving birth to other human beings and cows giving birth to other cows, the fecundity of the earth, and the perpetual flowing of rivers and streams.<sup>162</sup> God provided the heavens with the natural propensity to move with perfect, circular motion. He also gave human beings the ability to give birth to other human beings and cows, the power to generate other cows. As the planets followed their circular course and when the human beings had human children, they followed the natural order. Velcurio also described the natural course of the created universe through a similar example. He argued that God had endowed each natural thing with a disposition so that each must generate what its disposition dictated – animals came from animals, grain from grain, and fruit from a fruit tree.<sup>163</sup> Reisch gave a fuller description of the natural order than either Melanchthon or Velcurio in his ninth book on the origin of natural things. Here he intimated that this natural order included the seasonal changes and the dispositions God had implanted in each creature during the process of creation.<sup>164</sup> Titelmans extended this natural order throughout the entire created universe as he explained mixed bodies in the sixth book of his *Compendium*. He argued that the celestial bodies, following the course of nature, were efficacious throughout the heavens, in the sublunary realm, and even within the earth as God had willed and mandated.<sup>165</sup> Following the natural order, each celestial bodied moved in a predetermined way. This movement had a direct effect on the other celestial bodies, all things that dwelled on the earth,

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<sup>162</sup>Ibid., sigs. D2r-D2v.

<sup>163</sup>Velcurio, sig. C5v.

<sup>164</sup>Reisch, *Margarita Philosophica*, 1517, sig. Avir.

<sup>165</sup>Titelmans, sig. Liiv.

and on the earth, itself. Sharing the assumption that the world had such a natural order, these masters offered diverse explanations of God's relationship to it and to the natural phenomena of the created universe as a whole.

Though later chapters and books of these natural philosophical texts focused on how natural phenomena occurred, these authors dedicated the earlier sections of their texts to describing in general how God instilled a natural order in his creatures and the universe as a whole. These five authors all offered similar explanations of how God had implanted this order in the world. According to them, God infused it in two different ways during the process of creation - through both the intrinsic dispositions of each creature and through the causes extrinsic to them. All claimed that the intrinsic disposition of a creature came through its natural principles of matter and form. According to Brossier, each one of God's creatures was a substance made up of matter and form.<sup>166</sup> He described matter as a substratum in which generation and corruption occurred.<sup>167</sup> The matter provided the material of a creature. The form provided the matter with a *modus* or a "blueprint" for how this particular creature would behave.<sup>168</sup> Reisch discussed these natural principles and the dispositions they caused in God's creatures at much greater length. As we saw above, he read the Book of Genesis as a description of God's creation of the three natural principles of matter, form, and privation. Reisch's explanation of how this world functioned then developed from this description of the world's creation. He first claimed that God had created the matter directly through the Word. God had made this matter so that it had the intrinsic potential to take on forms.<sup>169</sup> Each creature was a composite of matter and form, and this composite gave

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<sup>166</sup>Brossier, sig. biiiir.

<sup>167</sup>Ibid., sig. bviiiir.

<sup>168</sup>Ibid., sig. cir.

<sup>169</sup>Reisch, *Margarita Philosophica*, 1517, sig. yvr.

each creature its disposition. This disposition was responsible for how and whether each creature moved or remained at rest.<sup>170</sup> Creating both matter and forms and granting to matter the intrinsic ability to take on forms, God set up a natural order. Titelmans made a similar argument, though he began his description of these intrinsic dispositions with the creatures and then described their natural principles. His first book argued that natural things were those that were composed of matter and form.<sup>171</sup> He then defined the nature that made up these natural things as an intrinsic foundation and cause through which a natural thing moves or stays at rest.<sup>172</sup> Moving on to where Reisch had begun, Titelmans claimed that principles of matter and form make up each natural thing.<sup>173</sup> These principles were therefore responsible for how each creature behaved. For example, fire's disposition caused it to be hot, dry, rare, and light, to move upwards and to cause other things to heat up and dry out.<sup>174</sup> The natural principles of matter and form that God had created *ex nihilo* were responsible for how each creature behaved while in the universe.

These authors all claimed that the dispositions God implanted in his creatures would cause them to behave according to these intrinsic dispositions unless something or someone intervened. Brossier and Titelmans offered similar examples to describe how creatures could behave according to the natural order, beyond the natural order, or even against this natural order depending on whether they followed their intrinsic dispositions. Brossier used the examples of fire and stones to do so. When fire behaved according to its intrinsic disposition as a hot, dry, rare, and light substance, it moved upward. These qualities intrinsic to fire made it behave in this

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<sup>170</sup>Ibid., sig. yviir.

<sup>171</sup> Titelmans, sig. Air.

<sup>172</sup>Ibid., sig. Aiir.

<sup>173</sup>Ibid.

<sup>174</sup>Ibid., sig. Aiiv.

way. In contrast, a stone behaved against its nature as a heavy substance when it did not fall to the earth but rather rose into the air through violent motion.<sup>175</sup> A substance behaved preternaturally when it did something that was neither repugnant nor appropriate to its nature. This occurred when a stone, propelled by *impetus*, moved laterally through the air. Brossier considered this a preternatural movement because the stone did not fall either to the ground (according to its nature) or rise into the air (against its nature).<sup>176</sup> Titelmans also used similar examples to describe the same phenomena. According to him, a natural thing is said to behave according to its intrinsic disposition when its accidents and its motion follow the nature that its own matter and form gave to it as when fire is hot, dry, rare, light, and moves upwards and causes other things to heat up and dry out.<sup>177</sup> He also argued that these bodies could work against and beyond their natures, employing a similar description of a stone's upward and lateral movements.<sup>178</sup> Though something external to it could change how a particular creature behaved, God's implantation of intrinsic dispositions in each creature insured that each would largely behave according to its intrinsic disposition.

These masters all then turned to causation to describe how God's creatures interacted with each other more fully. These authors distinguished between God, the first cause who had made all things, and the secondary causes that he had implanted in the universe to structure the natural order. As we saw above, Brossier had argued that God was the highest and first cause of all things because he had created the world. All secondary causes of the natural order served God

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<sup>175</sup>Brossier, sig. bvv.

<sup>176</sup>Ibid., sigs. bvv-bvir.

<sup>177</sup>Titelmans, sig. Aiiv.

<sup>178</sup>Ibid.

as he had created them to do.<sup>179</sup> Recalling that God was the first cause, people could discover how the natural order functioned by focusing on these secondary causes.<sup>180</sup> Velcurio's work reveals just how essential notions of causation were to these masters' conceptions of the natural order. Causation was of particular interest to him.<sup>181</sup> Much as Brossier had done, he defined God within the context of natural philosophy as the first cause, the first mover, the first nature, the infinite cause, the principal effector of all things, the highest good, the final end of all things, and the maker and author of all. All secondary causes depended directly on God.<sup>182</sup> He argued that there were four secondary causes that structured the behavior of the universe: fate, nature, fortune, and the will. All other special causes depended directly on these four secondary causes.<sup>183</sup> This relationship between God as the first cause and the secondary causes explained how natural phenomena occurred according to the natural order. For example, many of these masters pointed to the fertility of the earth as a basic feature of this order. God's infusion of both intrinsic dispositions and the sequence of secondary causation explained this fertility. The earth relied on the heat and light of the sun and the rain to be fertile. God as the first cause had created the earth intrinsically with the potential to be fertile as well as the sun and the rain to act as extrinsic, secondary causes of the earth's fertility. God as the first cause had also fashioned the matter and the form of the sun so that it intrinsically gave off this heat and light to cause

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<sup>179</sup>Brossier., sig. ciiir.

<sup>180</sup>Ibid., sig. ciiiv.

<sup>181</sup>See the discussion in Sachiko Kusukawa, "Nature's Regularity in Some Protestant Natural Philosophy Textbooks 1530-1630," in *Natural Law and Laws of Nature in Early Modern Europe: Jurisprudence, Theology, Moral, and Natural Philosophy*, ed. Lorraine Daston and Michael Stolleis (Ashgate: Surrey, England, 2008), 105-121.

<sup>182</sup>Velcurio., sig. B7v.

<sup>183</sup>Ibid.

terrestrial plant growth. The intrinsic disposition of each creature and other, extrinsic secondary causes provided the foundation of the created universe's natural order for all of these authors.

Though these authors all argued that there was a natural order that God as the first cause had implanted in the universe through natural principles and secondary causation, they offered slightly different explanations of the causes of natural phenomena in their works. Commenting on God's government and involvement with the created world, they each presented different explanations for these phenomena that drew on notions of the natural order as well as God's relationship to the created universe more broadly. According to Reisch, God was directly responsible for all the natural occurrences and phenomena that took place in the universe, even if God had given it a natural order. Reisch's description of fortune and fate and his discussions of whether they played a causal role in the universe reveal this viewpoint most clearly. When Reisch's pupil first asked the master about fortune and fate as causes, the master remarked that he would prefer to pass over this in silence but that there are too many terrible errors on this subject to do so.<sup>184</sup> After recounting various philosophers' opinions, he cited Augustine to argue that God as the first cause was responsible for all things that happened in the created universe, even those that appear to occur through the natural order. The causes of things may be hidden from human beings, but they should ultimately attribute them to God's will.<sup>185</sup> In a later section, Reisch claimed that nothing happened in the world that could truly be understood as fortuitous, dependent on chance, monstrous or miraculous. Instead, these were erroneous human labels that people assigned to events in the world when they did not understand their causes because they

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<sup>184</sup>Reisch, *Margarita Philosophica*, 1517, sig. zir.

<sup>185</sup> "Magister: Augustinus de civitate dei libro quinto capitulo nono aperuit dicens: Nos eas esse causas que dicuntur fortuite; unde etiam fortuna nomen accepit: non dicimus nullas sed latentes: easque tribuimus vel veri dei vel quorumlibet spirituum voluntati: ipsasque naturales nequaquam ab illius voluntate ferungimus qui est auctor omnis conditoris naturae." Ibid., sig. ziir.

did not know the will of God.<sup>186</sup> Despite attributing all things to God as the first cause of the world, he did still argue that people at least perceived a natural order in the natural occurrences of the universe. For example, people typically applied the term “monster” to anything that falls outside the common course of nature. A monster occurred when a natural body tried to produce something similar to itself and ended up with something that was dissimilar. Reisch offered the example of hermaphrodites or people with two heads.<sup>187</sup> According to the common course of nature, people should generate children that are either female or male and that have only one head just like the vast majority of other human beings. People typically labeled as monsters those human beings such as hermaphrodites and those with two heads that did not follow this common course of nature, even though these births actually occurred according to God’s will. Reisch claimed that people observed a natural order in the universe, but he also strongly asserted that God directly oversaw all the natural occurrences and phenomena that took place in the world.

Brossier, Velcurio, and Melanchthon offered a different understanding of God’s relationship to the created universe than Reisch had. All three men claimed that God as the creator of the world and the first cause of all things could theoretically intervene in those intrinsic dispositions and extrinsic causes that he had implanted in the world during creation to cause natural phenomena directly. Holding out the theoretical possibility of God’s direct

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<sup>186c</sup>Discipulus: Omnium itaque causalitatem in deum si referimus quam Augustini presentam sententiam nihil est quod vel fortuitum causale monstuosum aut miraculosum dici possit. Magister: Prorsus nihil. Nam et cum multa talia commemorasset Augustinus de trinitate libri 3 caput 3. Nihil inquit horum fit nisi voluntate dei: sed plerisque non apparet. Itaque licuit vanitate philosophorum etiam causis aliis ea tribuere vel veris vel proximis cum omnino videre non possent superiorem ceteris omnibus causam: id est voluntatem dei vel falsis et ne ab ipsa quidem prevestigatione corporialium rerum atque motionum sed a superstitione et errore prolatis.” Ibid., sigs. ziiiv-ziiir.

<sup>187c</sup>Magister: Monstra dici consueverunt eaque preter solitum nature cursum evenire solent. Agentia enim et si semper sibi similia producere conentur: nonnunquam tamen vel propter materie superabundantiam, defectum, corruptionem, qualitatum disconvenientiam aut aliquid aliud impedimentum dissimile generant: et hoc naturales monstrum dicunt: ipsum definientes taliter. Monstrum est peccatum illius quod sit propter aliquid: at clarius. Monstrum est difformitas quaedam in paucioribus conveniens entibus naturalibus: eveniens preter solitum cursum nature: disconveniens illis ex quibus traxit originem: ut cum hermoproditus aut duobus capitibus homo nascitur...” Ibid., sig. ziiir.

involvement in the universe as its first cause, their works strongly stressed that the world functioned almost exclusively through secondary causes. As we saw above, Brossier credited God with being the first cause of all things that occurred in the universe through the secondary causes of the natural order.<sup>188</sup> His text focused on how these secondary causes structured this natural order. For example, at the end of his discussion of causes, Brossier described how chance and fortune could act as efficient causes of things that occurred in the world without mentioning God as the first cause.<sup>189</sup> Chance and fortune had in common that they both worked accidentally and only rarely. They differed in how these efficient causes ultimately arose. While chance rested in natural things such as when fire secretly stole into a house's roof, there was intention behind fortuitous events. As Brossier explained, fortune proceeded through the choice or proposal of some acting force, again failing to mention God as its first cause.<sup>190</sup>

Velcurio's description of the natural order and God's relationship to the created universe were slightly different than Brossier's, though he too, emphasized the secondary causes that structured the universe. As secondary causes, fate, nature, fortune, and the will all came originally from God as their first cause, and Velcurio explicitly and repeatedly discussed the connection between first and secondary causes. His description of fate provides a good example. He argued that fate was the connection and perpetual order of cause and effect, but he also asserted that fate depended on God's providence as the first cause.<sup>191</sup> Whereas God's providence controlled fate along with the other causes, fate only necessarily implemented the causes and effects God had originally implanted in the natural order. Though attributing all the secondary

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<sup>188</sup>See above, 55-56.

<sup>189</sup>Brossier., sig. cviv.

<sup>190</sup>Ibid., sig. cviiiv.

<sup>191</sup>Velcurio.,sig. B8v.

causes to the first cause of God's providence, Velcurio's work focused largely on the effects of these secondary causes, and how they structured a natural order of the universe. For example, he described fortune as an accidental cause of events that happened neither always nor frequently, but rarely with purpose and deliberation.<sup>192</sup> He also defined the will as the power of the rational soul that sought good and avoided evil as it obeyed the intellect.<sup>193</sup> Velcurio more frequently connected secondary causes to God's providence as the first cause that structured the natural order than Brossier had done. He still argued that these secondary causes were largely responsible for what occurred in the universe, even if God was their first cause. The rest of his text even provided a taxonomy of these secondary causes and how they structured the occurrences in the heavens and on earth.

Melanchthon also stressed the regularity of the natural order and its secondary causes, even as he, too, claimed that God could theoretically intervene in the universe. He discussed this most directly in his critique of Epicurean notions of fortune and Stoic notions of fate or necessity.<sup>194</sup> Melanchthon defined the natural order and God's relationship to it against these two positions. God could theoretically cause an occurrence in the world directly at any time, and therefore the secondary causes did not necessitate anything that occurred in the world. The universe did not function through chance or fortune, either. God's creation of the world had fashioned a natural order in the universe that could not be broken without divine involvement. For example, the sun would follow its natural course in the heavens, and this course could not alter unless God actively changed it as God had actively gone against the natural disposition of fire when he saved Shadrach, Meshach, and Abednego from Nebuchadnezzar's fires in Babylon

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<sup>192</sup>Ibid., sig. G2v.

<sup>193</sup>Ibid., sigs. Bb5v-Bb6r.

<sup>194</sup>Melanchthon, sigs. D7r-D7v.

(Daniel 3:1-30). Though God was not bound to this natural order, the world largely worked through it, creating what Melanchthon called “physical necessity.”<sup>195</sup> This emphasis on a physical necessity underscored much as Brossier and Velcurio had that the created universe and all the natural occurrences in it typically functioned through the secondary causes of the natural order, even if God could theoretically change or subvert this order.

Titelmans offered a different understanding of the natural order and God’s relationship to the created universe. Though he, too, argued that God had created the natural principles and implanted secondary causes in the world to fashion a natural order, he also distance God much more from this order and the natural occurrences it caused than Reisch, Brossier, Velcurio, or Melanchthon did. We see this slight separation between God and the natural order in his discussion of both the intrinsic dispositions and the intrinsic and extrinsic causes that structured the natural order. He, too, argued that God did create the natural principles of matter and form, but he claimed that God also endowed matter with a natural ability to take on forms. This natural propensity in matter made it a participant along with God in all the things that occurred through the natural order. Titelmans even argued that one could say God was a co-creator of all things currently in the world along with these natural things. It was only in this way that one could explain how God, the most perfect and pure being, could have created something such as the universe that was currently impure and imperfect.<sup>196</sup> Titelmans proposed a similar relationship

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<sup>195</sup>“Necessitas physica est modus agendi ordinatus in causis naturalibus, quo modo non interrupto a Deo, non possunt illae causae aliter agere, ut Solis cursus dicitur necessarius, quia mutari non potest nisi divinitus. Ita ignis admota materia elementari, aut mixta, non potest non urere, sed in Babylonica fornace Israelite divinitus servantur. Etsi autem Philosophi dicunt coelum absoluta necessitate moveri, et primam causam necessario hanc rerum machinam, et hunc ordinem corporum mundi seu fudisse, seu fabricasse, tamen Ecclesia Dei adfirmat, Deum esse agens liberrimum, & libere, non necessario condidisse omnes creaturas, ut Psalmus 113 inquit: Deus autem nostre in coelo, omnia quaecunque voluit, fecit, volentem, id est, libere adfirmat eam omnia condidisse & agere.” Ibid., sig. D8r.

<sup>196</sup>“Cum autem inter agens & effectum oporteat esse similitudinem, forsitan mirum cuiquam videri poterit, quomodo deus perfectissimus atque purissimus actus & forma simplicissima, aut potuerit aut voluerit hanc

between God and the secondary causes that structured the natural order in the world. He took up the question of causes in the second book of his text. In the preface to this book, he argued that God was responsible for the final and the efficient cause of all things. Natural things, in contrast, provided the material and the formal cause.<sup>197</sup> Together, these four causes supplied the structure of the natural order as Titelmans went on to detail throughout this second book. Again, he asserted here that there must be some separation between God and the secondary causes of the natural order because if God were also the material and the formal cause of things, this would annex imperfection to him.<sup>198</sup> A separation between God and the natural order was imperative so that God was not responsible for the imperfection in natural occurrences. This is how Titelmans explained the introduction of monsters in the created universe. As we saw above, Reisch claimed that monsters appeared to contradict the natural order to human beings, but these came into the world through the hidden will of God. In contrast, Titelmans argued that God could not produce defects or imperfections in the world. Therefore, the secondary causes of the natural order were responsible for these monsters.<sup>199</sup>

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imperuam potentiam creare. Nam inter infinitam & puram formam, & finitam potentiam nihil actus habentem, nihil apparet similitudinis. Solitur autem ista dubitatio hoc pacto, quoniam materiam non per se creavit deus, quasi ens aliquod per se subsistens aut quasi hoc aliquid, sed concreavit potius cum re naturali, cuius in creatione erat materia, fecitque eam deus esse sub forma, quam in se recipit, sub qua quodammodo esse habet, atque ita etiam quodammodo Deo assimilatur, quatenus est sub forma ipsius rei naturalis cui ipsa substernitur. Neque simpliciter creatura dicenda videtur, neque simpliciter creata, sed potius concreatura sive concreatum aliquid cum re naturali.” Titelmans, sigs. Avv-Avir.

<sup>197</sup>Ibid., sig. Civ.

<sup>198</sup>“Ut autem singula causarum genera ad deum nunc accommodemus, sciendum est, quod prima duo causarum genera (nempe materialis & formalis) deo non conveniunt, quoniam habent imperfectionem annexam.” Ibid. sig. Dvir.

<sup>199</sup>“In illis autem operibus quae absque particulari causa mediata deus facit, nullus potest esse defectus, neque malum, neque peccatum. Sed in his quae per causam mediatam facit, potest malum & defectus evenire: non ex ipso primo principio summe bono atque perfecto, sed ex particularis alicuius efficientis insufficientia, vel imperfectione ipse enim generaliter influit & concurrat, ad omnem actionem & opus omne, tam naturalis quam voluntarii agentis. Caeterum, causae particulares & secundariae, quae ad effectum concurrunt, efficiunt facile, ut defectus aliquis sive peccatum contingat.” Ibid., sig. Dviir.

These authors held different opinions on whether, how, and how frequently God directly intervened in this world to cause particular natural phenomena as they described the natural occurrences of the created universe. Even though they offered different explanations of these matters, all discussed them. This shared focus on God's ability to subvert or even change the natural order suggests that though their individual conceptions of the natural order were fundamental for how they described and explored the created world, it did not provide any of them with an encompassing explanation for all the phenomena that took place in that world. For all these men, God's involvement with the world continued even after he had created it. Melanchthon's description of God subverting fire's tendency to rise in order to save Shadrach, Meshach, and Abednego as recounted in the Book of Daniel is one example of this. Reisch's discussion of miracles and wonders is another excellent example. Reisch argued that God also directly caused these just as God caused the birth of the monstrous. He separated these extraordinary occurrences into two categories – miracles and the wonderful or marvelous. He defined both against the notion of a natural order. Miracles were things that nature could produce but that happened in a way that the natural order could not accomplish. For example, animals could give birth to other living animals according to the natural order, but only God could produce the miracle of bringing something or someone who was dead back to life. In contrast, wonders or marvels were things that the natural order could not produce and that only God could cause such as the union of the divine and human in Jesus Christ and the glorification of animal bodies that had been putrefying in the earth.<sup>200</sup> Though Melanchthon and Reisch both argued that

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<sup>200</sup>Magister: Nec eadem que monstri nomine censent miracula dici solent: quam que raro sunt ipsa sunt mira: inquit Augustinus lib 21 de ci. C. 4 et 8. De tri . lib.3 . ca. 2 8. Et 10. Sed assiduitas experiendi paulatim subtrahit ad mirationis incitamentum et ibi deam ca. 8 dicit: Unde et ipsa que in rerum natura omnibus nota sunt non minus mira sunt: essentque stupenda consideratibus cunctis si solerent homines mirari nisi rara. Proprie autem miracula sunt quorum similis a natura produci possunt: modo tamen omnino alio ut natura in generatione vitam tribuit: et est naturale: deus iam e mortuo corpore subito vitam refundit: et est miraculum. Et quidem magis proprie miracula sunt haec et signa si ad aliquid divinitus annunciantur nostris sensibus admovent. Si vero aliquid fit

there was a natural order in the universe, they also both claimed that God's continued relationship to the created universe played a role in the natural occurrences of that universe.

Analyzing the works of Reisch, Titelmans, Brossier, Velcurio, and Melanchthon, we find that there were both resonances and clashes among their descriptions of natural philosophy's purposes and their explanations of the natural phenomena of the created universe. They all argued that the purpose of natural philosophy was to examine the universe God had created. They all argued that this world had a natural order. They all stressed that this world and its natural phenomena occurred through secondary causes most of the time. As Melanchthon's image of the theater of nature suggests, they all taught that a master should largely fix his eyes on these causes within the beautiful theater God had designed. Despite these similar conceptions of the purpose of natural philosophy and importance of the natural order for understanding the world God had created, they explained God's relationship to this world and its natural phenomena differently. For Reisch, God governed all aspects of the universe including its natural order through his providence, even though this providence might remain hidden from human beings. For Brossier, Velcurio, and Melanchthon, the created universe largely behaved according to this natural order even if God could intervene in it. In contrast to all these authors, Titelmans separated God as the first cause from the natural order. Though he also claimed that God could, cause some occurrences in the universe directly, this separation meant that the world typically functioned according to the natural order. These authors' different understandings of God's relationship to the created universe, its natural order, and its natural phenomena ultimately suggest that they held slightly different notions of the created universe.

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cuius simile natura facere non potest: nec ordinem ad hoc habet mirabile dici debet: ut est humanam natura divine in unitate suppositi uniri: corpus animale putrefactum in terra gloriosum resurgere." Reisch, *Margarita Philosophica*, 1517, sig. ziiiiv.

## John Calvin and Contemporary Masters on the Purpose of Natural Philosophy and the Created World

As John Calvin explained his own notion of the created universe in the 1559 *Institutes*, he, too, referred to it as a most beautiful theater. He argued that people had been placed in it to encourage pious delight in God's works. He claimed that the created universe functioned through a natural order that was the initial evidence of faith and that could bring people to pious knowledge of God, the world's creator.<sup>201</sup> Calvin then described the natural order as God's infusion of a structure into the universe. God created everything *ex nihilo* and then provided each creature with its intrinsic disposition and arranged each in a certain, fixed relationship to all other creatures during the creation process. This natural order was not exclusively responsible for what happened in the world. God actively intervened in the universe to give species new vigor because individuals were liable to corruption.<sup>202</sup> God could also directly control some of the natural occurrences people witnessed around them. As Calvin argued in an earlier chapter of the *Institutes* and in his other works, the purpose of natural philosophy was to teach people about this created universe – both about the natural order God had instilled in the universe during the process of creation and about the potential for God's active involvement in it to cause particular natural phenomena.

What Calvin had to say about the created universe and the purpose of natural philosophy in his works resonates with the purpose contemporary masters assigned to the study of natural philosophy. Calvin shared two basic presuppositions with these contemporary masters. First, they all argued that God had created the world. Calvin made this argument time and again in the

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<sup>201</sup>“Interea ne pigeat in hoc pulcherrimo theatro piam oblectationem capere ex manifestis et obviis Dei operibus. Es enim hoc (ut alibi diximus) etsi non praecipuum, naturae tamen ordine primum fidei documentum, quaquaversum oculos circumferamus omnia quae occurrunt, meminisse Dei esse opera, et simul quem in finem a Deo condita sint, pia cognitione reputare.” CO 2 Col. 131. Calvin also employed this image in the *argumentum* to his commentary on Genesis. See CO 23 Col. 11-12.

<sup>202</sup>CO 2 Col. 131-132.

various editions of the *Institutes*, his biblical exegeses, sermons, and polemical treatises.

Contemporary masters did so in the paratexts and in the first few chapters of their works. Their claims about God's creation of the world and their works' ability to teach people about this created universe were not irrelevant to or separated from the content of these texts. Instead, they along with Calvin assumed that the way in which God created and continued to govern the world had implications for how that world currently behaved and that masters must take this into account in order to know the universe around them. Assuming God's creation of the universe, the purpose of natural philosophy for all these men had to be the study of the world God created.

Calvin and these masters also described the way this created universe functioned in similar terms. All these men argued that God gave a natural order to the universe at its creation. The dispositions God infused into each creature and the arrangements among these creatures caused the world to behave typically in an orderly, predictable pattern. Calvin did not go into much detail about how God had implanted the natural order in the universe. His description of the creation process emphasized God's ordering of what had been especially chaotic "in the beginning." For him, the heavens, their motions, and these motions' effects on the earth were the premier example of this natural order his contemporaries could perceive. The planets moved with comparatively perfect, circular motion throughout the sky, causing plants to grow, the seasons to change, and some of the meteorological phenomena his contemporaries experienced.

Contemporary masters tended to delve into the ways in which God had implanted this natural order at much more length in their texts. Following their assertions of God's creation of the world and the discussion of natural philosophy's purpose, they described God's instillation of intrinsic propensities in each of his creature through the fashioning of matter and form. This was of particular interest to Gregor Reisch, but the rest of these widely printed natural philosophical

authors argued this as well. They also claimed that God had fashioned secondary causes in the world that structured the ways in which these creatures interacted with each other. As the first cause, God had made these intrinsic and extrinsic secondary causes responsible for the way the world typically functioned. Johann Velcurio in particular traced this series of causes at much length, even as Reisch, Titelmans, Brossier, and Melancthon included long discussions of causation in their works.

Despite this emphasis on the natural order in Calvin's and these natural philosophical texts, they also argued secondary causes could not explain all the natural phenomena that people witnessed in the world. Much as Titelmans and Brossier argued, God's creatures could act against the dispositions their matter and form gave them when they did something beyond or against those dispositions. People could throw stones laterally and up into the air, causing them to move beyond and against their natural propensity to fall to the ground. God's creation of the world also meant that he could alter or subvert the natural order when he saw fit. Calvin and these contemporary masters all expressed this. These men offered diverse explanations about whether, how, and just how frequently God was actively involved in the world to cause the natural phenomena contemporaries witnessed, and in doing so, proposed different conceptions of the created universe. Whereas Titelmans separated God from the natural order so that God would not be responsible for the imperfections of the world, Brossier, Velcurio and Melancthon stressed that the world largely functioned through it. Reisch argued in contrast that God's providential control over the world included both the natural order and all other occurrences that took place there. Calvin also discussed this topic at length. Though he claimed that the heavens tended to follow the natural order, he stressed much as Reisch had done that God oversaw this

natural order. He also pointed out specific natural phenomena that God directly caused such as some meteorological phenomena and the behavior of water.

These resonances between Calvin's descriptions of natural philosophy's purpose and those found in contemporary natural philosophical texts show that the created world, its natural order, and God's relationship to the universe more broadly were areas of common interest for both Calvin and these masters. All assumed that God had created the world with a natural order and that properly practiced natural philosophy could teach people about this created universe even when it did not follow this order. This notion of the created universe was a basic starting point for both Calvin and these masters as they described the world around them. A focus on the created universe connected sixteenth-century theology and natural philosophy.

