



## Images of Providence:

### Sebastian Münster's Cosmography and the Study on Nature within the Reformation

Ismo Puhakka

Thesis submitted for assessment with a view to  
obtaining the degree of Doctor of History and Civilization  
of the European University Institute

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European University Institute  
**Department of History and Civilization**

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## Abstract

Sebastian Münster's *Cosmographia* was printed in Basel, in the Swiss Confederation, for the first time in 1544. It was a richly illustrated combination of mathematical geography and descriptive history-writing. Moving from country to country, Münster offered his reader an extensive display of peoples and lands of the whole world. The global scope and coherent structure of his book secured a lasting popularity and made it an emblem of cosmography's new status and universal ambition. Münster's work marked an important turning point in the history of the modern geography, though scholars have time and again reminded readers of the religious (often taken as unmodern) aspects of the book. This study seeks to understand Münster's unique combination of geography and religion by looking at his work within the context of the Protestant Reformation and seeks to demonstrate how Sebastian Münster's geographical thought was influenced by the new ideas of the rising evangelical natural philosophy.

The Last decades have witnessed a growing awareness of the importance of Luther's co-reformer and humanist Philip Melanchthon's work in shaping a Protestant approach to the study of nature in the mid- Sixteenth century. Although Melanchthon's influence on Münster has been speculated upon, traditional views have often considered the boundary between Reformed and Lutheran communities intellectually unbridgeable. Focusing on the agency of Münster's close collaborator, humanist Simon Grynaeus, this study seeks to demonstrate that Melanchthon's intellectual impact went beyond the Lutheran circles. Despite religious disputes, exchange of ideas on geography, mathematics and natural philosophy was taking place between Wittenberg and Basel. Accordingly, the development of Melanchthon's natural philosophy may be re-assessed as a broader evangelical

debate on nature. Sebastian Münster's *Cosmographia* can be seen as a contribution to this debate.

This study pays also particular attention to the illustrations of the *Cosmographia*. Although scholars have been aware of a significant descriptive impulse in the northern renaissance art, only very recently has this phenomenon been connected with Protestant theology. This study aims at raising the question of whether the new theological currents endorsing minute recording of natural appearances could be seen as a key factor behind the emerging descriptivism in the Sixteenth Century images of nature.

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## Abbreviations

- ADB *Die Allgemeine Deutsche Biographie*, Bayerische Akademie der Wissenschaften. Historische Kommission (Leipzig : Duncker & Humblot 1875-1912).
- TIB *The illustrated Bartsch* (New York : Abaris, 1972 – ).
- BSB Bayerisches Staatsbibliothek, Digitale Sammlungen [bsb-muenchen.de].
- BSM *Briefe Sebastian Münsters: Lateinisch und Deutsch*, Karl Heinz Burmeister (ed.) (Insel: Ingelheim am Rhein 1964).
- CR *Corpus Reformatorum*, Karl Gottlieb Bretschneider (ed.), (Berlin: Schwetschke; Leipzig: Hensius, Zurich Theologischer Verlag).
- MBW *Melanchthons Briefwechsel*, Heinz Scheible (ed.), (Stuttgart-Bad Cannstatt: frommann-holzboog 1977- ).
- Hollstein [Hollstein's] *German engravings, etchings and woodcuts : 1400-1700* (Amsterdam, 1954-).
- WA *D. Martin Luthers Werke. Kritische Gesamtausgabe* (Weimar 1883-2009).
- SP *Supplementa Melanchthoniana: Werke Philipp Melanchthons, die im Corpus reformatorum vermisst werden*. Verein für Reformationsgeschichte. Melanchthon-Kommission (ed.) (Frankfurt, Minerva-Verl., 1968 – ).

# Introduction

Sebastian Münster's *Cosmographia* was printed in Basel, in the Swiss Confederation, for the first time in 1544. It was a richly illustrated combination of mathematical geography and descriptive history-writing. Moving from country to country, Münster offered his reader an extensive description of peoples and lands of the whole world. The global scope and coherent structure of his book secured a lasting popularity and made it an emblem of cosmography's new status and universal ambition.<sup>1</sup> Münster's work marked an important turning point in the history of modern geography, though scholars have time and again reminded readers of the religious, (often taken as unmodern), aspects of the book. But, although *Cosmographia*'s mixture of religion and scientific ambitions may seem conflicting to modern readers, it was very natural to Sebastian Münster and his contemporaries. Scholars of the history of science, (or sciences, as its lately put, emphasizing the plurality of various disciplinary fields and their different histories), have, during the last 30 years, deconstructed the thesis of the antagonism between science and religion. In the early modern period, science and religion walked hand in hand, and as it seems, religious ideas could even support the development of science. Accordingly, religion must be taken seriously, and reassessed not only as an obstacle to early modern scientific thought, but also as an organic part of it. The present understanding of the unity of religious thought, or better, theology and scientific ideas, is crystallized well by Charlotte Methuen who argues:

Modern discussions of the relationship between science and theology demonstrate increasing interest in investigating the ways in which the emerging natural sciences, rooted as they were in an intellectual culture which was dominated by theological concerns, were not only hindered but informed and stimulated by theology, particularly by Protestant theology.<sup>2</sup>

Protestant theology seems as a valid source of inspiration also in Sebastian Münster's case. The most important religious change during Münster's lifetime was inevitably the Protestant

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<sup>1</sup> Klaus A. Vogel, "Cosmography", pp. 496-496 in David C. Lindberg and Ronald L. Numbers (eds.), *The Cambridge History of Science* (Cambridge: Cambridge University Press, 2006), 489.

<sup>2</sup> Charlotte Methuen, *Science and Theology in the Reformation: Studies in Interpretations of Astronomical Observation in Sixteenth Century Germany*, (London: T&T Clark, 2008), 1.

Reformation. This study seeks to situate Münster's work in this context and to investigate how emerging evangelical natural theology and natural philosophy influenced Münster's geographical thought.

This study does not seek to write a new comprehensive portrait of Münster as a geographer or a scholar. There are already two very good presentations of Münster's work from a holistic perspective: Karl Heinz Burmeister's classic *Sebastian Münster: Versuch eines biographischen Gesamtbildes* and Mathew McLean's recent and accurate study, *The Cosmographia of Sebastian Münster: Describing the World in the Reformation*.<sup>3</sup> Both are warmly recommendable but when it comes to the Protestant Reformation and natural philosophy, they leave a visible lacuna. There is no need to repeat what has already been said in these books. Therefore, this study seeks not to write another biography but to complement, and at some points even challenge, these views by minutely investigating Münster's relationship to Protestant natural philosophy.

The last decades have witnessed a growing awareness of the importance of Luther's co-reformer and humanist Philip Melanchthon's work in the shaping of a Protestant approach to the study of nature in the mid-sixteenth century. Could Melanchthon's widely spread texts and ideas have had a direct influence on Münster? Although Melanchthon's influence on Münster has been speculated upon, traditional views have often considered "Lutheran" Melanchthon and "Reformed" Münster confessionally too different to have influenced one another. This study seeks to challenge this traditional view.

Intellectual influences cannot be transmitted without items and human agency, books, letters and real contacts between people. Sebastian Münster's colleague, a humanist and philosopher, Simon Grynaeus, was a man who personifies the high intellectual level of the post-Erasmian Basel. Grynaeus is a very little studied figure, but a person who seemingly was close to both Münster and Melanchthon. His agency may be the key to understanding Münster's philosophical influences. Therefore, this work is also a study about Grynaeus and the intellectual exchange that was evolving between him and Philip Melanchthon during the 1530s. The correspondence between Melanchthon and Grynaeus may offer a concrete context for understanding the theological and natural philosophical underpinnings of Sebastian Münster's geography. Grynaeus and Münster as "Reformed" men may also help us to re-assess the confessional nature of Melanchthon's natural philosophy.

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<sup>3</sup> Matthew McLean, *The Cosmographia of Sebastian Münster: Describing the World in the Reformation* (Aldershot: Ashgate 2007); Karl Heinz Burmeister, *Sebastian Münster. Versuch eines biographischen Gesamtbildes* (Basel: Helbig & Lichtenhahn 1969).

This study shall also pay particular attention to the illustrations of the *Cosmographia*. Although scholars have been aware of a significant descriptive impulse in northern renaissance art, only very recently has this phenomenon been connected with Protestant theology. Could the new theological currents endorsing minute recording of natural appearances be seen as a key factor behind the emerging descriptivism in the sixteenth century images of nature?

This study begins with a discussion about geographically oriented publications in chapter I. By exploring various influential cosmographical and chorographical books and publications of other genres, this chapter seeks to understand different expressions of cosmography in Münster's days. Charting of the pluralistic world of sixteenth century publishing shall demonstrate the important place Münster's *Cosmographia* holds among the very first richly illustrated works on world geography and history.

Chapter II continues with a broad overview of the research literature. By using a broader outline of research on Münster, the history of geography, Protestantism, and art, Chapter II asks: How Münster's book should be understood? Was it a piece of geography, history, art, science or religion? Proper understanding of Münster's work demands observations from different perspectives and invites scholars to cross disciplinary boundaries. Therefore this chapter shall also discuss some of the typical conceptual tools, such as 'science', 'Protestantism' and 'Reformed', which despite their undeniable heuristic value, turn out to be somewhat problematic in Münster's case.

Chapter III, *Sebastian Münster's Early Influences*, will follow Münster's first steps on the path of geography. By looking at Münster's first teachers, Gregor Reisch and Johannes Stöffler, it seeks to give a picture of the realities of education, natural philosophy, and geography during Münster's youth. Particular attention will also be given to Münster's school notes, the so called *Kollegienbuch*, which is a revealing document of the realities of geographical education in his youth.

Münster's close ties with the printing presses of Basel developed early and are also an important part of his story and the story of the *Cosmographia*. During the time Münster, as a young Franciscan friar, lived in Basel, the first tides of the Reformation started roaming in. Chapter IV shall discuss Münster's reaction to these events. Following Philip Melanchthon's path this chapter shall proceed with a short account on Luther's theologically motivated attack against the Scholastic theology, an attack that challenged the foundations of traditional education and philosophy at Wittenberg. This epistemological crisis nevertheless seems to

have worked as an important stimulus for Melanchthon to find a new theologically legitimate role for the study of nature.

Chapter V focuses on Münster's friend and colleague, Simon Grynaeus. In the 1530s, as direct connections between the schoolmates Münster and Melanchthon began to fade, Grynaeus steps in as an important connecting figure between them, and between the Lutherans and the Reformed in general. Münster meets Grynaeus at the University of Heidelberg where they both find themselves in increasing trouble with the conservative and scholastically oriented university officials. The reformation of Basel and its university in 1529 opens new doors and Grynaeus ends up playing a central role in winning Münster over to the evangelical side. As Münster and Grynaeus become established in Basel as university professors, Grynaeus takes up a leading position in Basel's post-Erasmian intellectual life.

Chapter VI takes a closer look at the intellectual exchange between Simon Grynaeus and Philip Melanchthon. As the study of nature, mathematics, and astronomy gains ever greater importance in the hearts and minds of Grynaeus and Melanchthon, these scholars find each other as important partners and philosophical interlocutors. In a series of scientific textbooks, orations and dedications, Grynaeus and Melanchthon seek to find theological legitimation for contemplation of the visible material world and for its mathematical study. This chapter shall also briefly discuss the reformation of the University of Tübingen, which offers a concrete example of Melanchthon's and Grynaeus' agreement in educational and philosophical matters.

Chapter VII shall focus on the development of Sebastian Münster's geographical thought in the context of evangelical natural philosophy. An analysis of Münster's early geographical publications seeks to demonstrate how Münster positioned himself in the epistemological landscape between ancient knowledge and fresh observations. On this basis it is also possible to make some remarks about the impact which the ideas of Grynaeus and Melanchthon had on the development of Münster's cosmography.

Chapter VIII, takes a closer look at Münster's book, the *Cosmographia*. Münster's compendium was an unforeseen combination of descriptive and mathematical geography. This chapter shall focus on Münster's individual approach to geography within the context of geographical publishing of his time. Despite its pronounced interest in the visible natural world, Münster's geographical narration was profoundly rooted in Christian spirituality. In order to see how Münster's providentially oriented spiritual approach differed from the earlier

medieval approach, this chapter shall compare Münster's work with Hartmann Schedel's *Nuremberg chronicle* from 50 years earlier.

Chapter IX and chapter X are the most central chapters of the thesis. Chapter IX is a theoretical account of the philosophical and theological transformations which promoted mathematical study of nature in the thought of Philip Melanchthon and Simon Grynaeus. These fundamental transformations shall also be compared with concrete developments within the field of visual arts. I shall propose that Melanchthon's de-ontologization of Aristotelian conception of causality resulted in the partial abandonment of substantial forms as a causally valid category, which in turn, made accidents (in this sense, individual and particular properties) an attractive subject of study in both arts and sciences. Chapter IX shall also make some observations on Melanchthon's and Grynaeus' understanding of scientific method. As the new philosophical trends challenged the traditional Aristotelian views on scientific (that is, certain) knowledge, Melanchthon and Grynaeus, like several other Renaissance philosophers, took a step towards mathematics and geometry. In this context mathematics was not understood as a sterile theoretical discipline, but as a concrete method that could be used in the study of nature.

Chapter X is an attempt to find concrete pictorial examples of these profound philosophical transformations in Sebastian Münster's *Cosmographia*. It is also a modest tribute to Münster's great illustrators, Hans Holbein, Conrad Schnitt, and Hans Rudolf Manuel Deutsch, whose achievements created the visual expression within Münster's book. Hans Holbein was one of the greatest painters of his time and Münster's collaboration with him seems to have left a permanent mark on Münster's understanding of the proper mode to describe nature in images. This chapter shall also discuss the differences between different editions of the *Cosmographia* in order to see what changes Münster made to his illustrations and how these changes reflect his taste and his visual ideals.

The concluding chapter shall offer a summary of this thesis. It shall also discuss how the findings of the thesis discuss with new questions and approaches brought about by recent studies on Reformation art and early modern geography.