Despite this connection, their different conceptions of God's relationship to the world and to its natural order suggest that all these authors did not share the same notion of this created universe. The following chapters explore this further as they investigate Calvin's and these masters' descriptions of God's relationship to the motions, location, and influence of celestial bodies, meteorological phenomena, and the behavior of water in detail. Calvin discussed these natural occurrences to highlight a particular aspect of God's relationship to the natural order and to the world he created more broadly. Exploring how he and these masters described these specific natural phenomena and God's relationship to them provides deeper insight into sixteenth-century conceptions of the created universe as well as sheds light on Calvin's own descriptions of these natural phenomena. It also reveals even deeper connections between theology and the natural philosophy in the sixteenth century.

### Chapter 3: The Heavens

Nempe ad disquirendos astrorum motus, distribuendas sedes, metienda intervalla, proprietates notandas, arte ac exactiore industria opus est; quibus perspectis, ut Dei providentia explicatius se profert, ita in eius gloriam conspiciendam, animum par est aliquanto sublimius assurgere.<sup>203</sup>

John Calvin, *Institutes of the Christian Religion* (1559)

In the 1559 *Institutes*, John Calvin claimed that natural philosophy could provide people with the skills to understand the celestial bodies. This skill and industry taught them to investigate the motions, location, relative position, and properties of the stars and planets. He repeatedly equated celestial bodies' motions and location with the natural order God had infused in the world during its creation and continued to sustain in many of his other works. According to Calvin in this edition of the *Institutes* and in these other descriptions of celestial bodies, observing the clear, obvious example of the natural order displayed in the heavens should draw human minds toward knowledge of God, their creator. Invoking this order to explain the motions, location, relative position, and properties of the celestial bodies, Calvin revealed how he viewed the relationship among this particular natural phenomenon, God, and the natural order.

Calvin drew on preconceptions he shared with contemporary masters about the world that surrounded them to describe the motions and location of the planets and stars. Both he and the most widely circulated natural philosophical texts of the sixteenth century taught that the purpose of natural philosophy was to explore the universe God had fashioned through the process of creation. As we saw in the last chapter, all taught that God had created the world, that this creation provided the world with a natural order that caused various natural occurrences, and that natural philosophy could teach people about these natural occurrences. They did not have the same opinions on how each natural phenomenon occurred in this created universe, though.

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<sup>203</sup>CO 2 Col. 42.

Holding slightly different conceptions of God's relationship to the created universe and its natural phenomena, they offered diverse explanations about whether, how, and how frequently God intervened in this universe to cause each natural phenomenon. When Calvin described the heavens as the best example of the natural order God had implanted in the world at its creation, he wrote and spoke about a topic that was debated among contemporary masters. The heavens therefore provide us with an example through which to explore how they understood the relationship among God, the created universe, and its natural phenomena. Analyzing Calvin's discussions of the heavens alongside those found in contemporary natural philosophical texts provides insight into how he and these masters all viewed the created universe more broadly. It also discloses further connections between sixteenth-century theology and natural philosophy.

### **Sixteenth-Century Masters on the Heavens**

Contemporary masters discussed the celestial bodies, their locations, their movements, and their influences on the earth at length as they described the world God had made.<sup>204</sup> Aristotle had included a discussion of the heavens in his *De caelo* in what was typically viewed as the second treatise of his natural philosophical works. Gregor Reisch, Frans Titelmans, Simon Brossier, Johann Velcurio, and Philipp Melanchthon all included an explanation of them, drawing on Aristotle as well as the Bible, Ptolemy's *Almagest*, and astrological works.<sup>205</sup> In doing so, they divided the universe into two parts. According to Brossier for example, the world divided into the earth or the sublunary realm and the heavens.<sup>206</sup> Melanchthon also made a

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<sup>204</sup>For a discussion of sixteenth-century cosmologies and their historical connections to those found in the previous and following periods, see Edward Grant, *Planets, Stars, and Orbs: The Medieval Cosmos, 1200-1687* (Cambridge: Cambridge University Press, 1994) and John North, *Cosmos: An Illustrated History of Astronomy and Cosmology* (Chicago: University of Chicago Press, 2008), especially 232-417.

<sup>205</sup>For a discussion of the sources of natural philosophers' cosmology, see Grant, *Planets, Stars, and Orbs*, 11-45.

<sup>206</sup>Brossier, sig. giiir.

similar distinction between the heavens and the earth, even as he gave a fuller description of what the heavens encompassed. He, too, argued that the heavens and the earth or the inferior bodies encompassed the world, and he intimated that the planets and stars were in the heavens.<sup>207</sup> The heavens therefore included those celestial bodies such as planets, stars, and any other natural body that existed above the sublunary realm. The similarities in Brossier and Melanchthon's descriptions of the celestial realm exemplify these masters' similar explanations of how God had fashioned the heavens. Though largely sharing a notion of the heavens' construction, their explanations of what caused celestial motions and of these motions' influence on the terrestrial realm were not entirely the same. They ultimately offered slightly different notions of the relationship among God, the heavens, and the natural order as they described these motions and heavenly influences.

Drawing on their similar notions of how God had fashioned the heavens, these masters offered similar accounts of the composition, relative worth, motions, and the arrangement of the celestial bodies. They began with what separated the heavens from the earth as they described the universe. They divided these two aspects of the universe first through what they claimed composed them. For example, Reisch along with these other authors claimed that ether or the quintessence made up the heavens while elements composed natural bodies on the earth.<sup>208</sup> In making this distinction, these authors argued that the heavens were fundamentally different than the earth. While elements could generate and be corrupted, the ether of the heavens was neither corruptible nor generable. As Velcurio explained, the elements and those bodies made up of a mixture of elements underwent corruption and generation while the heavens and its ether did

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<sup>207</sup>Melanchthon, sig. E5v.

<sup>208</sup> Reisch, *Margarita Philosophica*, 1517, sig. rir. Brossier made a similar distinction on sig. giiir as did Melanchthon on sigs. F5v-F6r.

not.<sup>209</sup> Titelmans provided the fullest explanation of this. After asserting that the heavens were very different from the earth because elements did not compose them, he explained at length how creatures on the earth experienced change due to these elements while the heavens did not.<sup>210</sup> This particular difference between the heavens and the earth had consequences for how these masters viewed the heavens in relationship to the earth. Describing the location of the various elements on the earth, Brossier, for example, argued that the heavens were simpler and nobler than the earth because they did not undergo corruption as the elements of the sublunary realm did.<sup>211</sup> The division these masters made between the heavens and its ether or quintessence and the earth and its elements meant that they all viewed the heavens as the noblest or even the most perfect aspect of God's creation.

This notion of the heavens' relative perfection and its difference from the earth had direct consequences for how these masters understood the motions that God had fashioned for the heavens. As Brossier explained, the elements of the earth caused sublunary bodies to move with linear motion. In contrast, the heavens revolved with circular motions.<sup>212</sup> Melanchthon even referenced the experience human beings had when looking at the heavens to confirm this circular motion because people could observe them rotating every twenty-four hours.<sup>213</sup> Much like their views of the ether in comparison to the earth's elements, these masters also deemed the circular motions of the heavens to be more perfect than the rectilinear motion that creatures underwent on the earth. As Velcurio explained, the heavens as nobler bodies had nobler and more perfect

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<sup>209</sup>Velcurio, sig. K2r.

<sup>210</sup>Titelmans, sigs. Miiir-Miiiv.

<sup>211</sup>Brossier, sig. giiir.

<sup>212</sup>Ibid., sig. giiir.

<sup>213</sup>Melanchthon, sig. E7v.

motion than the earth because this motion was both circular and uniform.<sup>214</sup> Drawing on Aristotelian, Ciceronian, and geometric notions of the perfection of circles,<sup>215</sup> these masters all connected the motions of the incorruptible and ingenerable heavens with this most perfect, geometrical shape.

Even in their discussion of these relatively perfect and noble heavens, these masters drew on their shared presuppositions about God's creation of the universe to describe these characteristics. Melanchthon, for example, credited God for the planets' perfect motions and the ways in which they affected the sublunary world as he explained where people could find this information within his physics text.<sup>216</sup> These shared presuppositions about the created universe and their similar notion of how God had fashioned the heavens are most apparent in their descriptions of how the various aspects of the heavens were arranged. All these authors argued that God had fashioned the universe in a spherical shape. They then subdivided this sphere into other spheres. They all taught that the earth's sphere was at the center of the universe, surrounded in various ways by the other elemental spheres of fire, air, and water.<sup>217</sup> Including the planets and stars, the heavens surrounded these elemental spheres. They all claimed that each planet had its own sphere in which it moved and that the stars were fixed in the eighth sphere or the firmament.<sup>218</sup>

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<sup>214</sup>Velcurio, sig. K2v.

<sup>215</sup>On natural philosophers' descriptions of the universe's shape, see Grant, 113-122.

<sup>216</sup>Melanchthon, sig. F6r.

<sup>217</sup>Melanchthon rejected heliocentric theories of the universe at some length. See sigs. E7v-F2v.

<sup>218</sup>See Reisch, *Margarita Philosophica*, 1517, sigs. rir-riir; Titelmans, sigs. Liiir-Mviiiv; Brossier, sigs. giiv-gviv; Velcurio, sigs. I6r-L4r; and Melanchthon, sigs. E5v-G2v.

Though crediting God with this arrangement, these masters argued for different numbers of spheres that made up the heavens. Melanchthon argued specifically for ten spheres without mentioning God directly. He claimed that starting with the earth there were seven spheres of planets – the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn. A sphere of fixed stars followed this. He then explained that there was a ninth and a tenth sphere or the first mobile (*primum mobile*), responsible for the daily motions of the heavens.<sup>219</sup> In contrast, Brossier and Reisch argued for eleven spheres in the heavens. In addition to those Melanchthon had named, they claimed that an empyrean heaven surrounded the other ten spheres, and they labeled the ninth sphere the crystalline sphere and the eighth, the firmament.<sup>220</sup> In doing so, they combined exegeses of the Book of Genesis along with what Aristotle and Ptolemy had taught about the planets. For example, Brossier claimed that the empyrean heaven was the seat of those whom the omnipotent God had blessed.<sup>221</sup> Reisch directly cited the Book of Genesis and the Psalms to describe the ninth sphere as the crystalline sphere. Drawing on the exegesis of Augustine, he pointed out that both the Psalms and Genesis described the existence of water above the firmament, even if its existence there escaped human understanding.<sup>222</sup> The crystalline sphere was the celestial water above the firmament that Genesis and certain psalms led people to expect. Assuming that God had made the world and that the Book of Genesis provided a reliable account of this creation process, Reisch and Brossier incorporated its teachings into their description of the celestial spheres. Though sharing these presuppositions about God's creation of the universe, Titelmans and Velcurio indicated differences between the way ancient philosophers such as

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<sup>219</sup>Melanchthon, sigs. F6r-F6v.

<sup>220</sup>See Brossier, sigs. giiiv-gviiv and Reisch, *Margarita Philosophica*, 1517, sigs. rir-riiir.

<sup>221</sup>Brossier, sig. giiiv.

<sup>222</sup>Reisch, *Margarita Philosophica*, 1517, sigs. riiv-riiir.

Aristotle and Plato and contemporary Christians numbered the heavenly spheres. Both men explained that the ancients had argued for eight spheres – the seven planetary spheres and the fixed stars.<sup>223</sup> Though they both claimed that theologians argued for the existence of a first mobile, the crystalline sphere, and an empyrean heaven in addition to these eight spheres, Velcurio and Titelmans handled Christian descriptions of these further three spheres differently. Whereas Velcurio just juxtaposed their accounts of the spheres with those of ancient philosophers,<sup>224</sup> Titelmans specifically stated faithful Catholics believed in the existence of these additional three orbs.<sup>225</sup> Even though these authors explained God's arrangement of the heavens slightly differently, they all argued that he had created each celestial body and placed each in a particular sphere, frequently drawing on Genesis to describe how these heavens had been fashioned and arranged.

Sharing the assumptions that God had made the heavens out of ether and given celestial bodies the disposition to move with more perfect, uniform circular motion within their spheres, these authors offered different descriptions of the dispositions and arrangements God had instilled in the heavens during the process of creation that caused the heavens to move in particular ways and that caused celestial bodies to influence the earth. We see these divergent explanations of the relationship among the heavens, the natural order, and God especially in their discussions of how the planets and stars were able to continue in perpetual, uniform circular motion. Though they all claimed that the natural order was responsible for these motions, they

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<sup>223</sup>Velcurio, sigs. K3v-K4r and Titelmans, sig. Mvir.

<sup>224</sup>After describing Aristotle's opinions on the fixed stars and the seven planetary spheres, Velcurio argued, "Theologi recentiores huic numero superaddunt adhuc tres orbes supra firmamentum, scilicet, Nonum, coelum aqueum vel Cystallinum, & decimum, primum mobile: & undecimum, coelum Empyreum." Velcurio, sig. K4r.

<sup>225</sup>In a section entitled, "De coelo empyreo, & de coelo crystallino sive aqueo, ac primo mobili," Titelmans argued, "Praeter autem praedictas sphaeras motu locali mobiles, Fides catholica & divini Theologi docent aliud superius esse omnis motus localis expers, perpetuo quiescens ab omni motu locali..." Titelmans, sig. Mviv.

offered different conceptions of this order. Titelmans gave a succinct explanation of the various opinions that were the most common among contemporary master. The first question a contemporary master should answer was whether the planets were animate or inanimate. If God had fashioned them as animals, then this would explain how they were able to move through the heavens. If the planets and stars were inanimate, then something or someone else must move them. Titelmans explained that many thought that intelligences such as angels propelled them.<sup>226</sup> The question he indicated here was essentially about how God had established and continued to govern the natural order in the heavens. Did God give the heavens a particular disposition to continue their circular motion? Or, did he arrange for other creatures such as angels to move these celestial bodies through the heavens? Titelmans, himself, argued for the latter, though he was careful to point out that the angels did not adhere to the planets due to their spiritual nature and that the planets in no way became animated while the angels moved them.<sup>227</sup> Reisch actually offered his readers both positions. While noting that some people claimed intelligences moved the planets, he also explained that others taught that the dispositions of the planets' substantial forms were responsible for this, giving credit to God for providing the first mobile with the inexhaustible vigor to continue the heavens' motions.<sup>228</sup> Drawing on many of these same natural philosophical doctrines, Velcurio also argued for the natural disposition God had given the first mobile and for the existence of intelligences that moved the celestial bodies. He explained that this gave the motions of the spheres a quasi-animated quality.<sup>229</sup> In contrast to Reisch and Velcurio who noted both opinions, Melanchthon attributed the motions of the celestial bodies

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<sup>226</sup>Ibid., sig. Mvv.

<sup>227</sup>Ibid.

<sup>228</sup>Reisch, *Margarita Philosophica*, 1517, sig. rvr.

<sup>229</sup>Velcurio, sig. K3r.

solely to their dispositions in his discussion of stars. He argued that the stars had neither rational nor animal natures, but rather that they moved as through a perpetual law.<sup>230</sup> While all these masters taught that God had fashioned the planets to move with uniform, circular motion in their spheres as the sphere of the fixed stars rotated, they explained how these motions took place in diverse ways because they had different notions of the characteristics of the natural order God had implanted in the universe during the creation process.

Their different explanations of celestial motions and celestial influences reveal that these masters held slightly different views of the relationship among the heavens, the natural order, and God. Though all these authors argued that the motions of the celestial bodies had some effect on the sublunary realm, they described different effects of these motions because they held diverse notions of the heavens' natural order and God's relationship to the created universe more broadly. The difference of opinion between Velcurio and his teacher, Melanchthon, provides a good example of this. Velcurio argued for the celestial bodies' limited effect on the lower realm. Though he claimed that the various celestial bodies could have some influence on meteorological phenomena and therefore the sterility of the earth as well as the complexion and qualities in the human body, he denied that these celestial bodies had any direct effect on individual human lives beyond their influence on human bodies.<sup>231</sup> The natural order of the heavens and God's relationship to the created universe did not allow the planets to determine the course of any other terrestrial body or activity. Melanchthon discussed this question at great length. Though he carefully distinguished between diabolical and legitimate ways of understanding the heavens' influence, he also argued that the heavens played a role in determining the future course of

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<sup>230</sup>Melanchthon, sigs. G1v-G2r.

<sup>231</sup>Velcurio, sigs. K7v-K8v.

individual human lives, so much so that human beings could use their knowledge of celestial motions to predict some aspects of future events.<sup>232</sup> For him, the natural order God provided the world was different than for Velcurio. For Melanchthon, this order was so regular and all encompassing that people could use the planets to predict what would happen on the earth.

These diverse explanations of how the planets and stars were able to move and what effects these celestial motions had on the sublunary realm indicate that there were substantive clashes among sixteenth-century masters about how celestial natural phenomena occurred and what caused these phenomena to function in a particular way. They all claimed that God had fashioned the heavens from ether or quintessence and that celestial bodies moved with uniform, circular motion. They all taught that God had also fixed the stars in the eighth sphere or the firmament and placed the planets in separate spheres in which their uniform, circular motion took place, even as they offered different explanations for the number of spheres that composed the universe. They all claimed that this ether and these circular motions made the heavens nobler than the corruptible, sublunary realm. Despite these shared notions of the heavens, they offered different explanations as to why the planets and stars moved in the way they did and what effects these motions had on the lower realm. These divergent views of the relationship among the heavens, the natural order, and God suggest that they all held slightly different notions of the created universe.

### **John Calvin on the Heavens**

Drawing on presuppositions he shared with these contemporary masters about God's creation and fashioning of the heavens along with similar conceptions of the superlunary and sublunary realms, Calvin discussed the relationship among the heavens, the natural order, and God in his own descriptions of the heavens, their motions, and their influence on the terrestrial

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<sup>232</sup>Melanchthon, sigs. S3v-T4r.

realm. The 1559 *Institutes* contained a brief statement about how Calvin viewed the natural order in the heavens. As we saw above and in the first chapter, Calvin often pointed to the heavens as the best example of the natural order of the universe, and his description of them in this edition of the *Institutes* included those features of the heavens and its natural order that he explored at length throughout many of his other works. He first did so in the fifth book of the first chapter as he differentiated between those of God's works that followed the natural order and those that occurred beyond it. Here he briefly mentioned heavenly bodies' locations, distance from the earth, and their properties as the particular aspects of the heavens that masters should study.<sup>233</sup> This passage established that God had implanted a natural order in the heavens as he gave each celestial body a certain disposition and arranged it in a certain location relative to the other celestial bodies and the earth during the process of creation. Calvin returned to these themes in the fourteenth book of this first chapter immediately after he had likened the world to a theater. Here he described the connection between the heavens and the natural order in greater detail. According to Calvin, four things in particular distinguished the way God had fashioned the heavens and the ways in which the heavens continued to function after creation. The first was the way God had fashioned and placed the stars. Though there was a large multitude of them, God had carefully ordered them and fixed them in the heavens so that there was not a more glorious sight in the whole universe. While this seemingly endless variety of stars remained fixed and ordered in the firmament, the planets moved through the heavens. These planets had a specified course so that there was no confusion among them. Third, the planets' set motions had a direct effect on the earth below it. Calvin explained that God had arranged these motions so that they were directly responsible for the day and the night as well as the months, years, and seasons. Finally, he again asserted that God's power was directly responsible for sustaining this massive

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<sup>233</sup>CO 2 Col. 42.

structure and for governing the revolutions of the heavenly bodies.<sup>234</sup> For Calvin, both the natural order and God's active upholding of the universe caused celestial bodies to move in predictable patterns. Calvin's more detailed descriptions of this natural order and God's active support of it therefore sheds light on his notion of the relationship among the heavens, the natural order, and God as well as allow us to analyze resonances and clashes between his views of this relationship and those contemporary masters advanced in their own discussions of the heavens.

Whereas this edition of the *Institutes* explained general features of the heavens' natural order such as the placement of the fixed stars, the orderly motions of the planets, these motions' influence on the earth, and God's direct involvement with it, Calvin explored the characteristics of this natural order in greater detail in his commentary and sermons on the Psalms, his commentary and sermons on Genesis, in his sermons on the Book of Job, and in his commentaries, sermons, and lectures on the prophets. These descriptions reveal that Calvin attributed three features in particular to the natural order that he repeatedly emphasized God had instilled in the heavens. First, he wrote extensively and often in some detail about celestial bodies' orderly placement and their predictable motions throughout the heavens. Second, he explained how this placement and these motions extended the celestial influences throughout the universe. Third, he claimed that this influence was the result of the arrangements between the various aspects of the entire universe according to the natural order.

His commentary on Genesis 1:14-16, his sermon on Job 26:1-7, and his commentary on Psalm 19:1-6 all explored the placement and the motions of the stars and the planets in great detail. All of these descriptions emphasized the orderly, regular characteristics of celestial bodies' placements and motions according to the natural order. Whereas the 1559 edition of the *Institutes* described the heavens as "ordered" and the stars and planetary courses as "fixed,"

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<sup>234</sup>CO 2 Col. 132-133.

Calvin's comments on Genesis 1:14-16 described this order explicitly.<sup>235</sup> Explaining the teaching of astrologers, he stated that they taught God located the planets in distinct, individual spheres and fixed the stars in the firmament.<sup>236</sup> Much as contemporary masters had claimed, Calvin intimated that this was the arrangement of the heavens that people observed and that it was within these arrangements that the motions of the heavens took place. Calvin described this fixed, perpetual motion that he took to be basic to the heavens even more extensively in his sermon on Job 26:1-7 as he discussed the seventh verse of this biblical book.<sup>237</sup> Though the sun and presumably all the other planets had set motions that God had arranged during creation, Calvin here described the general, uniform motion of the firmament that contained those stars God had fixed in it. He likened this general motion of the heavens to the turning of a wheel on an axle. As a wheel turned around an axle rod, the heavens turned around the North Star and another pole hidden under the earth on which his European contemporaries dwelled, located in the Antarctic.<sup>238</sup> Once again, he classified this general, continual movement of the whole heavens around these poles as the outcome of the heavens' arrangement and natural disposition. Anyone could open their eyes to experience this motion, and its uniformity provided people with proof of God's wisdom because he had given the heavens a natural order that caused the stars and the planets to move in these particular ways.<sup>239</sup> His commentary on Psalm 19:1-6 provides further insight into how Calvin judged the regular motions of these celestial bodies that the

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<sup>235</sup> Genesis 1:14-16 read, "And God said, 'Let there be lightes in the firmament of the heaven to separate the daie from the night, & let them be for signes, and for seasons, and for daies and yeares. And let them be for lightes in the firmament of the heaven to give light upon the earth' and it was so. God then made two great lightes: the greater light to rule the daie, & the lesse light to rule the night: he made also the starres."

<sup>236</sup>CO 23 Col. 22.

<sup>237</sup>Job 26:7 reads, "He stretcheth out the North over the emptie place, and hangeth the earth upon nothing."

<sup>238</sup>CO 34. Col. 429-430.

<sup>239</sup>CO 34. Col. 430.

natural order caused.<sup>240</sup> Invoking a theme commonly found in contemporary natural philosophical texts, he here argued that the heavens were the noblest aspect of all of God's creation and claimed that their splendor should even lead people to contemplate the rest of the created universe.<sup>241</sup> Their careful arrangement and their regular, circular motion made the heavens the noblest of God's creation for Calvin. As he had in the 1559 *Institutes*, Calvin pointed to the heavens' variety as well as their orderly arrangement and the diversity of their courses and locations to explain that they were the best evidence of God's providential control over the world.<sup>242</sup> For Calvin, an ordered arrangement of the great variety of stars and planets along with specified, predictable motions were one of the main characteristics of the heavens and its natural order.

Calvin's comments on the second verse of Psalm 19 indicated another aspect of the heavens' natural order that he frequently emphasized when he described them. For him as for contemporary masters, the natural order of the heavens did not just have an effect on the heavens. The influence of celestial motions extended throughout the entire universe. In his commentary on Psalm 19:2, he argued that the placement and the controlled motions of the sun, moon, and stars were responsible for the days and nights as human beings experienced them on the earth. When the sun and moon moved in the heavens, these motions caused day and night on the earth. This series of motions that all human beings could observe in the sky gave testimony to

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<sup>240</sup>Psalm 19: 1-6 read, "The heavens declare the glorie of God, and the firmament sheweth the worke of his hands. Daie unto daie uttereth the same, and night unto night teacheth knowledge. There is no speache nor language, where their voyce is not heard. Their line is gone for the through all the earth, and their wordes into the ends of the worlde: in them hathe he set a tabernacle for the sunne. Which commeth forthe as a bridegrome out of his chambre, and rejoyceth like a mightie man to runne his race. His going out is from the end of the heaven, and his compas is unto the ends of the same, & none is hid from the heate thereof."

<sup>241</sup>CO 31 Col. 194.

<sup>242</sup>CO 31 Col. 195.

God's glory.<sup>243</sup> Calvin argued that the heavens' careful arrangement and controlled motions through the natural order had a direct effect on how long human beings experienced day light on the earth.

The influence of the celestial bodies did not end with their causing of the day and the night. In his commentary and sermon on Genesis 1:14-16 and his lecture on Jeremiah 10:1, Calvin argued that the arrangement of these stars and planets and their uniform motions had a direct effect on the terrestrial realm, extending the influence of the planets and their motions according to the natural order throughout the entire universe. Both this commentary and this lecture involved a careful explanation of how the planets could act as signs for people who dwelled on the earth. As we saw in the first chapter, Calvin's commentary on Genesis 1:14-16 explained how God had fashioned the sun and the moon to act as instruments to dispense light and heat to the earth, even as God remained the first cause of this heat and light.<sup>244</sup> Calvin also drew on these verses to describe how the perpetual, orderly motions of the sun and the moon affected the earth. According to him, Moses claimed that the course of the sun and the moon directly caused night and day, months, years, and seasons on the earth and could therefore act as signs of these and these only. For example, the seasonal changes as well as the heat that the sun's motion provided during the day had a direct influence on the earth's agriculture. As Calvin explained, the motions of the sun and the moon caused the vernal season when the sun came close enough to the earth to heat it. This allowed people to grow food. The rotation of the sun and the moon were also useful for human civil organizations. They provided people with a way to number years and months, which allowed them to organize their societies precisely because

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<sup>243</sup>CO 31 Col. 195-196.

<sup>244</sup>See chapter one, pp. 35-36.

these rotations were so orderly and consistent.<sup>245</sup> In his sermon on these same biblical verses, Calvin very carefully distinguished this influence that the motions and the arrangement of the sun and the moon had from the ways in which other people historically had understood the planets and stars as signs. He first argued here that Moses had rightly called the sun and the moon signs of the day, the seasons, and months.<sup>246</sup> People tried to use the motions of the heavenly bodies to predict what would happen on the earth and in individual human lives. Calvin singled out princes, the royals, and the *plus grands* in particular whom the devil had entrapped with this art. He marked this as contrary to God and against all human beings.<sup>247</sup> The motions of the sun and the moon according to the natural order did have a direct effect on the earth in its seasons and in bringing the day and the night. These motions did not determine the future course of individual lives or other events on the earth. Understood carefully, the motions of the heavenly bodies could be useful signs to human beings because the natural order caused the planets and stars to move in such predictable, regular patterns.

Calvin made a similar distinction about the motions of the planets and stars as signs in his lecture on Jeremiah 10:2. Here Calvin again claimed that the motions of the planets and stars could influence the earth because of their regular motions and placement through the natural order, even as he carefully distinguished his opinion from those who taught that these motions could determine or cause anything that occurred on the earth directly without God as its first cause. In doing so, Calvin depicted how the motions of the planets caused particular season more clearly. This verse recounts God's command through Jeremiah to the people of Israel that they

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<sup>245</sup>CO 23 Col. 21.

<sup>246</sup>SC XI/1, 36.

<sup>247</sup>Ibid.

should not learn the ways of the heathen nor be afraid of the signs in heaven.<sup>248</sup> Commenting on this verse, Calvin first pointed out that it seems to contradict Moses' injunction in Genesis 1:14 that the stars in the firmament and the planets should be signs.<sup>249</sup> He argued that Jeremiah did not use the word, "sign," here in the same sense that Moses had meant it in Genesis. As he had in his commentary and sermon on Genesis 1:14-16, Calvin claimed here that the sun and the moon along with the fixed stars were signs of the months and years as well as the seasons according to the natural order. The moon's motion was a sign of the months, while the sun's was the sign of the year. When the sun moved through the twelve signs of the Zodiac, it also signified the seasons as it came closer to and moved further away from the earth. In contrast to this understanding of the planets and stars as signs according to the regular, uniform motions according to the natural order, Jeremiah condemned those who tried to use the planets and stars to determine the fate of all nations and the lives of individual human beings.<sup>250</sup> Providing a fuller description of the way the sun moved through the various houses of the Zodiac to cause particular seasons, Calvin again claimed that the natural order that propelled celestial motions had some direct effects on the earth. These bodies moved in certain, predictable patterns that affected human agriculture and civil society, though Calvin strongly denied that these planets and stars could determine or even shape the courses of nations or individual human lives. The natural order simply did not have this much influence over the earth.

The relationship Calvin posited between the heavens and the earth as he wrote about celestial influence also provides insight into how he viewed the arrangement between the

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<sup>248</sup>Jeremiah 10:2 reads, "Thus saith the Lord, Learn not the way of the heathen, and be not afraide for the signes of the heaven, thogh the heathen be afraide of suche."

<sup>249</sup>CO 38 Col. 58.

<sup>250</sup>CO 38 Col. 59.

superlunary and sublunary realms as a whole. While Calvin claimed that the stars remained fixed in the firmament and that God had restrained the planets within their courses so that they moved with uniform motions, affecting the earth's seasons and the changes of days into nights, he also claimed that the earth remained at rest at the center of the universe. For Calvin, this is how God had fashioned the universe as a whole during the process of creation. There has been much debate among scholars about whether Calvin knew of Nicolaus Copernicus's *De revolutionibus orbium coelestium* (1543) and its argument for a heliocentric universe.<sup>251</sup> Calvin never cited Copernicus directly by name.<sup>252</sup> In his works, though, he argued repeatedly for a universe in which the earth remained at rest in the center of the world. His sermon on 1 Corinthians 10:19-24 is an excellent example.<sup>253</sup> Perhaps singling out those whom he judged to have misused their

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<sup>251</sup>The more recent iteration of this argument began with Edward Rosen's "Calvin's Attitude toward Copernicus," *Journal of the History of Ideas* 21 (1960): 431-441 and Joseph Ratner's response, "Some Comments on Rosen's 'Calvin's Attitude toward Copernicus,'" *Journal of the History of Ideas* 22 (1961): 382-385. Rosen responded to this with "Reply to Dr. Ratner," *Journal of the History of Ideas* 22 (1961): 386-388. Whereas Rosen claimed there was no evidence that Calvin had even heard of Copernicus, Ratner argued that Calvin's silence on the subject was not proof that he had not heard of Copernicus. Richard Stauffer's "Calvin et Copernic," *Revue de l'histoire des religions* 179, no. 1 (1971): 31-40 responded to this debate by bringing forth the evidence of Calvin's eighth sermon on 1 Corinthians 10:19-24 in which Calvin clearly rejected heliocentric theories as evidence for Calvin's knowledge of Copernicus' work. Pierre Ch. Marcel, "La Légende ou les Faits? La Science et l'Astronomie chez Calvin," *La Revue Réformée* 31 (1980/1981): 14-36 cited Calvin's obvious respect for astrology and astrologers, and posits that perhaps Calvin only heard of Copernicus and his followers in 1556 as he was writing his sermons on 1 Corinthians. According to Marcel, Calvin would have been unable to assess the mathematical merits of Copernicus' theory because he lacked technical mathematical education. More recent scholars have set aside the question of whether Calvin knew Copernicus's work and have explored other facets of his exegesis of 1 Corinthians 10:19-24. See for example, R Hooykaas' "Calvin and Copernicus," *Organon* 10 (1974): 139-148 and Christopher B. Kaiser's "Calvin, Copernicus, and Castellio," *Calvin Theological Journal* 21, no. 1 (1986): 5-31. With the exception of Stauffer's work, these articles have been collected in *Calvin and Science*, ed. Richard C. Gamble (New York: Garland Publishing, Inc, 1992).

<sup>252</sup>Beginning in the nineteenth century, it became commonplace to attribute the question, "Who will venture to place the authority of Copernicus above that of the Holy Spirit?" directly to Calvin and his commentary on Psalm 93:1. This false attribution continues to be present in popular culture as well as contemporary scholarship. See Rosen, "Calvin's Attitude toward Copernicus" for a discussion of this attribution and its continued influence.

<sup>253</sup>1 Corinthians 10:19-24 read, "What say I then? That the idole is any thing? Or that which is sacrificed to idoles is any thing? Nay, but that these things which the Gentiles sacrifice, they sacrifice to devils, and not unto God, and I wolde not that the shulde have a felowshippe with the devils. Ye can not drinke the cup of the Lord, and the cup of the devils. Ye can not be partakers of the Lords table and of the table of devils. Do we provoke the Lord to anger? Are we stronger then he? All things are lawful for me, but all things are not expedient: all things are lawful for me, but all things edifie not. Let no man seke his owne, but everie man anothers wealth."

Christian liberty,<sup>254</sup> he claimed that people who argued for a universe in which the sun was at rest at its center and the earth moved around this sun were fanatics, who perverted the truth. These people blinded their own eyes to the order of nature so much so that if you showed them white, they would say that it was black and vice versa. Calvin went so far as to claim that God had placed such stark raving mad people before other human beings as a mirror so that they could learn to stay inside the fold and to fear him.<sup>255</sup> Though Calvin did not specifically condemn Copernicus in this sermon, his condemnation of anyone who argued for a heliocentric universe would have also included him. For Calvin, the earth was the immobile center of the world. He labeled anyone who argued otherwise as a fanatic because this was not the way God had structured the world. For him, when the stars and the planets moved and affected the sublunary realm with their uniform motions according to the natural order, this influence flowed from the planets and stars located in the heavens toward the immobile earth at the center of the universe.

Calvin's many descriptions of the earth, which, he claimed was at the center of the universe, allows us to explore his understanding of the relationship among the heavens, the natural order, and God more fully. Though he argued that God had given celestial bodies

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<sup>254</sup>Kaiser argues in his "Calvin, Copernicus, and Castellio" that there is no evidence to suppose Calvin directly responded to Copernicus or his followers in this sermon. Instead, Kaiser claims that Calvin was answering those he viewed as libertines and skeptics such as Sebastian Castellio who, Calvin believed, perverted the truth, using Cicero's *Academica* as a model with which to condemn these libertines and skeptics.

<sup>255</sup>Calvin scholars and those scholars interested in relationship between science and religion have debated this passage at some length. It reads, "Et ne soyons pas semblables à ces fanatiques, qui ont un esprit d'amertume et de contradiction, pour trouver à redire par tout, et pour pervertir l'ordre de nature. Nous en verrons d'aucuns si frenetiques, non pas seulement en la religion, mais pour monstrier par tout qu'ils ont une nature monstrueuse, qu'ils diront que le soleil ne se bouge, et que c'est la terre qui se remue et quelle tourne. Quand nous voyons de tels esprits, il faut bien dire que le diable les ait possédez, et que Dieu nous les propose comme des miroirs, pour nous faire demeurer en sa crainte. Ainsi en est'il de tous ceux qui debaten par certaine malixe, et ausquels il ne chaut d'estre effrontez. Quand on leur dira, Cela est chaut. Et non est (diront-ils) on voit qu'il est froid: quand on leur monstrera une chose noire, ils diront qu'elle est blanche, ou au contraire: comme celui qui disoit de la neige qu'elle estoit noire. Comme ainsi s'out qu'on apperçoit sa blancheur, laquelle est assex cogneu de tous, encores y voiloit il contredire manifestement. Mais voyla comme il y a des forcenez qui voudroyent avoir changé l'ordre de nature, mesmes avoir esblouy les yeux des hommes, et avoir abruti tout leur sens." CO 49 Col. 677.

particular dispositions and specific arrangement as seen in their orderly arrangement and uniform motions, Calvin also credited God repeatedly for directly and actively upholding this universe and the natural order through which the planets moved and affected the sublunary realm in his discussions of the heavens. In his commentary on various Psalms in particular, he praised God for holding up the immobile earth at the center of the universe.<sup>256</sup> We see this first in his commentary on Psalm 75:3.<sup>257</sup> This verse describes God's establishment of the pillars on which the earth rests. According to Calvin, whereas other exegetes had applied this verse to Christ and what would occur on the earth at his arrival, he applied it strictly to the natural world. He argued that God directly upholds the earth as with his hands. Pointing out that the earth was at the center of the universe, he explained that the earth did not rest on firm foundations there. Instead, it hung in the middle of the air. The natural state of the earth was to dangle in the air with God alone to support it.<sup>258</sup> God's relationship to the earth showed that he did not just provide the planets and stars with a natural order and leave them to follow it. Instead, he was actively involved in upholding all aspects of the universe even into the present day.

Calvin combined this focus on God's upholding of the earth at the center of the universe with God's direct involvement in the uniform motions of the heavens in his commentary on Psalm 93:1.<sup>259</sup> Once again, his comments on this verse show that God took an active role even in the perfectly arranged and perpetually moving heavens whose motions affected the terrestrial

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<sup>256</sup>On this motif in Calvin's works, see Schreiner, *The Theater of His Glory*, 22-30 and her "Creation and Providence," 270-271.

<sup>257</sup>Psalm 75:3 reads, "The earth and all the inhabitants thereof are dissolved: but I wil establish the pillars of it. Selah."

<sup>258</sup>CO 31 Col. 702.

<sup>259</sup>Psalm 93:1 reads, "The Lord reigneth, & is clothed with maiestie: the Lord is clothed, & girded with power: the worlde also shalbe established, that it can not be moved."

realm according to the natural order. He began his commentary on this verse with the motions of the heavens. He underscored their daily rotations and the magnitude of these revolutions. According to him, it was astounding that people did not experience any disturbance from the planets' uniform motions as they dwelled on the earth despite its speed. The sun also varied its revolution on a diurnal basis, but it always returned to the same point as all the planets maintained their positions. God alone was responsible for restraining the sun and for these quickly rotating heavens. Calvin returned to the location of the earth at the center of the universe to underscore God's activity within the world. Much as he had in his commentary on Psalm 75:3, he pointed out that the earth hung in the midst of air, and that only God upheld it. God not only upheld the earth. He also kept it from moving when the rest of the heavens rotated rapidly and constantly around it.<sup>260</sup> God had arranged the universe in a specific way during the process of creation and continued to uphold it so that rapid, even threatening planetary revolutions did not disturb the earth and so that the earth remained immobile at the center of the universe even as it hung in the air.

His comments on Psalm 104:5 made God's active involvement in the universe even in the noble heavens explicit.<sup>261</sup> Again, Calvin pointed out that the earth hung in the midst of the air and only God's active support of the earth could uphold it. In this particular commentary, he introduced the element of water to further underscore the importance of God's active support for the earth and the heavens that surrounded them. Rather than claiming only that the earth hung in the midst of the air as he had in his commentary on Psalm 75:3 and Psalm 93:1, he here stated that pillars of water supported it within this air. Calvin considered this a wonder that God's power alone had caused. Assuming that the earth rested on these pillars of water, Calvin

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<sup>260</sup>CO 32 Col. 16-17.

<sup>261</sup>Psalm 104:5 reads, "He set the earth upon her fundacions, so that it shal never move."

explained that the natural place of water should be to flood the earth. Therefore, water's natural disposition alone could not explain why there was dry land for people to live on. All credit must be given to God.<sup>262</sup> Calvin then followed this assertion of God's directly supporting the earth in the air and his restraint of the pillars of water with an assertion that God was actively involved in the universe. Here he claimed that since God had created the world, the whole order of nature depended on God's decree through which each element received its specific properties.<sup>263</sup>

His sermon on Job 26:7 also made this direct connection between God and the behavior of the created universe according to its natural order. As Calvin explained the rotation of the firmament around the poles of the North Star and the Antarctic, he again brought up the location of the earth and how it currently hung in the air. Calvin juxtaposed Job who claimed that this occurred through the majesty of God with those philosophers who attributed earth's position to the order of nature alone.<sup>264</sup> Once again, he argued that there was a natural order that people could especially observe in the heavens. People must also realize God's power and majesty was responsible for directly sustaining the universe. His description of the earth's placement relative to the heavens in his commentary on these various Psalms and in his sermon on Job 26:7 show that Calvin taught God's active involvement was essential for how this aspect of the created universe behaved. Though the planets, stars, and the earth may function through the dispositions and the arrangements God had given them during creation, Calvin also claimed that God was actively involved in upholding this natural order even after God had fashioned the celestial bodies. If God were not, Calvin argued that the entire universe would collapse.

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<sup>262</sup>CO 32 Col. 86.

<sup>263</sup>Ibid.

<sup>264</sup>CO 34 Col. 430.

God's active involvement in the universe did not just end with his upholding of the motions and the locations of the planets and stars for Calvin. He also claimed that God was directly implicated in the ways in which these heavenly motions and arrangements affected things on the earth. He made these arguments especially in the context of how the sun and the moon could be signs in his lecture on Jeremiah 10:2 and his sermon on Genesis 1:14-19. In both works, he claimed that God had instilled a natural order in the heavens so that motions of the sun and the moon were signs of day, night, the years, months, and seasons. He also explained that these signs would have great utility for agriculture and civil society precisely because those motions were so regular. Despite this insistence on the significance of the natural order in both his lecture and his sermon, Calvin ultimately gave credit to God for directly upholding and governing the seasonal changes and the change from day into night. In his lecture on Jeremiah 10:2, he did so by indicating God's direct control over the course of the sun and the moon to cause the seasons. Calvin pointed out that God varies the seasons even though the sun and the moon were signs of these changes. After all, no two winters or springs were exactly the same, and each year was also different than those that preceded and followed it. God's government of the course of the sun, moon, and stars also had a direct effect on the earth as Calvin claimed that God could use these celestial motions to cause drought and disease on the earth.<sup>265</sup> He made a similar argument in his sermon on Genesis 1:14-19 as he described how the sun and the moon presided over the day and the night. Calvin argued here that God had ordained this course for the sun and the moon.<sup>266</sup> Therefore, God was actively involved in the natural order that people witnessed in the planets' motions and experienced when day alternated with night.

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<sup>265</sup>CO 38 Col. 60.

<sup>266</sup>SC XI/1, 34.

As he had in the 1559 *Institutes*, Calvin described the characteristics of the heavens in many of his other works. These comments provide a window into his conception of the relationship among the heavens, the natural order, and God and the created universe more broadly. For Calvin, the heavens were the best example of the natural order God had infused into the universe. He emphasized the variety of the stars and their fixed positions in the firmament, the orderly arrangement and the perpetual, uniform motions of the firmament and the planets, and these motions' effects on the sublunary realm with the earth at its center to describe and explain this natural order. Calvin's comments on these characteristics of the heavens also reveal that he did not view this natural order as independent from God's activity in the world. God directly upheld the universe he had created during the process of creation. God was actively involved with the universe he had made as he restrained the planets so that they followed the natural order and upheld the earth as it hung, immobile, in the midst of the air and of the rapid planetary motions even as it rested on pillars of water.

Calvin's descriptions of the superlunary realm and his conception of the relationship among the heavens, the natural order, and God resonated in many ways with descriptions of the heavens and of this relationship in contemporary natural philosophical texts. As we have seen, these masters separated sharply between the heavens and the sublunary realm. They taught that natural bodies on the earth generated and were corrupted as well as moved with linear motions. In contrast to this, incorruptible and ingenerable ether composed the heavens, and the planets and sphere of the fixed stars moved with uniform, circular motion according to the natural order. Calvin's comments about the heavens stressed many of these same features. Though he did not describe the materials out of which God had fashioned the heavens, he repeatedly stressed their wonderful variety and their ordered, uniform motions according to the natural order. His

comments on Psalm 19:1-6 in particular resonate strongly with what these masters taught about the heavens. Much as these masters had explained in their works, Calvin here argued that the heavens were the noblest aspect of God's creation, and he pointed to their wonderful arrangement and their ordered, uniform motions to explain this nobility.

Despite these resonances, these masters' diverse explanations of the relationship among the heavens, the natural order, and God in their discussions of how celestial bodies moved and of whether and how these motions affected the sublunary realm as well as Calvin's emphasis on God's active upholding of the natural order of the heavens suggest that they did not have the same notion of this particular natural phenomenon or even of the created universe more broadly. The question of the celestial bodies' influences on the lower realm provides us with a way to explore their understandings of the relationship among the heavens, the natural order, and God in more detail. As we saw above, Calvin claimed that the planets and stars could act as signs for the years, days, nights, months, and seasons. He discussed further effects celestial bodies had on the terrestrial realms in many of his other works. This topic appears to have been of particular interest to him. In 1549, for example, he had written an entire treatise on astrology—his *Advertissement contre l'astrologie judiciaire*. These masters also included further descriptions of these effects whether in their discussions of the heavens or in separate sections labeled, “astrology.” These discussions of celestial influences included assumptions and even direct descriptions of the natural order displayed in the heavens and of God's relationship to this aspect of the created universe. Exploring the resonances and clashes among these discussions and their depictions of the relationship among the heavens, the natural order, and God allows us to analyze how Calvin and these masters viewed the created universe more broadly.

### Calvin and Sixteenth-Century Masters on the Influence of Celestial Bodies

Calvin and these masters shared the notion that the motions and the disposition of celestial bodies affected the sublunary realm. They offered different explanations both of how these celestial bodies did so and of the specific effects they could have in the terrestrial realm because they did not share the same conception of the relationship among the heavens, the natural order, and God. Describing celestial influences, Calvin and these masters touched on a topic that Christian scholars had debated since antiquity. There were traditionally two loci of these debates – whether the celestial bodies had effects on the earth so that one could actually make predictions about the events on the earth and individual human lives based on the study of celestial motions and whether it was pious for Christians to do so. Influentially, Augustine of Hippo had answered “no” to both questions in book five, chapter seven of the *City of God*.<sup>267</sup> The stars neither influenced individual human lives in the way that some people claimed, nor was it permissible for a pious Christian to believe such a thing. Though many authors in the middle ages carefully noted Augustine’s claims, some continued to debate just how much influence the celestial bodies had on the terrestrial realm, the characteristics of this influence, and whether it might be permissible for Christians to explore some aspects of this influence and not others. The publication of Giovanni Pico della Mirandola’s *Disputationes adversus astrologiam divinatricem* in 1496 brought the question of the celestial bodies’ influence once again to the forefront of discussions about the heavens just prior to the period in which Calvin and these masters wrote. Mirandola’s treatise argued strongly against the notion that one could make predictions based on the motions of celestial bodies. His nephew, Gian Francesco Pico, claimed that Mirandola did so to safeguard God’s active government of the world apart from the heavens.

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<sup>267</sup> Augustine of Hippo, *The City of God against the Pagans*, ed. G. E. McCracken, Loeb Classical Library (Cambridge, MA: Harvard University Press, 1957-1972), 5.VII.

The publication of this treatise created a large debate between those who sided with Mirandola and those who claimed that one could make some predictions based on celestial motions and that such predictions were not diabolical.<sup>268</sup> As Gian Francesco Pico's comments on his uncle's work suggest, these debates about celestial influences directly included both notions of the natural order as well as God's relationship to the created universe more broadly. What Calvin and these masters had to say about these influences therefore sheds light on their conceptions of the created universe as well as on the relationship between sixteenth-century theology and natural philosophy.

Calvin described the influence of the celestial bodies on the lower realm and how Christians should understand these in his numerous discussions of astrology and its ability to teach people about the created universe. As we saw in the first chapter, Calvin closely associated the purposes of natural philosophy with that of astrology. He argued in the 1559 *Institutes* that they both were meant to teach people about the world God had created.<sup>269</sup> His lecture on Jeremiah 10:2 made this connection between astrology and knowing the created universe even more specific. Describing Egyptian and Chaldean astrologers, Calvin argued here that they had practiced this art in a praiseworthy manner. In observing the heavenly bodies, they considered the miracle of the created world and God's power, wisdom, and goodness so much so that Calvin explained that astrology could be called the alphabet of theology with some merit.<sup>270</sup> There was a correct and an incorrect way to understand these influences, though, and Calvin's description of

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<sup>268</sup>On debates about the appropriate content and the legitimacy of astrology among Renaissance scholars, see Eugenio Garin, *Astrology in the Renaissance: The Zodiac of Life*, trans. Carolyn Jackson, June Allen, Eugenio Garin, and Clare Robertson (London: Routledge, 1983, reprint New York: Arkana, 1990) and Anthony Grafton, *Cardano's Cosmos: The Worlds and Works of a Renaissance Astrologer* (Cambridge, MA: Harvard University Press, 1999).

<sup>269</sup>CO 2 Col. 42.

<sup>270</sup>CO 38 Col. 58-59.

them provides insight into his understanding of the relationship among the heavens, the natural order, and God. For him, the natural order did cause the heavens to move in a certain way so that they could signal the day and night, the seasons, the years, and the month. This natural order was not entirely responsible for the heavens' influence, though. Governing and changing the seasons as it pleased him,<sup>271</sup> God ultimately caused these celestial influences. For Calvin, this meant that people could not use the celestial bodies to predict the future course of events or individual human lives as certain astrologers claimed because the natural order was not solely responsible for these influences. He even explicitly argued against such astrologers toward the end of this lecture. Without denying the celestial bodies' influence on the lower realm, he continued to insist that God actively governed this influence and that claiming everything depended on celestial bodies' influence over the world as these astrologers did was to extinguish faith.<sup>272</sup> In this lecture, Calvin argued that there was a natural order in the heavens that could cause some effects in the terrestrial realm. He claimed, though, that God was ultimately responsible for these effects because God continued to be actively involved with the created universe.

Calvin had previously explored the topic of astrology more extensively in his *Advertissement contre l'astrologie judiciaire*. This work also depicted a similar relationship among the heavens, the natural order, and God even as Calvin offered more details about celestial influences than he had in his lecture on Jeremiah 10:2. Much as he had in this lecture, Calvin here argued that there was a difference between legitimate, natural astrology that aimed to understand the celestial bodies' motions and their effects on the lower realm, and judicial astrology that tried to predict the future course of events on the earth along with individual human lives. This division between legitimate and illegitimate astrology again depended on a

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<sup>271</sup>CO 38 Col. 59-60.

<sup>272</sup>CO 38 Col. 60-61.

proper understanding of the relationship among the heavens, the natural order, and God. Calvin's description of this legitimate astrology also insisted that there was a natural order in the heavens that God actively upheld and directed. He argued that "true astrology" was knowledge of this order or the dispositions God had provided for the planets and stars.<sup>273</sup> Calvin explained that celestial motions could have three different effects on the earth according to the natural order. First, he explained that God had made celestial motions responsible for governing the day, night, seasons, months, and years that had a direct effect on agriculture and civil society as he had in many of his other works.<sup>274</sup> Second, the course of the moon had a particular effect on bones and oysters. According to Calvin, the moon's motion caused oysters to fill and void as it had a similar effect on the marrow of bones.<sup>275</sup> Finally, Calvin also claimed that the planets and stars could affect the complexion of human bodies. In this way, the study of astrology was useful to the study of medicine.<sup>276</sup> Throughout his explanation of celestial influences, he stressed that God was ultimately responsible for the natural order and that this meant God continued to govern the heavens' influences. He then contrasted this natural astrology that explored the natural order of the planets that God continued to uphold with judicial astrology that claimed to predict the future of individual human beings and of the general state of the whole world.<sup>277</sup>

As Calvin refuted what he labeled foolish and blasphemous claims, he further explained how God related to the natural order through which the celestial bodies moved and affected the days and seasons, bones and oysters, and human bodies. Calvin granted to these *Messieurs les*

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<sup>273</sup>Calvin, *Advertissement contre l'astrologie judiciaire*, 53-54.

<sup>274</sup>*Ibid.*, 54.

<sup>275</sup>*Ibid.*, 56.

<sup>276</sup>*Ibid.*, 56-57.

<sup>277</sup>*Ibid.*, 57.

*Genethliaques* that the celestial bodies did have an effect on the world through the natural order. Still, God's active involvement with the world was never to be forgotten. Calvin pointed out that this order was neither the originator nor the main part of this influence. Instead, God's will was ultimately responsible for what happened in the universe.<sup>278</sup> Since God had instilled a natural order in the world at its creation that caused the celestial bodies to affect the lower realm, God had the final control over these motions and the created universe as a whole. Once again this meant that these judicial astrologers should not and even could not actually use celestial bodies to predict the future because the heavens did not govern the lower realm. Analyzing Calvin's comments on astrology, we find that his notion of this aspect of the created universe included both the natural order and God's active involvement in the world. He certainly taught the heavens had a direct effect on the lower realm and that this effect largely came through celestial bodies' motions and their dispositions according to the natural order. God's creation of and continual involvement in the heavens also meant that people had to acknowledge God's direct government over the heavens before they could understand the natural phenomena of the created universe, though. Calvin's notion of God as extremely active in the world he had created meant that there was more to the behavior of the heavens and of the universe than the natural order. Throughout his discussions of astrology, Calvin stressed God's direct government of everything in the created universe.

The relationship among the heavens, the natural order, and God depicted in Gregor Reisch's descriptions of astrology resonates with the one that emerges from Calvin's discussions

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<sup>278</sup>Calvin explained the relationship between the natural order and God's active upholding of it thus: "Or je confesse bien, suyvant ce que j'ay cy dessus traité, qu'entant que les corps terrestres ont convenance avec le ciel, on peut bien noter quelque cause aux astres des choses qui aviennent icy bas. Car tout ainsi que l'influence du ciel cause souvent les tempestes, tourbillons et temps divers, item les pluyes continuelles, ainsi, par consequent, elle amene bien la sterilité et les pestilences. Entant donc qu'on verra un ordre et comme une liaison du haut avec le bas, je ne contredy pas qu'on ne cherche aux creatures celestes l'origine des accidens que on void au monde, j'entends l'origine non pas premiere et principale, ainsi comme moyen inférieur à la volonté de Dieu, et mesme dont il se sert comme de preparatione pour accomplir son oeuvre, ainsi qu'il l'a deliberé en son conseil eternal." Ibid., 69-70.

of celestial influences. Reisch devoted the second treatise of his seventh book solely to the subject of astrology. Having discussed the composition, arrangement, and the motions of the celestial bodies in the first treatise on astronomy, Reisch divided the second treatise on astrology into six parts. The first covered the principles of astrology. The second focused on the conjunctions of the various planets and their effects on the lower realm. The third explored whether the arrangement of the celestial bodies at one's birth could determine one's life path. The fourth focused on false prophecies people had historically attributed to the heavens' motions. The fifth explored the planets' effects on the weather and the lower realm. The sixth and final part investigated whether one could make images to represent the constellations in order to draw down the power of those particular constellations.<sup>279</sup> Much as Calvin had, Reisch explained that the celestial bodies had an influence on the lower realm due to their motions, their dispositions, and the arrangements among them. He even described the planets' motions through the various signs or houses of the Zodiac at great length.<sup>280</sup> It was in the second part of this book that Reisch directly took up the question of whether and how the celestial bodies could affect the earth. Citing Augustine, he explained that the superior heavens did have an effect on inferior bodies.<sup>281</sup> He then proposed the rule that would determine how he judged the legitimacy of the following four aspects of astrology. Citing various theologians along with Scripture, he explained that celestial bodies may affect human bodies and other bodies on the earth but neither human minds nor human wills.<sup>282</sup>

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<sup>279</sup>Reisch, *Margarita Philosophica*, 1517, sig. vir.

<sup>280</sup>Ibid., sigs. vir-vvr.

<sup>281</sup>Ibid., sig. vvr.

<sup>282</sup>Ibid., sig. vvv.

Reisch applied this understanding of the celestial bodies' influence in his discussion of the following two aspects of astrology. These discussions in particular reveal how he viewed the relationship among the heavens, the natural order, and God. He did so first in a lengthy exploration of whether the arrangement of the stars at one's birth could affect the outcome of an individual's life. Though he ultimately concluded that this was a foolish claim, Reisch described the doctrine of those who supported such a claim at much length. For example, he explained in detail how astrologers typically forecasted an individual's life path through understandings of the planets' dispositions and their conjunctions in the various houses of the Zodiac.<sup>283</sup> Despite giving this in-depth description of how astrologers practiced their art, Reisch asserted that the stars could not control human lives at the end of each of these chapters. The natural order alone was not responsible for all that happened in the heavens and on the earth. When he turned to those aspects of the world that the celestial bodies did affect through their motions in the fifth part of his work, he insisted on God's government of the natural order. He first asserted that the heavens could have an effect on the humors of the human body and on the weather.<sup>284</sup> Citing Augustine, he claimed that this all ultimately occurred according to divine providence. The stars had no power to effect things on their own. Instead, God controlled all the things that took place on this earth.<sup>285</sup> Reisch's description of astrology provided a somewhat ambiguous account of God's relationship to the natural order and to the heavens. Though he did state that God's providence alone ruled everything that happened in the heavens and on the earth and that the stars and planets did not determine individual human lives much as Calvin had done, the sheer amount of information he presented on how astrologers made such predictions also provided a tacit

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<sup>283</sup>Ibid., sigs. vvir-xiiv.

<sup>284</sup>Ibid. sig. xiiiv.

<sup>285</sup>Ibid., sigs. xiiiv-xiiiir.

argument for the significance of the natural order to the motions of the heavens and their effects on the earth. Reisch's account ultimately juxtaposed an insistence on God's active government of the world through his providence and an implicit argument for the influence of the heavens through the natural order.