Historical research means a discussion between the historiographical tradition and the sources produced by the people of the past. This study has sought to avoid ahistorical perspectives by contextualizing ideas of the past within historical situations and speech acts. The attempt has been, so to speak, "to see things their way". Particular attention has been paid to investigate

how thoughts were transmitted from one person to another. This has required (particularly in chapters V and VI) careful investigation of the correspondence and publications of Münster, Melanchthon, Grynaeus and their contemporaries. Printed correspondences and their indexes have been vital for this work. Prefaces and dedications in the works of Melanchthon, Münster and Grynaeus have also been a central source for this investigation. With Melanchthon I have been lucky to find English translations of his key texts, but I have also consulted the originals when understanding of the proper meaning of the text has required it. With Münster much can be found in German, and Münster himself authored German versions of his key publications. In quoting *Cosmographia*, I have referred mostly to German editions. Grynaeus' publications, which are primarily in Latin, haven't been translated, but there is a German translation of his letters.<sup>4</sup> With Latin texts I have consulted two experts of early modern Latin, Miikka Kuha and Lauri Ockenström at the University of Jyväskylä.

References to different editions have been specified in the footnotes (the VD 16 codes and archival signatures have been listed in the bibliography, when available).

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<sup>4</sup> Rädle, Herbert (ed.), "Simon Grynaeus (1493-1541): Briefe", in *Basler Zeitschrift für Geschichte und Altertumskunde*, 90 (1990).



# Chapter I

## Cosmography in Münster's day

By entering into a discussion about cosmography in Münster's days one soon realizes that this rich and broad area engaged many different fields of activity and included various practices and arts which necessarily did not have much to do with each other. During the period of the renaissance and reformations, the concept of cosmography was vague and ambivalent one and its definitions varied from one author to another. Acknowledging this fact, this chapter does not aim to define cosmography in any specific or distinct way, but rather seeks to have a look at its different expressions. This shall be done by exploring various influential cosmographical and chorographical books and publications of other genres, like city view books and encyclopedias. Charting of these various publications shall demonstrate the important place Münster's *Cosmographia* holds among the very first richly illustrated works on world geography and history.

Between 1450 and 1650 the words *geography* and *cosmography* were oftentimes used in a synonymous fashion, and their meaning was relatively unstable.<sup>5</sup> One of the key tensions in renaissance cosmography was caused by the fact that the very word was used to refer both to the mathematical art of charting the world, and also to a bookish practice of describing it and thus engaged with literary genres, ancient literature and philosophy. In the middle-ages spatial representations flourished in various forms, such as itinerarios, mappamundis and descriptions, but geography and cosmography as distinct disciplines did not yet exist. Roughly from the 1450s to 1530s cosmography and geography started to emerge as a motley set of different practices scattered around mathematics, astronomy, and Aristotelian natural philosophy. During the fourteenth century imaginary travel literature, *mirabilia mundi*, became a fashionable genre, and the renowned poet Petrarch made the ancient geographer Pomponius Mela's work, *Cosmographia sive De situ orbis* (first century AD) known to some selected readers. This treatise on world geography was printed in Milan in 1471 and provided an influential model for descriptive cosmography. Similar rediscoveries

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<sup>5</sup> Dario, Tessicini."Definitions of 'Cosmography' and 'Geography' in the Wake of Fifteenth- and Sixteenth-Century Translations and Editions of Ptolemy's *Geography*", pp 31-50 in Zur Shalev and Charles Burnett (eds.), *Ptolemy's Geography in the Renaissance*, (London, The Warburg Institute 2011).

of other classical works, like Pliny the Elder's *Historia Naturalis* or Strabo's *Geographia*, provided a model for a new kind of geographical narrative: a description of different parts of the world, their inhabitants, plants and animals.

The foundation of mathematical representation of the universe was founded on euclidean geometry and Ptolemaic astronomy. The academia rudiments of these disciplines were taught based on popular textbooks like Johannes Sacrobosco's *De sphaera* and Regiomontanus' *De triangulis*.<sup>6</sup> *De sphaera*, which explained the fundamentals of Ptolemaic astronomy – originated in the 13<sup>th</sup> century. *De triangulis*, a work that gave a new spin to the European plane geometry and trigonometry, was published in 1464. The single most important publication of the emerging geography, however, was Claudius Ptolemy's book *Geographike Hyphegesis* (translated alternatively as 'Guide to Geography' or 'Guide to Cartography'), later called here simply as the *Geographia*, which Jacopo d'Angelo translated in 1406.

Ptolemy's book, originating in the second century A.D, was primarily a guide for map making. It explained how the Aristotelian cosmos, including the elemental mundus and the incorruptible coelo, could be charted and represented within a system of mathematical coordinates. Ptolemy defined his work as "an imitation of through drawing of the entire known part of the world together with the things that are, broadly speaking, connected with it."<sup>7</sup> According to Ptolemy's *Geographia*, the discipline of geography, in its essence, was about mapping and describing the earth and seas. This approach was apparently quite different to that proposed by Pomponius Mela, Strabo and other ancient cosmographers who emphasized verbal description and knowledge of culture and history of people dwelling in a particular geographical area. During the fifteenth century these two different approaches on cosmography became mixed.

When *Geographia*'s revival began in Florence with Jacopo d'Angelo's first Latin translation, the city's intellectual milieu was influenced by neo-Platonistic currents. Within this cultural environment, Ptolemy's cartographical work also became engaged with Neo-Platonism and thus was placed into a larger philosophical frame: The *Geographia* was understood as a tool to understand the harmony and order of God's creation. The Neo-Platonistic influences have also been connected to Jacopo d'Angelo's decision to entitle his

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<sup>6</sup> Menso Folkerts, *The Development of Mathematics in Medieval Europe: Arabs, Euclid, Regiomontanus* (Aldershot: Ashgate, 2006).

<sup>7</sup> Tessicini 2011.

translation ‘Cosmographia’, instead of ‘Geographia’.<sup>8</sup> Partly because of this decision, the disciplinary boundaries of geography and cosmography continued to be unclear and the renaissance cosmography retained a continual tension between mathematically based mapping and verbal description.<sup>9</sup> Due to the cosmographical framework, it became common for renaissance scholars to emphasize both the disciplinary unity of astronomy and geography, and the interconnectedness of the objects of their study: the two spheres of the world, heavens and the earth, were to be studied within a single frame. This was a relatively permanent feature in renaissance cosmography. Philip Melanchthon, for instance, lecturing from the pulpits of the University of Wittenberg in 1536 argued: “The science of the heavenly movements and geography are connected with one another, and they cannot be torn apart.”<sup>10</sup>

D’Angelo’s translation of Ptolemy’s *Geographia* (In this study, following Sebastian Münster’s choice, and in order to distinguish this classical work from the many cosmographies of the period, Ptolemy’s book shall be called the *Geographia*) brought the idea of a grid of longitude and latitude right back into the heart of European cosmography. It presented heaven and the earth as spheres which could be charted and described mathematically upon a grid of coordinates. The novel theory of space as a mathematical grid was potent. It is nevertheless good to remember that the radicalism of this theory was “shackled” by two inherited classical conceptions about the nature of the Earth: The Aristotelian concept of the world as an assembly of the elements, where only the earth element was taken as a habitable one, (the other elements coexisting on the globe as its uninhabitable parts) – and the Ptolemaic concept of a restricted Oecumene, i.e. the habitable world in contrast to the rest of the globe which was considered as improper for the human settlements.<sup>11</sup> The new concept of the globe as one that was united and fully habitable emerged slowly. It took until the mid-sixteenth century before the medieval concept of the Earth, split into habitable and non-inhabitable elements, vanished. Another thing to remember is, that the gradually increasing Ptolemaic way of representing the world had relatively popular alternatives: Late medieval Portolan maps, created without the coordinate system, had already charted the Mediterranean Sea with astonishing accuracy, and itineraries persisted as

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<sup>8</sup> Marica Milanese, “Geography and Cosmography in Italy from XV to XVII Century”, pp 443-68 in *Memoria della Società Astronomica Italiana*, 65, 1994.

<sup>9</sup> Ibid.

<sup>10</sup> Philip Melanchthon, ‘Oration on Astronomy and geography held at Wittenberg in 1536’. CR XI, 292-8. Translated in Philip Melanchthon, [Sachiko Kusakawa, ed.] *Orations on Philosophy and Education* (Cambridge, Cambridge University Press 1999), 117.

<sup>11</sup> Jean Marc Besse, *Les grandeurs de la Terre. Aspects du savoir géographique à la Renaissance* (Lyon: ENS éditions, 2003).

tools for way finding.<sup>12</sup> Ptolemy's theories that enabled adjusting and ascertaining any spot of the globe on a map were important, but the old forms of spatial cognition kept persisting, living side by side with the new innovations.

### *Mathematical Cosmography*

In Münster's days the Ptolemaic theories were developed further by mathematically oriented cosmographers like Peter Apian, who had chairs in mathematics in Vienna, Ingolstadt and Innsbruck.<sup>13</sup> Apian's *Cosmographicus Liber* (1524) was a very influential publication and was printed 29 times. It was richly illustrated with cosmographical diagrams and other instructional pictures which aided comprehension of cosmographical models. It also included a catalogue of locations of places noted in longitude and latitude. Gemma Frisius (1508-1555) continued Apian's work and developed a new edition of his *Cosmographia*. Frisius experimented also with globes. In 1530 he published his ideas in a work entitled *De Principiis Astronomiae et Cosmographiae*.<sup>14</sup> *De Principiis* is an interesting piece of cosmographical writing; a blend made up of a treatise on the benefits of globes in cosmographical observations and a condensed world description. Having presented the rudiments of Ptolemaic theory, Frisius listed continents, lands, mountains and other noteworthy formations. Also a brief description of America was included, beginning with a story of how the continent was named after Americo Vespucci, and supplied an account of the cannibals in the new world.<sup>15</sup> Frisius is also known for promoting more accurate methods of land surveying. Although the geometrical basis for triangulation was already known in the late middle ages, Frisius' treatise *Libellus de locorum describendorum ratione, & de eorum distantis inveniendis nunquam unte*

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<sup>12</sup> Tony Campbell, "Portolan Charts from the Late Thirteenth Century to 1500" pp. 371- 463 in J.B. Harley (ed.) *The History of Cartography vol 1, Cartography in Prehistoric, Ancient, and Medieval Europe and the Mediterranean*. (Chicago: The University of Chicago Press, 1987); David Woodward, "Cartography and the Renaissance: Continuity and Change" pp. 3-24 in David Woodward (ed.) *The History of Cartography vol 3, Cartography in the European Renaissance*. (Chicago: The University of Chicago Press, 2007), 9.

<sup>13</sup> My presentation of cosmographers and geographers in Münster's days is indebted to Matthew McLean's useful account and catalogue in McLean 2007 pp 91-125. I have nevertheless gone through the originals and at several places I shall put weight on different matters as McLean, who, by taking Münster's work primarily as an heir to the verbally oriented tradition of the *Germania illustrata* movement, payed little attention on illustrations of cosmographical books in Münster's time.

<sup>14</sup> Gemma Frisius, *De Principiis Astronomiae et Cosmographiae, deque usu Globi ab eodem editi* (Antverpia, 1530).

<sup>15</sup> *Ibid.*, cap xxx.

*hac visus* (1533) was the first book to explicitly propose the use of these methods in cartographical practice.<sup>16</sup>

Another important exponent of the mathematical stream of cosmography was the French mathematician and cartographer Oronce Finé (1494 – 1555). Finé studied at the Collège de Navarre and received a degree in medicine in 1522. In 1531 he received a mathematics chair in the Collège Royal and taught there until his death. Finé worked extensively in a wide range of mathematical disciplines, including arithmetic, optics, practical geometry, gnomonics and astronomy. This is also the context in which he placed cosmography. Finé's most influential contribution to the discipline of cosmography was his popular textbook *De Mundi Sphaera, sive Cosmographia* that was published in 1532.<sup>17</sup> The frontispiece of Finé's *Cosmographia* pictures four personifications of the quadrivium: arithmetic, music, geometry and astronomy. As typical of the Ptolemaic approach, textual and visual description did not belong to Finé's vision of cosmography.

The mathematically oriented cosmography during Münster's lifetime, represented by the works of Apian, Frisius, and Finé, and minor works like Martin Waldseemüller's *Cosmographiae introductio* (1507) or Heinrich Glareans' *De geographia* (1527), sought to present the mathematical rudiments of the art of cosmography and geography in a clear and distinctive way. The theoretical basis for this was found in the ancient works of Ptolemy. Following the great Greek geographer these books characteristically opened with the principles of astrology and cosmography, and then continued with a contemplation of the heavenly bodies, the Sun, Moon, planets, and the constellations of the fixed stars orbiting around the Earth on their determined spheres. After these fundamental principles, the authors would usually observe the length of night and day, eclipses of the Sun and the Moon, and the theory of different climate zones, proceeding finally to calculate the locations of regions and formations on the Earth, such as mountains, oceans, rivers and so on. This kind of theoretical discourse habitually closed with a short description of the four parts of the Earth then known; Europe, Asia, Africa and America. Usually some statistical tables of astronomical observations were included, sometimes also instructions on triangulated measurement of smaller areas.<sup>18</sup>

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<sup>16</sup> Mclean 2007, 125.

<sup>17</sup> Oronce Finé, *De mundi sphaera : sive cosmographia, primave astronomiae parte, lib. V.* (Parisiis: Colinaeus, 1542). [BSB, Signatur: 13213955.]

<sup>18</sup> I have followed here the structure of Gemma Frisius' improved version of Peter Apian's *Cosmographicus liber*, renamed *Cosmographia* (1553). Similar contents, however, can be observed in a number of textbooks of mathematical cosmography in the era.

The essential difference between these works and Münster's later cosmography is that the former completely omitted verbal description and history-writing. The difference is even more striking when one considers visual descriptions. Images of castles and towns, exotic animals or portraits of rulers, so characteristic for many cosmographies of the latter half of the century, rarely if ever, appear in the books of the earlier mathematical tradition. These early works contained illustrations: Apian's *Cosmographicus Liber* for instance included numerous images – but these were primarily astronomical diagrams. Only one map was included in Apian's *Cosmography*, but city views and portraits of natural phenomena were completely absent. Glarean's works make no exception to this rule, which is true also for Finé's *Cosmographia*. Like Apian's work, Finé's *Cosmography* was famous and was appreciated for its woodcut illustrations, but these illustrations did not contain maps or topographical descriptions.