Though Calvin's account of celestial influences and his notion of the relationship among the heavens, the natural order, and God largely resonated with Reisch's, the descriptions of this relationship and of these influences Johann Velcurio and Frans Titelmans offered both resonated and clashed with those Calvin and Reisch advanced. Velcurio described the influence of the celestial bodies on the sublunary realm and how God and the natural order were responsible for this influence in the fifth chapter of his second book. This chapter dealt with the stars and their similarities and differences from planets. Velcurio took up the question of these celestial bodies' influence on the lower realm in the sixth part of this chapter. He started this section with the assertion that the heavens have an effect on the lower realm, and the rest of the section explored what type of effect this was and from where it came.<sup>286</sup> Velcurio's initial description of this influence emphasized that the disposition of each planet was responsible for these influences, thereby crediting the natural order for the effects these planets had on the earth. He taught that the planets' influence stemmed from the particular qualities of each planet because these qualities had a direct effect on the complexions of human bodies. Saturn caused a melancholy complexion, whereas Jupiter caused a sanguine one, for instance.<sup>287</sup> This insistence on the natural order's responsibility for celestial influences clashed with Reisch's and Calvin's accounts

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<sup>286</sup>Velcurio, sig. K7v.

<sup>287</sup>Ibid. This claim for Saturn's ability to cause melancholy had a long tradition. See Raymond Klibansky, Erwin Panofsky, and Fritz Saxl, *Saturn and Melancholy: Studies in the History of Natural Philosophy, Religion, and Art*, 2<sup>nd</sup> ed. (Nendeln: Kraus Print, 1979).

as they both emphasized God's active involvement in these influences. Velcurio did not end his discussion with this emphasis on the natural order alone, though, as he very carefully defined the planets' influence on the lower realm. Though he claimed that these planets' qualities could affect the complexions of human bodies, he argued that this did not impose necessity on individual human beings much as Calvin and Reisch had also argued. The planets could only incline (*inclino*) human minds to a particular effect and not bind their free wills.<sup>288</sup> Though the planets did have an influence on the earth through the natural order, this influence did not determine what occurred there. In making this argument about the influence of the planets, Velcurio also carefully explained how God related to these influences. He stressed that celestial influences occurred through the natural order that God had instilled in the planets at their creation. He explained that God as the first mover had given the planets their particular motions and their qualities. God also made it so that these motions and these qualities would have an effect on the lower realm.<sup>289</sup> For Velcurio, when the cold, dry nature of Saturn inclined an individual toward melancholy, the planet behaved as God had fashioned it during the process of creation. This emphasis on God as the first cause of planetary qualities both clashed and resonated with what Calvin and Reisch had argued. Though Velcurio also gave God the ultimate credit for the natural order that structured both celestial influences and the phenomena of the created universe as a whole as Calvin and Reisch had claimed, God's activity in the heavens was more circumscribed for Velcurio than it was for them. Whereas Calvin and Reisch claimed that God was actively involved in governing the heavens and controlling their limited influences on

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<sup>288</sup>“Quatenus coeli & stellae qualitates habent non quidem in se tanquam formas accidentarias, sed tanquam effectus & virtutes in corpora composita. Unde non consequitur statim, influentiam coelestem aliquid necessitatis imponere libero arbitrio aut animo hominis (ut valde prolixè disputat Picus Mirandulanus in verboso opere contra Mathematicos) nisi quatenus complexiones & qualitates corporum a coelis & stellis temperatae, inclinant animum ad hos vel illos effectus, ad has vel illas virtutes & vitia. Tametsi ergo inclinent stellae & astra, homini tamen non imponunt necessitatem aliquam.” Velcurio, sig. K8v.

<sup>289</sup>Ibid., sig. K7v.

the sublunary realm, Velcurio attributed these limited influences specifically to the secondary causes. Though God was ultimately responsible for these influences as their first cause, Velcurio claimed that this particular phenomenon of the created universe occurred through the natural order.

Titelmans' descriptions of celestial influences contained a similar notion of God's relationship to the natural order that caused them even as he argued that these influences were more extensive than Velcurio had claimed. Rather than including a separate discussion of astrology, Titelmans explored celestial influences in chapters twenty-one through twenty-three of his seventh book on the heavens and the earth. He described the influence of the planets on the earth as he explained the differences among the various planets. Titelmans argued that the celestial bodies did have an effect on the earth, and he claimed that the planets could even influence the direction of individual human lives according to the dispositions God had provided for them at their creation. His discussion of Saturn is a good example. Titelmans first described the properties of Saturn and then explained how these properties affected fetuses. According to him, Saturn was a masculine planet that had bad or malevolent and harmful effects. These properties allowed Saturn to control whether a fetus was born or died. Dominating the fetus during its eighth month, Saturn could cause the fetus' death. Titelmans contrasted this with the effects of Jupiter that acted as the font and giver of life in the ninth month.<sup>290</sup> For him, the disposition and the arrangement of the planets according to the natural order accounted for each planet's effects on each, individual fetus. Titelmans also argued this explicitly as he described another effect the celestial bodies could have on the lower realm. He explained that the very nature of the sun caused it to give off light that spread out to and affected the other celestial

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<sup>290</sup>Titelmans, sig. Niiiiv.

bodies in the heavens and other natural bodies on the earth.<sup>291</sup> For Titelmans, the natural order was responsible for the many influences the celestial bodies had on the earth.

He did not leave the influence of the heavens on the earth exclusively to the natural order, though. Titelmans carefully depicted God's relationship to the effects these planets had on the terrestrial realm much as Velcurio had done. He explained that God's most providential wisdom was actually responsible for establishing the dispositions of these planets so that they acted as intermediaries. Depending on its position, Mars was sometimes more or less harmful to people living on the earth, and God through his most providential wisdom and most wise providence controlled when this occurred. God even used the harmful influence of Saturn as an intermediary to deal with enemies and keep evil away from the living.<sup>292</sup> Titelmans invoked God's providence to explain the effects he claimed the celestial bodies had on the earthly realm. For him as for Velcurio, the particular dispositions God had given Saturn and the sun at their creation were responsible for the way Saturn affected fetuses and the way the sun's light spread throughout the heavens and the earth even if they described the effects of this influence differently. In following their dispositions, these celestial bodies acted as God's intermediaries so that Titelmans could claim everything in the heavens ultimately happened according to God's providence. For Titelmans much as for Velcurio, this aspect of the created universe functioned through the natural order that God had initially implanted in the universe and therefore that God continued to oversee.

Simon Brossier and Philipp Melanchthon both argued that celestial influences occurred exclusively through the natural order, proposing a different relationship among the heavens, God, and the natural order than Velcurio and Titelmans had. Their descriptions of these

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<sup>291</sup>Ibid., sig. Nvv.

<sup>292</sup>Ibid., sig. Niiiiir.

influences also clashed strongly with Calvin's and Reisch's as they argued both that the planets and stars had extensive influences on individual human lives and that the natural order was almost exclusively responsible for these influences. The 1536 edition of Simon Brossier's *Totius philosophiae naturalis epitome* did not include a separate discussion of astrology, though Brossier and the text's redactor, Rupeus, also assumed that the celestial bodies could directly affect the terrestrial realm in the seventh chapter on the heavens. His description of these effects is most similar to Titelmans' as Brossier claimed that the planets' dispositions could affect individual human bodies. There are differences between Brossier's descriptions of how these particular planetary dispositions affected the earth and those Rupeus added. Whereas Brossier assumed that these dispositions directly affected individual human lives, Rupeus' additions stressed the effects the planets could have on human beings' temperaments. Much as Titelmans had claimed, Brossier argued that Saturn was dry and cold whereas Jupiter was hot and humid, and Mars was fiery and dry.<sup>293</sup> These qualities meant that Saturn determined whether or not a fetus was born and born with a disabled body, that Jupiter helped restore bodies to more vigor and steadiness, and that Mars raised people's choler and bile.<sup>294</sup> Rupeus, on the other hand, added what the dispositions of each one of these planets did to particular humors in the body. According to him, Saturn affected one's black bile, while Jupiter affected the blood, Mars, the yellow bile, and Venus, the phlegm.<sup>295</sup> The impression both Brossier and Rupeus gave about celestial influences over human lives and human health strongly stressed the significance of the natural order. Neither mentioned God or God's providence as the governor of celestial influences

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<sup>293</sup>Brossier, sigs. gvir-gviv.

<sup>294</sup>Ibid., sig. gviv.

<sup>295</sup>Rupeus, sigs gviv-gviir.

as Velcurio and Titelmans had done. Instead, they credited only the dispositions that God gave the planets at their creation as part of the natural order for these celestial influences. For them both, this aspect of the created universe therefore acted as the natural order caused the heavens to behave.

Melanchthon embedded his discussion of the celestial bodies' influence in the context of his discussion of causes in the second book of the *Initia doctrinae physicae*. In doing so, he began his description of the heavens' influence on the sublunary realm with an explicit explanation of how God related to the order of nature that he had created and infused into the world. Melanchthon argued that God had two different types of actions in the universe he had fashioned. Whereas it was necessary to attribute some events to God's providence, others belonged to the natural order. Melanchthon explained further that God fashioned this second type of general action through secondary causes.<sup>296</sup> For Melanchthon, God had created the natural order, and the world functioned largely through its secondary causes.

This focus on the natural order continued as Melanchthon began to describe the influences of the celestial bodies on the lower, earthly realm. He first began with the topic that Velcurio and many of these other masters had. He argued that the arrangement of the stars could govern and affect the temperaments of human beings.<sup>297</sup> Melanchthon's verb usage signals that he taught the planets had an extensive influence on the terrestrial realm – especially when we compare it to Velcurio's. Whereas Velcurio wrote of how the stars could only incline (*inclino*) the mind toward something, Melanchthon claimed that these stars actually governed (*gubernari*) and varied (*variari*) human temperaments through their movements. This emphasis on the power

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<sup>296</sup>Melanchthon, sig. Q8v.

<sup>297</sup>“Verum est autem, stellarum positu gubernari & variari temperamenta.” Ibid., sig. R1v.

of the stars according to the natural order over the sublunary realm continued in his discussion of whether God had prohibited people from observing the motions and the affects of the celestial bodies. Melanchthon argued here that the existence of the natural order in the created world meant that the planets and their motions affected the earth and that people could explore these natural causes to make predictions about the future.<sup>298</sup>

Drawing on this understanding of how God had made the world, Melanchthon ultimately argued that there were four things that the celestial bodies could definitely influence through the natural order. He claimed that these celestial motions played a role in diseases, the temperaments of human beings and the inclinations and occurrences for single individuals, in the signification of good and evil, and in the political and economic events on the earth because the stars marked out the years, seasons, and days.<sup>299</sup> Though these other masters had cited the celestial influences on the temperaments of human bodies and on the day, night, seasons, months, and years, Melanchthon's descriptions of these four areas of influence show just how much more influence and regularity he attributed to the heavens and their natural order than Reisch, Velcurio, Titlemans, and Brossier had. Analyzing the heavens' effects on individual temperaments, Melanchthon claimed that the natural order was mostly responsible for this so that human temperaments, personal inclination, and outcomes were largely congruent with each other. As he went on to explain, the various conjunctions of planets at a person's birth helped determine how those with a bad temperament would be drawn either toward anger or desire (*libidio*).<sup>300</sup> The regularity of the natural order and the celestial bodies' effects on the earth through it also meant

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<sup>298</sup>Ibid., sig. S5r.

<sup>299</sup>Ibid, sigs. T2r-T4r.

<sup>300</sup>Ibid., sigs. T2v-T3r.

for Melanchthon that people could predict good and evil happenings because the celestial bodies signified them. Though there had been many abuses in this practice, Melanchthon explained that regulated teaching and divine assistance would help cure a good mind of these abuses.<sup>301</sup> The regularity of the natural order for Melanchthon meant that the heavens could determine something of what happened on the earth and that human beings could therefore use their knowledge of the heavens to predict some aspects of the future. Though he argued that God was responsible for the heavens' natural order, Melanchthon stressed much more than these other masters or Calvin had that this order was responsible for the natural phenomena of the created universe.

Since the circulation of Augustine's *City of God* and more recently during the debates Giovanni Pico della Mirandola's work had caused, the motions of the heavens, these motions' possible effects on the earth, and God's relationship to both these motions and these effects had become contested topics. These debates included conceptions of the natural order and God's relationship to the world he had created precisely because these were some of the important questions at issue. Each author whether Calvin, Reisch, Titelmans, Brossier, Velcurio, or Melanchthon, proposed his own notion of this relationship that correlated with his view of the created universe. Whereas Calvin and Reisch insisted that God remained actively involved with the heavens even as the motions of celestial bodies influenced the earth through the natural order, Brossier and Melanchthon argued that celestial influences occurred through the dispositions of and the arrangements among the planets according to the natural order. The accounts of Titelmans and Velcurio provided a middle ground. Though describing the characteristics and the extent of celestial influences differently, they both explicitly argued that God oversaw these influences either because he was the first cause of all secondary causes or because his providence

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<sup>301</sup>Ibid., sig. T3v.

ultimately controlled the world. Sharing the assumptions that the natural order and God's power to govern the universe were basic to that universe and the motions of its heavens, they offered diverse explanations of what caused these heavens to influence the earth.

These diverse explanations of the causes of celestial influences suggest that there were a variety of resonances and clashes among their broader views of the created universe. Though all these authors assumed that God had created the heavens, that he had fashioned them in a certain way, and that he had instilled them with a natural order, they explained and described how this natural phenomenon functioned differently. These different views of this relationship among the heavens, the natural order, and God had implications for how they all viewed the created universe. For Calvin, Reisch, and even Velcurio and Titelmans to a certain extent, God was actively involved in the created universe as he was ultimately responsible for the motions and the influence of the heavens, even if Calvin and Reisch emphatically argued for God's direct engagement with the universe more strongly than Velcurio and Titelmans had. In contrast, Brossier and Melancthon claimed that the natural order was directly responsible for these influences and for many of the natural phenomena of the created universe. This insistence on the significance of the natural order for the created universe clashed with Calvin's emphasis on God's active upholding of this order in the heavens and his direct involvement in celestial influences on the earth.

The example of the heavens suggests that there were many connections between natural philosophy and theology as university-educated authors described how and why any particular aspect of the created universe behaved the way that it did. It also suggests that there were possible tensions between them as Calvin and some of these masters focused on different aspects of the relationship among God, the created universe, and the natural order to explicate why and

how these celestial bodies influenced the sublunary realm. In the 1559 *Institutes* and in many of his other works, Calvin also wrote of God's relationship to the created universe in the context of his discussions of meteorological phenomena and of the behavior of water. Exploring these examples in Calvin's works alongside descriptions of them in these contemporary natural philosophical texts allows us to investigate these connections and these potential tensions between sixteenth-century theology and natural philosophy further.

## Chapter 4: Meteorological Phenomena

Iam potentia quam praeclavis speciminibus nos in considerationem sui rapit? Nisi forte latere nos potest cuius sit virtutis, infinitam hanc coeli ac terrae molem suo verbo sustentare; solo nutu nunc fragore tonitruum coelum concutere, fulminibus quidlibet exurere, fulgetris aerem accendere nunc variis tempestatum formis conturbare, eundem ipsum statim, ubi libuit, uno momento serenare...<sup>302</sup>

John Calvin, *Institutes of the Christian Religion* (1559)

Writing of the heavens in the 1559 *Institutes* and in his other works, Calvin stressed God's active involvement in the natural order that people observed there. His description of the meteorological phenomena of the created universe in this edition of the *Institutes* also underscored God's direct intervention in the world he had fashioned. Chastising people for ignoring the power of God's word as it sustained the boundless mass of the heavens and the earth, Calvin pointed to God's control over these meteorological phenomena to highlight this power. At one time, God shook the sky with thunder, sent forth scorching lightning, and set the air into a blaze. At another, he caused raging tempests in diverse forms, and all at once, when it pleased him, he calmed them in one moment. As God upheld celestial motions so that they determined the seasons and years, he also controlled thunder, lightning, and tempests.

Calvin's comments on these meteorological phenomena in the 1559 *Institutes* suggest that he connected them with the natural order and God's active upholding of it much as he had the heavens. For example, he here separated this thunder, lightning, and these tempests from the second type (*genus*) of God's works that took place beyond the ordinary course of nature (*praeter ordinarium naturae cursum*). According to Calvin, this second type of God's works included those through which God punished the wicked as well as chastised and provided for the

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<sup>302</sup>CO 2 Col. 45.

faithful.<sup>303</sup> In many of his other writings, though, Calvin equated meteorological phenomena with this second type of God's works. He specifically gave the example of the weather to describe this second type of work through which God chastised the faithful and punished the wicked in his 1545 polemical treatise against a group of French Libertines, *Contre la secte phantastique et furieuse des libertins qui se nomment spirituelz*.<sup>304</sup> Though he did not explicitly argue that God actively intervened in the universe to cause meteorological phenomena against the natural order in this polemical treatise, his inclusion of them here among the second type of God's works suggest that meteorological phenomena had a different relationship to the natural order than the heavens.

Reading Calvin's descriptions of meteorological phenomena alongside discussions of meteorology in contemporary natural philosophical texts allows us to investigate the relationship among them, God, and the natural order in Calvin's works as well as to explore further connections and possible tensions between sixteenth-century natural philosophy and theology. As we have seen in previous chapters, masters also wrote about the relationship among the created universe, its natural order, and God at some length, offering diverse explanations of how the natural phenomena of the created universe occurred. For example, even as their descriptions of the heavens' characteristics resonated strongly, these masters proposed different conceptions

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<sup>303</sup>“In secundo genere quoque operum eius, quae scilicet praeter ordinarium naturae cursum eveniunt, nihilo obscuriora se proferunt virtutum eius argumenta. Nam in administranda hominum societate ita providentiam suam temperat, ut quum sit erga omnes innumeris modis benignus ac beneficus, apertis tamen quotidianis indiciis, suam piis clementiam, improbis ac sceleratis severitatem declaret. Non enim dubiae sunt quas de flagitiis sumit ultiones; quemadmodum non obscure tutorem, ac etiam vindicem se innocentiae esse demonstrat, dum bonorum vitam sua benedictione prosperat, necessitati optulatur, dolores lenit ac solatur, calamitates sublevat, saluti per omnia consulit.” CO 2 Col. 46.

<sup>304</sup>“La seconde espece ou façon par laquelle Dieu opere en ses creatures, est qu'il les faict servir à sa bonté, iustice, et iugement, selon qu'il veut maintenant aider ses serviteurs, maintenant punir les mescheants, maintenant esprouver la patience de ses fideles ou les chastier paternellement. Ainsi quand il luy plaist de nous benir en abondance de biens, il pleut en la saison, il donne chaleur et beau temps par son soleil, et use de tous les autres moyens naturelx comme d'instrumens de sa benefiction. Quand il retire sa main, le ciel est comme d'airain et la terre comme de fer. Tellement que c'est luy qui tonne, que gelle, qui gresle, tempeste et cause la sterilité.” CO 7 Col. 187.

of how celestial bodies affected the sublunary realm, putting forward diverse notions of the natural order and God's relationship to the world in the process. These different conceptions of the heavens' influence on the earth suggest that these masters' explanations of the dispositions and the arrangements of the heavens and the earth that caused meteorological phenomena may have also clashed at certain points. Analyzing masters' descriptions and explanations of them, we gain further insight into their understandings of the created universe as well as their notions of the relationship among the created universe, the natural order and God even as these descriptions and explanations shed light on Calvin's own conception of this relationship and this universe.

### **Masters, Meteorology, and the Natural Order**

Typically viewed as the fourth treatise of his natural philosophical works, Aristotle's *Meteorology* provided sixteenth-century masters with a starting point for their descriptions of meteorological phenomena.<sup>305</sup> Though Philipp Melanchthon did not do so, Gregor Reisch, Frans Titelmans, Simon Brossier, and Johann Velcurio included long discussions of them in their works. A separation between the superlunary and the sublunary realms was a basic starting point in their discussions of meteorological phenomena much as it had been in their descriptions of the heavens. These masters all taught that meteorological phenomena both arose and took place in the sublunary realm. Change was the main characteristic of this realm as all natural bodies in it generated and decayed. It was from these changes within the four elemental spheres of the sublunary realm that meteorological phenomena arose. When these masters explored the natural order and God's relationship to the created universe in the context of meteorological phenomena, they described the ways in which the dispositions and the arrangements among God's creatures

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<sup>305</sup>On meteorology in the Renaissance, see S. K. Heninger Jr., *A Handbook of Renaissance Meteorology* (Durham, NC: Duke University Press, 1960, reprint New York: Greenwood Press, Publishers, 1968), and Craig Martin, *Renaissance Meteorology: Pomponazzi to Descartes* (Baltimore: The John Hopkins University Press, 2011).

caused aspects of the sublunary realm to change and the ways in which these changes caused specific meteorological phenomena.

Their discussions of meteorological phenomena did not encompass all aspects of the sublunary realm. Meteorology was only one of the subjects that these masters discussed when they described it. According to them all, the four elements of fire, air, water, and earth composed all things in the sublunary realm, though no element currently existed in its pure state. Instead, a mixture of the elements composed each sublunary natural body, and the ways in which these elements interacted within each natural body and among natural bodies were responsible for the generation and corruption characteristic of this realm.<sup>306</sup> Understanding a mixture of elements to compose all the things on the earth, these masters made a sharp distinction between perfect mixtures of these elements and imperfect mixtures of them. Whereas perfect mixtures composed the natural bodies of the earth, only imperfect mixtures could cause meteorological phenomena. Melanchthon gave a succinct definition of the two in the only mention he made of meteorology in his physics text. His description is similar to those found in the works of Reisch, Titelmans, Brossier, and Velcurio. According to Melanchthon, the difference between perfect and imperfect mixtures had to do with the type of alteration that had occurred in the mixture when the four elements came together to compose it. When there was a great alteration so that the mixture of the elements produced a new substance with a new form or a different natural body, then it was a perfect mixture. When the elements combined and only slight alteration took place in some of the substance's parts without creating a new and different form or a different natural body, then it was an imperfect mixture, causing things such as clouds and steam.<sup>307</sup> These

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<sup>306</sup>Reisch, *Margarita Philosophica*, 1517, sigs. tiir-tiiv; Titelmans, sigs. Liiiiv-Miv; Brossier, sigs. evv-fiiir; Velcurio, sigs. K8v-M1r; and Melanchthon, sigs. Z3v- a4v.

<sup>307</sup>Melanchthon, sig. b1v.

imperfect mixtures were only partial transformations of the elements and therefore did not have distinct substances.

These masters adopted the Greek word, *meteora*, to describe those imperfect mixtures out of which the meteorological phenomena of the sublunary realm arose.<sup>308</sup> There were many similarities among their accounts of these imperfect mixtures and their causes. According to all four men, a combination of celestial motions, sublunary vapors and exhalations, and the disposition of the air caused *meteora* to arise. As Velcurio explained, vapors and exhalations that occurred in the air or in the bowels of the earth brought about these *meteora*.<sup>309</sup> Brossier described these exhalations and vapors, the regions of the air, and their connections to celestial bodies more fully. According to him, exhalations were dry and hot whereas vapors were more dense, only warm, and humid. The influx of celestial bodies' influences and the sun's heat were responsible for raising these vapors and exhalations from the earth and the water into the air.<sup>310</sup> What type of meteorological phenomenon these vapors and exhalations caused depended on the disposition of the region of the air into which they rose. Dividing the air into three regions, Brossier explained that the upper most region was adjacent to the fire, and therefore it was perpetually hot. Neighboring the earth, the lowest region of the air was warm because it received reflections from the sun's rays that reverberated off the earth. The middle region of the air was the coldest region because it was adjacent to neither fire nor the earth.<sup>311</sup> As Reisch explained,

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<sup>308</sup>I use the Greek, *meteora* (singular: *meteoron*), throughout this chapter because the modern English, "meteor," does not carry the same meaning. Whereas sixteenth-century natural philosophers understood *meteora* to be imperfect mixtures that arose within the sublunary realm and caused meteorological phenomena, the modern English, "meteor," refers to a small body of matter from outerspace that enters the earth's atmosphere.

<sup>309</sup>Velcurio, sig. P2r.

<sup>310</sup>Brossier, sig. fvr.

<sup>311</sup>Ibid., sig. fiiiv-fiiiv.

depending on the characteristics of the vapor or exhalation and the qualities of the region of the air into which it went it went, a fiery, aqueous, or middle *meteoron* would occur. Fiery *meteora* included “plummet fire,” “burning taper,” “burning spear,” “little sparks flying out,” “assub ascending,” “assub descending,” “jumping she-goats,” “falling stars,” “fire going before one,” “flying dragons,” and other things of this kind. Aqueous *meteora* included hail, sleet, snow, rain, frost, dew, springs, and streams. Middle *meteora* included earthquakes and winds.<sup>312</sup> Though offering slightly different lists of specific *meteora*, Titelmans, Brossier, and Velcurio all shared with Reisch the notion that meteorological phenomena occurred in the sublunary realm due to its imperfect mixtures of the four elements and the celestial bodies’ influences on these mixtures.

These masters’ similar descriptions of the characteristics of meteorological phenomena continued in their explicit discussions of and implicit preconceptions about what caused them to occur. Whether discussing it directly or just describing these meteorological phenomena, these masters all shared the notion that secondary causes of the natural order were responsible for causing meteorological phenomena. Whereas Titelmans and Velcurio both explicitly addressed the relationship among God, the natural order, and causes of meteorological phenomena, Reisch, Brossier, and Melanchthon drew on presuppositions about the natural order’s existence as they described these phenomena. Titelmans’ description of their causes began with a contrast between the incorruptible heavens and the corruptible sublunary realm in the preface to his sixth book on imperfect mixtures and meteorological phenomena. Making this distinction, he specifically credited God for the generation and corruption of the sublunary realm as well as its

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<sup>312</sup>“Magister: Rursus autem si ista alterata fuerint multorum et in aere et terra apparentium cause erunt. Discipulus: Quot? Magister: Impressionum ignitarum aquosarum et medio modo se habentium. Ignitarum quidem: ut sunt iginis perpendicularis: candela accensa: lancea ardens: scintille evolantes: a subascendens: a subdescendens: capre saltantes: stelle cadentes: ignis procedes: draco volans: et que sunt huiuscemodi nature. Aquosarum autem ut sunt grando, grandulle, nix, pluvia, pruina, res fontes et flumina. Medio modo se habere videntur ventus et terremotus.” Reisch, *Margarita Philosophica*, 1517, sig. Bir.

meteorological phenomena. He argued that as long as God ordered it and when God ordered it, things on the earth would be born and would be corrupted. God also caused meteorological phenomena, and when it pleased him, they would cease.<sup>313</sup> Here Titelmans stressed God's direct causing of meteorological phenomena without mentioning the natural order. Though he did not explore it in this preface, his comments at the end of this sixth book on meteorology connected God's causation of meteorological phenomena with the natural order. He first argued that these meteorological wonders must be admired and that they must astound people. He then gave the credit for these to both God and the natural order. In doing so, he indicated that these meteorological phenomena actually occurred through secondary causes that God as the first cause had established. Commenting on the frequency of each *meteoron*, Titelmans explained that some occurred often and some infrequently just as the course of nature demanded and just as God, the author of nature, wanted and mandated.<sup>314</sup> This emphasis on God as the author of nature gave God the ultimate responsibility for the order of nature, while still crediting secondary causes for producing meteorological phenomena.

Velcurio offered a similar description of God's relationship to the natural order and meteorological phenomena as he discussed their causes. This description also built on his notion of the relationship between God as the first cause and those secondary causes that God had implanted in the universe at its creation to structure the natural order. Velcurio began by asserting that God was the primary cause of all things. Turning to the *meteora*, though, he explained that people must avoid general and remote causes and must turn to particular and

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<sup>313</sup>Titelmans, sig. Kiiv.

<sup>314</sup>“Haec sunt mirabilia magna admiranda atque stupenda, quae solis & astrorum virtute atque efficientia sive in coelo sursum sive in terram introrsum, sive super terram deorsum fieri quotidie conspiciamus: quaedam quidem frequentius, alia rarius, iuxta quod naturae cursus ex postulat, & iuxta quod author naturae Deus voluerit atque mandaverit.” Ibid., sig. Liiv.

proximate causes in order to understand from where they came. Though God was the primary cause of all things on the earth, Velcurio urged his readers to turn to the secondary causes of meteorological phenomena because these were more directly responsible for them. The rest of Velcurio's description focused on these secondary causes. For example, he argued that the efficient cause of these *meteora* was the motions, power, influence and qualities of the celestial bodies. These characteristics of celestial bodies raised from the earth vapors and exhalations that then provided the materials for the *meteora*.<sup>315</sup> Much as Titelmans had done, Velcurio also gave God the ultimate credit for causing meteorological phenomena because God, as the creator of the world, was the first cause of everything that took place in that world. As Titelmans had, Velcurio also claimed that the natural order – those dispositions and arrangements God had instilled in this created universe, was responsible for these meteorological phenomena. When it rained or snowed, or when the wind blew, all these *meteora* occurred through secondary causes.

In contrast to Titelmans and Velcurio, Reisch, Brossier, and Melanchthon did not discuss God's relationship to meteorological phenomena specifically. Their accounts suggest, though, that these three men also held views of the natural order that caused meteorological phenomena similar to those Titelmans and Velcurio had expressed. Melanchthon only discussed imperfect mixtures very briefly in his text within the context of his description of generation and corruption of natural bodies in the sublunary realm as he described how the particular dispositions of elements and mixtures caused substances to generate and decay. In contrast to this, Reisch and Brossier offered very similar descriptions of how meteorological phenomena occurred to those Titelmans and Velcurio advanced, even if they did not describe God's relationship to secondary causes explicitly in this context. Emphasizing the dispositions of the heavens and the earth as

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<sup>315</sup>Velcurio, sigs. P2r-P2v.

well as the arrangements between them, their accounts of how meteorological phenomena occurred also relied on similar presuppositions about the natural order.