### *Descriptive Cosmography and Chorography*

Besides a reestablishment of the mathematical tradition, the fifteenth century also saw the ascendance of descriptive topographical tales. In Münster's lifetime these elegant and complementary descriptions of small geographical areas like towns and countries, were known as chorographies. The definition of chorography comes from Ptolemy who defined it as a description of an individual place in the finest of detail. The work of a chorographer was thus to describe smaller geographical entities such as harbors, villages, rivers or castles. Chorography aimed at presenting the particular "spirit of a place" and to transmit its "true likeness". During the Renaissance this genre developed into a humanistic tour de force that was made famous by Poggio Bracciolini's (1380-1459) descriptions of the remains of ancient Rome and Egypt, and was elevated to its full splendour with the refined and learned descriptions of Enea Silvio Piccolomini (the later pope Pius II) in his *Europa*. The humanistic chorographies usually followed rhetorical paragons of classical authors and sought to represent the nobility of a described region. Often chorographies were also used as a way to demonstrate their author's erudition. The characteristic attempt of this genre to seek some link to the ancient past, using a classical anecdote or some other kind of connection between the region and the admired antiquity, directed these texts closer to literature than observations of nature.

As Humanism moved north, the German humanists began to follow these Italian models, which eventually became cherished, and were adopted, particularly by the *Germania Illustrata* movement. The paragon of the *Germania Illustrata* movement was in the Florentine Humanism, particularly in Flavio Biondo's idea of the *Italia illustrata*. The central force of this movement was the humanist Conrad Celtis (1459 – 1508), whose visions and exhortations launched the movement to grow as one of the most remarkable historical undertakings. In visions, which Conrad Celtis orated in the University of Ingolstadt, German humanists were called to unite to describe their country and to polish the somber picture of their homelands given by the ancient authors. Tacitus' *Germania*, and its praise for the primitive virtues of Germans offered an encouraging model for a positive view of Germany. Celtis, however, dreamed of a historical compendium which would give Germany a civilized image. The major work was to describe Germany's regions, the beauty of its landscapes, richness of its natural resources, and temperaments of local peoples. Celtis saw the task as a collaborative project. The description of Germany would compare the picture of modern Germany with that given by the ancients; and would present German topography, cities, peoples and genealogies, and the dynastic lineages from tribal chiefs down to the Habsburgs. Celtis started the project and began correspondence with other German humanists, but his death in 1508 put an end to these undertakings. Celtis' own production left for posterity only two topographical texts: A chorographical description of Norimberga and a brief poetic description *Germania generalis* included in his *Amores*.<sup>19</sup>

Celtis' visions and ideals were carried on by other scholars. The banner of the *Germania illustrata* attracted a number of learned men to share the collective task, to describe the country and its past, and to raise its inhabitants' awareness of their political and cultural identity. The crucial question was, "What is Germany?" Answers were sought using humanistic methods: philological studies, reading and writing, compiling, and commonplacings. To these ends, history writing and geography were also presented as important tools – tools which, up to a certain degree, could be based on personal experience and practice. Inside the movement, information and materials circulated relatively freely. Gradually these culturally, historically and geographically oriented publications accumulated into a remarkable library.<sup>20</sup>

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<sup>19</sup> Collins, David, "The *Germania Illustrata*, Humanist History, and the Christianization of Germany" pp.101-120 in Katherine van Liere, Simon Ditchfield & Howard Louthan (eds.) *Sacred History: Uses of the Christian Past in the Renaissance World* (Oxford: Oxford University Press, 2012); McLean 2007, 91.

<sup>20</sup> McLean 2007, 93.

In the Empire, one of the earliest cosmographically oriented works to engage with the new humanistic ideals sought by Celtis, was a book by humanist and physician, Hartmann Schedel (1440-1514), known as the *Liber Chronicarum* – or after the place of birth – as the *Nuremberg Chronicle*.<sup>21</sup> The book was published as cooperative venture by Anton Koberger in 1493. It was a financial disaster, but today remains in book history as a unique and bold endeavour, which in a fascinating way, characterizes the transition between medieval chronicling and the new humanistic trends. Matthew McLean has rightly credited *The Nuremberg Chronicle* as “the first book of the world, relevant to a study of sixteenth century cosmography”. Schedel’s work was an encounter between theology and cosmography, which sought its own way through the Mosaic view of the creation and the more sophisticated, but less authoritative, views of philosophers and humanists. As one of the very rare illustrated world descriptions to have appeared before 1550s, the *Nuremberg Chronicle* offers an important point of comparison to Münster’s *Cosmographia*.<sup>22</sup>

In his chronicle Schedel used a wide range of sources, both ancient and modern, but Italian Humanism dominated. Schedel’s main source was the *Supplementum chronicarum* by Giacomo Filippo Foresti da Bergamo which he used throughout his work, and which provided Schedel’s chronicle its structure. Platina’s *Vitae pontificum* and Flavio Biondo’s *Decades* were important for Schedel’s biographies of emperors and popes. Biondo’s *Roma instaurata* offered material for Schedel’s description of Rome and his *Italia illustrata* for Italian cities. Also, Petrarch, Poggio Bracciolini, Leonardo Bruni, and Enea Silvio Piccolomini were of great importance.<sup>23</sup> Schedel’s description of Europe, for instance, came almost directly from Enea Silvio Piccolomini’s *Europa*. Schedel inserted into his work biographies and portraits of illustrious men, genealogies of dynasties, stories of miracles, sensations and pagan legends. Descriptions of cities and how they were founded also take up a lot of space in the Chronicle. Particularly important were great German cities and their histories. Germany on the whole receives special attention. The Holy Roman Empire, its history and its rulers, both ecclesiastical and secular, and its many Christian orders are

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<sup>21</sup> Schedel, Hartmann, *Liber chronicarum* (Nürnberg, 1493), [BSB-Ink S-195 - GW M40784 - ISTC is00307000]; Christoph Reske, *Die Produktion der Schedelschen Weltchronik in Nürnberg. The production of Schedel's Nuremberg chronicle* (Wiesbaden: Harrassowitz, 2000); Steven Rowan, “Chronicle as Cosmos: Hartmann Schedel’s Nuremberg Chronicle, 1493.” pp 127 – 159 in Gerhild Scholz Williams & Lynne Tatlock (eds.) *Literature und Kosmos: Innen- und Aussenwelten in der deutschen Literatur des 15. bis 17. Jahrhunderts*. [conference publication] (Amsterdam: Rodopi, 1986); Elisabeth Rücker, *Die schedelsche weltchronik: Das größte Buchunternehmen der Dürer-Zeit*. (München: Prestel-verlag 1973).

<sup>22</sup> McLean 2007, 115.

<sup>23</sup> Reske 2000, 35.



described. All these topics remained central also for works of the mature *Germania Illustrata* – movement. History of the Empire, genealogies and portraits of cities were similarly important for Münster's *Cosmographia*. Schedel's work nevertheless differs significantly in its structure and methodology from later regional and world descriptions. Schedel's Chronicle presented its diverse materials unsystematically and its history writing was digressive: the story of patriarch Abraham, for instance, jumps to the supposedly coincidental founding of Trier. Schedel's history writing moved readily from Old Testamental stories and theological teachings to cultural commonplaces and events of mundane history, making no difference between near contemporary events and those in the distant, ancient or biblical past. Despite its humanistic flavor the main interest of Schedel's chronicle was in the Bible and sacred history. Sacred history provided Schedel's work also with a structure: the chronicle was not geographically organized but was grounded in the framework of seven world ages starting from creation and culminating in a seventh and last age of the Antichrist and last judgement.<sup>24</sup>

The most striking aspect of Schedel's Chronicle is its numerous illustrations, particularly its many city views. Schedel's cityscapes were often done from an oblique angle, emphasizing the characteristic features and buildings of the city. The mode of representation, however, was not uniform: verisimilitude and the level of detail of these pictures varied greatly. Topographical accuracy was not consistent and imaginative and authentic views appear side by side. Even duplicates occur: the view of Paris for instance, is a reversed image of Magdeburg.<sup>25</sup> However, the illustrations in the Nuremberg chronicle have also been seen to be strongly integrated within the network of texts and other images. The illustrations create a continuum where city views are connected with the narratives of the cities and the genealogies of ecclesiastical and worldly princes with their pertinent symbols. Rowan Steven has gone as far as to argue that "the illustration program did not decorate Schedel's text: it was an integral part of what the book was about. The illustrations must be understood with the text in mind, and the text without the illustrations is incomplete".<sup>26</sup> How integral these illustrations were for Schedel's argumentation is certainly a debatable matter (an opposite view shall be discussed in chapter VIII. However, the panorama of cityscapes in the *Nuremberg Chronicle* is unique – anything comparable will not appear before Johannes Stumpf's *Swiss Chronicle* and Münster's *Cosmographia*. The extensive scope of Schedel's work covering the whole world history shall also remain as an exception: The majority of geographical and historical texts born around the *Germania illustrata* movement shall take place in a more modest form of regional descriptions or local chorographies.

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<sup>24</sup> McLean 2007, 116.

<sup>25</sup> McLean 2007, 117.

<sup>26</sup> Rowan 1986, 143

Topographical descriptions are one of the most substantial achievements of the *Germania illustrata* movement. They combined the ideals of the movement, pride of local identity, pleasure of homelands and erudition in classical languages and literature. Between the 1520s and 1540s a great number of patriotic works saw daylight. These texts handled a wide range of topics from general notions of Germany to small principalities or local towns.<sup>27</sup> Sometimes patriotic passions devolved into defensive attitudes which obscured historical accuracy. Jacob Wimpfeling's, *Epitoma rerum germanicum usque as nostra tempora* (1505), was an attempt to present German excellence against foreign authors' accusations. Although it focused on arts and culture instead of martial virtues, its historical accuracy gave way to its patriotic tendencies.

Connections with the classical past were one of the most central means used to indicate value of cultural objects in the humanist discourse. One of the key works answering to these needs was the *Exegesis Germaniae* (1518), a useful collection of commonplaces compiled by Franz Friedlieb, also known as Irenicus. It was a gazetteer of German cities and contained an extensive catalogue of classical references to Germany with Irenicus' own annotations. Typically for the period, collected names of cities, regions and other areas were an important part of the work. Relying on statistical and philosophical methods, Irenicus did not save his efforts in seeking connections between the ancient place-names and the modern ones. Also, Coelius Rhodignus' the *Lectiones antiquae* (1516) was a work on words. *Lectiones*, which in 1541 had grown into 30 volumes, consisted of commentaries which sought knowledge of things starting from an individual word, adage or judicial formula. These learned studies of ancient philosophical doctrines or natural philosophy had a long-lasting influence on German topography and history writing. Later scholars who wished to verify biographical details of historical personalities or to trace histories of place-names from antiquity to the present day, could draw from the rich reservoir of these encyclopedic works.<sup>28</sup>

The ideals of the *Germania illustrata* movement provided inspiration for a number of topographical works and can be connected with the strong chorographical impulse amidst the Swiss Humanism of the early sixteenth century.<sup>29</sup> For German chorographers, or

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<sup>27</sup> David J. Collins, S.J. "The *Germania Illustrata*, Humanist History, and the Christianization of Germany" pp.101-120 in Katherine van Liere, Simon Ditchfield & Howard Louthan (eds.) *Sacred History: Uses of the Christian Past in the Renaissance World* (Oxford: Oxford University Press, 2012), 119

<sup>28</sup> McLean 2007, 91-92.

<sup>29</sup> McLean 2007, 114. McLean offers a long list of minor regional works which in one way or another answered to Celtis' exhortation. Albinus' *Meissen*; Sebastian Brant's description of the Rhine Valley; Suntheim's piece on the Danube Valley; Philip Apian's *Bavaria* and Kantzow's *Pomerania*; Josias

topographhistorians as they are sometimes called, history and geography were inseparable. They were convinced that, past events cannot be understood without including the landscape where they took place, and geography does not profit much if it does not pay attention to those people who dwell in that landscape. One of the Swiss humanists who exhorted his fellows to produce chorographies was Heinrich Loriti or Glareanus (1588 – 1563). In the spirit of *Germania illustrata*, Glareanus wrote a poetic work *Helvetia Descriptio* (1514) where he defended his homeland against the scorn of foreigners.<sup>30</sup> Glareanus also mastered the mathematical side of geography and penned a short treatise *De Geographia* (1527), where he explained the rudiments of Ptolemaic theories on the structure of cosmos. Another remarkable Swiss author of topographical texts was Aegidius Tschudi (1505- 1572), an unshakeable Catholic humanist who had travelled widely and was experienced in topographical studies. Tschudi's compromiseless precision nevertheless caused his geographical output to remain rather modest. His only publication was *De Prisca ac Vera Alpina Rhaetia* (1538), a work which Glareanus, Sebastian Münster and Beatus Rhenanus translated, edited and printed without asking permission from the author himself.<sup>31</sup> In the spirit of Celtis, Tschudi attacked strongly those, who for the lack experience or being too credulous with old myths, had fostered a somber picture of Germany. In the introduction of the *Rhaetia* he wrote:

Shortly before our times have the old memories, stories and deeds of the lands situating by Rein and Dona, that is, Helvetia, Rauracia, Swabia, Vindelicia, Rhaetia, Wallis and their neighbors in Gallia and Germania have come to such an oblivion, that even the names have become unknown. Following this the localities have circulated fabels until finally each nation has obtained a made up opinion and history of its past. These are completely without basis, since German language became to be written only eight-and-half-hundred years ago and therefore, what the ancestors might have known could not be written. That is why any Latin history writers have not appreciated their things. Such histories are only useless dreams, old nightmares, similar to that about the old Hildebrand and similarly fabricated stories. In these curiosities all learning extinguished

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Simler's Two Alpine treatises; Christian Wursisten's description of the western regions of Switzerland; Albert Krantz: *Saxonia*; and Cochlaeus' *Germania* which appeared as a part of Pomponius Mela – edition.

<sup>30</sup> Glareanus, Henricus Loriti: *Descriptio de situ Helvetiae et vicinis gentibus*, Basileae, 1519 [VD16 L 2675]

<sup>31</sup> In Latin: Aegidius, Tschudi, *Aegidii Tschvdi ... de prisca ac uera Alpina Rhaetia, cum caetero Alpinarum gentium tractu, nobilis ac erudita ex optimis quibusq[ue] ac probatissimis autoribus descriptio* (Basileae, 1538) [VD16 T 2155]. In German: Aegidius, Tschudi, *Die vralt varhafftig Alpish Rhetia sampt dem Tract der anderen Alpebirgen nach Plinij Ptolemei Strabonis auch anderen Welt vn[d] gschichtscheybern warer anzeygung*, (Basel 1538), [BSB, VD16 T 2153].

by us Germans and in many libraries the ancient history writers' books stand unknown. In Italy as well there have been many highly learned men who have not wanted to take pains with our lands and have thus remained unqualified and inexperienced with it.<sup>32</sup>

In order to counter erroneous views of his country, Tschudi's chorographical narrative described the region of Rhaetia or Graubunden in the south-east corner of the confederation with great attention.<sup>33</sup> Typical for the genre, Tschudi offered an account of the borders of the region in antiquity, portrayed its ancient tribes, and then the character and development of its current inhabitants, their language and culture. Tschudi's carefully executed regional map received special attention, otherwise his account was imageless.

Beatus Rhenanus was another scholar close to Sebastian Münster who made a significant contribution to the *Germania illustrata* movement. Like Tschudi, Rhenanus remained faithful to the Roman church. In his topographical output Rhenanus' focus was on the classical texts. He wrote a commentary on Tacitus and Pliny's *Historia Naturalis* (1526). By discussing, selecting and arranging classical topographical accounts, these works provided important tools for the further descriptions of Germany and for the later encyclopaedic world descriptions. In a work entitled *Rerum Germanicum Libri Tres* (1531)<sup>34</sup>, Rhenanus went further and combined views of the ancients (primarily those of Tacitus) with information he had gathered during his own travels. *Rerum Germanicum* combined, standardized and organized a large body of cultural, historical and topographical material. These narratives on the migrations of German tribes, origins and histories of toponyms and on the overall

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<sup>32</sup> Aegidius Tschudi, *Die vralt varhafftig Alpish Rhetia...* (Basel 1538), vorred. Kurtz vor vnsern zytē / sind die alten gedechnussen / geschichten vnd thaten nechtgelegner landen by dem Rhyne vnd Thūnow / der Helvetiern/ Rauracern / Schwabē / Vindelicern / Rhetiern / Sedunern / vnd iro anstöffern zū Gallien vnnd Germanien / in söllich vergessenheit komen /das auch die nammen vnerkant worden / habendt sich die Landtstetten do vff die fabeln begeben /vñ gar nach yede nation ein sondere erdichte meinung vnnd historia ires harkommens gehalten / gantz one grund / dan tütsche sprach erst innert achthalbhundertjaren angefangen zūschryben /vñ dauon nit im bruch schrybens gewesen / was ellters habend sy dann mögen wissen: So wirt vsz kheinē Latinischen gschichtschrybern üt jrer dingen bewärt. Deszhalb söllich historien / allein von vnnützen tröumen / alten tantmären / glych wie vom altē Hiltteprandt / vnd derglychen / erdicht sind / inn sonders so by vns Tütschen alle leer zum theyl erlöschen / der alten geschriffschrybern bücher in vil Librarien vnbeuüszet verlegen. Vnnd wiewol in Italiē vil hoch gelerter gewesen /habendt doch dieselben nit müh wöllen haben mit vnseren landen / so jnen vngelegen vnd vnerfahren.

<sup>33</sup> McLean 2007, 107.

<sup>34</sup> Felix Mundt (ed.), Beatus Rhenanus, *Rerum Germanicarum libri tres (1531) : Ausgabe, Übersetzung, Studien* (Tübingen : Niemeyer, 2008). This recent edition contains also a German translation and excellent commentary.

development of German civilization had a permanent impact on German chorographical and cosmographical literature.<sup>35</sup>

Aegidius Tschudi's *De prisca et vera alpina* (1538) and Heinrich Glareanus' *Descriptio De Situ Helvetiae* (1514) were books which Münster seemingly knew well and were used as sources for his own narrative.<sup>36</sup> Münster was particularly well acquainted with the work of Joachim Vadian, a reformer, humanist and geographer, who had enriched the descriptive genre by his editions and commentaries on Pliny and Mela.<sup>37</sup> Münster's own edition of Mela's work was preceded by an exchange of thoughts with Vadian, whom Münster had also sent a map of Swiss lands.<sup>38</sup> Like Beatus Rhananus and Aegidius Tschudi, Joachim Vadian (1484 – 1551) was a topographical writer who was relatively close to Sebastian Münster. Vadian, a former professor in Vienna and an old member of Celtis' circle, had moved to St Gallen, where he first professed as a physician but was later nominated as the Mayor in 1525. Vadian's geographical and topographical interests were oriented towards ancient learning. Vadian's edition of Pomponius Mela's classic *Pomponii Melae Hispani, Libri de situ orbis tres* was published in Vienna in 1518, and in 1525 Vadian published an edition of Pliny the elder's *Historia naturalis*. In the preface to Mela-edition, Vadian defined the tasks and boundaries of geography, chorography and cosmography.<sup>39</sup>

In his disciplinary formulations, Vadian took as his starting point Ptolemy's disciplinary division, on which he elaborated further. His views reflect largely the actual realities in geographical publishing. According to Vadian, cosmography was related to geometry and astronomy. Whereas geography described locations of continents in relation to oceans and seas, cosmography presented the whole cosmic system, with the heavens and earth alike, based on the coordinate system of longitudes and latitudes.<sup>40</sup> The task of a cosmographer was to fix the boundaries of the continents and countries, to mention cities,

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<sup>35</sup> McLean 2007, 113.

<sup>36</sup> Münster's letter to Tschudi on 17th of August 1537 BSM, epp.4. Münster thanks Tschudi for a map he had sent, provides him a broad account of his geographical activity and asks to Tschudi to encourage Glarean to send him a (geographical) book.

<sup>37</sup> Pomponius Mela, (Joachim Vadianus), *Pomponii Melae Hispani, Libri de situ orbis tres* (1522) [John Carter Brown Library - German Collection]; Gaius Plinius Secundus, (Joachim Vadianus), *C. Plinii Secundi Naturae historiarum libri XXXVII* (Nürnberg: Ioannis Kobergii 1518), [VD 16 3528].

<sup>38</sup> Sebastian Münster's letter to Joachim Vadian on the 2<sup>nd</sup> of June 1538, BSM, epp. 5.

<sup>39</sup> Mela 1522, Vadian's Preface.

<sup>40</sup> Ibid. GEOGRAPHIA tamen si Etymon vocabuli sequimur proprie ea est quae terrae situm/ ut extra intraque ad Oceanum nostrumque mare se habet / cum locorum passim iacentium enumeratione/ describit [...] COSMOGRAPHIA uero quanquam utriusque/ coeli inquem & terrae rationem habet, magis tamen id curat, ut quibus terrae extantis partibus/ coeli secundum longitudinem latitudinemque/ spatium adsit, ostendat.

oceans, and mountains and to fix their locations in relation to the heavenly constellations.<sup>41</sup> Cosmography and geography were like the two sides of a coin. The role of geography, in Vadian's scheme, comes close to Mela's conception of cosmography. A geographer, according to Vadian, listed places and their history, offered knowledge of the origins of cities, races and peoples, about meaning of names, and described the most significant natural events and human affairs.<sup>42</sup> Geography was a literary tradition and more uncertain than cosmography. The task of chorography, instead, was to distinguish one place (a province or a region) from others. Geography precedes chorography like a painter who first observes whole object before painting its details. The focus of chorography is on character more than on magnitude and it should create a special likeness of places. Vadian also explains two sub-disciplines of chorography, "topography", which presents the extensions of a region and "topothesia" that describes the history of a place like poets do.<sup>43</sup>

Vadian's definitions offered an explicit form for descriptive geography. Themes which had formerly been discussed, mostly within the narrow setting of local description, and chorography, were now placed within the larger framework of geography. Vadian's concept of geography drew from the ancient descriptive tradition of Pomponius Mela and Strabo. Importantly, Vadian did not abandon the mathematical aspects of the endeavour, but simply placed these more clearly in the nexus of cosmography, the description of the whole cosmos.

Vadian had become impressed with Luther's texts by 1518-19. During these years he had left his professorship in Vienna and returned to his native city St Gall. The Swiss reformation was never a popular movement, but the evangelical ideas were spread through the network of likeminded humanists, who were drawn to social and religious reforms. As a prominent humanist, Vadian became a leader of the reformation and after his election as Mayor of St Gall, the movement gained a strong foothold in the city.<sup>44</sup> Vadian's later works were colored by religious themes and confessional polemics. In *Epitome trium terrae partium* (1534) Vadian interpreted biblical geography for lay readers. A trope of a moralized landscape lay in the heart of his exposition. Physical aspects of a region mirrored its spiritual

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<sup>41</sup> Ibid. Cosmographus non alio fine regiones: oppida: amnes: maria/montesque enumerat, nisi ut uel terminos statuatur regionum: quaque exordia & qui fines sint enumeret, uel sub qua coelestis superficiei habitudine illa uniuersa sint: demonstret.

<sup>42</sup> Ibid. Cumque Geographus praeter locorum enumerationem, & historiam addat/ & plerumque quae civitatum/ quae gentium / nationum, populorum/ origo fuerit/ atque unde data rebus nomina, tum & illustria non nunquam naturae sive miranda opera historice indicans, in terrae situ multo esse uberius soleat...

<sup>43</sup> Ibid

<sup>44</sup> Bruce Gordon, *The Swiss Reformation* (Manchester: Manchester University Press 2002), 89-92

significance. Gaza produced good wine, Vadian wrote. This material fecundity was transformed into spiritual significance, the seed of Gospel and the rain of the apostolic doctrine yielding from the soil of Gaza. Antiokia was as rich in beautiful flowers as it was in martyrs and confessors.<sup>45</sup> *Epitome trium* demonstrates Vadian's thorough learning in geography. His sources were extensive; he had collected great amounts of classical literature, chronicles and even travel accounts of Pyrenees voyagers. Vadian, as Matthew McLean has pointed out, mocked those who clung to authorities and closed their eyes to the world. He claimed that experience exceeds authorities and appreciated the testimony of the eye above everything.<sup>46</sup> Although Vadian emphasized the importance of eye witness, he did not promote ocular proof in form of pictures. In his own geographical works Vadian did not differ from his contemporaries in a sense that his books did not use of pictures or maps as a part of the argument. In the late 1540s, Vadian nevertheless contributed to Johannes Stumpf's *Swiss Chronicle*, a work which made an extensive use of images. Unfortunately, the shadow side Vadian's evangelical sentiments, his harsh views on the Roman Church and his slander against traditional religious orders, turned out to be fatal for Stumpf's great enterprise.

Johannes Stumpf's (1500-1577/8) *Swiss Chronicle*, or *Gemeiner loblicher Eydgnoschafft, Stetten, Landen und Völckeren Chronik wirdigen thaaten Beschreibung*, as the title goes, came out in Zurich four years after the first edition of Sebastian Münster's *Cosmographia* in 1548.<sup>47</sup> Stumpf's Chronicle consisted of two large folio volumes, divided into 13 books. The first three books contained short descriptions of Europe, Germany and France, the remaining ten books consisting of proper chorography. The latter explored the history of Swiss tribes through the ages, beginning from the classical times and proceeding through Roman rule and the founding of the first cantons. Then, following a consistent formula, Stumpf's Chronicle described the individual regions. Classical references to each region were presented first, followed by a general geographical description, and then smaller descriptions of cities, villages, lakes and rivers. Collecting such a vast amount of information would have been impossible, had Stumpf not had a broad circle of colleagues assisting him and providing him with their materials. Stumpf was assisted for instance by Heinrich Bullinger, Nicolaus Briefer, Aegidius Tschudi, Beatus Rhenanus and Wolfgang Lazius.<sup>48</sup> Swiss and South German humanists were keen to take part in these types of collective ventures and information and texts were circulated inside the learned circles. However, when

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<sup>45</sup> McLean 2007, 113.

<sup>46</sup> Ibid.

<sup>47</sup> Johannes Stumpf, *Gemeiner Loblicher Eydgnoschafft Stetten, Landen und Völckeren Chronick wirdiger thaaten beschreybung* (Zürych: Froschouer, 1548) [BSB, Signatur: 13180928].

<sup>48</sup> McLean 2007, 109.

the costs of editorial projects started to get higher, this kind of collaboration suddenly turned out to be more problematic. One of the scholars who generously lent his material to Stumpf was Sebastian Münster. This was rather natural as both of them belonged to the same Protestant and humanist networks. The relationship between Stumpf and Münster cooled off in 1543, however, as Münster started to believe that Stumpf's work would be too similar to his own.<sup>49</sup> This time the stake was higher than in usual publications. Münster and his printer-publisher Heinrich Petri had made significant investments in the book and its wood cut maps and illustrations. Also, Stumpf's book, unlike most works in the *Germania illustrata* being mostly imageless, was supplied by rich illustrations. Indeed, the Swiss chronicle had over 2400 woodcuts: city views, coins and portraits, making it also a weighty financial investment.<sup>50</sup> The collaboration between Münster and Stumpf died down and was replaced by nervous prying into the scope and goals of one another's project.

With its primary focus on the local Swiss landscape, history and culture, Stumpf's chronicle was not a world description or a universal cosmography, but a work in the chorographical tradition. Nevertheless, many of its elements and its methodological approach parallel with those of Münster's *Cosmographia*. Both Stumpf's chronicle and Münster's, to a lesser degree, reflected the ambitions of the *Germania illustrata* movement. Stumpf was explicit about his desire to make the world aware of the quality and morality of the Swiss land and people.<sup>51</sup> Stumpf wished to correct the wrongs of ancient history writers and polish up the picture of his glorious homeland. Both Münster and Stumpf presented the history and geography of the regions described from a providential view point: the fate of men was in the hands of God, who already rewarded and punished people in this life. They both wished to celebrate the wonderful work of God's creation and used texts and images to illustrate it. To what extent the growth of evangelical natural philosophy was reflected in Sebastian Münster's work shall be explored here, but Stumpf still remains unexamined. The darker side of the religious reforms, perhaps left its mark on Stumpf's chronicle and ultimately led to its rejection. One of Stumpf's assistants, Joachim Vadian, had decided to season his narratives with Protestant insults to monks and the Catholic religion. Vadian's mockery aroused predictable controversy and opposition and Stumpf's book was banned in the Empire.<sup>52</sup>

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<sup>49</sup> For a full account on the rivalry between Münster and Stumpf see Matthew McLean, "Between Basel and Zurich: Humanist Rivalries and the Works of Sebastian Münster", pp.270-291 in Malcolm Walsby & Graeme Kemp, *The Book Triumphant. Print in Transition in the Sixteenth and Seventeenth Centuries*, (Leiden: Brill, 2011).