We see this similar understanding of the natural order that caused particular meteorological phenomena in the descriptions of the causes of rain, winds, thunder and lightning, and earthquakes found in the works of Reisch, Titelmans, Brossier, and Velcurio. Drawing largely on Aristotle's *Meteorology*, their explanations of them relied on similar notions of the particular dispositions of celestial bodies, of the vapors and exhalations, and of the air as well as of the arrangement between the heavens and the earth to explain why a certain meteorological phenomenon occurred. In the case of rain, they all argued that the motions of the planets and stars would cause vapors to rise from the bowels of the earth or from water into the middle region of the air. When the region was cooler than the vapors, this would cause the vapors to swell up and condense into clouds. When the sun's heat compressed the clouds, this would cause it to rain.<sup>316</sup> According to all these men, wind did not come from vapors, though it arose through a process similar to that which produced rain. In contrast to rain, winds developed from the hot and dry exhalations that were in the bowels of the earth that the motions of celestial bodies drew out and that then moved laterally around the earth. Wind's motion also had to do with the relative coolness of the middle region of the air and the heat of the air surrounding the earth. Wind rose from the earth into the middle region of the air. Its coldness sent the wind back down toward earth, and its own warmth sent it back up to the air again. This heat and running into other exhalations kept the wind moving laterally across the earth.<sup>317</sup> Unlike rain and winds, these

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<sup>316</sup>Reisch, *Margarita Philosophica*, 1517, sig. Biiir; Titelmans, sig. Kvv; Brossier, sigs. fviv-fviir; and Velcurio, sigs. P8r-P8v.

<sup>317</sup>Reisch, *Margarita Philosophica*, 1517, sigs., Bvir-Bviv; Titelmans, sigs. Kviiv-Kviiiir; and Velcurio, sigs. R3v-R5v.

masters described thunder and lightning as developing from a combination of vapors and exhalations. According to them, both occurred when a cloud ruptured. When the power of the sun and stars raised a vapor into the middle region of the air and an exhalation made it all the way up into the same region, the vapor would thicken and form a cloud around the exhalation. When the exhalation became too warm, it would push against the side of the cloud and alight until it ruptured the cloud. When a higher such cloud squeezed a lower one, then the exhalation in the lower cloud would alight after it had ruptured the cloud, causing thunder and lightening.<sup>318</sup> Earthquakes provided a similar example but within the bowels of the earth. Even when vapors were trapped inside the bowels of the earth, the heat of the sun warmed them during the day, and they were cooled due to the lack of sun during the night. Seeking an exit from the earth, these vapors shook the earth and sometimes even broke it open.<sup>319</sup> As these masters wrote about rain, wind, thunder and lightning, and earthquakes, they all relied on similar notions of the dispositions of vapors, exhalations, and the air as well as the arrangement between the heavens and the earth. They all assumed that the dispositions God had given the heavens and the earth as well as the arrangements between them he had established during creation were responsible for the meteorological phenomena human beings witnessed and experienced while dwelling on the earth. All of these men depicted these secondary causes in a similar fashion as they explained why certain meteorological phenomena occurred at particular times and not others.

We see the centrality of this notion of the natural order as an explanation for what caused meteorological phenomena in Reisch and Velcurio's discussions of meteorological prognostication. For example, the connection between the natural order and meteorological

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<sup>318</sup>Reisch, *Margarita Philosophica*, 1517, sigs. Bviv-Bviir.; Titelmans, sigs. Kviiiv-Lir; Brossier, sigs fviir-giv; and Velcurio, sigs. R6r-R6v.

<sup>319</sup>Reisch, *Margarita Philosophica*, 1517, sigs., Bvv-Bvir; Titelmans, sigs. Kviiir-Kviiiv; Brossier, sigs fviir-giv; and Velcurio, sigs. R5r-R5v.

phenomena was foundational for Reisch's description of comets and whether and how they could act as signs of war, sterility, and the death of princes.<sup>320</sup> He offered two different explanations for this particular meteorological phenomenon. Both of these explanations drew on assumptions about the existence of the natural order of the created universe and how it caused meteorological phenomena. Reisch first asserted that comets came from a hot, dry, fatty, and sticky terrestrial exhalation that the power of celestial bodies raised to the highest region of the air. This region bordered the fire, and when this particular type of exhalation rose into it, the fire set the exhalation aflame, producing a comet.<sup>321</sup> This particular explanation relied on preconceptions about the fixed arrangements between the heavens and the earth as well as the disposition of fire to explain the production of comets. Whereas the arrangement between the celestial bodies and the earth raised a particular type of exhalation to a particular region of the air, the characteristics of fire lit this exhalation to cause a comet. The second explanation also drew on notions of the natural order, even as it focused on different arrangements and dispositions. Reisch explained here that some philosophers offered a different view of comets. These philosophers taught that they came from a subtle exhalation that was not on fire but rather shined with the light of the sun and the moon it had incorporated into itself. The action of the stars caused these exhalations to generate in the bowls of the earth especially when the earth's pores were cold. It escaped the earth when heat relaxed these pores. The exhalation was not raised at once, but gathered piece-by-piece into the air, and the comet then expired when the original exhalation ceased to nourish it.<sup>322</sup> Again, the arrangement between the heavens and the earth were essential to explain comets

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<sup>320</sup>Reisch's notions of the causes of comets and prognostication based on them had a long tradition. See Sara J. Schechner, *Comets, Popular Culture, and the Birth of Modern Cosmology* (Princeton, NJ: Princeton University Press, 1997).

<sup>321</sup>Reisch, *Margarita Philosophica*, 1517, sig. Cir.

<sup>322</sup>Ibid.

for these philosophers as well, though they offered a more complicated view of this arrangement than Reisch's initial description of them had. In this explanation, the exhalation did not rise immediately from the earth, but rather the bowels of the earth nurtured it until the stars caused the earth to release the exhalation in pieces. The particular disposition of this exhalation also accounted for how long the comet would endure because it would disappear when there were no further parts of the exhalation to nourish it.

His emphasis on the importance of the natural order for the explanation of meteorological phenomena continued as he discussed what these comets could signify. Arguing that comets could signify sterility, pestilence, and sedition,<sup>323</sup> Reisch explained that comets only did so because of the dispositions of the natural bodies in the heavens and on the earth and the arrangements among them. We see this emphasis on the natural order first in the case of sterility. He explained that sterility occurs whenever there are hot and dry conditions, and these were precisely what preceded and followed a comet.<sup>324</sup> The regularity of the natural order allowed people to use comets to predict sterility because the same type of exhalation that caused it was also responsible for comets. The established arrangements between the earth and the celestial bodies also explained why pestilence often followed comets. According to Reisch, when the exhalations that form comets developed, other impure and poisonous exhalations developed along with them. These impure and poisonous imperfections infected the air, harming human beings in general and seemingly princes in particular perhaps because the impure air affected their delicate and intemperate bodies more than other people's bodies.<sup>325</sup> The disposition of

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<sup>323</sup>Ibid.

<sup>324</sup>Ibid.

<sup>325</sup>Ibid.

princes' bodies and the celestial bodies' ability to raise both comet-producing exhalations and poisonous ones explained these diseases. For Reisch, the situation was also similar with sedition. Though he expressed some hesitation in this particular argument, he also argued here that the exhalations that produced comets likely changed the air surrounding people. This air disturbed the imagination and excited the irascible and concupiscent appetite, affecting a person's reason and leading him or her to sedition.<sup>326</sup> Due to the dispositions of the exhalations that produced comets and the way the arrangement of the heavens and earth caused these exhalations to happen in a reoccurring, regular pattern, one could use his knowledge of the natural order to predict sterility, pestilence, and sedition.

Velcurio emphasized secondary causes in a similar manner as he discussed whether and how people could predict tempests. Once again, this discussion reveals just how essential the notion of the natural order was to masters' descriptions of meteorological phenomena and their causes. Velcurio first explained that tempests were one of the middle *meteora* that included flashes, gales, thunder and lightning, and similar things. He argued that they were caused partly through the collision of clouds and partly through the struggling of winds.<sup>327</sup> He then claimed that one could make predictions about these tempests in four different ways.<sup>328</sup> Much as he had in his explicit description of God's relationship to the meteorological phenomena and the natural order, Velcurio taught that one could only make prognostications about tempests because the created universe had a natural order structured through causes and their effects. Knowing the secondary causes that initiated tempests allowed people to predict them when they happened to observe these causes. Velcurio's first example relied on the arrangement between the celestial

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<sup>326</sup>Ibid, sigs. Cir-Civ.

<sup>327</sup>Velcurio, sig. R6r.

<sup>328</sup>Ibid., sig. S1v.

bodies and the earth. The constellations of the stars and other celestial bodies were the efficient cause of tempests because of the particular arrangement between the heavens and the earth. Therefore, knowing Orion was the efficient cause of rain also made it a sign of this rain.<sup>329</sup> The second reason these conjunctions of planets and stars would allow people to predict tempest also had to do with these causes. Since prognostication focused on effects of preceding causes, a preceding cause could also be a sign of that effect because again the planets and stars were efficient causes of meteorological phenomena.<sup>330</sup> Velcurio's third reason for why one could prognosticate tempests also drew on the relationship between secondary causes and their effect in the natural order, though this time exploring the material cause of rain. Clouds were effects of the celestial bodies' abilities to raise vapors into the air. These clouds then acted as the material cause and preceding effect of rain.<sup>331</sup> The fourth way to predict storms did not have to do with cause and effect in the natural order per se, but rather those occurrences that tended to accompany tempests such as raucous shouts of a raven, the loud noise of geese, and a lower flight of swallows over bodies of water.<sup>332</sup> Even though these did not cause tempests, they still typically occurred prior to them according to these birds' inherent dispositions.

Describing the prognostication of comets and tempests, Reisch and Velcurio offered similar descriptions of the natural order that caused these meteorological phenomena. In doing so, their works again reveal these masters' overwhelmingly similar explanations of how meteorological phenomena occurred within the created universe. They attributed the occurrence of both comets and tempests to those secondary causes God had implanted in the world at its

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<sup>329</sup>Ibid.

<sup>330</sup>Ibid.

<sup>331</sup>Ibid.

<sup>332</sup>Ibid.

creation. Both emphasized the arrangement between the celestial bodies' motions and the natural bodies of the earth. This arrangement caused exhalations and vapors to rise into the air, and the particular disposition of these exhalations and vapors along with the disposition of the region of the air caused particular *meteora*. Reisch and Velcurio also assumed that the regularity of the natural order allowed people to predict tempest and those outcomes that would follow the appearance of comets. The normal course of nature dictated that a certain type of air would accompany the appearance of comets, and the characteristics of this air would cause sterility, pestilence, and sedition. The regularity of the natural order even caused comets to signify these events. For Velcurio, the sequence of secondary causes of the natural order also allowed people to predict tempests. According to the natural order, celestial bodies caused vapors and exhalations to rise into the air, and then clouds formed, and then rain fell. Various bird calls and flight patterns also typically accompanied these tempests, according to the common course of nature. People could observe the heavens, watch for clouds, and listen for certain types of birds, and they could predict when storms were coming precisely because the natural order that caused meteorological phenomena was so regular.

Though positing slightly different notions of the relationship among God, the natural order, and the heavens, these masters' accounts of what meteorological phenomena were and how they arose resonated strongly. For these masters, meteorological phenomena took place in the sublunary realm due to the heavens' influence on imperfect mixtures. They pointed to the motions of the heavens and the dispositions and the arrangements of the natural bodies within the sublunary realm to explain how these phenomena occurred, arguing either implicitly or explicitly that they occurred through the natural order God had provided the universe at its creation. They even offered very similar explanations of the secondary causes of meteorological phenomena as

their accounts focused on celestial bodies, the various vapors and exhalations, and the three regions of the air to explain how these phenomena took place. In contrast to their discussions of the heavens, these masters' descriptions of the natural order that caused meteorological phenomena to occur were remarkably similar.

### **Calvin, Meteorology, and the Natural Order**

John Calvin drew on many of these natural philosophical teachings about meteorological phenomena as he described the relationship among them, God, and the natural order. His statement in the 1559 *Institutes* about God's direct control over thunder, lightning, and tempests did not directly address whether God always caused them through direct involvement in the created universe or whether they always or even usually occurred through the secondary causes of the natural order that God had fashioned and continued to uphold.<sup>333</sup> There are multiple ways to interpret this passage. On the one hand, it could posit a similar relationship among God, the natural order, and meteorological phenomena as Calvin outlined when he described the heavens and their behavior. As we saw in the last chapter, he frequently equated the heavens and their motions with the natural order, and he also just as frequently insisted that God was directly involved in controlling and governing these motions because God took an active role in the natural order. On the other hand, this statement in the 1559 *Institutes* could also refer to God's active intervention in the world beyond or even outside the natural order as Calvin did not mention the dispositions or the arrangements God had implanted in the sublunary realm at its creation here as he did in many of his descriptions of the heavens and their natural order. His more detailed descriptions of these meteorological phenomena in his lectures on Jeremiah and his commentary on the Psalms offer us further insight into how he understood the causes of these phenomena. These more detailed descriptions also allow us to explore resonances and clashes

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<sup>333</sup>CO 2 Col. 46.

among Calvin's discussions of the relationship among God, the natural order, and meteorological phenomena and those descriptions of it contemporary masters offered.

Calvin's lecture on Jeremiah 10:12-14 drew on natural philosophical conceptions of vapors and exhalations and the various regions of the air to describe the causes of meteorological phenomena.<sup>334</sup> This lecture offered multiple conceptions of the relationship among God, the natural order, and these meteorological phenomena that also appeared in Calvin's other discussions of meteorological phenomena and their causes. Before describing the causes of wind and rain, Calvin first connected God's active engagement with the created world directly to the natural order much as he had God's control over the motions and influence of the heavens. He explained that philosophers gave reasons why vapors ascend into the air due to their characteristics, though these did not exclude God's activity in the world. Rather, when one spoke *naturaliter* or according to the natural order about the rains, Jeremiah here revealed to people that God had so arranged the world to show that he ruled in the heavens and on earth.<sup>335</sup> Calvin's underscored this close connection among God's activity in the world, the natural order, the rain, and the wind in his own discussion of their causes. Much as contemporary masters explained, Calvin pointed to the difference between the cooler, humid, and heavier vapors, the hot and dry exhalations, and the characteristics of the middle region of the air to explain why particular meteorological phenomena occurred. Whereas the dispositions of vapors and the particular characteristics of the middle region of the air caused the vapors to turn into clouds, snows, and

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<sup>334</sup>Jeremiah 10:12-13 read, "He hath made the earth by his power, and established the worlde by his wisdom, and hath stretched out the heaven by his discretion. He giveth his voyce the multitude of waters in the heaven, and the causeth the cloudes to ascend from the ends of the earth: he turneth lightnings to raine, and bringeth forth the winde out of his treasures."

<sup>335</sup>"Videmus enim vapores exsurgere e terra, et sursum attolli. Philosophi ostendunt qua ratione id fiat: sed non poterit tamen excludi virtus Dei, ubi naturaliter aliquid fieri dicimus. Nam hinc melius cognoscitur quod docet hic propheta, nempe Deum ita disposuisse orbem, ut dum attollit vapores sursum, ostendat se dominari in coelo et in terra." CO 38 Col. 77.

rains, exhalations could produce thunder, lightning, comets, and winds. He explained that the characteristics of the vapors and the exhalations caused one particular meteorological phenomenon and not another.<sup>336</sup> In the first part of his explanation of these verses, Calvin stressed God's active upholding and governing of the natural order to explain the causes of rain and wind much as he had in his explanation of celestial influences.

The end of his comments on this verse argued for a slightly more complicated relationship between God and this natural order in the causing of rain and wind. Here, Calvin introduced the notion of sudden winds that the dispositions of vapors and exhalations or the characteristics of the middle region of the air simply could not explain. Calvin argued that philosophers must not only give God the credit for causing meteorological phenomena through the natural order because this was the chief point of philosophy. They must also do so because God's direct activity in the created world was the only thing that could explain the sudden appearance of winds on a calm day.<sup>337</sup> God's direct government of the world and not the dispositions of exhalations were responsible for these sudden changes. His lecture on Jeremiah 10:12-14 ultimately offered two, different viewpoints on the relationship among God, the natural order, and meteorological phenomena. Calvin drew on natural philosophical doctrines about vapors and exhalations to explain these meteorological phenomena even as he credited God with actively causing them through his upholding of the natural order, much as he had in his description of celestial bodies and their motions. He also introduced another aspect of the relationship between God and the natural order here as he argued that God actively intervened in the world when there were sudden changes in the weather that knowledge of secondary causes

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<sup>336</sup>CO 38 Col. 78.

<sup>337</sup>Ibid.

could not explain. God was directly involved with meteorological phenomena in these two different ways.

Calvin's various comments about meteorological phenomena in the rest of his lectures on Jeremiah and in his commentary on the Psalms explored either one or both of these aspects of God's active government of meteorological phenomena. His lecture on Jeremiah 49:36 emphasized God's active involvement with the natural order to cause winds, again drawing on natural philosophical conceptions of the exhalations to do so. This biblical passage invoked the four winds from the four corners of the earth that God would rise up against Elam,<sup>338</sup> and Calvin explained that these four winds should be understood metaphorically as four enemies that would unite their power to oppress the Elamites.<sup>339</sup> In his exegesis of the verse, Calvin explained the connection between God and these winds at some length in order to underscore that God could and did raise these enemies to punish Elam. His conception of God's active upholding of the natural order made this metaphor such a strong one for explaining how God could do this. Drawing again on natural philosophical doctrines, Calvin explained that the winds arose from earth due to cold and dry exhalations and that people did not perceive the wind until it reached the middle region of the air. He argued that these sudden winds showed people the formidable power of nature because God actively raised them.<sup>340</sup> Just as God directly caused the winds and the awesome power of nature, he could also raise enemies to punish the Elamites. His conception of God's active support of secondary causes and masters' teachings about exhalations and the

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<sup>338</sup>Jeremiah 49:36 reads, "And upon Elam I wil bring the foure winds from the foure quarters of heaven, & wil scattre them towards all these windes, and there shalbe no nation, whether the fugitives of Elam shal not come."

<sup>339</sup>CO 39 Col. 386.

<sup>340</sup>Ibid.

causes of winds provided Calvin with metaphor for how God could actively employ certain groups of human beings to protect his chosen people.

Calvin's commentary on Psalm 147:7-8 explored both aspects of God's active control over meteorological phenomena through his upholding of the natural order and his direct involvement in the world.<sup>341</sup> Much as he had in his lectures on Jeremiah 10:12-14 and 49:36, Calvin explained that philosophers taught correctly about the vapors that come from the earth and the sea to form clouds to cause rain. Calvin also credited God with upholding this natural order. For him, these vapors were only secondary or mediate causes of this rain. He argued that people should pay attention to God's active control of these phenomena through his providence because God used these mediate causes to furnish the earth with the moisture it needed to be fruitful.<sup>342</sup> In this discussion of mediate causes and God's providence, Calvin once again extolled God's activity in the world through the natural order he had provided for the universe.

His statements about the clouds in the heavens in this commentary suggested the second type of God's active involvement with meteorological phenomena. Calvin's word choice in this description signaled God's active intervention in the created universe to cause these meteorological phenomena directly. Rather than write about the natural order, Calvin explained that these clouds were wonders (*miracula*) in the atmosphere. He specifically equated these wonders with sudden changes that God particularly caused in the atmosphere in order to grab human beings' attention. Calvin explained that if the atmosphere were always serene, it would not display God's power to human beings as readily as when God suddenly veiled the sun's light

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<sup>341</sup>Psalm 147:7-8 read, "Sing unto the Lord with praise: sing upon the harpe unto our God, Which covereth the heaven with cloudes and prepareth raine for the earth, and maketh the grasse to growe upon the mountaines:"

<sup>342</sup>CO 32 Col. 428.

with clouds.<sup>343</sup> God's direct involvement in the universe to cause sudden clouds disclosed his power to human beings. This connection of wonders to sudden changes God particular made in the atmosphere proposed a different relationship between God and the created world than the one witnessed when vapors rose into the sky and formed clouds. Whereas vapors were the secondary causes of clouds, sudden changes and the wonders of the sky belonged strictly to God's active government in the created universe.

His commentary on the fifteenth through eighteenth verses of this same psalm also explored these two types of God's active control over meteorological phenomena.<sup>344</sup> Calvin's commentary on these verses began with a long discussion of God's activity specifically within the order of nature. He explained that God actively governs all things through a secret influence. There would be no movement among the elements according to the natural order unless God had previously given a secret decree. God's active engagement with the natural order was vital for people to recognize unless people wanted to practice a wrong-headed natural philosophy. Citing Aristotle's discussion of *meteora* specifically, Calvin argued that even the uneducated and simple with a little piety would be better placed to grasp this main point of philosophy. Mediate causes were not responsible for these meteorological phenomena. Instead, the natural order was only the prompt carrying out of God's orders, and all therefore depended on the will of God.<sup>345</sup>

Despite this emphasis on God's activity through the natural order in his commentary on these

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<sup>343</sup>“Primo, dicit *operire coelos nubibus*, quae mutatio expergefaceret sensus nostros debet, nisi nimium stupidi essemus. Certe utcunque in coelo fulgeant innumera Dei miracula, si tamen eadem semper maneret serenitas, non tam conspicua esset eius virtus, quam ubi repente coelum obnubilans subducit solis fulgorem, et quasi mundo novam faciem induit.” Ibid.

<sup>344</sup>Psalm 147:15-18 read, “He sendeth forth his commandment upon earth, and his worde runneth verie swiftly. He giveth snow like wool, & scattereth the hoare frost like ashes. He casteth forth his yce like morsels: who can abide the colde thereof? He sendeth his word and melteth them: he causeth his winde to blowe, & the waters flowe.”

<sup>345</sup>CO 32 Col. 430-431.

verses, Calvin also described God's active involvement in the world to cause meteorological phenomena directly. Labeling these particular phenomena, "wonders," Calvin argued that going from the piercing cold to the scorching heat and back to the cold again through the succession of seasons should cause people to recognize the power of God. The sudden changes in these wonders revealed to people that God reigned over the world.<sup>346</sup> This description of sudden changes in meteorological phenomena as wonders that reveal God's power suggests that for Calvin, rain, winds, snow, sleet, and hoar frost could develop from different causes. These meteorological phenomena could occur through the arrangement between vapors and the middle region of the air that God had implanted and continued to uphold in the created universe, or they could occur suddenly when God directly intervened in the created universe to show human beings his power over that universe.

Calvin again described these two different types of God's active government over meteorological phenomena in his commentary on Psalm 135:6-7.<sup>347</sup> Here he did so through two different examples and then in a more general discussion of God's relationship to the natural order. This description of God's active control over meteorological phenomena developed out of the emphasis Calvin placed on God's active government of the world he had fashioned during the process of creation. As he explained, the sixth verse of this psalm showed God not only created the heavens and the earth but that he also continued to govern all things in the created universe through his will.<sup>348</sup> Calvin claimed that the prophet here used the example of meteorological phenomena in the seventh verse to show people this active government of the

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<sup>346</sup>CO 32 Col. 431.

<sup>347</sup>Psalm 135:6-7 read, "Whatsoever pleased the Lord is great, and that our Lord is above all gods. He bringeth up the cloudes from the ends of the earth and maketh the lightnings with the raine: he draweth forth the winde out of his treasures."

<sup>348</sup>CO 32 Col. 359.

world.<sup>349</sup> According to Calvin, this active government proceeded both through the dispositions and arrangements God had given the world and through God's direct government of the universe. First, the formation of clouds could be understood according to the natural order due to the characteristics of vapors. Once again, Calvin praised God for his ultimate control over the vapors' dispositions and their ability to form clouds. After all, clouds truly disclosed God's power because he had so arranged it that such thin vapors could rise into the air and form puffy, dense clouds. Unlike cloud formation that happened through the secondary causes God upheld, any lightning that occurred at the same time as rain was directly due to God's intervention in the created universe. Fire largely composed lightning whereas water was the main element in rain. When lightning occurred with rain, this meant that fire occurred along with water, and for Calvin, this occurrence went against the characteristics of both because water and fire were contraries.<sup>350</sup> Their presence together in the clouds showed God's direct activity in the universe and its ability to cause meteorological phenomena. Calvin turned to the question of the natural order explicitly at the end of his commentary on this seventh verse, again arguing that the natural order alone could not fully explain the behavior of winds or rain. Indicating philosophers and their teachings on the order of nature, Calvin argued that the prophet here taught that not a drop of rain falls without God's firm dispensation. Whereas all these authors would certainly teach that God was the author of the rain, thunder, and winds because he had established the order of nature, the order of nature did not ultimately cause meteorological phenomena. Instead, God himself decreed through his will at one time to darken the sky with clouds, and at another, to

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<sup>349</sup>Ibid.

<sup>350</sup>CO 32 Col. 359-360.

return the sunlight.<sup>351</sup> Though secondary causes certainly were basic for how meteorological phenomena occurred, Calvin claimed in his commentary on this psalm that God not only directly upheld this order. He also argued that God could actively intervene in the world to cause some of the meteorological phenomena in that world.

In the 1559 *Institutes*, Calvin emphasized God's active government over meteorological phenomena, but it was unclear here whether he viewed this active engagement with them in the same way as he described the relationship among God, the natural order, and the heavens in this and in his other works. His descriptions of these meteorological phenomena in his lectures on Jeremiah and especially in his commentary on the Psalms suggest that Calvin viewed this particular aspect of the created universe somewhat differently than he did the heavens. Whereas he emphasized God's active upholding of the natural order in the motions of the heavens, his comments on meteorological phenomena stressed both God's active upholding of secondary causes as well as God's direct involvement in the created universe to cause sudden changes in these phenomena. Calvin's descriptions of meteorological phenomena and their causes therefore suggest that he viewed them as occurring through a variety of causes, depending on the particular situation. Some meteorological phenomena occurred through the secondary causes that God actively supported. God also directly caused others such as when he suddenly covered the sun with clouds.

Calvin's descriptions of these meteorological phenomena and their causes clashed with those contemporary masters offered. When he described how these phenomena took place through the natural order, he did draw repeatedly on natural philosophical notions of vapors, exhalations, and the middle region of the air. He even pointed to the dispositions and arrangements of vapors and exhalations to explain the occurrence of rain, wind, thunder, and

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<sup>351</sup>CO 32 Col. 360.

lightening. Calvin's appropriation of these natural philosophical teachings underscored a different conception of how meteorological phenomena took place even through the natural order, though. Although Titelmans and Velcurio had given God credit as the author of the order of nature or as the first cause of those secondary causes through which *meteora* arose, their accounts of meteorological phenomena focused on these secondary causes and this order of nature. Even when writing of the order of nature, Calvin stressed God's active upholding of it. These clashes over the causes of meteorological phenomena between Calvin and these masters become even more apparent when we turn to Calvin's emphasis on God's active intervention in the world to cause particular *meteora*. As Velcurio emphasized the regularity through which tempests occurred according to the natural order so much so that one could look at the constellations and clouds or listen and watch for particular birds to predict them, Calvin often wrote of how God raised storms and winds suddenly, in calm weather – something philosophers simply could not explain through secondary causes. As Titelmans attributed meteorological phenomena to the natural order that God, the author of nature, had instilled in the created universe, Calvin called many of these meteorological phenomena, “wonders,” and his writings suggest that he viewed at least some of these wonders as taking place beyond or even outside the natural order due to God's continuing government of the created universe.

Comparing Calvin's descriptions of meteorological phenomena to those found in contemporary natural philosophical texts, we see that Calvin and these masters continued to share presuppositions about God's creation of the world, his implantation of a natural order in that world, and natural philosophy's ability to teach people about this universe. Even as Calvin drew on these presuppositions to appropriate from contemporary natural philosophical teachings on meteorology, though, his emphasis on God's direct involvement with meteorological

phenomena whether within or beyond the natural order discloses a very different notion of this aspect of the created universe than these masters offered in their own descriptions of these phenomena. Clashing so strongly with these natural philosophical discussions of meteorological phenomena, Calvin's many descriptions of them and their relationship to the natural order and God's direct intervention in the world provide a window into his broader notions of the created universe as well as possible tension between sixteenth-century natural philosophy and theology.

### **Calvin and God's Active Control over Meteorological Phenomena: The Created Universe**

The clash between Calvin's explanations of meteorological phenomena and those contemporary masters offered is striking when we consider these masters' overwhelmingly similar accounts about what caused various *meteora* to occur. Whereas Calvin's depiction of the relationship among the heavens, God, and the natural order touched on a topic that was somewhat debated among contemporary masters, his description of the causes of meteorological phenomena broke with the relatively consistent explanations of their causes these same masters offered. The strong resonances among these masters' discussion of this subject suggest that Calvin's clashing with them about the causes of meteorological phenomena had deep significance. He did not just have a different notion of why it rained or why winds arose at one particular moment and not another. Stressing God's active upholding of the natural order and his direct involvement in the created universe to cause these meteorological phenomena was vital for Calvin in order to explain how and why the natural phenomena of that universe occurred. His statements about God's active control over meteorological phenomena therefore shed light on how Calvin viewed the created world more broadly.