<sup>50</sup> McLean 2007, 108.

<sup>51</sup> McLean 2007, 110.

<sup>52</sup> McLean 2007, 118 and McLean 2011.



Münster's ability to manoeuvre through the confessional partisanships allowed his work a broader audience, and ultimately made it a more influential work.

David J. Collins has pointed out that although traditional scholarship has often focused on the secular contents of the *Germania illustrata* texts, religious material, and religious history actually had a significant role in the construction of patriotic identities in early modern Germany.<sup>53</sup> That a good number of the Swiss writers of these topographical narratives are also known as local Reformers is a largely unstudied, but interesting subject. We don't know how these stories were received by readers, or to what extent they were used for other than educational purposes, say, political or religious purposes. It has been noticed however, that for instance, Heinrich Bullinger, a Reformer and early formulator of covenant theology, applied topographical and historical material in his religious pamphlets.<sup>54</sup> In his early pamphlet, *Anklag und ernstliches ermanen Gottes Allmaechtigen* (1525/1528)<sup>55</sup>, as Hildegard Elisabeth Keller has observed, Bullinger offered the first third of the whole work as a narration of the history of the Swiss Confederation before moving to his actual message, a Reformation criticism of church practices. In the *Anklag*, Bullinger drew a parallel between Jewish and Swiss history. Bullinger applied the idea of a covenant between God and his chosen people to present political reality, associating it with God's alliance with the Confederates. In his pamphlet, the national history and the history of salvation thus mirrored each other. As Keller points out, Bullinger used terms that had political, institutional and theological meanings cleverly intertwining political renewal with religious reform."<sup>56</sup> Thus, history became used as a demonstration of God's providence for his chosen people, both in the past and the present. Keller describes Bullinger's rhetorical means: he wanted the members of the Confederation to feel that they were under observation, and to recognize how God judged their present actions. God's keen vision penetrated space, (the Alpine landscape), and time, (the history of the Confederation). For Bullinger, this topography represented more

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<sup>53</sup> David J. Collins, S.J. "The *Germania Illustrata*, Humanist History, and the Christianization of Germany" pp.101-120 in Katherine van Liere, Simon Ditchfield & Howard Louthan (eds.) *Sacred History: Uses of the Christian Past in the Renaissance World* (Oxford: Oxford University Press, 2012), 119

<sup>54</sup> Hildegard Elisabeth Keller, "God's plan for the Swiss confederation: Heinrich Bullinger, Jakob Ruf and their uses of historical myth in reformation Zurich."pp. 139-167 in Randolph C. Head (ed.), *Orthodoxies and Heterodoxies in Early Modern German Culture : Order and Creativity, 1550-1750*. (Leiden: Brill, 2007).

<sup>55</sup> Heinrich Bullinger, *Anklag und erstliches ermanen Gottes Allmaechtigen / zuo eyner gemeynenn Eydgnoschafft / das sy sich vonn jren Sünden / zuo jmm keere* (n.p. [Zurich], 1528).

<sup>56</sup> Keller 2007, 142.

than a fortunate natural resource, rather, it proved that the Creator of the world was the architect of the Confederation's political arrangement as well.<sup>57</sup>

How extensively the powerful trinity of history, topography and providence came to be used in the chorographical descriptions of the Reformation period is still to be uncovered. It is perhaps improbable that the findings of the religious tracts could be generalized to more humanistically oriented chorographies, although they weren't fully secular either. In the case of Münster, however, a sign of providential discourse being used in topographical histories is an important clue that should be thought about more closely. Bullinger's case demonstrates how spirituality of topographical narration and providential ideas were intertwined. In Münster's case, unlike that of Bullinger, the spiritual drive seemed to be a factor that forced scholars to enlarge the scope of geography. Bullinger saw a limited geographical area mirroring divine guidance, but Münster saw guidance in the histories of all peoples. This distinguishes Münster also from the *Germania illustrata* movement, although he remained hesitant about extensions of his geographical focus. It is true that, in Münster's geographical works one may perceive a clear intention for improving the image of his country. In the preface of the *Cosmographia* Münster confesses: "Moreover, the dear reader should know that my first object was the German nation".<sup>58</sup> But at the same time Münster writes that Germany was not all he wished to show:

I wish to leave no land unexamined, so that we would acknowledge what rare and miraculous things God has created on the wide Earth, giving to every land something that shall not be found in another, his gifts being so wonderfully shared that we would thereby learn, that a man and a land need each other in every way, and no one has received excessive amount of anything.<sup>59</sup>

Although recent research has put into doubt the views of earlier historiography that emphasized the secular character of the *Germania Illustrata* tradition, it is clear that the Protestant reformation brought the spiritual questions to the agenda with ever-greater urgency.

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<sup>57</sup> Keller, 2007, 145-146.

<sup>58</sup> Sebastian Münster, *Cosmographie oder beschreibung aller laender/ herschafften/fürnemsten stetten/ geschichten gebreüchē / hantierungen etc.[...]* (Basel: Heinrich Petri 1550 – fac-simile, Amsterdam: Theatrum Orbis Terrarum 1968). Vorred, no pagenumbers [6], "Weiter solt du freüntlicher leser wissen /dz mein erst fürnemē ist gewesen Teütsch nation".

<sup>59</sup> Münster, *Cosmographie* (1550), vorred, no pagenumbers [5], "Also wöllen mir kein land onersücht lassen / do mit wir erkennen was Gott für seltzame vnd wunderbarliche ding auff dem weiten ertrich erschaffen hat / vnd je einem land etwas geben / das in dem andern nit gefunden wirt / vnd seine gaben also wunderbarlich ausz getheylt / das wir dar bay lernetē / das ein mensch vnd ein land des anderen al[w/m]egen bedarff / vnd keins alle ding über ein hauffen empfangen hab."

With many north-european authors, like Vadian and Stumpf, it is nevertheless difficult to distinguish the new flavours brought in by the reformations from the traditional flavors of humanistic and patriotic writing. The abundance of fruit in a particular region could be explained in both views as God's gift for the good people cultivating the land. But whether the prosperity of land was explained by divine providence – or the providence rationalized on grounds of material prosperity of the earth, were of course two different rhetorical objectives. Within the ramification of the Protestant reformation, with its greater emphasis on spirituality, brought a focal shift from a regional to a universal view point: the interest in God's creation strengthened. In the post-reformation works of Stumpf and Münster the new rhetorical weight is precisely on the work of God's hand in the nature.

The relationship between novel religious currents and the production of geographical knowledge, however, was not straightforward. In many cases, like in that of Münster, religious ideas and the study of nature supported each other and the will to understand God's creation strengthened attempts to understand nature and history. But historical and geographical narratives could serve religious motives in other ways also. The famous example of such an approach is the work of a religious non-conformist Sebastian Frank (1499 – 1543) entitled the *Chronica, Zeytbuch und Geschychtsbibel* (1531).<sup>60</sup> Frank was one of the most original and bold religious thinkers, and due to his views, which differed radically from the Catholic orthodoxy and the mainstream Protestantism, he had to spend most of his adult life on the run; Being forced to move from Nuremberg to Strasbourg, then to Ulm and finally to Basel. Frank's 536 page-long "historical bible and chronicle" folio was also dedicated to his spiritual ideas. Frank believed in a fully invisible, personal, and spiritual relationship with the divine; and he abandoned all visible organizations, secular governments, churches and sects as man-made structures. In the light of this vision Frank wrote his chronicle. In the first three books of the work Frank, describes freely historical periods from Adam to Christ, tells the story of temporal rulers of different ages as a story of God's punishment on man – and condemns all Churches and sects and admonishes his readers to a personal piety. Against the common trend in humanistic history writing, Frank did not believe in progress of humankind: for him all ages are equally distant from the Creator. Although God has set his image in everything, human knowledge is uncertain. In his fourth book, the so called "Weltbuch", Frank delves into a very special kind of geography. The book does not follow geographical exactness or organization but serves a spiritual goal: it aims at

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<sup>60</sup> Sebastian Franck, *Chronica, Zeytbuch und geschychtbibel : von anbegyn biß inn diß gegenwertig MDXXXI. jar, darin[n] beide Gottes und der welt lauff, hendel, art, wort, werck ... begriffen wirt* (Straßburg, Beck, 1531)[VD 16 F 2064]

demonstrating the madness of the world and humankind divided by innumerable sects and beliefs .<sup>61</sup>

### *Travel Literature*

Anthony Grafton's view on the "rich marriage" between humanism and science in the early modern period, according to which, "relations between the books of nature and the books of men were tangled in these transitional years" pertains perhaps nowhere as well as to the relationship between geographical knowledge and the great discoveries.<sup>62</sup> Although geographical and travel literature of the Renaissance received a significant boost from the discoveries of new regions, humanistic interests and classical literature offered a stimulus that was at least important. The discovery of the new world aroused a wave of enthusiasm: the letters of Columbus were presented to a German audience for the first time in 1497, and found company with the letters of Vespucci and Cortes' travel accounts. After the initial shock, interest in lands overseas cooled down: The travel literature offered mostly views on regions previously known regions.

In German markets, one of the most popular descriptions of exotic lands was Johann Boemus's *Omnium Gentium Mores* (1520) that was eventually published 24 times.<sup>63</sup> Boemus' work was a collection of narratives on Africa, Asia and Europe. Relying on a cornucopia of classical and modern literature it explored habits of peoples on these three continents, seeking to present the Christian faith as the highest achievement of humanity. Views on exotic countries were offered also by Peter Martyr's *De Novo Orbe*, Marco Polo's travel accounts, Petrarch's *Itinerarium siriacum*, the highly fantastic John de Mandeville's *Travels*, Pierre d'Ailly's theologically oriented cosmography, *Imago Mundi*, and Bernhard von Breidenbach's *Peregrinatio in terram sanctam*. All in all, these popular, imaginative narratives speak for little interest in the new world during the first half of the sixteenth century.<sup>64</sup> Even if these works discussed regions which were already marked on the late medieval maps, they gave an important contribution to the developing cosmography. The

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<sup>61</sup> McLean 2007, 118.

<sup>62</sup> Anthony Grafton, "Kepler as a Reader", *Journal of the History of Ideas*, Vol. 53, No. 4 (Oct. - Dec., 1992), pp. 561-572, 562. Also: Anthony Grafton, *New Worlds, Ancient Texts : the Power of Tradition and the Shock of Discovery* (Cambridge: Belknap Press/ Harvard University Press, 1992).

<sup>63</sup> Johann Boehme, *Omnium Gentium Mores, Leges & Ritus* (Friburg: Brisinger, 1536) [VD16 B 6311].

<sup>64</sup> Tzvetan Todorov, "Der Reisende und der Eingeborene", pp. 341-370 in Eugenio Garin (ed.) *Der Mensch der Renaissance*. (Frankfurt: Campus Verlag 1990).

contents of these travel accounts, stories of exotic people and sensational anthologies circulated in the academic and humanistic discourses notwithstanding the fact that their original authors or publisher were not often scholars.<sup>65</sup>

There are no comprehensive statistics from the Holy Roman Empire, but in the Kingdom of France, as Andrew Pettegree has argued: the New World discoveries do not seem to have played a large role in the publishing industry's presentation of the world beyond the kingdom's borders" and that "Reprints of the early accounts of American voyages found a diminishing audience in the middle years of the century, and it was not until the French themselves became engaged in colonial ventures that this interest to some extent revived."<sup>66</sup> Although France's entry into geography and cartography was relatively late in comparison to Italy, Germany and the Pyrenees Empires, Pettegree's insight on the French realities reflect the big picture of European publications of the sixteenth century: the accounts of the new world were seemingly marginal and the discoveries of the Americas and the new routes to Asia a little discussed topic. Still in 1548 Sebastian Münster's "rival", Johannes Stumpf wrote without a shade of uncertainty: "The whole surface of the Earth is usually divided in three parts, Asia, Africa and Europe."<sup>67</sup>

In the middle of the sixteenth century the interest in the new world increases again. Sebastian Münster's colleague Simon Grynaeus, for instance, in 1532 edited a collection of travelogues of the New World, *Novus Orbis Regionum*, which Münster supplied with a world map. The greater impulse to describe the new world and its inhabitant, however, seems to have started only in the latter half of the century with works like Hans Staden's popular book *Wahrhaftig Historia und Beschreibung... der wilden nacketen, grimmigen Menschfresser... in der Newen Welt*, (1556) and André Thevet's accounts on the Brazil: *Cosmographie de Levant* (Lyon 1554) and *Les Singularités de la France Antartique* (1557). The ascending paradigm in these works, notwithstanding their actual sensational and often fantastic content, was the appeal to "eye witness" and personal testimony.

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<sup>65</sup> McLean 2007, 103.

<sup>66</sup> Andrew Pettegree, "A new world of Mind" in *Renaissance? Perceptions of continuity and Discontinuity in Europe c. 1300 – c. 1550* (Leiden: Brill, 2010), 316. French readers could find a book about the New World only as late as 1515 when Antonio Francanzano da Montalboddo's Italian narrative became translated and printed. Montalboddo's *Le nouveau monde et navigations* went through five editions between 1515-1517 and was reprinted again in 1521 and 1534, but had no rivals.

<sup>67</sup> Johannes Stumpf, *Gemeiner Loblicher Eydgnoschafft Stetten, Landen und Völckeren Chronick wirdiger thaaten beschreybung* (Zürych: Froschouer, 1548) [BSB, Signatur: 13180928]. Das erst Buch, 1. Der gantz umkreiss des Erdbodens/ wirdt gmeinlich in drey teil vnderscheiden/ als /Asiam/ Aphricam /vnd Europam.

The growth of geographically oriented literature cannot be explained simply by the great discoveries or a practical need for tools of wayfinding. The texts of the Germania illustrata movement, for instance, rose primarily from an interest in local landscape and culture. This issue can be reflected in miniature by analyzing the increase in the number of maps in the sixteenth century. In this period map making went through a profound transformation both quantitatively and qualitatively. The number of maps waxes tremendously and the amount of maps and topographical views picturing mundane landscapes increase. Relying on the calculations of Robert Karrow in 1500, there was, in the heartlands of Europe, one map for every 720 people, where as in 1600 there was one for every four.<sup>68</sup> Thinking about this dramatic rise it is good to notice that a great amount of the newly printed views and maps could hardly serve any practical end. For example, maps and views of the Holy Land, which comprised a good share of the maps printed<sup>69</sup>, obviously assisted a more interior than exterior travelling. A map of Mount Sinai, for instance, could provide its viewer a way to visualize biblical stories, even though he could not walk there physically. Certainly a similar remark could be made of Mappamundi, world maps and maps of continents. It is hard to see how these large scale images, with their approximate accuracy, could serve any real navigational needs. While the number of maps increased, a great amount of them were describing regions that were already known. New, accurate and practically tested maps of the new world did not flow to the common markets. They were considered to be state secrets and were closed in the vaults of monarchs. The academic cosmographical project of the sixteenth century did not stem from practical needs and therefore could hardly respond to them: the bookish humanistic cosmography being put to test by Pyrenees sailors in the new world was a failure and resulted in a complete reassessment and revision of methods, as Maria Portuondo has demonstrated.<sup>70</sup>

Despite of this relatively unpragmatic character of cosmography, it is clear that the huge interest in it took the discipline further. These observations have a parallel in the history of botany. Brian Ogilvie has described the explosion of botanical knowledge from 500 plants known to Dioscorides in 1550 to the 6000 species listed in *Pinax theatri botanici*

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<sup>68</sup> Robert Karrow, "Centres of Map Publishing in Europe, 1472 - 1600" pp. 611- 621 in David Woodward (ed.) *The History of Cartography vol 3, Cartography in the European Renaissance*. (Chicago: The University of Chicago Press, 2007).

<sup>69</sup> David Woodward 2007, 10. According to Woodward, "In the sixteenth century, the most popular country portrayed on maps was arguably the Holy Land. Certainly more maps were made of it during the century than of France, Spain, or Portugal. Almost as many maps of the Holy Land were made as world maps or maps of the African continent."

<sup>70</sup> Maria Portuondo, *Secret Science: Spanish Cosmography and the new World*. (London: Johns Hopkins University Press, 2005).

(1623) by Caspar Bauhin. According to Ogilvie this remarkable rise in botanical knowledge was not so much caused by the specimens found in the new world as it was a consequence of the Renaissance naturalist's passion to describe. The desire to study plants with meticulous care and detail, resulted in rapid growth of botanical discoveries in Europe and in already relatively familiar regions like the Levant.<sup>71</sup>

The emerging genre of illustrated natural books such as Münster's *Cosmographia*, must be seen within the broader phenomena of increasing passion for describing nature, demonstrated vividly in a number of natural picture books. This passion for picturing nature was not restricted to books that today would be named as "scientific", but also appeared in more fantastically oriented books like wonder collections or 'mirabilia'. This genre, bringing together curiosity and erudition, was already popular in fifteenth century Italy, where it was cultivated by learned men like Aldus Manutius and other classically oriented humanists, drawing heavily from ancient natural books and encyclopedic works by classical authors like Pliny, Strabo and Mela. In the mid-sixteenth century, however, the mirabilia became increasingly illustrated. One influential pioneer in the new more profuse use of pictures was Konrad Lycosthenes' work *Prodigiorum ac ostentorum chronicon*, or by its German title the *Wunderwerck Oder Gottes vnergründliches vorbilden, das er inn seinen gschöpffen allen so Geystlichen so leyblichen ... von anbegin der weldt biß zu vnserer diser zeit erscheynen ... lassen ...*, *Alles mit schönen Abbildungen gezierdt vnnd an den Leser einer Vorrede ... eygentlich fürgescribe[n] vnd abgemalt* (1557).<sup>72</sup> As the title promises, Lycosthenes' work offered a broad panorama of various mysterious creatures, both spiritual and corporal, presenting these as God's wondrous creations in many beautiful pictures and texts. Lycosthenes' book publisher was Heinrich Petri, Sebastian Münster's son-in-law and the publisher of the *Cosmographia*. Petri was experienced in printing illustrated works. With

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<sup>71</sup> Brian W. Ogilvie, "Encyclopaedism in Renaissance Botany: From historia to pinax", pp 89-99 in Peter Binkley (ed.), *Pre-Modern Encyclopaedic Texts: Proceedings of the Second COMERS Congress, Groningen, 1-4 July 1996* (Leiden: Brill 1997) and Brian W. Ogilvie, *The Science of Describing* (Chicago: Chicago University Press 2006). Holding description as the central concern in the Renaissance natural history Ogilvie has called Renaissance natural history a science of describing, with an intentional reference to Svetlana Alper's interpretation of the seventeenth century Dutch Art.

<sup>72</sup> In Latin: Konrad Lycosthenes, *Prodigiorum ac ostentorum chronicon quae praeter naturae ordinem, motum, et operationem, et in superioribus & his inferioribus mundi regionibus, ab exordio mundi usque ad haec nostra tempora, acciderunt*, (Basileae: Henricum Petri, 1557) [VD16 W 4314]; In German: Lycosthenes, *Wunderwerck Oder Gottes vnergründliches vorbilden, das er inn seinen gschöpffen allen so Geystlichen so leyblichen ... von anbegin der weldt biß zu vnserer diser zeit erscheynen ... lassen ...*, *Alles mit schönen Abbildungen gezierdt vnnd an den Leser einer Vorrede ... eygentlich fürgescribe[n] vnd abgemalt*, (Basel: Heinrich Petri, 1557) [VD16 W 4315]

Lycosthenes' work he saved resources by printing the book partly with plates of the *Cosmographia*.

Lycosthenes' work cannot be explained by simply a sheer interest in the peculiar, although its many sensational images obviously improved sales. The central scheme of the *Wunderwerck* is spiritual. As the title suggests, Lycosthenes wanted to show God's work. All the various miracles are presented in a theological context which seeks to understand God's creation. The book begins with the Creation and the miracles of the Old Testament: Creation of the world and Paradise were God's first wondrous work.<sup>73</sup> These are followed by the story of Cain and Abel, the deluge, rainbow, tower of Babel, and then the book continues with myths in classical and modern literature. Also, exotic or otherwise remarkable species of animals belong to Lycosthenes' miracles. There too one could discern the print of God's hand. Lycosthenes' work is an example of a discourse where spiritual contemplation of God's creation was combined with variegated notes on natural phenomena.

Another significant exponent of the wonder-genre was Pierre Boaistuau, whose *Histoires prodigieuses* (1560), has sometimes been taken as an archetype of the illustrated book during the renaissance. Boaistuau's early career was spent in France where he had received patronage from the court of Henry II. As the environment turned increasingly hostile to Protestants, Boaistuau escaped to England in 1559 where he sought protection from the court of Queen Elizabeth I. The manuscript of the *Histoires prodigieuses* had probably been written in France, but the work was printed in England and dedicated to Boaistuau's new protector Elizabeth. Boaistuau's book was largely indebted to Lycosthenes, which the author himself stated in the preface.<sup>74</sup> Like the *Wunderwerck*, Boaistuau's *Histoires prodigieuses* was a collection of natural wonders, miracles, oddities, curiosities and legends. The book became immensely popular and during the sixteenth and seventeenth centuries it was re-edited dozens of times. The popularity was largely due to its extensive and meticulously drawn illustrations. Like Lycosthenes' work, the *Histoires prodigieuses* also was essentially a spiritual work. Marvelous stories, like the destruction of Jerusalem and miraculous deaths of princes and monarchs worked as a way to discuss the meaning of God's creation.<sup>75</sup>

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<sup>73</sup> Lycosthenes, *Wunderwerck* (1557), i.

<sup>74</sup> Pierre Boaistuau, *Histoires prodigieuses extraictes de plusieurs fameux auteurs, grecz & latins, sacrez et prophanes...* (Paris : V. Norment et J. Bruneau, 1564) [Bibliothèque nationale de France], *Advertissement au lecteur*. "Mais sur tous autres, ie suis grandement redeuable à Conradus Lycosthenes Rubeaquansis, lequel oultre la doctrine qui luy est cõmune avec les autres, encores a il surpassé tous ceulx qui l'ont precedé, en labour, & en diligence."

<sup>75</sup> Stephen Bamforth (ed.), *Pierre Boaistuau, Histoires prodigieuses* (Geneva: Librairie Droz, 2010).



A profound interest in natural phenomena and images was explicit also in Georg Agricola's work *De re metallica* (1556) – but in a way that was very different to the works of Lycosthenes and Boaistuau. *De re metallica* was an informative work on metals and minerals, emphasizing the great benefits of nature for man.<sup>76</sup> In Agricola's work, praise of God's work was superceded by a more pragmatic approach to natural resources. Agricola differed from Boaistuau and Lycosthenes both in that he had no protestant sympathies. This friend of Erasmus opposed the Protestant Reforms and refused to convert to Lutheranism till the very end. Later these attitudes eased and Agricola made friends with Melanchthon, Camerarius and other Protestant leaders.<sup>77</sup>

By the end of the sixteenth century books that were based on various forms of pictorial collections and catalogues became even more common. One such popular genre was books that presented portraits and biographies of famous personages. Among the pioneers of this genre were Heinrich Pantaleon's *Prosopographia* (1565) and André Thévet's *Vrais portraits pourtraits et vies des hommes illustres* (1585).<sup>78</sup> Portraits of illustrious men also held a central place in Münster's *Cosmographia* – lots of this material became re-framed and re-interpreted in Thévet's work. Thévet is well known also for his cosmographical work.<sup>79</sup> Like the *Vrais portraits*, Thévet's *Cosmographia Universelle* was abundantly illustrated: the two folio volumes of *Cosmographia Universelle* contained over 200 woodcuts and 35 maps.<sup>80</sup> Münster's materials found their way also to Thévet's universal cosmography, although the royal cosmographer Thévet criticised Münster sharply for his credulous attitude towards sources.<sup>81</sup> Münster's illustrations also were used in Thévet's rival François de Belleforest's *Cosmographia* (1575) – a translation of Münster's *Cosmographia*, but improved and modified enough to take it as an original work (remembering that the originality of these compilatory

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<sup>76</sup> Agricola had already written about metals in 1530, but this work *Bermanus sive de re metallica* was imageless.

<sup>77</sup> Herbert Hoover (ed.), *Georgius Agricola De re metallica [...] with biographical introduction, annotations and appendices...* (London: The Mining magazine, 1912), viii

<sup>78</sup> André Thévet, *Les vrais portraits et vies des hommes illustres grecz, latins et payens : recueilliz de leurs tableaux, livres, médalles antiques et modernes* (Paris: Vesve Kervert et Guillaume Chaudière, 1584)

<sup>79</sup> The classic and influential study on Thévet and sixteenth century cosmography is Frank Lestringant's *L'atelier du cosmographe* – for an English translation see Lestringant, *Mapping the Renaissance World: Geographical Imagination in the Age of Discovery* (Cambridge: Polity Press 1994).

<sup>80</sup> McLean 2007, 120.

<sup>81</sup> Thévet 1584, 559v. Quant à luy, pour auoir esté trop prompt à croire au raport d'autruy, il s'est laissé couler en vne milliaste de fausetés, bourdes & niaiseries, aucunes desquelles l'ay en passant remarqué, ainsi que le pouuoit permettre le suiet, que ie traictoye.

works is problematic and in reality can hardly be attributed to a single “author”).<sup>82</sup> The relationship between Thévet, Belleforest and Münster’s *Cosmographia* has been broadly acknowledged, but Münster’s images were appropriated also in several other interesting European publications which in earlier research have received virtually no attention. *Premier Livre des figures et povrtraits des villes* (1552), *Épitomé de la corographie d’Europe* (1553) and *Plantz povrtraits et descriptions de plusieurs villes* (1564) were produced in Lyons, a flourishing mercantile centre near to the Swiss Confederation and notorious for its unorthodox printing – and spiritual radicalism. The man behind the first two of these publications was Guillaume Gueroult, a religious non conformist whose collaboration with the famous Anabaptist and philosopher Michel Servet led him into trouble.<sup>83</sup> The third work was edited – with Gueroult’s plates – by a Huguenot, pastor Antoine du Pinet. Similarly, little known is the fact that Münster’s images were disseminated through these works to Italy where they had an important role as illustrations in the very first Italian city scape books, namely Paolo Forlani’s *Il primo libro delle citta et fortezza principali del mondo*<sup>84</sup> (1567) and Giulio Ballino’s *De’ disegni delle piu illustri città, & fortezze del mondo*<sup>85</sup> (1569). The similarity of the Lyonnese and Venetian works to Du Pinet’s *Plantz povrtraits et descriptions de plusieurs villes* has actually been acknowledged by Giorgio E. Ferrari in a preface to the reprint of Ballino’s work, but Du Pinet’s debt to Münster has remained unmentioned.