Calvin's commentaries on Psalms 18:7-10, 104:3, and 29 offer insight into why he stressed God's active control over meteorological phenomena. In all of these exegeses, Calvin

explained that God's active control over these phenomena had to do with the role that the created universe played in the relationship between God and the human beings he had created. For example, his commentary on Psalm 18:7-10 explained that God used his active control over meteorological phenomena to provide people with evidence of his power.<sup>352</sup> According to Calvin, David had set forth an image of God's help in the sky and on earth in this psalm to exalt the help that God had provided David.<sup>353</sup> Calvin invoked the natural order that God actively oversaw as well as direct government of the created universe to explain this similitude. If God could actively change the weather through this power either directly or through the natural order, then he also had the power to provide help for the faithful such as David. These sudden changes in the atmosphere even gave people visible evidence of God's power. For Calvin, meteorological phenomena made God's ability to protect the faithful and punish the wicked visible to human beings because God was so active in causing these phenomena to occur.

In his commentary on the eighth verse of this psalm, Calvin analogized God's power over clouds to the power of God's wrath. Once again, Calvin drew on his understanding of God's direct control over meteorological phenomena to argue that these phenomena made God's anger and the power of that anger visible to people. According to him, the vapors that caused clouds were similar to the smoke a person was said to breathe from the nose when he or she was angry. God actively caused these mists and vapors to darken the sky and take away the sun and stars' brightness so that people were overwhelmed with darkness. This darkness in the sky taught people how formidable God's wrath actually was because God was responsible both for his

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<sup>352</sup>Psalm 18:7-10 read, "Then the earth trembled and quaked: the fundacions also of the mountaines moved and shoke, because he was angrie. Smoke went out at his nostrels, and a consuming fyre out of his mouth: coles were kindled thereat. He bowed the heavens also and came downe, and darkenes was under his fete. And he rode upon Cherub and did flie, and he came flying upon the wings of the winde."

<sup>353</sup>CO 31 Col. 174.

wrath as well as the secondary causes that produced dark clouds.<sup>354</sup> Whereas these comments on the likeness between low-hanging, dark clouds and the impressiveness of God's anger relied on conceptions of the natural order to explain how the created universe made God's anger visible, Calvin's comments on the seventh verse emphasized only God's active control over those meteorological phenomena that happened suddenly. These comments again stressed that the created world made God's power visible to human beings. When the sky was suddenly transformed with rain, thunder, or storms, people who were once lethargic to God's power were awakened as the unexpected disclosed God's presence in the world. These sudden changes manifested this power better than continually calm weather.<sup>355</sup> According to Calvin, both God's active upholding of the natural order to cause meteorological phenomena and his direct intervention in the universe to cause meteorological wonders allowed God to use these natural occurrences to display his power to human beings.

Calvin explained further implications of God's direct control over meteorological phenomena in his commentary on Psalm 104:3.<sup>356</sup> Here he went beyond claims that this control displayed God's power to people as he argued that God's direct government of the world raised winds that disclosed his presence in the created universe to human beings. For Calvin, the main point of the verse was that people did not need to seek the origin of God above the heavens because it met people in the world. He even claimed that the created universe forced living pictures of this into human eyes.<sup>357</sup> God's active involvement in the world meant both that God

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<sup>354</sup>CO 31 Col. 175.

<sup>355</sup>Ibid.

<sup>356</sup>Psalm 104:3 reads, "[The Lord: o Lord my God] Which laith the beames of his chambers in the waters, and maketh the cloudes his chariot, and walketh upon the wings of the winde."

<sup>357</sup>CO 32 Col. 85.

was present in the created world and that human beings should be able to recognize this presence. Calvin argued that David's description of God walking on the wings of the wind in this verse supported this conclusion. According to him, God drove the winds around the universe according to his will to demonstrate the presence of his powers (*virtutes*) there. This showed that God's command regulated and moderated all disturbances in the air and that winds did not blow blindly nor did lightning arise through fortuitous impetus.<sup>358</sup> This notion of God's presence in the created world as he actively controlled meteorological phenomena was so significant for Calvin that he contrasted God's actual active control over the winds and lightning with the incorrect notion that these phenomena occurred by chance. God's active control over the winds and lightning meant that a particular *meteoron* did not happen randomly. Instead, God directed the various meteorological phenomena, and the ways in which he directed them made both his power and his presence visible to human beings.

In his comments on Psalm 29, Calvin explained at some length why God's relationship to meteorological phenomena in particular showed his power and his presence to human beings. His commentary on its third verse included many of those themes that Calvin associated elsewhere with God's active intervention in the world to cause meteorological phenomena.<sup>359</sup> He first explained that this verse recalled natural wonders (*miracula*) as he had in exegeses of other psalms when describing God's direct control over meteorological phenomena. He here associated these wonders with the natural order, explaining that there was nothing in the ordinary course of nature whether in the heavens or on the earth that did not invite people to knowledge (*notitia*) of God because God actively upheld this order. After explaining that this knowledge of

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<sup>358</sup>Ibid.

<sup>359</sup>Psalm 29:3 reads, "The voice of the Lord is upon the waters: the God of glorie makeh it to thunder: the Lord is upon the great waters."

God was available within the natural order, Calvin claimed that it was especially apparent in meteorological phenomena because of God's particular relationship to them. Unlike with the sun and stars, God not only upheld the natural order that caused meteorological phenomena to occur. He also actively intervened in the world to cause them. This direct involvement provided people with better proof of God's power, presence, and active government over the world than his upholding of the natural order of the heavens did.

Explaining why this was so, Calvin turned to human beings who should be able to look at meteorological phenomena and discern God's power, presence, and government through them. Once again, Calvin stressed the sudden changes in the weather that God's active government of the universe could cause to make this argument. The motions of the celestial bodies were consistent, and this made God's power, wisdom, and government over them hard for people to discern. When God suddenly changed meteorological phenomena, though, such sudden changes woke people up from their lethargy and even dragged them toward the adoration of God.<sup>360</sup> In his comments on the ninth verse of this psalm,<sup>361</sup> he continued this focus on the human beings who should be witnesses to God's active control over meteorological phenomena. Calvin here severely chastised people who would not acknowledge God's providence and government over the created world because there was much evidence for this in the created universe. In doing so, he explicitly explained that some of these works in the world occurred through the natural order and some were infrequent or rare and that these infrequent works more clearly displayed God's

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<sup>360</sup>CO 31 Col. 287.

<sup>361</sup>Psalm 29:9 reads, "The voice of the Lord maketh the hinds to calve & discovereth the forests: therefore in his Temple doeth everie man speake of his glorie."

providence and government to people.<sup>362</sup> God's active government over meteorological phenomena allowed him to change the appearance of the atmosphere quickly. These sudden changes that did not take place through the natural order woke people up to God's power over, presence in, and government of the created universe.

Calvin's emphasis on God's active control over meteorological phenomena may have clashed with those viewpoints of them expressed by contemporary masters. His commentary on various psalms show that this emphasis had a larger purpose for Calvin as it begins to reveal his broader conception of the created universe. Stressing God's active control over meteorological phenomena, Calvin also underscored that God controlled the natural occurrences of the created universe to disclose certain aspects of himself to human beings and to force them to acknowledge this discloser. Calvin broke with masters on the causes of meteorological phenomena to emphasize that the created universe played a role in the relationship between human beings and God. His three sermons on the thirty-seventh chapter of Job provide a way in which to explore this in greater detail than Calvin's commentary on various psalms allow. According to him, this thirty-seventh chapter of Job taught people to open their eyes to observe the order of nature so that they could discern God's majesty in his works.<sup>363</sup> Calvin explored the role the created universe played in the relationship between God and human beings and the further meaning of God's active control over meteorological phenomena as he explained how the various *meteora* mentioned in Job 37 arose and how his audience should understand these biblical verses.

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<sup>362</sup>“Subest (ut diximus) tacita comparatio. Est enim plus quam absurdum et monstro simile, homines Dei voce non affici, cuius vis tam efficaciter se exserit erga feras bestias. Iam quidem foeda ingratitude est, in toto naturae ordine, non sentire eius providentiam et imperium: sed detestabilis est ista socordia, raris saltem et insolitis eius operibus, quae feras bestias ad obsequium cogunt, ipsos non doceri.” CO 31 Col. 289-290.

<sup>363</sup>CO 35 Col. 315.

Calvin's first sermon in this series focused on Job 37:1-6. As we saw in the first chapter, this sermon began with a discussion of how meteorological phenomena related to the natural order and God's active upholding of it. He also explained that God used these phenomena to punish the wicked and chastise the faithful.<sup>364</sup> This sermon explored how God revealed his power and his presence to human beings in the created universe through his control over meteorological phenomena. According to Calvin, it was not enough to know that God was almighty and that all creatures were in his hands to use as he pleased. Knowing that God had power over the created universe and disclosed himself to people as he exercised this power over meteorological phenomena was not enough. People also needed to know why he used these creatures in a particular way. Calvin claimed that God did so in order to judge human beings. God directly governed the created universe to cause meteorological phenomena in order to provide for and chastise the faithful and punish the wicked.<sup>365</sup> He returned to this theme in the middle of his sermon, giving a fuller notion of the effect of this judgment on the created world. Explaining Eliu's description of thunder, lightning, rain, and dew, Calvin explained that Eliu spoke here both of the sweet (*douce*) rain as well as the violence and the fury of meteorological phenomena through which God governed the world. Whether there was sweet rain or violent storms, this was God's way of judging human beings. When God sent sweet rain, the earth became fruitful and provided people with food. When God sent violent storms, the rain could damage all of this sustenance.<sup>366</sup> According to Calvin, how God actively changed the weather was directly contingent on his relationship to human beings. God was the father as well as the

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<sup>364</sup>See chapter one, pp. 41-42.

<sup>365</sup>CO 35 Col. 315.

<sup>366</sup>CO 35 Col. 319.

creator of human beings. God showed this fatherhood as he modified the meteorological phenomena of the created universe. When he sent storms to ruin crops or sweet rain to fructify the earth, he used the created world to punish, chastise, and provide for human beings.

This focus on the created universe's role in the relationship between God and human beings continued toward the beginning of Calvin's sermon on Job 37:7-13.<sup>367</sup> This section of his sermon explored the ways in which God's active control over meteorological phenomena affected human beings in more detail than he had in his commentary on Psalm 29. Though God could suddenly change meteorological phenomena to punish, chastise, and provide for human beings, Calvin explained here that these sudden changes in particular had more to do with human beings than God's paternal care for them. He claimed that God directly caused these sudden changes in the weather so that human beings would notice the judgments God attempted to reveal through meteorological phenomena. Calvin explained that people would prefer it if the weather were always temperate without great heat, cold, wind, or rain. People wanted a perpetual springtime, though they would better perceive God's glory and judgment if the weather changed. When God first caused rain and then scattered the clouds or caused the cold to succeed the heat, these sudden changes woke people up to the presence of God's majesty in the world as well as to his ability to judge them through it. Calvin argued that people were currently dull-witted due to their sin, and they needed these sudden changes in the created universe to notice God's manifestation in and power over the world. When the temperature changed, clouds thickened, it rained, or there was a drought, these alterations manifested God and his power much more

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<sup>367</sup>Job 37:7-13 read, "With the force thereof he shutteth up euerie man, that all men may knowe his worke. Then the beasts go into the denne, and remaine in their places. The whirle winde cometh out of the South, and the colde from the North winde. And the breath of God the frost is giuen, & the breadth of the waters is made narrowe. He maketh also the cloudes to labour, to water the earth, & scatereth the cloude of his light. And it is turned about by his gouernement, that thei may do whatsoeuer he commandeth them upon the whole world: Whether it be for punishment or for his land, or of mercie, he causeth it to come."

visibly to sinful human beings than if everything just followed its own, natural course.<sup>368</sup>

Actively intervening in the world to cause sudden changes in the weather, God not only directed these natural occurrences to judge human beings. God also did this so that human beings would notice that he was the creator of the universe and that he judged them through his active control over particular meteorological phenomena.

Speaking about the clouds and their significance to the relationship between God and people later in this sermon, Calvin gave further indication of how he viewed the created universe as a whole. God's active control over meteorological phenomena and other natural occurrences actually meant that God employed his power and control over the created universe strictly for human beings. God directed the created universe as he chose for the benefit of human beings and not for his other creatures. Whether he was punishing, chastising, or providing for them, God used meteorological phenomena for the ultimate advantage of human beings. Drawing on the example of clouds, Calvin showed that he viewed the way in which God directly controlled the natural phenomena of the universe as anthropocentric. He explained that God employed the clouds for human beings' service as they provided the earth with rain. According to Calvin, this was an example of how God guided all of his creatures for human use as though the clouds were people's servants and chambermaids.<sup>369</sup> Toward the end of this sermon, Calvin made the anthropocentric direction of God's control over the created universe explicit. He argued that it was God who chastises people when there was drought. The air was a senseless thing, and therefore it was not the rain that punished human beings when it did not fall. Instead, such

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<sup>368</sup>CO 35 Col. 329-330.

<sup>369</sup>CO 35 Col. 331.

droughts were chastisements that came directly from God to punish human beings.<sup>370</sup> In this second sermon on Job 37, Calvin argued that the created universe not only took part in the relationship between God and human beings. God also specifically directed the natural occurrences of this created universe for the sake of human beings.

His third and final sermon on Job 37:13-24 clarified much of what was at stake for Calvin when he stressed God's active control over meteorological phenomena.<sup>371</sup> As God directly controlled the weather to punish the wicked and chastise and provide for the faithful and as God changed the weather suddenly so that human beings would pay attention to this judgment, this active control over meteorological phenomena ultimately showed people that God had created the world and that he continued to govern that world to the present day. For Calvin, this was the important point that people must understand about the created universe more generally. God, not the natural order, was responsible for governing the weather and the other *meteora* of the world. After detailing here how and what people were able to learn about God through the created universe,<sup>372</sup> Calvin argued that people must know that God not only created the world but that God also continued to govern that world into the present day.<sup>373</sup> Calvin then claimed that the way meteorological phenomena occurred provided proof of God's active government over the entire

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<sup>370</sup>CO 35. Col. 335.

<sup>371</sup>Job 37:14-24 read, "Hearken unto this, o Job: stand and consider the wonderous works of God. Didest thou knowe when God disposed them and caused the light to shine? Hast thou knowen the varietie of the cloude, & the wonderous workes of him, that is perfite in knowledge? Or how thy clothes are warme, when he maketh the earth quiet through the South winde? Hast thou stretched out the heavens, which are strong & as a molten glasse? Tel us what we shal say unto him: for we can not dispose our matter because of darkenes. Shal it be tolde him when I speake? Or shal man speake when he shalbe destroyed? And now men se not the light which shineth in the cloudes, but the wind passeth and clenseth them. The brightnes cometh out of the North the praise thereof is to God, which is terrible. It is the Almightye: we can not finde him out: his is excellent in power & judgement, & abundant in iustice: he afflicteth not. Let men therefore feare him: for he wil not regarde any that are wise in their owne conceit."

<sup>372</sup>CO 35 Col. 339-341.

<sup>373</sup>CO 35 Col. 341.

world and thereby his creation of that world in the first place. The characteristics of the heavens and the earth did not cause the clouds. God did. He set the order for both good weather and bad weather so that he commanded every little puff of wind. In this way, God showed to people that he had created and continued to govern all things.<sup>374</sup> When Calvin stressed God's active control over meteorological phenomena, he did so not only to show that the created universe played an important role in the relationship between human beings and God. He also did so to emphasize something more fundamental – God actively governed each and every thing that took place in the created universe precisely because God was the creator of that universe.

Calvin stressed God's active control over meteorological phenomena in his sermons on Job 37 and in his commentaries on various psalms because this active control was an important aspect of the created universe for Calvin. God as the creator of the world must also be the governor of that world or the created universe could not continue. If God were not actively involved with it, the universe would devolve into chaos as the secondary causes he had instilled into it simply could not sustain it. God's direct government of the created universe was not just vital for its continuance. The created universe also played a role in the relationship between human beings, the pinnacle of creation, and God, who had fashioned them in his image and likeness. God controlled the various natural phenomena of the created universe whether directly or through the natural order to punish, chastise, and provide for human beings. He also tried to catch their attention through these natural phenomena so that they would know he created the world and continued to act as a their father. For Calvin, to deny God actively controlled meteorological phenomena or to stress only that these phenomena occurred through secondary causes would be to deny God's role as creator of the universe and of the human beings toward whom the natural occurrences of that universe were directed.

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<sup>374</sup>CO 35 Col. 342.

This notion of the created universe clashed with those conceptions of it that Reisch, Titelmans, Brossier, Velcurio, and Melanchthon's explanations of meteorological phenomena at least implicitly offered. Though Titelmans and Velcurio in their discussions of meteorology continued to stress that God had created the world, these masters all implicitly or explicitly credited secondary causes for causing these meteorological phenomena. These discussions therefore depicted a created universe in which natural phenomena occurred in a regular and orderly manner through the dispositions and arrangements that God had instilled in the world at its creation. These depictions of the created universe lacked Calvin's overwhelming concern with the necessary connection between God's creation and government of the world as well as Calvin's notion that God employed the phenomena of the universe in his relationship with human beings. At least in their discussions of meteorological phenomena, Calvin and contemporary masters offered very different notions of the created universe and why at least some of its natural phenomena occurred as they did.

These different notions of the created universe reveal tension between contemporary masters' and Calvin's conceptions of the world around them. Before concluding from this that there was fundamental tension between sixteenth-century natural philosophy and theology over why and how the natural phenomena of the created world occurred, though, we should recall that meteorological phenomena were only one aspect of the world. As we saw in the last chapter, these masters offered slightly different conceptions of the natural order and God's relationship to the world in their descriptions of the heavens, and some of these conceptions even resonated with those Calvin himself advanced when he described celestial bodies and their influences on the terrestrial realm. It is therefore necessary to explore a further aspect of the created universe in the works of Calvin and these sixteenth-century masters in order to determine whether we can

generalize the tension surrounding discussions of meteorological phenomena to their notions of the created universe as a whole. Water and its relationship to the earth on which human beings dwell provide ideal examples with which to do so. As we saw in the first chapter, Calvin claimed that God caused water to behave beyond the order of nature when it did not flood the earth in many of his works. This suggests that discussions of God and the natural order clustered around the topic of water in the period. Exploring the descriptions of it in contemporary masters' and Calvin's works provides deeper insight into their broader conceptions of the created universe as well as into whether there were some fundamental differences between sixteenth-century natural philosophy and theology.

## Chapter 5: Water

Iam potentia quam praeclavis speciminibus nos in considerationem sui rapit?  
 ...Mare, quod assiduam terrae vastationem minari sua altitudine videtur, quasi in  
 aere suspensum coercere; et nunc horrendum in modum tumultuoso ventorum  
 impetu concitare, nunc sedatis undis, pacatum reddere.<sup>375</sup>

John Calvin, *Institutes of the Christian Religion* (1559)

As Calvin claimed that God's active control over meteorological phenomena disclosed God's power to human beings in the 1559 *Institutes*, he also singled out God's relationship to water as a second example of God's power over the created universe. In addition to shaking the sky with thunder, scorching it with lightning, and causing raging tempests, God's power held the sea back from flooding the earth as though it were suspended in the air. The sea seemed to threaten the constant ravaging of the earth. At one moment, God lashed it into fury with the assault of the winds. At another, God restored peace, calming its waves. God's direct control over water was solely responsible for saving the earth from the total destruction that the sea threatened. It also provided people with evidence of his power and had direct implications for the natural phenomena of the created universe.

Though he did not do so in the 1559 *Institutes*, Calvin described the relationship among water, God, and the natural order directly in his commentary on Genesis 1:9-10. These biblical verses recount God's gathering together of the waters during the third day of creation to expose dry land.<sup>376</sup> For Calvin, these verses showed that water had a different relationship to God and the natural order than those he depicted for the heavens or even meteorological phenomena. According to him, God actively upheld the natural order through which the heavens moved and influenced the sublunary realm and through which some meteorological phenomena occurred.

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<sup>375</sup>CO 2 Col. 45-46.

<sup>376</sup>Genesis 1:9-10 read, "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."

God was also directly involved in the world irrespective of the natural order, and therefore he could directly cause other meteorological phenomena. For Calvin, God's control over water was even more direct than this. Commenting on Genesis 1:9-10, he argued that water's failure to flood the earth was an illustrious wonder (*miraculum*). Citing philosophers, he explained that the water's disposition should lead it to submerge the earth entirely. God's active gathering together of the waters against its inherent disposition was seemingly preternatural or beyond the order of nature.<sup>377</sup> Whereas Calvin claimed God was actively involved with the heavens and meteorological phenomena, he asserted here that God directly intervened in the world to cause water to behave against its disposition or beyond the natural order.

Calvin's description of water in his commentary on these biblical verses suggests that water is an ideal example with which to explore whether the tension between his account of meteorological phenomena and those contemporary masters offered extended to other facets of the created universe. Whereas contemporary masters stressed that these phenomena occurred through the secondary causes, Calvin emphasized God's direct control over them. He did so to argue both that God not only created but also governed the universe and that the ways in which God governed the natural phenomena of the created world played a role in his relationship to human beings. Calvin's explicit discussion of the natural order in the context of the dry land's existence suggests that this particular subject also drew comments from contemporary masters about the relationship among water's behavior, God, and the natural order. Analyzing how Gregor Reisch, Frans Titelmans, Simon Brossier, Johann Velcurio, and Philipp Melanchthon explained water's failure to flood the earth alongside Calvin's insistence that water behaved beyond the

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<sup>377</sup>“Hoc quoque illustre est miraculum, quod aquae suo discessu habitandi locum hominibus dederunt. Nam et philosophi concedent naturalem esse situm aquae, qualem initio fuisse tradit Moses, ut totam terram involvat: primum, quia elementum est, circulare esse oportet, et quia elementum est gravius aere, terra levius, deberet hanc toto circuitu tegere. Quod autem in tumulos redacta maria locum hominibus concedunt, hoc est quasi praeter naturam: atque ideo bonitatem Dei hac in parte scriptura saepe extollit...” CO 23 Col. 19.

natural order due to God's direct interference in the created universe allows us to explore whether there were fundamental clashes between natural philosophy and theology about the created universe and its occurrences.

### **Water, Earth, and the Four Elemental Spheres**

Describing the behavior of water as a wonder in his commentary on Genesis 1:9-10, Calvin explicitly drew on natural philosophical teachings about the four elemental spheres to explain why water's failure to cover the earth went beyond the natural order. Discussions of these four elemental spheres in the works of Reisch, Titelmans, Brossier, Velcurio, and Melancthon suggest why Calvin made such a claim. These masters all divided the created universe into celestial and elemental spheres. Whereas ether composed heavenly bodies and each one of these heavenly bodies moved with uniform, circular motions within their assigned sphere, the four elements, fire, air, water, and earth, composed sublunary bodies. These masters taught that each one of these elements had its own sphere in the sublunary realm and that these four elements combined together to make up all natural bodies in this realm.

The shape of the elemental spheres and the qualities of the elements that these masters taught composed sublunary bodies made water's failure to cover the earth problematic. Claiming that each one of these spheres was round, these masters argued that these spheres must nestle one inside the other in order to make up what they argued was an entirely round universe. The qualities of each element determined which sphere that element occupied. These masters understood fire to be the lightest element, and they argued that it enclosed the spheres of air, water, and earth. Lighter than water and earth but heavier than fire, air was inside the sphere of fire and enclosed water and earth's spheres. They all also taught that earth was the heaviest element and was therefore at the center of the universe. According to this notion of the four

elements, water was heavier than fire and air but lighter than earth, and it should surround earth's sphere entirely. Experience taught otherwise. Though water submerged at least some of the earth, it did not cover all of it. There was some dry land on which human beings, animals, and plants lived.<sup>378</sup>

Water's failure to follow its disposition as an element heavier than fire and air but lighter than earth required explanation. Though all five of these masters subscribed to this notion of the four elements and listed the same qualities for each one of the four elements, this notion and these qualities alone could not explain water's behavior in relationship to the earth. Something other than the intrinsic qualities of water and the arrangement among the four elements according to the natural order was responsible for the existence of dry land. Water's failure to follow its disposition and the arrangements among the four elements invited Calvin and these contemporary masters to grapple with the characteristics of the created universe and God's relationship to what he had fashioned more broadly.

### **Calvin, Water, *Miracula*, and *Praeter Naturam*: The Created Universe**

Natural philosophical teachings about the four elements and their natural place within the universe played a significant role in Calvin's descriptions of water and the existence of the dry land. Explicitly noting and drawing on natural philosophical teachings about the disposition of water and the arrangements of the four elements, Calvin asserted in his works that water actually behaved as a wonder. According to him, God directly intervened in the world to keep water from flooding the earth much as he had described in the 1559 *Institutes*.<sup>379</sup> He repeatedly remarked

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<sup>378</sup>On the elements and the elemental spheres, see Reisch, *Margarita Philosophica*, 1517, sigs. rir, tiir-tiiir, and Aviir-Aviiir; Titelmans, sigs. Lvir-Lviiir; Brossier, sigs. fiv-fiiv and giiir; Velcurio, sigs. K8v-L4r; and Melancthon, sigs. Z3v-Z5r.

<sup>379</sup>CO 2 Col. 45-46.

that the existence of the dry land went against the disposition and arrangements God had initially provided for the universe during the process of creation.<sup>380</sup> As we saw in the first chapter, he conceived of water's behavior as quasi *praeter naturam* or beyond the order of nature from the third day of creation. His commentary on Genesis 1:9-10 described how this had occurred during the process of creation.<sup>381</sup> His commentary on Psalm 24:2 also asserted that God continued to restrain water from following its inherent disposition and the arrangements among the elements into the present day.<sup>382</sup> Focusing on the preternatural aspects of water's behavior, Calvin's discussions of the dry land's existence and his appropriations of natural philosophical teachings on the subject provide further insight into his conception of the created universe as a whole as they explicitly included descriptions of the relationship between God and one of the phenomenon of that universe. In doing so, they provide a further vantage point from which to explore the tension between Calvin and contemporary masters' descriptions of God's relationship to the created universe and its natural occurrences that we observed in the last chapter.

Calvin appropriated natural philosophical doctrines to describe the relationship among water, God, and the natural order in his descriptions of the earth's foundations. His discussions of the pillars of water that supported the earth allow us to analyze Calvin's conception of water's behavior. Calvin did not just give God credit for first fashioning and then upholding the natural order as he supported the earth in the middle of the universe in these discussions. He also explained that the earth rested on pillars of water and that God's power alone kept water from following its propensity to flood the earth. His discussions of this wonder reveal how Calvin

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<sup>380</sup>On Calvin's conception of water and its relationship to his notion of providence, see Schreiner, "Creation and Providence," 270-272.

<sup>381</sup> CO 23 Col. 19.

<sup>382</sup> CO 31 Col. 244.

viewed the relationship between God and the created universe in more detail than his descriptions of God's active control over sudden meteorological phenomena had.

Calvin's sermon on Job 38:4-11 explored the behavior of water within this context as he claimed that the earth balanced on pillars of water.<sup>383</sup> Here he argued for the utter obviousness of God's active government of the world to restrain the water from its propensity to flood the earth. Arguing that water was the foundation of the earth, Calvin described what even those philosophers who did not consider God said about its behavior. According to him, there were many disputes among these philosophers about why water did not flood the earth. Despite such arguments, Calvin claimed that even these philosophers who did not consider God in their works confessed that water's behavior was above the natural order (*par dessus nature*). Even these philosophers had to admit that water shrank aside and allowed people a dry place on the earth in which to live. Even these philosophers had to allow that this dry land did not exist based on the disposition of water itself but rather because of divine providence. They may have been blind to God, but even they could not deny that the water behaved above the natural order.<sup>384</sup> This rhetorical device of including supposed philosophers' opinions on the behavior of water in this sermon stressed that water's failure to flood the earth was a clear wonder that went beyond the secondary causes God had implanted in the world during the creation process. For Calvin, even philosophers who did not acknowledge God realized that there was something odd about water's behavior that the natural order and its secondary causes could not explain.

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<sup>383</sup>Job 38:4-10 read, "Where wast thou when I layed the fundacions of the earth? Declare, if thou hast understanding, who hath layed the measures thereof, if thou knowest, or who hath stretched the line over it: Where upon are the fundacions thereof set: or who layed the corner stone thereof: When the starres of the morning praised me together, and all the children of God rejoiced Or who hath shut up the sea with dores, when it yssued and came forth as out of the wombe: When I made the cloudes as a covering thereof, and darkenes as the swadeling bandes thereof: When I stablished my commandment upn it, and set barres and dores, and said, Hetherto shalt thou come, but no farther, and here shal it staye thy proude waves."

<sup>384</sup>CO 35 Col. 366-367.