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<sup>82</sup> It is beyond the scope of this study to discuss in greater detail the question of authorship in early modern period, which is a highly interesting but complex subject. For a recent assesment of question, see: Margaret J.M. Ezell, *Social Authorship and the Advent of Printing* (Baltimore: Johns Hopkins University Press, 1999); Harold Love, *Attributing Authorship: An Introduction*. (Cambridge: Cambridge University, 2002)

<sup>83</sup> This PhD project started originally by focusing on these French works and I wish to share here some useful literature on these peculiar and little studied editors. For Gueroult see: Daniella Boccassini, *La parola riscritta: Guillaume Gueroult. Poeta e traduttore nella Francia della Riforma*. (Florence: La Nuova Italia 1985). Enea Balmas, *Montaigne a Padova e altri studi sulla letteratura francese del cinquecento* (Padova: Liviana 1962). Baudrier Henry, *Bibliographie lyonnaise. Recherches sur les imprimeurs, libraires, relieurs et fondeurs de lettres de Lyon au XVIe siècle*. (Lyon, Auguste Brun [Later Brossier] 1895-1921.), volume 10, 99. Guillaume Gueroult in Du Verdier pp.480-496 (with a lengthy citation from Gueroult’s translation « Discours de la droicte Administration des Royaumes & Republicques ») and in *La Croix du Maine* p. 148. Studies on Antoine du Pinet: Irena Backus, *Reformation Readings of the Apocalypse: Geneva, Zurich, and Wittenberg*. (Oxford: Oxford University Press 2000). Madeleine Lazard, "Antoine du Pinet, sieur de noroy, et la taxe de la boutique du pape." pp. 157 - 169 in *Revue d'histoire et de philosophie religieuses* 2003, tome 83 nro 2. Antoine du Pinet in *Du Verdier* pages 75-78 and in *La Croix du Maine*, p.19.

<sup>84</sup> Paolo, Forlani (Furlani), *Il Primo libro delle citta, et fortezze principali del mondo* (Venice, 1567).

<sup>85</sup> Giulio Ballino, *De’ disegni delle più illustri città et fortezze del mondo*, Parte I; la quale ne contiene cinquanta [...] Venetiis, MCLXIX, Bolognini Zalterii typis et formis. Ristampa anastatica con una presentazione di Giorgio E. Ferrari, (Roma: Jouvence 1982 [Venice B. Zalterij 1568/1569]).

These cityscape collections, drawing from Münster's *Cosmographia*, characterize a rising trend of city view books that was commercialized most successfully by Georg Braun and Franz Hogenberg's *Civitates Orbis Terrarum* (1572). Also, Braun and Hogenberg used some of Münster's visual material. *Civitates Orbis Terrarum* raised the bar of topographical realism and created new higher standards for the popular genre of city view books. Combining the chorographical tradition of local textual description with topographically genuine pictures of cities, the city view collections became an expression of local identity and pride as well as a vehicle for geographical research. Images and texts provided cities an opportunity to tell about their history and appearance in positive light – and the readers these collections offered a way to see far-away places.

### *Theatres of Verba and Res*

Although it is right to argue that Münster's *Cosmographia* was a descendent of the *Germania illustrata* tradition with its local descriptive “geographistories”, there are two things which distinguish it from these predecessors: first its universal scope; second, the centrality of visual material such as maps, city views and the portraits within it. The humanistic geography and eloquent chorographies of the *Germania illustrata* celebrated the art of word. Sebastian Münster received a lot from this tradition.<sup>86</sup> As essential as it is to understand Münster's *Cosmographia* as an heir to the *Germania Illustrata*, it is equally essential to acknowledge the *Cosmographia* as a pioneer among the booming genre of natural picture books. In the emerging of city view books, Münster's *Cosmographia* played a central role – and as the first early modern book to present the whole world in words and pictures, it can be held as a precursor for a specific type of geographical picture book, which after Gerard Mercator's cosmographical book in 1592, became known as the atlas.<sup>87</sup>

Münster's *Cosmographia* was thus part of a new trend making pictures an integral element of a natural book. After the *Nuremberg Chronicle* and Bernard von Breidenbach's

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<sup>86</sup> By putting a particular emphasis on the *Germania Illustrata* -tradition Matthew McLean has continued this interpretative scheme set forth by Gerald Strauss in 1950's. McLean 2007 and Gerald Strauss. *Sixteenth-Century Germany: Its Topography and Topographers*. (Madison: University of Wisconsin Press, 1959).

<sup>87</sup> Gerard Mercator, *Atlas sive Cosmographiae Meditationes de Fabrica Mundi Fabricati Figura*, Duisburg, 1592.

travelogue to the Holy Land,<sup>88</sup> descriptive geographical books, cosmographies and chorographies were almost completely imageless. Text books of mathematical cosmography used more illustrations – but in a didactical function as diagrams clarifying the planetary system – visual description never belonged to its key interests. Works of Thévet, Stumpf and Münster characterize a significant moment in the history of cosmographical literature, the forceful emergence of images.

The rise of picture books such as illustrated cosmographies and cityview books can be seen in conjunction with several different factors. McLean, for instance, had engaged the broader trend of natural encyclopedias with the esthetic ideal of *varietas*: this meant gathering and tracing varied and extensive collections of objects, questions, and studies: Cosmographies, chorographies, encyclopediae and compendia offered an opportunity in collecting and presenting classical quotes and to show erudition.<sup>89</sup> Collecting of various elements, textual fragments, images and objects has also been connected with the information overload of the sixteenth century. The flood of information caused by the invention of the printing press, compelled authors, editors and publishers of the renaissance to develop new ways to manage the huge influx of new data. Different types of compilation-books and innovative forms of layout, marginalia, and indexes can be seen as a practical means to meet this challenge.<sup>90</sup> An essential feature of picture books in Münster's era is their compilational character. Picture books can be taken as a specific type of reference book, gathering samples of “verba” and “res”. Similar ambitions to organize and understand nature characterizes the so called Wunderkammer, another typical phenomenon of the period. Wunderkammern were collections of artifacts, gems, rocks, minerals, fossiles, flowers, and shells, anything natural or manmade. The motivation for such collections could be simple wonder, but the collections and catalogues of various items could also respond to Neo-Platonistic and Hermetic ideas, which saw the universe as an interconnected network and tried to understand it by seeking correspondences, similarities and harmonies.<sup>91</sup> Although these various influences and factors are easily discernible, the relationship between picture books, images of nature and proper natural philosophy is complex and difficult to outline. Sometimes, however, authors of natural

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<sup>88</sup> Bernhard von Breydenbach, *Des saintes peregrinations de Jerusalem et ses environs...* (Lyon: Michelet Topie et Jacques Heremberck, 1488). Studies on the *Peregrinatio*: H.W. Davies, *Bernhard Breidenbach and his journey to the Holy Land 1483-1484*, (Utrecht : Haentjens Dekker und Gumbert, 1968 [1911]), Horst Kunze, *Geschichte der Buchillustration in Deutschland. Das 15. Jahrhundert*, (Leipzig : Insel Verlag 1975).

<sup>89</sup> McLean 2007, 100

<sup>90</sup> Ann M. Blair, *Too Much to Know. Managing Scholarly Information before the Modern Age* (New Haven: Yale University Press 2010)

<sup>91</sup> McLean 2007, 104.

picture books referred to natural philosophy explicitly. Such a testimony was given, for instance, by a Lyonnaise humanist and educator Barthélemy Aneau (1505 – 1561).<sup>92</sup> In a preface to his illustrated and moralizing bestiary *Decades de la description des animaux* (1549) Aneau stressed the importance of knowledge of animals. Aneau praised man as the king of animals and exhorted his readers to have knowledge of animals that were created for his use and service. Therefore man should study “proper nature form and virtue – both real and corporeal, as well as verbal and imaginary” – as this knowledge, according to Aneau, “constitutes also one of the main parts of the natural philosophy”.<sup>93</sup>

Aneau’s emblems with their moralizing commentaries can be seen as a continuation of the medieval tradition of metaphorical natural books. These medieval encyclopaedic natural books, which aimed at visual contemplation and moral edification, were often called “mirrors” or “specula”. (The mirror title referred also to a summation of encyclopaedic scope, such as Vincent of Beauvais’ four specula: doctrinal, natural, historical and moral). The medieval mirror metaphor could nevertheless also include the possibility of a negative interpretation: the mirror could be a distorted and indirect reflection of reality.<sup>94</sup> Meanwhile, there emerged another powerful concept in natural books during the sixteenth century alongside the mirror metaphor – “theatre.”

According to Ann Blair, the concepts of the theatre of the world and the theatre of nature were a continuation of the medieval mirror and book of nature metaphors. What is

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<sup>92</sup> Aneau who had born in Bourges studied under Melchior Wolmar together with Theodor Beza and Jean Calvin. In 1529 he was nominated as a regent in the Collège de la Trinité in Lyon and in 1550’s he served as the principal of the Collège writing a program called “Formulaire et institution du Collège”, which followed loosely the outlines of educational ideas of Erasmus and Parisian humanism. Amidst the rising confessional tensions, Aneau was accused of Protestantism and killed in riots which broke out during the feast of Corpus Christi in 1561. See. Mathieu Ferrand, “Le théâtre de Barthélemy Aneau. Écriture dramatique et pédagogie de l’action. pp. 363-378 in Cahiers de Rescherches Médiévales et Humanistes, 22, 2011; Alison Saunders, ‘The influence of Ovid on a sixteenth-century emblem book: Barthélemy Aneau’s Imagination poetique’, Nottingham French Studies 16, (1977), 1-18; Alison Saunders, ‘The bifocal emblem book: or how to make one work cater for two distinct audiences’, in Emblems in Glasgow, (Glasgow: University of Glasgow French and German Publications, 1992), pp.113-133; François Cornilliat, ‘De l’usage des images muettes: Imagination poetique de Barthélemy Aneau’, L’Esprit créateur, 28.2 (1988), 78-88.

<sup>93</sup> Aneau, Barthélemy, *Décades de la description, forme et vertu naturelle des animaux, tant raisonnables que brutz /* (Lyon: Arnoullet 1549) [Bibliothèque nationale de France], praeface. *Ainsi n’est ce point petit honneur à l’homme Roy de tous les animaux, & constitué Seigneur sur toutes bestes vivantes, à luy subiectes, & crees pour son vsage, & seruiice, auoir, la cognoissance d’icelles, par leur propre nature, forme, & vertu, sinon, reale, & corporelle: aumoins verbale, & imaginaire, qui est vne des meilleures parties de la Philosophie naturelle.*

<sup>94</sup> Ann Blair, *The Theatre of Nature. Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997, 153.

specifically interesting about these concepts, however, is that the theatre of nature concept engaged both natural philosophy and cosmography of the late sixteenth century.

The term “theatre of the world” had by 1600 become a cliché. It was used in literature and drama by canonical authors like Cervantes and Shakespeare. In its theatrical use it often emphasized the vanity of human existence, its bitterness and tragicomedy, seeing the world is a theater, men are the actors.<sup>95</sup> In the natural philosophy and encyclopaediae the concept had nevertheless a different application: it also took nature and the world as a theater, but referred to man, not as an actor, but as a spectator. According to natural philosophers like Jean Bodin the “*theatrum mundi*” was God’s providential presentation for the edification of man. The idea of the theater of nature as God’s theater portrays the world as a stage where God demonstrates his abilities and his providence and man witnesses the beauty and order of his creation.<sup>96</sup>

This concept of theater of nature, as it was understood in the sixteenth century, was often closely linked to the concept of providence, which earlier had appeared together with the idea of the book of nature. Contemplation of providential nature was not limited to natural theology but also occurred in prophetic and apocalyptic texts. According to Ann Blair the theater of nature emphasized the wideness and majesty of nature, and its variety of harmonies, as it was perceived in human contemplation.<sup>97</sup> Jean Bodin, a natural philosopher, active in the late sixteenth century, also used it to denote a sense or place where we have entered and where the spectator himself is a part of the scene. According to Blair this idea of active participation was nevertheless foreign to Philip Melanchthon and other natural philosophers in the middle of the century.

As a book title, the theatre metaphor was widely spread during the years 1550 – 1700 and it started to become very general by the end of sixteenth century. As a title it announced encyclopaedic ambitions and handling of the subject in an ample, thorough-going and systematic way. Before that “theater”, “mirror” and “book of nature” were used in a corresponding way.<sup>98</sup>

All these terms included an idea of contemplation and moral edification. The theater –metaphor nevertheless transmits a more positive idea of representing a project. By the end of the sixteenth century, “theater” was used in the titles of many kinds of books: moral

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<sup>95</sup> Ibid.

<sup>96</sup> Ibid.

<sup>97</sup> *Idem*, 154.

<sup>98</sup> Ibid.

theaters, mathematical theaters, floral theaters, pedagogical theaters.<sup>99</sup> The most important of these groups was, nevertheless, geographical theaters.<sup>100</sup> According to Blair, it stands out as the most clearly identifiable group. The pioneer of geographical theaters was Abraham Ortelius' *Theatrum orbis terrarum* (1570) which went through an astonishing 73 editions between 1576 – 1697. Before Ortelius, Blair has found only two cases where “theatre” had been used in geographical context. After Ortelius the term geographical theater had become a cliché. After Ortelius geographical theater meant a collection of modern maps in opposition to “geography” that presented maps according to the ancient Ptolemaic tradition.<sup>101</sup> In the Ortelius -type of theater, maps indicated geographical contours, cities and rivers, alternately with textual description of human geography.<sup>102</sup> The city views and maps worked also as stages opening views to the world.

In the continuum of natural picture books and geographical picture books Münster's *Cosmographia* stands at a turning point. Although Münster never called his *Cosmographia* a theater, it appeared in a period when the concept of theater of nature started to emerge. The *Cosmographia* was also the first book to present the concept which was later used in geographical theaters and atlases: It was a universal cosmography seeking to describe the whole world, and its many maps and illustrations, city views and portraits supported its narrative. These illustrations, combined with its global scope, distinguish Münster from the earlier *Germania Illustrata* –tradition. Like the later theaters of nature, Münster's book also was grounded on providential natural theology. The relationship between *Cosmographia*'s providentialism and its illustrations is interesting. Münster's book marks a moment when pictorial descriptions become an integral part of a geographical book.

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<sup>99</sup> Idem, 159

<sup>100</sup> Idem, 174

<sup>101</sup> François de Dainville, introduction to Maurice Bouguereau, *Le Théâtre François* (Amsterdam: Theatrum Orbis Terrarum, 1966 [Tours, 1594]). First cited in Blair 1997.