Water's odd behavior was so obvious for Calvin that many of his other discussions of the earth's foundations such as his commentary on Psalm 75:3 and Psalm 104:5-6 explored what this subversion of the natural order meant for the created universe as a whole. According to Calvin, God's active restraining of the waters protected the earth and everything on it from annihilation. His commentary on Psalm 75:3 focused on the behavior of those waters that existed inside the earth to emphasize this theme. Assuming the existence of water in the bowels of the earth much as contemporary masters did, Calvin argued that this water would cause the earth to dissolve except that God's secret power kept the water from doing so. The created world could not continue without God's direct involvement in it. Calvin underscored the importance of God's active control over water for the continued existence of the created universe as he intimated that this control went beyond this particular natural occurrence and even the natural order of the universe. Though the prophet here may allude to the natural order in these verses, Calvin explained that the prophet actually meant to raise people higher than this as this particular example taught them about God's relationship to the created universe as a whole. This example showed that God, not the natural order or its secondary causes, was responsible for directly sustaining the universe. God's active direction of water and his preservation of the earth showed that if the universe were to collapse, God's power alone would provide the universe with a new stability.<sup>385</sup> Emphasizing God's direct intervention in the world to protect the earth from the inherent disposition of water to dissolve the dry land, Calvin claimed that God alone was responsible for supporting the universe and that God would protect that universe even against the natural order he had given to it at its creation.

Calvin's commentary on Psalm 104:5-6 also explored the relationship among water, God, and the natural order as it described how God directly protected the earth from the threat of

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<sup>385</sup>CO 31 Col. 702.

water. Here Calvin even more explicitly drew on natural philosophical teachings about the four elements and their dispositions to highlight God's active involvement of the world to ensure the continued existence of the universe. Water was the best example of this for Calvin because it highlighted God's power even over the natural order. Though conceptions of the four elements according to the natural order could explain why the earth was at the center of the universe, they did not indicate why the waters failed to flood the earth. Calvin asserted that the only explanation for this situation was that God's providence actually corrected the natural order.<sup>386</sup> Calvin drew much the same lesson from this as he had in his commentary on Psalm 75:3. Stating that the entire natural order depended on the decree of God because he was its creator, he explained that God's secret power alone kept the earth stabilized. This secret power as well as the upholding and the subverting of the natural order provided people with a dry, stable place to live. This wonder not only provided people with a place on which to dwell. The created universe would utterly cease to exist if God did not continue to uphold and directly govern it. God's active involvement with the world was so obvious to Calvin that he even argued God's particular relationship to water should allow people to live without trepidation or anxiety and with hope for the future when they saw just how much God supported the earth and the created universe as a whole.<sup>387</sup>

Calvin again insisted on God's direct control over water's behavior in the sixth verse of this same psalm. Focusing on particular features of the earth that the natural order should lead water to destroy thoroughly, he again stressed that God's relationship to water showed that

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<sup>386</sup>Calvin's language here suggests just how great the contrast between the natural order and God's direct intervention beyond this natural order was for him: "Deinde si aquae supereminet, quia leviores sunt, cur non ergo circulariter operiunt totam terram? Hic certe non habent philosophi quod respondeant, nisi Dei providentia correctum fuisse naturae ordinem, ut hospitium pateret hominibus." CO 32 Col. 86.

<sup>387</sup>CO 32 Col. 86-87.

human beings and even the universe could not continue to exist without God's direct intervention in it. Psalm 104:6 reads, "Thou coveredst it with the deepe as with a garment: the waters wolde stand above the mountaines." Calvin first asserted that God had direct control over the waters and then alluded to natural philosophical teachings about the four elements to explain the significance of this control. He claimed that water would cover the valleys and the mountains unless the waters fled from God's rebuke. God had set particular boundaries for the water so that they did not return to submerge the earth.<sup>388</sup> According to Calvin, the prophet used this example to show that the appearance of the dry land did not occur through the natural order (*naturaliter*) but rather that it was clearly a wonder. He emphasized this contrast between the wonderful behavior of water and its behavior according to the natural order to show how essential God's support was for the continuance of the universe. Despite God's restraining of the waters, they still retained their disposition. If God were to take away the boundaries that held water back from the earth, then the waters would suddenly (*repente*) cover the mountains.<sup>389</sup> If water were to follow its disposition, the earth and life on it as Calvin's contemporaries knew it would cease to exist. God's active government of the world to cause water to behave beyond the natural order was solely responsible for the continuance of the created world.

Calvin's insistence on God's government of the universe beyond simply upholding the natural order to restrain water from flooding the earth reveals a similar view of the created universe as his discussions of God's direct intervention into the world to cause particular meteorological phenomena did. Much as he had argued in his descriptions of suddenly occurring meteorological wonders, Calvin's discussions of water's preternatural behavior also insisted on

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<sup>388</sup>CO 32 Col. 87.

<sup>389</sup>"Ergo propheta non temere contendit claro miraculo, non autem naturaliter fieri ut appareat aliqua terrae facies. Nam si habenas mari Deus laxaret, repente starent aquae super montes." Ibid.

God's role as creator and govern of the universe. If God had not created and continued to uphold the universe, it would cease to exist. Calvin also stressed that God's restraining of the waters played a role in the relationship between God and human beings as God used this intervention to provide people with dry land on which to live much as his descriptions of God's control over meteorological phenomena had. His other discussions of water and its relationship to God, though, show that water had an even more significant role to play in the relationship between human beings and God than meteorological phenomena did. For Calvin, God's control over water was a control over the life and death of human beings as well as over the continued existence of the created universe. As such, God's restraining or unleashing of water had a more direct influence on human beings and the created universe than meteorological phenomena did. God used water to judge human beings directly. Without God's active restraint of the water to provide for the faithful, water's natural disposition would allow the postlapsarian chaos to take over the world and utterly annihilate both the faithful and the wicked.

Calvin's comments on Psalm 33:7 stressed how God used his control over the water to provide for human beings.<sup>390</sup> God's control over water went beyond simply bestowing rain to water crops for human beings to eat. Instead, God's restraint of the waters allowed the very existence of human beings to continue. The beginning of his commentary on this verse stressed God's active control over water's behavior, drawing on natural philosophical doctrines of the four elements and the dispositions of water. Water failed to flood the earth despite the characteristic arrangement of the four elements and the disposition of water as a fluid, unstable element. Calvin then drew implications from this that focused on the created universe as a whole. According to him, God considered human welfare when he restrained the waters behind secret

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<sup>390</sup> Psalm 33:7 reads, "He gathereth the waters of the sea together as upon an heape, and laieth up the depths in his treasures."

ramparts. God actively subverted the natural order to provide people with a dry place to live. They could not survive without this dwelling place. His comments on the second part of this verse again highlighted that God controlled the created universe to provide for the existence of human beings. Indicating the “immense mass of water” in the seas and in the hollows and the bowels of the earth, Calvin again pointed out that God’s restraint of them provided people with a place to live.<sup>391</sup> If God’s power did not keep the waters in these hollows and seas, they would swallow up the earth. God exercised his paternal care for human beings as he directly controlled water in order to provide people with a stable, secure place to live.

There was no better example of God’s paternal care for people than when he exercised his power over the created universe to part the Red Sea. This particular example again highlighted that God used his control over water to provide life and death to human beings. Calvin directly took up this topic in his discussion of Exodus 14:21 within his commentary on Moses’ five books in 1563.<sup>392</sup> For Calvin, this verse underscored God’s power over the created universe that he used to protect the lives of his chosen people and to kill those who persecuted them. God’s parting of the Red Sea was a miracle, but this miracle stemmed from the active control God had over the created universe and his employment of that control to aid the chosen and punish the wicked. Calvin made this argument by denying that the Red Sea parted due either to Moses’ power or the power of the winds. According to Calvin, Moses even wrote this verse to show that he had no control over the parting of the waters. Instead, God’s power over both the

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<sup>391</sup>CO 31 Col. 328.

<sup>392</sup>Exodus 14:21 reads, “And Moses stretched forth his hand upon the Sea, and the Lord caused the Sea to runne back by a strong East winde all the night, and made the Sea drye land: for the waters were devided.” Calvin’s commentary on Genesis was initially published in 1554. It appeared again in 1563 along with his commentary on the remaining four books of the Pentateuch under the title, “*Mosis libri V cum Ioannis Calvini Commentariis: Genesis seorsum; reliqui quatuor in formam harmonia digesti.*” See the discussion of this work in Wulfert de Greef, *The Writings of John Calvin: An Introductory Guide*, trans. Lyle D. Bierma (Grand Rapids, MI: Baker’s Books, 1993), 105-106.

water and sudden changes in meteorological phenomena was responsible for the Israelites' escape from the Egyptians. Due to God's ability to intervene in the world directly, he could have parted the Red Sea without the aid of the winds. God chose to use the winds to part the sea to show that he had power over the created universe so that he could aid human beings.<sup>393</sup> Calvin signaled the importance of this direct control over the parting of the sea through a significant phrase. Stating that the winds could not part the sea, Calvin argued that God's secret power that caused the winds to do so occurred *supra naturae modum*.<sup>394</sup> God's status as creator and governor of the created universe allowed him to go beyond or even contradict the natural order so that he could control the behavior of water. God even used this control during this one particular miraculous event to save the lives of some human beings and take the lives of others. When the Red Sea parted, the created universe had become an arena in which its behavior was directly dependent on the relationship between God and particular groups of human beings.

Calvin's lecture on Jeremiah 5:22 also drew on natural philosophical teachings about the four elements and the natural disposition of water to highlight God's active government of the world.<sup>395</sup> Rather than focusing on how God controlled the behavior of water to provide life and death to human beings, Calvin focused on what human beings could learn from God's active control over water in his lecture on this biblical verse. In addition to showing people that God used his control over water to care for human beings, this biblical verse disclosed that the behavior of water chastised people for their disobedience of God. Again, labeling water's failure

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<sup>393</sup>CO 24 Col. 153-154.

<sup>394</sup>“Etsi autem in Dei ipsius arbitrio erat nullo aeris motu aquae dispellere: ut tamen ostenderet sibi totam naturam parere, et nutu suo regi, ventum orientalem excitare placuit. Interea tenendum est, nullo quantumvis impetuoso flatu potuisse siccari mare, nisi supra naturae modum arcana vi spiritus sui operatus esset.” CO 24 Col. 154.

<sup>395</sup>Jeremiah 5:22 reads, “Feare ye not me, saith the Lorde? Or wil ye not be afraid at my presence, which have placed the sande for the bondes of the sea by the perpetual decre that it can not passe it, and thogh the waves thereof rage, yet can thei not prevaile, thogh thei roare, yet can thei not passe over it?”

to submerge the earth as a wonder due to water's characteristic propensity to flood it, Calvin explained that water actually behaved beyond this disposition due to God's direct intervention in the world. Here Calvin described this intervention from the perspective of the water rather than emphasize God's protection and punishment of human beings. When water failed to flood the earth, it obeyed God's command rather than its own characteristic disposition. Calvin contrasted the violence and the fury of water's disposition with its quiet, calm obedience of God's command to underscore this compliance. Though the sea tossed furiously according to the natural order, God kept it in restraint through his control over the world. For Calvin, water's failure to follow its natural disposition chastised people because of the type of creatures both water and human beings were. Whereas human beings had reason and understanding, water did not, and therefore it could be expected to follow the natural order blindly. As such, water's obedience of God's command emphasized human beings' disobedience because as rational creatures, they should more quickly follow God's command than water did.<sup>396</sup> Since God controlled water with his command, this provided people with a model of how they should respond to God's command because the created universe played such a significant role in the relationship between God and human beings. This claim went beyond the one Calvin had made in the context of meteorological phenomena. Though sudden changes in the weather could capture people's attention, God did not just control water to wake people up to his power over the created universe as he did the weather. Instead, God's use of water to allow people to live or to cause them to die provided people with a much more immediate lesson about obedience to God.

According to Calvin, there was one historical instance when water had followed its inherent characteristics, and it was also directly related to such disobedience. During the Flood,

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<sup>396</sup>CO 37 Col. 631-633.

God had withdrawn his care from human beings and used water's natural propensity to submerge the earth to punish them. This singular occurrence revealed yet again that the natural occurrences of the created universe reflected the relationship between human beings and God for Calvin and that God's control over water in particular was a control over the life and death of human beings. Calvin made this argument especially in his commentary on Genesis 7:11.<sup>397</sup> He pointed out here that God actively subverted the natural order as he controlled the behavior of water. God directly restrained the sea from overflowing its ramparts and kept the subterranean waters from bursting out of the earth. This restraint kept people alive and provided them with a place to dwell. When God decided to flood the earth and punish all people with the exception of Noah and his family, he withdrew his previous direct intervention in the world. In doing so, he allowed the water to seek its natural place above the dry land. Following its natural disposition, water flooded the earth, killing the vast majority of humanity, animals, and plant life.<sup>398</sup> God's power over water and through it over human life and death continued as he reinstated his active control over the water after the forty days of the Flood. According to Calvin's explanations of the eighth and ninth chapters of Genesis, after God had destroyed most of humanity and cursed the earth, he gathered the waters together once again and re-imposed the previous barriers. Water once again behaved beyond the natural order after the Flood due to God's re-intervention in the created world. The sea retreated to its previous place, and the subterranean water returned to the channels and hollows inside the earth. God also promised people that he would never again cease to keep water behind these ramparts, sealing this promise by engraving a mark of it in a

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<sup>397</sup>Genesis 7:11 reads, "In the six hundereth yere of Noahs life in the seconde moneth, the sevententh day of the monthe, in the same day were all the fountaines of the great depe broken up, and the windowes of heaven were opened."

<sup>398</sup>CO 23 Col. 131-132.

rainbow.<sup>399</sup> God's promise and his re-intervention in the world ensured people that he would continued to restrain the waters and uphold human life within the created universe.

Much as he had in his descriptions of meteorological phenomena, Calvin also revealed his notion of the created universe as he wrote about the relationship among water, God, and the natural order. His writings on this particular relationship stressed even more than his descriptions of meteorological phenomena had that the created universe played a significant role in the relationship between God and human beings. Water had such a significant place in this relationship because of its peculiar connection to God and the natural order. Unlike meteorological phenomena that could follow the natural order God upheld, water's everyday location in seas, rivers, lakes, and in the hollows of the earth was actually due to God's direct involvement in the world in contrast to the disposition and the arrangements of the natural order. Human beings could only survive when God caused water to behave beyond the natural order. When water did follow the natural order such as during the Flood, this was an exceptional experience never to be repeated after God's promise to Noah and his progeny. Calvin's notion of God as directly restraining the water from overwhelming the earth and killing human beings and everything on it along with the characteristic of water as a common substance underscored that God and God alone was responsible for the continued existence of both human beings and the created universe.

Calvin's depiction of the created universe in his descriptions of water's preternatural behavior resonate with his depiction of it in his discussions of meteorological phenomena. In both cases, he argued that God actively intervened in the world to cause sudden meteorological wonders and the existence of the dry land because God was the governor of the world he created

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<sup>399</sup>See especially Calvin's comments on Genesis 8:1-2 (CO 23 Col. 135-137); 8:21-22 (CO 23 Col. 139-141); and 9:13 (CO 23 Col. 149).

and because this government played a role in the relationship between human beings and God. As we saw in the last chapter, Calvin's notion of the created universe in the context of meteorological phenomena clashed with those masters offered in their accounts of the secondary causes that caused these phenomena to occur. Analyzing what Reisch, Titelmans, Brossier, Velcurio, and Melanchthon wrote about water and the existence of dry land allows us to analyze this tension surrounding both God's relationship to the created universe and the causes of the natural occurrences of that universe more fully.

### **Masters on Water and the Existence of Dry Land**

Many contemporary masters also singled out water's failure to flood the earth as an occurrence requiring particular explanation. The comments of Frans Titelmans and Johann Velcurio on the behavior of water begin to suggest just how widely these explanations varied among these masters. Titelmans remarked that the question of water's placement relative to the earth was particularly difficult because water did not submerge the earth as one might expect.<sup>400</sup> Velcurio also stated that the location of water was controversial because it was not located in its natural place as the other elements were.<sup>401</sup> For these masters as well as for Calvin, the difficulty and the controversy surrounding this question stemmed from water's seeming failure to follow the dispositions and the arrangements of the natural order. According to their notions of the four elements and the inherent characteristics of water, the dry land simply should not exist. Much as Calvin had done, Reisch, Titelmans, Brossier, Velcurio, and Melanchthon all explicitly explored God's relationship to the universe he created as they explained the existence of the dry land.

Reisch, Brossier, and Melanchthon drew on conceptions of the natural order that God had instilled in the universe at its creation to explain the dry land's existence. Since water's inherent

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<sup>400</sup>Titelmans, sig. Lviiiir.

<sup>401</sup>Velcurio, sig. L6v.

disposition to flood the earth could not explain its failure to do so, these three authors all pointed to different aspects of the natural order to explain why water did not flood the earth. Reisch argued that God's initial arrangement of the elemental spheres was responsible for the existence of the dry land. He claimed that God had arranged the spheres of fire, air, and water around the geometric center of the universe and the earth's sphere to be slightly off-center. Having different centers, this meant that some of the earth's sphere stuck out above the water, creating one combined sphere of water and earth and providing the dry land on which animals lived and plants grew.<sup>402</sup> The context of Brossier and Melanchthon's descriptions of the dry land's existence was slightly different. Rather than describe the relative positions of the four elemental spheres as Reisch had done, Brossier and Melanchthon explored the position of water in the context of a description of elemental mixtures. Though sharing this context, Brossier and Melanchthon ultimately pointed to different aspects of the natural order to explain the dry land's existence. Brossier claimed that the surface of water curved inward in comparison to the surface of the earth. This explained why the elements of water and earth so readily mixed together.<sup>403</sup> Melanchthon's explanation focused more on the mixtures of the elements themselves rather than the shape of the elemental spheres. Arguing that pure forms of fire, air, water, and earth simply did not exist, he showed that the various qualities of the elements that God had given them during the course of creation caused a mixture of the various elements to make up all the objects people encountered in the world including the waters of the ocean and the dry land on which they dwelled. Dry land existed because the element of earth mixed with the element of water

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<sup>402</sup>Reisch, *Margarita Philosophica*, 1517, sigs. tiir-tiiv.

<sup>403</sup>Brossier, sig. fiir.

around it.<sup>404</sup> Sharing a notion that some aspect of the natural order could explain why water did not flood the earth, Reisch, Brossier, and Melanchthon all singled out a different aspect of that natural order to explain the existence of dry land.

Though sharing assumptions about the significance of the natural order for the behavior of water, these authors' focus on different aspects of it suggest that water and its behavior was a more contentious topic among contemporary masters than meteorological phenomena or even the heavens. While these authors all intimated that the natural order God had implanted in the universe caused water to behave in this particular manner, they offered different explanations of exactly which aspect of the natural order caused it, revealing that there was still slight clashes even among these masters' explanations of how this particular natural phenomenon of the created world occurred. Turning to the works of Titelmans and Velcurio, we find that these clashing explanations of water's behavior extended beyond different views of the arrangements between and the dispositions of water and the dry land. Their explanations of water's failure to flood the earth clashed strongly with those Reisch, Brossier, and Melanchthon offered.

Titelmans and Velcurio directly took up the topic of God's relationship to the natural order and the created universe more broadly as they argued that water's behavior actually went beyond this order. For them, only God's direct intervention in the world to cause water to behave beyond its natural disposition could explain why it did not flood the earth. As we saw above, Titelmans singled out water's behavior in relationship to the dry land as a particularly difficult question to answer because water did not behave according to its inherent disposition. He then declared that the behavior of water allowed he and his readers to seek knowledge about God's works precisely because it did not follow its own disposition. According to him, there were three possible explanations for its behavior – God's power alone, the natural order God had provided

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<sup>404</sup>See Melanchthon's discussion of the qualities of the elements, sigs. Z5r-a4v.

for the world during its creation, or some combination of the two.<sup>405</sup> Eventually arguing for God's direct intervention in the world, Titelmans listed other philosophers' arguments for the existence of the dry land that credited its existence to either the natural order alone or a combination of this order and God's active government of the world. The arguments he cited are significant both because they provided the background against which his own arguments developed and because they suggest yet more conflict among masters about the relationship among water, the natural order, and God than even the clashes among Reisch, Brossier, Melanchthon, Titelmans, and Velcurio's explanations of the dry land's existence reveal. According to Titelmans, some philosophers credited the natural order as they pointed to Saturn's characteristics to explain the existence of dry land. These philosophers taught that God had fashioned Saturn as a cold, dry planet, and its inherent dryness influenced water so that it did not flood the earth. The other two opinions Titelmans attributed to philosophers built on notions of the cooperation between the natural order and God's direct activity in the world to explain why the dry land existed. According to Titelmans, some claimed that God's command to water on the third day to gather together was a wonder that occurred through God's power alone. The continued existence of dry land over the course of time, though, occurred through the natural order for these philosophers. A second group of philosophers taught something related, though slightly more specific. Though these philosophers also claimed that God's power was initially responsible for the position of water, the disposition of the earth to float in water meant that dry land currently existed through the natural order.<sup>406</sup> As Titelmans grappled with the relationship

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<sup>405</sup>“Quaerimus ergo ad cognitionem operis dei, an sola divina virtute absque cooperatione naturae ista terrae discooperatio, & aquarum separatio facta sit, an simul ulla naturalis virtus ad hanc rem concurrerit. Et si sola Divina virtute id factum dicamus in principio, die tertio distinctionis rerum, an usque nunc eodem modo, deus miraculose sua sola virtute eam ita contineat.” Titelmans, sig. Lviiiir.

<sup>406</sup>Ibid., sigs. Lviiiir-Lviiiiv.

among water, God, and the natural order, his comments suggest that contemporary masters were widely divided on the subject of how this particular phenomenon of the created universe occurred. More significantly, they suggest that there was even a middle position between that of Reisch, Melanchthon, and Brossier who argued that some aspect of the natural order accounted for water's behavior and that of Titelmans and Velcurio who attributed it solely to God's intervention in the world. This middle position held that a combination of both God's historic activity in the world and the natural order explained the existence of dry land.

Titelmans drew on Scripture to argue that only God's direct intervention in the world could explain water's behavior beyond its natural disposition. He claimed that the Book of Genesis provided people with a true account of the creation of the world. This account was so accurate for Titelmans that he explained the most certain knowledge people could have about water's behavior came from "the infallible teaching of sacred Scripture." Genesis taught that God's "most powerfully efficacious" word caused water to gather together into one place and expose dry land even into the present day.<sup>407</sup> God's direct activity in the world through his word and not the natural order caused water to fail to flood the earth. Titelmans then employed various psalms along with passages from the Book of Job, Proverbs, and the Book of Wisdom as proof texts to argue against those philosophers who claimed a combination of God's direct involvement in the world and the natural order could explain the behavior of water. Though some may argue that celestial influences kept water from flooding the earth, the psalms showed that people must ascribe this wonder solely to God. Titelmans even claimed that these biblical

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<sup>407</sup>“Verum enim praedicat sint omnino incerta (quis enim definire nobis poterit an virtus aliqua talis sit in terra, vel in coelestibus constellationibus ad eam rem sufficiens) praestat ut eo quod certissimum est contenti simus, hoc autem est, quod ex infallibili doctrina sanctae scripturae didicimus, nempe Divina virtute terram esse discooperatam, verbo & iussione omnipotentis dei, dicentis (ut primo capite Geneseos scribitur) Congregentur aquae quae sub coelo sunt in locum unum & appareat arida. Cuius verbi sane potentissimi efficacia, credimus usque nunc permansisse aquam in eo situ & loco quem tunc accepit, & in quo nunc cernitur: ita scilicet ut terram non, quomodo ab initio ex omni parte circundet, sed ex magna parte nudam velut circumlambat.” Ibid., sig. Lviiiiv.

passages showed the search for other causes of water's behavior was unnecessary.<sup>408</sup> For Titelmans, Genesis recounted God's efficacious, direct command that went against the natural order. It was only this active intervention in the world that kept water from submerging the earth, and he read Psalms, Job, Proverbs, and Wisdom to support this reading of Genesis.

Velcurio's explanation of the behavior of water reveals sixteenth-century masters' clashing descriptions of the relationship among water, God, and the natural order even more clearly. Though Velcurio argued emphatically that God directly caused water to behave against its inherent disposition, he juxtaposed his argument with those claims some philosophers made about the natural order and its ability to keep water from flooding the earth without reconciling his argument with these philosophers' claims. Velcurio began his own claims for God's active control over water differently than Titelmans had. Rather than proposing the causes of water's behavior as a question for investigation, he contrasted the behavior of water during the first two days of creation and during the Flood with the way water behaved the rest of the time. He argued that water had followed its disposition according to the natural order during the first two days of creation and during the Flood. God's command on the third day of creation caused water to behave against this disposition.<sup>409</sup> As Velcurio summarized his argument, he argued that water's behavior after this period was a wonder that God's command directly caused.<sup>410</sup>

His following statements about other philosophers suggest how debated water's behavior and the existence of the dry land were among contemporary masters. After he made his argument for God's active intervention in the universe to separate water from the earth, Velcurio recounted

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<sup>408</sup>Ibid., sigs. Lviiiiv-Mir.

<sup>409</sup>Velcurio, sig. L6v.

<sup>410</sup>Ibid., sig. L7r.

some philosophers' explanations for water's failure to flood the earth. He explained that "according to philosophers," the earth and the water mixed together to form one spherical body much as Reisch had done. He also included the argument for the two different centers of the elemental spheres of water and the earth, again as Reisch had explained at length in his own text.<sup>411</sup> These philosophers' arguments stressed the natural order as the explanation for water's behavior. For Velcurio's philosophers, the arrangement of the elemental spheres and the dispositions of water and earth within those spheres explained why water did not submerge the dry land. This attribution of water's behavior to the natural order clashed with Velcurio's own insistence that God's command alone was responsible for the existence of the dry land. The juxtaposition of his opinion with these philosophers' descriptions only heightened the clash between them. Though Velcurio himself did not reconcile these two separate viewpoints, his inclusion of them both supports the statement he made toward the beginning of his description of water's location when he stated that water's position was controversial because it did not occupy the place it should according to the natural order.<sup>412</sup>

We see this controversy surrounding the relationship among water, God, and the natural order in Velcurio's own juxtaposition of contrary positions as well as in the clashing explanations of water's behavior that he along with Reisch, Brossier, Melanchthon, and Titelmans offered. Whereas Reisch, Brossier, and Melanchthon pointed to some aspect of the natural order to explain the dry land's existence, Velcurio and Titelmans argued that only God's direct involvement in the world to cause water to behave beyond the natural order could account

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<sup>411</sup>The transition from Velcurio's argument to his account of philosophers' claims was abrupt. Giving an example to support his claim about God's direct intervention into the world, he then immediately asserted, "Est ergo secundum Philosophos quoque unum corpus sphaericum constitutum ex tota aqua & terra simul sibi invicem mistis, cuius corporis duplex centrum traditur..." Ibid.

<sup>412</sup>Ibid., sig. L6v.

for its failure to flood the earth. Their works reveal that sixteenth-century masters offered different views of the particular relationship among water, the natural order, and God even though their descriptions of the causes of meteorological phenomena largely resonated.

These authors' different explanations of why water did not submerge the earth also encompassed diverse notions of God's relationship to world he had created. As Reisch, Brossier, and Melanchthon explored the features of the natural order that made life on earth possible, these masters or those responsible for redacting and publishing their texts all explicitly described God's relationship to the natural order. In doing so, they stressed that God actively governed the created universe through the natural order he had instilled in it at creation. Reisch made this claim through his exegesis of Scripture. He employed biblical passages similar to those Titelmans discussed, though he drew very different conclusions from these biblical texts. Stating that the arrangement between the spheres of water and earth was responsible for the dry land's existence, Reisch assumed that the creation account in the Book of Genesis was an account of God's implantation of the natural order in the universe and that other biblical texts described the actual behavior of water according to this natural order. Reading the Book of Genesis, Reisch argued that God's command on the second day to separate the waters and his command on the third day to the waters to gather together were actually God's providing of the arrangement between water and earth, even though water had covered the earth during the creation of primordial things.<sup>413</sup> On the third day, the elemental spheres received the arrangements that they would have into the sixteenth century. Explaining the presence of water in the bowels of the earth, Reisch then turned to various Psalms to prove that this water existed within it. Given the

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<sup>413</sup>“Aqua in primordialium rerum creatione ad modum nebulae tenuissime totam terrae circumdedit superficiem et usque ad superiora progrediebatur. Sed iussu creatoris firmamentum aquas ab aquis divisit: et quae sub firmamento relictæ sunt in locum unum...Ex tota itaque terra et aquae substantia unum corpus sphericum est constitutum.” Reisch, *Margarita Philosophica*, 1517, sig. tiir.

arrangement of the sphere of water in relationship to the earth's, water ran through hollows in the middle of the earth. Reisch then added that Scripture attested to water's existence within these hollows.<sup>414</sup> His different usages of Scripture in his explanations of both the existence of dry land and the presence of water in the bowels of the earth reveal how he viewed God's relationship to water and his government of the created universe more broadly. Reisch assumed that God had created the world and given it a natural order through which water did not flood the earth. He also assumed that Scripture had an accurate description of this creation process as well as the behavior of God's various creatures to the extent that Scripture could act both as a starting point for natural philosophical arguments as well as an illustrative example for a natural philosophical doctrine. Though employing Genesis as a starting point for his argument and various other biblical texts, including the psalms as proof texts much as Titelmans had done, Reisch made the exact opposite conclusion. Drawing on Scripture, Reisch argued that the existence of dry land occurred through the natural order even as he insisted that one could not separate this natural order from God who had created the world and continued to govern it.

It is unclear whether Brossier personally included the explicit mention of God's relationship to the behavior of water in the 1536 edition of his text or whether his redactor, Hieronymus Rupeus, or someone involved with the publishing of the text did so. Despite this uncertainty, this edition of the *Totius philosophiae naturalis* included a marginal note directly beside his assertion that the shape of water's surface accounted for its failure to flood the earth that did so directly. This marginal note asserted that water's seemingly strange behavior occurred

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<sup>414</sup> "Totius tamen est una superficies convexa nec aqua terre superficiem supergreditur: sed in concavitate eam per medium quasi diluit et circumdat: sacra attestante scriptura." Ibid., sig. tiiv. The biblical attribution in the margin reads, "Psalmus ciii.a."

through “the great providence of God.”<sup>415</sup> When a reader explored this edition of the text, he was at least presented with this attribution of water’s behavior to the providence of God. Taking the marginal note and Brossier’s own explanation of the existence of dry land together, we find that this edition of the text gave a similar impression of God’s government of the created universe through the natural order as Reisch’s had. Brossier himself asserted that the natural order was responsible for water’s position relative to the earth’s location, pointing out that the cause of the mixture between the elements of earth and of water was the arrangement between water’s surface and the earth.<sup>416</sup> The marginal note gave credit to God’s providence for overseeing specifically this particular aspect of the created universe. The impression that this text gave was that water failed to flood the earth because God’s providence oversaw the arrangement between the water and the earth, much as Reisch had argued.

Melanchthon’s descriptions of the mixture of elements through which he explained the dry land’s existence was even more explicit about God’s government of the created world through the natural order. For him, the qualities God had infused into the elements at their creation explained how God continued to govern the universe through the natural order. Melanchthon’s discussion of God’s relationship to these qualities reveals his reliance on the natural order as a way to explain the behavior of water clearly. Melanchthon asserted that knowing about the primary qualities of each element was useful to the consideration of God’s works because God governed changes in sublunary bodies through these primary qualities.<sup>417</sup>

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<sup>415</sup> The marginal note reads, “Iterum magna dei providentia.” Brossier, sig. fiir.

<sup>416</sup> “Non enim homini (quem sane dominus inter opera manuum suarum principem effecit) purum omnino conveniret elementum. . . . Quin & ob eandem causam, desinit aquae superficies concava, ipsius terrae, ut in caeteris fit, locus esse.” Ibid., sigs. fiv–fiir.

<sup>417</sup> “Deinde iuvat etiam considerare admirandam Dei opificis artem. Cum tam variae sint corporum mutationes, alterationes, mixtiones, coagulationes, dissipationes, tractiones, exhalationes, putrefactiones,

Though God was ultimately responsible for the changes among these bodies because he had given the elements their primary qualities, elements such as water and earth mixed together to form the dry land and the seas because the qualities of these elements were secondarily responsible for changes in sublunary bodies. God remained the first cause of all changes in the terrestrial realm for Melanchthon, and as the first cause, God continued to govern the created universe. Yet, the qualities of these elements lent particular dispositions to water and earth. These dispositions were more directly responsible for changes in the sublunary realm as they were an aspect of the secondary causes that God had instilled in the world to structure the natural order through which the vast majority of natural phenomena occurred.

Reisch, Brossier, and Melanchthon did not offer the exact same description of the relationship among water, God, and the natural order when they explained the existence of dry land. Still, all three explicitly drew on their presuppositions about God's creation of the world and his implantation of a natural order in that world to explain why water did not submerge the earth, even if they pointed to different facets of the natural order to explain this seemingly strange behavior. All three also assumed that God continued to govern the world through this natural order and its secondary causes. Even when the world functioned through the regular patterns of the natural order for these authors, water would not flood the earth. God was ultimately responsible for this as the creator and the governor of the world, but the secondary causes of the natural order more directly caused water to remain within the boundaries of the seas and within the bowels of the earth.

While sharing the same presuppositions about God's creation of the world and its natural order and secondary causes with these authors, Titelmans and Velcurio broke with them on why

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*corruptiones, generationes, ut infra species aliquas recitabimus, tamen varietatem tantam a paucis qualitibus primis, scilicet calore, frigore, humiditate & siccitate gubernari Deus voluit.*" Melanchthon, sig. Z2v.

water behaved as it did. This different understanding of the causes of water's behavior also included a different notion of the created universe. Proposing that God actively intervened in the world to keep water from flooding the earth and to make water behave beyond its natural disposition, Titelmans and Velcurio also discussed how God governed the world. Though focusing on a similar topic as Reisch, Brossier, and Melanchthon, their descriptions also explored further aspects of God's relationship to the created universe. Stressing that God directly restrained water from flooding the earth, Titelmans and Velcurio argued that the behavior of water could teach people about the relationship between God and human beings because this particular natural occurrence played a role in this relationship.

Titelmans pointed to God's direct control over water's behavior to argue that this aspect of the created universe could teach human beings about their lack of obedience of God. God's direct restraining of the waters provided people with a model for their behavior precisely because this aspect of the created universe played a role in the relationship between human beings and God. Titelmans described God's government over the created universe and water in particular as he argued against the labeling of water's behavior as violent. Even though God's direct intervention in the world to restrain water did go against the natural order, Titelmans claimed that this did not mean people could call water's behavior, "violent" as some philosophers had argued. For Titelmans, God governed the created universe as its *paterfamilias*. There could be no sweeter (*dulciter*) or more pleasant (*sauviter*) governor of the world than this one.<sup>418</sup> Water's failure to flood the earth meant that this aspect of the created universe could teach people about

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<sup>418</sup>Titelmans described God's government of the created universe thus: "Quomodo enim violentum & ullius creatae naturae poterit esse contrarium, quod est ex voluntate & iussione domini naturae, dulciter gubernantis, & disponentis omnia suaviter? Quomodo in familia bene ordinata & subiecta violentum esse poterit aliquid eorum quae paterfamilias sua voluntate disposuit? Non ergo nunc violente cohibetur aqua ne circundet terram, sed sauviter & dulciter sese continet Dei imperio obsequens usquedum in consummatione seculi (mixtis omnibus consummatis) eiusdem verbi iussione suum locum recipiat." Titelmans, sigs. Mir-Miv.

their relationship to God precisely because God acted as the *paterfamilias* of the created universe. As its creator, God oversaw his creatures for their own good. God governed water in a certain way to provide people with a model for their behavior. In doing so, God used his control over the creatures of the created universe to benefit human beings. As one of God's creation, water obeyed God's direct command when it did not submerge the earth. As one of God's creation, human beings should have the same response to God's word as the water did. Despite water's obedience, Titelmans pointed out that human beings currently did not learn to obey from this example. Instead, water's obedience of God taught people about their own disobedience of his word.<sup>419</sup>

Also stressing God's active government over the created universe in the context of water, Velcurio drew a slightly different conclusion about what water's behavior could show people concerning their relationship with God. For him, God's active restraining of the waters showed that God acted as a father for the entire created world. Rather than stress God's directing of the natural occurrences of the created universe especially for human beings, Velcurio emphasized that human beings were one creature among the many that God actively protected as he governed the universe. For him, God directed the natural occurrences of that world to ensure that each and every one of his creatures continued to exist. He made this claim in two different places within his discussion of water and the existence of the dry land. As he initially credited God's command on the third day of creation for holding back the waters, he explained what would have happened in the created universe if God had not ordered this. Currently, God's command to the waters provided human beings, animals, and plants with a place to grow and dwell. If water were to submerge the entire earth, none of this could occur. Neither human beings nor animals could survive, and plants would not grow because the water would cause human beings and animals to

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<sup>419</sup>Ibid., sig. Mir.

suffocate and the earth to become sterile.<sup>420</sup> God's active, direct restraining of the water ensured that that universe and its natural phenomena, including the life of human beings continued to exist and to occur. Velcurio made this explicit during the summation of his argument. He stated that God was the parent of all of his creatures and that God conserved them all. When God held back the waters from flooding the earth, he kept animals from suffocating and allowed plants to grow to feed them.<sup>421</sup> For Velcurio, God's active control over the water showed people that God was the father of all of his creatures and that he acted to benefit all of these creatures through his government of the created universe. Though God's active restraint of water showed that the created universe played a special role in the relationship between human beings and God, this was the relationship between the creator and one of his many creatures. For Velcurio, as God watched out for human beings, he also ensured that animals did not suffocate and that plants continued to grow. For him, then, the further existence of the created universe and all its creatures rather than the particular relationship of God and human beings was at stake when he insisted on God's active restraining of water from flooding the earth.

As the writings of these masters show, water provided an ideal topic for these authors in which to explore the relationship among the created universe, its natural order, and God because common natural philosophical teachings about the four elemental spheres and the dispositions of the elements could not explain why dry land existed. The behavior of water was so difficult or controversial as Titelmans and Velcurio claimed that all these masters or at least someone involved with their texts were explicit about how God related to water's seemingly strange failure to flood the earth. In these descriptions, these masters continued to share the presuppositions that God had created the world and that he had provided it with a natural order,

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<sup>420</sup>Velcurio, sig. L6v.

<sup>421</sup>Ibid., sig. L7r.

but their descriptions of God's relationship to the world and its natural order in the context of water showed that these masters had very different notions of how this particular phenomenon of the created universe actually occurred. These notions had a direct effect on their understandings of the ways in which God governed this aspect of the created universe and what this government meant for the relationship between human beings and God.

Their usage of Scripture in their arguments reveals both that these masters continued to draw on these shared presuppositions in their descriptions of water's behavior and that they reached very different conclusions about this aspect of the created universe based on them. Reisch, Titelmans, and Velcurio specifically mentioned God's command in Genesis 1:9-10 for the waters to gather together into one place, though they did something different with this biblical text. Pointing to the Book of Genesis, these three men assumed that God had created the universe and that Scripture contained an accurate account of this creation. These authors differed over what this biblical account meant for the created universe as a whole. For Reisch, God's command to the waters on the third day was a direct accounting of how God had established the arrangements and the dispositions of water and the earth that allowed dry land to exist. This passage was a direct example of God's instilling of a natural order in the universe for him and provided an explanation of how God continued to govern this aspect of the created universe into the sixteenth century. In contrast, both Titelmans and Velcurio claimed that this passage was actually an example of God's direct intervention in the world against the natural order that he had established during those first two days of creation when water overwhelmed the earth. Starting from the same presuppositions about God's creation of the world and even the same base text, these masters gave very different accounts of water and the created universe.

These different accounts show that there were no strong resonances among masters' descriptions of the relationship among water, God, and the natural order as there had been among their explanations of meteorological phenomena. Though they offered similar descriptions of this particular facet of the created universe, water was a different story entirely. When we compare their explanations for water's behavior with those John Calvin offered, we find that his discussions of it again both resonate and clash with those these masters offered. Perhaps most importantly, Calvin also singled out water's behavior as a particular natural occurrence that required explanation because it did not follow what masters taught about the arrangements of the four elements and their dispositions. Calvin's account of this behavior and those contemporary masters offered resonate precisely at this point as they all recognized water's behavior was a subject that required them to explain God's relationship to the created universe more broadly. Calvin also explored similar questions to those that masters discussed when they examined God's relationship to the existence of dry land. For both Calvin and these masters, the subject of water's failure to flood the earth raised questions about how God governed the universe he created and the ways in which this government reflected the relationship between God and human beings.

It is only when we explore their answers to these questions that Calvin's account of water's behavior begins to clash with some of these masters' descriptions of it while still resonating with others. Taking Titelmans' notion of the three different possible explanations for water's behavior – through the natural order, against the natural order with God's direct activity in the world, and through a combination of both of these, as an example of the three opinions one could hold on the subject, Calvin's position resonates strongly with Titelmans and Velcurio's insistence that only God's direct restraining of water against the natural order could explain the

existence of dry land. For all three of these men, God's active government of water showed something significant about God's relationship to human beings and his other creatures. Calvin's descriptions of what this government taught people about this relationship even emphasized water as an example of obedience to God's command as Titelmans had. Calvin also emphasized God's care for his creatures and his control over water to enable life for them much as Velcurio claimed. At least in descriptions of this particular natural phenomenon, Calvin's account was very similar to the one that Titelmans and Velcurio offered.

All three of their works clashed strongly with the explanation of water's behavior that Reisch, Brossier, and Melanchthon offered, though. Returning to Titelmans' model, these three authors belong to the group of philosophers who argued that some aspect of the natural order was responsible for water's failure to submerge the earth. Though also sharing an explicit interest in how God governed the world through the natural order to make the dry land possible, their crediting of the natural order for its existence focused more on its secondary causes and less on God, the first cause and the creator of that natural order. These widely varying explanations for water's behavior found in sixteenth-century natural philosophical texts show that at least on this subject, there was more tension between masters such as Velcurio and even Melanchthon, his teacher at the University of Wittenberg, than between Calvin and Titelmans. The resonances among the works of Calvin, Titelmans, and Velcurio along with their clashes with the works of Reisch, Brossier, and Melanchthon suggest that while there may have been tension between Calvin and these masters surrounding meteorological phenomena, such a dichotomy does not apply to their explanations of water's behavior.

### **The Relationship between Natural Philosophy and Theology: The Created Universe and Its Heavens, Meteorological Phenomena, and Water**

John Calvin claimed in his sermon on Job 38:4-10 that philosophers had widely debated why water behaved seemingly against the arrangements among the four elemental spheres that God had instilled in the universe during creation. The discussions of water and the existence of the dry land in the works of Reisch, Titelmans, Brossier, Velcurio, and Melanchthon strongly suggest that there was such debate among contemporary masters on this particular subject. Their discussions of celestial influences and the causes of meteorological phenomena in these works and in Calvin's own suggest that we could extend Calvin's statements here about the contested topic of water to the created universe and its natural occurrences more broadly. Though there were resonances among masters' descriptions of the causes of meteorological phenomena, their different depictions of celestial influences and their different explanations of water's behavior show that these sixteenth-century masters did not share one, single view of the world that surrounded them. There were many disputes among these masters about why and how the natural occurrences of the created universe occurred.

Occasionally remarking on these disputes as he did in his sermon on Job 38:4-10, Calvin's own descriptions of the heavens, meteorological phenomena, and water included a similar concern with the causes of the natural phenomena of the created world. Calvin shared with these masters the preconceptions that God had created the universe and that he had provided it with a natural order through the process of creation that had a direct effect on the ways in which the natural occurrences of the created universe functioned. He also argued that natural philosophy could teach people about this created universe and its natural occurrences. The disputes Calvin remarked upon among masters and perhaps participated in himself developed because there were multiple explanations of God's relationship to that universe. Calvin along

with these masters repeatedly asked both implicitly and explicitly: Was the natural order and its secondary causes solely responsible for the way the creatures of the created universe behaved? If so, how did this behavior relate to God as the creator and the first cause of the universe? Could God intervene in the world to cause particular natural phenomena? If so, how and how frequently did God do so? Asking and exploring similar questions in their works, these masters and John Calvin offered very different answers to them. These divergent answers along with their shared presuppositions about God's creation of the world and its natural order resulted in both the resonances and the clashes we have analyzed throughout this dissertation between and among Calvin's descriptions of the heavens, meteorological phenomena, and water and those contemporary masters expressed.

Analyzing their descriptions of celestial influences, meteorological phenomena, and water, we find that Calvin and these masters actually offered different answers to these questions depending on the particular phenomenon on which they focused. Their depictions of God's relationship to the created universe as a whole therefore depended on which particular aspect of that universe they happened to describe. Whereas there were slight clashes among masters' accounts of celestial influences on the sublunary realm and glaring clashes about why water did not flood the earth among them all, Calvin's explanations of meteorological phenomena clashed strongly with masters' descriptions of them. As we have seen, Calvin's descriptions of the heavens, meteorological phenomena, and water emphasized God's active government of the created universe because Calvin connected God's government of the world with his creation of it. His descriptions of the heavens, meteorological phenomena, and water therefore focused specifically on God's relationship to each phenomenon in order to stress this connection between God's creation and active government of the world. Calvin's exploration of this topic occurred

even when he wrote extensively about the natural order. Though arguing that the heavens moved in a regular, orderly manner due to the secondary causes of the natural order, he explicitly gave God credit for these causes and the order they structured. In one case he even distinguished the natural order from a perpetual rule to underscore that God alone ultimately governed celestial motions and their influences.<sup>422</sup> This focus on God as actively upholding the natural order continued as Calvin described those meteorological phenomena that took place through the dispositions of vapors and exhalations and the arrangements between the celestial and terrestrial realms. Calvin's descriptions of God's direct intervention to cause particularly sudden meteorological wonders and to restrain water from submerging the earth further highlighted the connection between God's government and creation of the world. For Calvin, God governed the natural occurrences of the created world for the benefit of human beings. As he stated explicitly on a number of occasions, Calvin ultimately explored God's active control over the created universe to provide people with hope that God as their creator and father would protect them from the chaos that had crept into the world after the Fall.

Sharing Calvin's concern with how God governed the created universe and what this government meant for the various natural phenomena of that universe, Reisch, Titelmans, Brossier, Velcurio, and Melanchthon only discussed the relationship between God and the created universe in certain contexts. Though we cannot make definitive conclusions about this from the exploration of only three examples, their discussions of God and the natural order in their descriptions of celestial influences, meteorological phenomena, and the existence of the dry land suggest that these masters explored God's relationship to the created universe especially

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<sup>422</sup>“Il n'y a celuy qui ne voye les pluyes, les gresles et neiges, et qui n'oye le bruit des ventz, mais nul ne sait les causes que par le moyen de l'astrologie, laquelle, comme j'ay dit, en donne mesme quelques conjectures pour l'advenir, combien qu'on n'en peust pas faire une reigle perpetuelle; je parle donc du cours ordinaire, qui n'est point empesché d'autres accidens survenans d'ailleurs.” Calvin, *Advertissement contre l'astrologie judiciaire*, 55-56.

within discussions of topics that were particularly debated among contemporaries or within discussions of topics where widely held natural philosophical doctrines could not explain the occurrence of a particular natural phenomenon. Beginning in the fifteenth-century, there was renewed debate about celestial influences on the sublunary realm with the publication of Giovanni Pico della Mirandola's work on astrology. These masters were likely careful to explain the relationship among planetary motions, God's direction of these motions, and their effects on the terrestrial realm because this topic was so widely discussed and debated in the period. These masters' statements about the behavior of water and even Calvin's discussions of the existence of the dry land also suggest that water had historically been a debated topic among masters because water did not seem to follow its own disposition or the arrangements among the four elements. The contested character of both celestial influences and the behavior of water suggests that masters wrote specifically about the relationship between God and the created universe when discussing topics about which there was controversy. This explicit exploration of God's relationship to the created universe also seems to have led them to different articulations of how these particular phenomena of that universe occurred. Their overwhelmingly similar descriptions of the causes of the meteorological phenomena also suggest that controversial topics in particular drew explicit discussions of God's relationship to the world he had made and of the causes of particular phenomena. Though masters' explanations of meteorological phenomena certainly change over time, they continued to discuss vapors and exhalations as the causes of these phenomena well into the seventeenth century.<sup>423</sup> Assuming that God had created the world and instilled it with a natural order, they do not seem to have explored the implications of this

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<sup>423</sup>On these changes throughout the sixteenth and seventeenth centuries as well as the continuities in the study of meteorology see Martin, *Renaissance Meteorology*.

assumption unless the controversy surrounding a particular topic prompted them to express their opinion on causation within the created universe explicitly.

The descriptions of the heavens, meteorological phenomena, and water in Calvin's works and in natural philosophical texts taken as a whole do not suggest then that there was tension specifically between sixteenth-century natural philosophy and theology about the natural occurrences of the created universe but rather that there was tension surrounding the question of God's relationship to that universe in this period that both natural philosophy and theology explored. The investigation of God's relationship to the created universe and its natural occurrences was therefore a significant connection between them. Alexandre Koyré argued in 1957 as he described René Descartes' notion of the infinite universe that "The God of a philosopher and his world are correlated."<sup>424</sup> The works of Calvin and these masters suggest that their different conceptions of the natural phenomena of the created universe were also related to their different conceptions of God. The world sixteenth-century human beings lived in was a created universe. Their notions of this universe by definition therefore included the God who fashioned it. When they offered different explanations of how God related to this universe, this did not reflect a fundamental conflict between natural philosophy and theology in the period. Rather, it reflected the engagement of these men with similar sources – particularly the works of Aristotle and the Christian Scriptures, and a similar starting presupposition – God had created the world and the way that world functioned had something to teach people about God as they continued to dwell in the world that he had made. Beginning with similar sources and a similar starting point, Calvin, Reisch, Titelmans, Brossier, Velcurio, and Melanchthon reached different conclusions about the various natural occurrences of the created universe.

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<sup>424</sup>Alexandre Koyré, *From the Closed World to the Infinite Universe*, 2<sup>nd</sup> ed (Baltimore: The John Hopkins University Press, 1968), 100.

## Conclusions: Further Connections between Sixteenth-Century Theology and Natural Philosophy

Neque enim de causis inferioribus satis argute sibi videntur disserere philosophi, nisi longa distantia Deum a suis operibus separent. Diabolica autem haec scientia est, quae in naturae contemplatione nos retinens a Deo avertit.<sup>425</sup>

John Calvin, *Commentary on Psalms* (1557)

Deum Physici cognominant primam causam, primum motorem, primum movens, primam naturam, causam infinitam, principium effectuum omnium rerum, summum bonum, summum finem omnium rerum, factorem & autorem omnia. Quia ipse peculiariter & potenter omnia tam in coelo, quam in terra faciat, & fovat propter suam ipsius gloriam. Reliqua de bonitate, misericordia, beneficentia Dei, & de fide, timore, cultu, reverentiaque erga Deum proprie pertinent ad Theologiam solam: illa enim non nisi Christiani & vere pii intelligere possunt, & sibi vindicare.<sup>426</sup>

Johann Velcurio, *Commentarii libri IIII in universam Aristotelis Physicen* (1539)

Though John Calvin and contemporary masters wrote about God's relationship to the universe he had fashioned as they described the natural occurrences of that universe, they offered both resonating and clashing accounts of the characteristics of this universe and the causes of its natural phenomena. Assuming that they dwelled in a created universe and that the creation process had implications for how that universe functioned, they advanced diverse explanations of that universe and its phenomena in their works. The passages above from Calvin's commentary on Psalm 29:5-8 and from Johann Velcurio's description of God in the first book of his *Commentarii libri IIII in universam Aristotelis Physicen* suggest that these resonances and clashes extended further. For these men, natural philosophy was not theology, and they commented on the proper methods of and boundaries between the investigation of God and the investigation of the created universe. In doing so, they explained how people could explore this universe correctly in a period when the boundaries between natural philosophy and theology had become more fluid. For Calvin, many natural philosophers tried to understand the universe in an

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<sup>425</sup>CO 31 Col. 289.

<sup>426</sup>Velcurio, sig. B7v.

improper manner. These natural philosophers focused only on the inferior causes of the natural order and averted their eyes from God, its creator. It was only when these natural philosophers acknowledged God's creation and government of the world that they could truly understand God's relationship to the universe and what caused its natural occurrences. In contrast, Velcurio proposed a clear boundary between natural philosophy and theology. Much as Calvin had, he claimed that natural philosophy should focus on the universe that God had made and that it explored God only as the creator and first cause of that universe. Theology – particularly the theology that pious Christians practiced, focused on God's attributes and human responses to and interactions with God in the form of faith, fear, worship, and reverence.

Frans Titelmans and Philipp Melanchthon also discussed the boundaries between natural philosophy and theology explicitly as they explained how their works could teach people about the created universe. Arguing that natural philosophy should lead to fuller knowledge of God and an increase in piety, Titelmans claimed that his text actually mixed together natural philosophy and theology for his readers precisely because God had created the world.<sup>427</sup> Melanchthon, on the other hand, argued for a strict separation between the two. Though both natural philosophy and theology could teach people about vital aspects of God and human beings' relationship to God, Melanchthon argued that natural philosophy's focus on the created universe was a focus on the Law or God's providential control of the world. Theology, in contrast, focused on the Gospel or God's promises to human beings. Knowledge of the Law may help all people govern their societies, but only knowledge of the Gospel could save Christians from eternal death.<sup>428</sup> The descriptions of properly practiced natural philosophy and the lengthy discussions of the

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<sup>427</sup>Titelmans, sig. Bbviiiiv.

<sup>428</sup>Melanchthon, sigs. C8r-D1r. On this division between Law and Gospel and its impact on Melanchthon's physics, see Kusakawa, *The Transformation of Natural Philosophy*, 124-173.

boundaries between natural philosophy and theology in the works of Calvin, Velcurio, Titelmans, and Melanchthon suggest that this topic was as widely debated in the period among masters as God's relationship to the created universe was. These authors offered different views on how to understand this relationship and on how people should investigate it.

These divergent views – about the proper practices of and boundaries between natural philosophy and theology and about God's relationship to the universe he had created and its natural phenomena, are evidence of the fundamental links among the works of Calvin, Reisch, Titelmans, Brossier, Velcurio, and Melanchthon. The exploration of such questions was what ultimately connected sixteenth-century natural philosophy and theology. As we have seen throughout this dissertation, Calvin and these masters offered multiple explanations of God's relationship to the created world, even varying their descriptions of this relationship depending on the natural phenomenon about which they wrote or spoke. As we saw above, they also argued for different boundaries between natural philosophy and theology as well as for diverse ways in which to investigate God and the world properly. These clashes did not signal a separation between theology and natural philosophy but rather its contrary. These sixteenth-century masters were connected precisely because they were all actively engaged in exploring similar questions about God's relationship to the world and the proper ways to investigate this relationship. Their works suggest that investigating God and investigating the world were interdependent for these university-trained scholars in this period, even if each drew his own boundaries between these investigations and offered his own explanation of God's relationship to the world.

Their works also suggest that the connections between sixteenth-century natural philosophy and theology did not end with the exploration of similar questions. A foundational practice connected Calvin's works with those of contemporary masters as they all attempted to

explain the proper relationship between and the correct methods of investigating God and the world – the interpretation of texts judged to be authoritative. These scholars all participated in textual communities. Scripture played a similar role in the practices of exegesis and theology as Aristotle's *libri naturales* and other ancient works played in natural philosophy. Trained in universities and reading other, earlier works, biblical exegetes interpreted Scripture, earlier and contemporary commentaries on Scripture, ecclesiastical decrees, and other theological writings, and they shared these interpretations with audiences through the publication of written works, through letters, and in sermons. Religious reform movements certainly extended the range and increased the acrimony surrounding these interpretative practices, but the interpretation of authoritative texts remained basic to the practice of exegesis, theology, and even preaching in the period. While these interpreters read Scripture, ecclesiastical decrees, and other theological texts, there is also abundant evidence that many exegetes, preachers, and theologians read widely on a number of other subjects.<sup>429</sup> Though the hermeneutical practices theologians and masters brought to each text certainly varied widely, the practice of reading authoritative texts, interpreting those texts, and sharing their interpretations with audiences connected sixteenth-century natural philosophy, theology, and biblical exegesis at a methodological level.

Exploring similar questions about the created universe and employing similar methods to do so, both Calvin and these masters ultimately linked knowing God and knowing the world. This linkage connected sixteenth-century natural philosophy and theology even as it begins to suggest how the knowledge of God and the knowledge of the world were constructed in the period more broadly. Shared assumptions about God's creation of the world made knowledge

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<sup>429</sup>On Calvin more specifically, see Breen, *John Calvin: A Study in French Humanism* and Bouwsma, *John Calvin: A Sixteenth-Century Portrait*. More generally, see Kusakawa, *The Transformation of Natural Philosophy*, and Margaret J. Osler, *Divine Will and the Mechanical Philosophy: Gassendi and Descartes on Contingency and Necessity in the Created World* (Cambridge: Cambridge University Press, 1994).

claims about either God or the world partially dependent on each other. To know God as the wise, powerful, good, and just being that had created and continued to govern the world was also to know that the world would behave in an orderly fashion. What these masters taught about the characteristics of God's creatures and the causes that structured the natural order among these creatures provided important foundations for descriptions of God's creation and providence. What biblical exegetes and preachers taught about God as creator and governor of the world influenced natural philosophical descriptions and investigations of these creatures and this natural order. One set of knowledge claims built on the other in this period, even if each author argued for different understandings of God and the world.

In the Geneva Bible of 1560, Genesis 1:1 states, "In the beginning, God created the heaven and the earth." Appearing frequently in their works, this biblical verse was fundamental to John Calvin, Gregor Reisch, Frans Titelmans, Simon Brossier, Johann Velcurio, and Philipp Melancthon as they explained and described the natural phenomena of the world around them. As sixteenth-century Christians, they all knew that God had created the world. As sixteenth-century Christians, they all knew that how God created this world had implications for the ways in which its natural phenomena occurred. As textual interpreters educated in northern European universities, they all drew on the texts foundational to their societies and cultures – the Christian Scriptures, commentaries on biblical books, sermons, theological tracts, ecclesiastical decrees, and natural philosophical texts, to construct their own understandings of this God and the world he was believed to have fashioned. Knowing from Scripture that God made the world and drawing on ancient natural philosophical texts to describe how that world behaved, all these men grappled with the interdependence of knowing God and knowing the world as they constructed

their own connections and boundaries between theology and natural philosophy and formulated their own understandings of God's relationship to the created universe.

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