<sup>102</sup> An important exception to these geographical theaters is provided by Gerard Mercator's famous definition of the Atlas by using the mirror metaphor. Mercator's quote demonstrates also the continuity of theological concerns in cosmographical studies: “I have set this man Atlas, so notable for his erudition, humaneness, and wisdom as a model for my imitation, so far as my genius and suffice, as I begin to contemplate cosmography as through in the lofty mirror of the mind, if by chance I may be able to uncover some truth in matters hitherto obscure, which you might bring to your studies of wisdom. [...] Thus I shall lay out the whole world as through in a mirror, so that there shall be certain rudiments for finding the causes of things and attaining wisdom and prudence, sufficient to lead the reader to higher speculations.” Gerard Mercator, *Atlas Sive Cosmographicae Meditationes De Fabrica Mvndi Et Fabricati Figura* (Dvisbvrge Clivorum : Mercator 1595) Translated in Peter van der Krogt's “Gerard Mercator and his Cosmography: How the Atlas Became an Atlas”, pp.466-483 in *Archives internationales d'histoire des sciences*, vol. 59/2009.

Sebastian Münster is a figure who may enable us to receive some glimpse of how the new metaphors of natural philosophy affected geographical picture books. Münster's close colleague and friend, Simon Grynaeus, was one of the first to cultivate the concept of theater in the context of natural studies. Grynaeus is known to have already used the metaphors of "the spectacle of nature" and "the theatre of nature" in connection with cosmography in 1532 in his preface to the travelogue anthology, *Novus Orbis*. Later, in his edition of Ptolemy's *Almagest* Grynaeus praised how the "ancient and noble work of King Ptolemy [...] leads mankind to the highest visible theatre of the world with God's excellent benevolence".<sup>103</sup> In a similar way Grynaeus' interlocutor, Lutheran reformer Philip Melanchthon, used the trope of "theatre" as the leitmotif in his preface to his natural philosophy and wrote: This whole most beautiful theatre, heaven, lights, stars, air, water, earth, plants, animals, and everything else in the world's body, is created with such a great art, and decorated with beauty and form, harmony of movements, efficiency of forces and sympathy, and divided so orderly, that it is a shining testimony of God the Creator.<sup>104</sup>

The parallelisms between natural philosophy and natural theology on one hand – and natural picture books on other – are interesting. It is nevertheless clear that the relationship between these two does not follow a simple one-way logic of one being the cause and the other one the effect, nor does it follow any deterministic path towards one predetermined goal. In the case of Melanchthon and Grynaeus, however, the new concepts of nature are generally related to the transformation of natural philosophy, which sought to respond to a challenge set by the Protestant Reformation. The following chapter seeks to understand Münster's relationship with the Reformation and map out the broader questions related to the Protestant reformation, concerning nature and pictures.

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<sup>103</sup>Ptolemy: *Almagest*]Claudii Ptolemaei magnae constructionis id est perfectae coelestium motuum pertractationis lib XIII. Theonis Alexandrini in eosdem commentariorum lib XI, (Basileae: Ioannem Vvaldervm, 1538), [VD16 P 5200], 2r. vetustum ac nobile Ptolemaei regis opus, quod in supremum mundi uisibilis theatrum genus hominum singulari beneficentia Dei ducit.

<sup>104</sup> Philipp Melanchthon, *Initia Doctrinae Physicae Dictata in Academia Vuitebergensi* (Vuitebergae 1549), preface. Totum hoc pulcherimum theatrum, Coelum, Lumina, Stella, Aer, Aqua, Terra, Planta, Animantia, & cetera mundi corpora, ideo tanta arte conditum est, ornatum specie, figura, harmonia motuum, efficacia uirium, συμπραθεία, & ordine distributum, ut illustre testimonium sit de Deo opifice.



## Chapter II

### Protestantism, geography and illustration

This chapter aims to explain the contextual fabric for Münster's *Cosmographia* in this study. A contextual landscape is always an artificial creation based on existing debates and established views about a historical period and the major forces thought to have influenced the object of study. Seen with today's tools of conceptual measurement, Münster's *Cosmographia* stands out as a highly anomalous object, a work positioned somewhere between religion, geography, cartography and art. Accordingly, the following historiographical overview cannot be anything but a wide-ranging account touching on various historiographical discourses – in this case, Protestantism, science, geography, geographical illustration, maps, and visual arts.

#### *Protestantism and Science*

During the last decades, intellectual history has witnessed something that could be called a “spiritual turn”. After decades of oblivion, interest in religion has returned with force.<sup>105</sup> Among historians of science this has become apparent, particularly in a greater awareness of the influence of theological concepts on the early modern study of nature.<sup>106</sup> In this context,

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<sup>105</sup>See Alister Chapman, John Coffey and Brad S. Gregory (eds.), *Seeing Things Their Way: Intellectual History and the Return of Religion* (Notre Dame: The University of Notre Dame Press, 2009).

<sup>106</sup>See for instance. Günther Frank & Stefan Rhein (eds.), *Melanchthon und die Naturwissenschaften seiner Zeit*, (Sigmaringen: Jan Thorbecke Verlag, 1998); Peter Harrison, *The Bible, Protestantism, and the Rise of Natural Science*, (Cambridge: Cambridge University Press, 1998); Sachiko Kusukawa, *The Transformation of Natural Philosophy: The Case of Philip Melanchthon*, (Cambridge: Cambridge University Press, 1995); Charlotte Methuen, *Kepler's Tübingen: Stimulus to a Theological Mathematics*, (Aldershot: Ashgate, 1998); Charlotte Methuen, *Science and Theology in the Reformation: Studies in Interpretations of Astronomical Observations in Sixteenth Century Germany*, (London: T&T Clark, 2008).

the increasing attention has been paid to Protestant natural theology, which by challenging the medieval scholastic tradition, is assumed to have cleared the table for new ways of investigating nature. “The emerging natural sciences, rooted as they were in an intellectual culture which was dominated by theological concerns,” Charlotte Methuen has put it, “were not only hindered but informed and stimulated by the Protestant theology.”<sup>107</sup>

The discussion on Protestantism and science is of course older than the latest currents in intellectual history. It can be traced back to the 1930s when works of Dorothy Stimson, R.F. Jones (*Ancients and Moderns*, 1936) and Robert K. Merton (*Puritanism, Pietism and Science*, 1938) raised question concerning the role of Puritanism in the emerging natural science.<sup>108</sup> Stimson argued that the Puritanism was one of the key factors behind Francis Bacon’s philosophical reforms.<sup>109</sup> Merton’s more socio-historically oriented approach provided a key tenet for later investigations by observing that Protestants, and particularly Puritans, were disproportionately represented among the seventeenth century scientists. Adapting Max Weber’s influential ‘Protestantism and Capitalism’ theory to science, Merton claimed that scientific endeavours could be seen as good deeds that would qualify as signs of election. In the 1970s Charles Webster’s extensive study, *The Great Instauration* (1975), strengthened these views, but could not save the Puritanism and science -thesis from later criticism, which ultimately led to the debunking of it.

The critics of the ‘Puritanism and science’ thesis have raised two central points. Firstly, that the individual scientists mentioned in the studies of Merton and friends were not Puritans but actually Latitudinarians or simply Anglicans. Secondly, that the thesis had a problem in dating. Before the Puritan revolution of 1640, the works of Galileo, Harvey and Descartes were already mostly completed and the scientific take-off was well on its way. Moreover, counter to the Puritanism and science -thesis the early development of science cannot be confined to England or other Protestant countries. Puritanism may thus have provided favorable conditions for science, but its beginnings should be dated to an earlier period.

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<sup>107</sup>Methuen, *Science and Theology in the Reformation*, 1.

<sup>108</sup>See. I. Bernard Cohen, *Puritanism and the Rise of Modern Science: The Merton Thesis* (New Brunswick & London: Rutgers University Press, 1990).

<sup>109</sup>Since Stimson’s research on Bacon has grown massively and also the Puritanism aspect has got new hues. A view quite different to Stimson’s has been expressed lately by Steven Matthews who emphasized Bacon’s ability to express unorthodox philosophical ideas in the disguise of popular (Calvinist) religious rhetoric. Steven Matthews, *Theology and Science in the thought of Francis Bacon* (Aldershot: Ashgate, 2008).

The criticism helped to develop the classical “Puritanism and science” -thesis into a more general ‘Protestantism and Science’ thesis. Peter Harrison, a professor of science and religion in the University of Oxford and one of the most prominent speakers stressing the importance of Protestantism in the rise of the natural science, lists the key arguments of the thesis in the following way. Firstly, Protestantism promoted everyone’s direct access to God and the Bible without priestly mediators or learned interpreters, what is known as the doctrine of priesthood of all believers. Adapted to science this doctrine meant that all students of nature had direct access to the book of God’s works, liberating scholars from the domination of classical texts and from the censorship of the ecclesiastical authorities. This idea is also connected to the criticism of scholastic philosophy that led to educational reforms, and ultimately, to the end of Aristotle’s dominance in academic curricula.<sup>110</sup> Secondly, Harrison points out the Protestant demystification of the world, has been observed to have supported the mechanical understanding of nature. By endorsing skepticism of miracles and sacramental magic of medieval Christianity, and by challenging the status of priests and saints as supernatural mediators, the Reformation also contributed to the rise of a law-like and deterministic concept of the universe, usually held as a precondition for scientific research.<sup>111</sup>

Harrison’s own research has contributed to the debate by including the Protestant approach on texts, to the list of scientific stimulants.<sup>112</sup> According to Harrison, the Reformation changed the way how the meaning of nature was interpreted. Harrison refers to an old Christian tradition to talk about the Bible and nature as God’s two books. In the patristic and medieval periods, Harrison argues, the book of nature, i.e. the world was understood as a symbolic text, and natural phenomena were interpreted according to a system of similitudes. According to Harrison, the Protestant Reformation and its literal approach to texts, particularly with the Bible, challenged the metaphorical interpretation of the world. As the Bible came to be understood literally, it could no more serve as storage of allegories.

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<sup>110</sup>Phyllis Allen, ‘Scientific Studies in the English Universities in the Seventeenth Century’ (1949) See Harrison 1998. It is good to remember, however, that anti-Aristotelism has also a long history, since the condemnation of 1277. The tense atmosphere of the late Renaissance nevertheless encouraged philosophers to seek alternatives to Aristotle. The new alternatives like Epicureanism (Pierre Gassendi), Stoicism (Justus Lipsius), or various forms of Neo-Platonism (Marcilio Telesio, Francesco Patrizi), were often presented as more Christian and more pious alternatives to the prevailing Aristotelism. However, the majority of philosophers remained faithful to Aristotle. In seventeenth century Parisian Universities criticizing of Aristotle was still impious. See. Ann Blair, “Mosaic Physics and the Search for a Pious Natural Philosophy in the Late Renaissance”, pp. 32-58 in *Isis* 91(1) 2000.

<sup>111</sup>Richard Westfall, *Science and Religion in Seventeenth-Century England*; Greaves, *Puritanism and Science*; Hooykaas, *Religion and the Rise of Modern Science*; Eugene Klaaren, *Religious Origins of Modern Science*. See Harrison 1998.

<sup>112</sup>Harrison 1998, 266-273.

Similarly, “the quest for the divinely-instituted purpose of nature” was, Harrison argues, “diverted solely into the search for its practical utilities.”<sup>113</sup> Harrison’s “disappearing allegories” -argument runs parallel with the main premise of this study: illustrations in Sebastian Münster’s work demonstrate a similar change, allegorical pictorial mode gives way to a more descriptive approach.

Recent scholarship has both challenged and qualified Harrison’s study.<sup>114</sup> One of the key perceptions of later discussions has been that allegories and symbolism within the Protestant studies of nature were actually more persistent than what had been assumed by Harrison. Kathleen M. Crowther’s study on sixteenth century Lutheran nature books, for instance, has come to the conclusion that allegorical and symbolical meanings of plants and animals were central to these authors. According to Crowther these observations define the picture given by Harrison in two ways: “First, the demise of an allegorical view of nature in which plants and animals offered moral and theological lessons was neither immediate nor complete in the sixteenth and seventeenth centuries. Second, the rejection of allegory by Lutherans was never absolute.”<sup>115</sup> Crowther points out that the works of the Lutheran authors of her study, in comparison to those studied by Harrison, speak for a “bifurcation in the aims and practices of natural knowledge in this period.”<sup>116</sup> Among Lutheran authors studied by Crowther, there were many who were not interested in discovering new animals or plants, remained confined to species mentioned only in the Bible, and were not part of the European wide community of naturalists. These perceptions suggest that variation was rising within the Protestant approaches on nature, depending, say, on the level of professionalism. In which case, lively interest in nature is still seen as a central part of the religious culture of early modern Protestantism. Notwithstanding their use of allegory, Crowther’s Lutheran authors also “all strove to encourage and define a pious way of engaging with the natural world,” which according to her “would remain an important part of the Lutheran devotional culture well into the Enlightenment.”<sup>117</sup>

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<sup>113</sup> Harrison 1998, 269.

<sup>114</sup> For the critique of Harrison’s book see also: Jitze M. van der Meer and Richard J. Oosterhoff, “God, Scripture, and the Rise of Modern Science (1200 – 1700): Notes in the Margin of Richard Harrison’s Hypothesis,” pp. 363–96 in van der Meer and Mandelbrote (eds.), *Nature and Scripture in the Abrahamic Religions: Up to 1700* (Leiden: Brill, 2008).

<sup>115</sup> Kathleen M. Crowther, *Adam and Even in the Protestant Reformation* (Cambridge: Cambridge University Press 2010), 224.

<sup>116</sup> *Ibid.*

<sup>117</sup> *Idem*, 225.

The line of research originating in Harrison's work, including Harrison himself, has turned to propose that the early modern approach and explanations of nature cannot be understood without understanding its central metaphors.<sup>118</sup> Accordingly, the latest studies have sought to understand how allegories, and the way they were used in religious language, implied studies of nature. In so doing, historians have drawn from Sociologists of science who have emphasized the constitutive role of metaphor in scientific practice, theory and explanation of the world.<sup>119</sup> Metaphors, as James Bono has proposed, are more than tropes, they are fundamental cognitive operations and are central for thinking and operating in the world. Metaphors do not so much represent the features of the world as much as they "invite us to act upon the world as if it were configured in a specific way like that of some already known entity or process."<sup>120</sup> These theories help us to understand the notion that sixteenth century natural philosophers often mixed up their discipline "natural philosophy" and their subject "nature" in itself. According to Ann Blair, Jean Bodin, for instance, fuse "theatre" as a book and "natural theatre".<sup>121</sup> Seen from the perspective of the later metaphor theory, Bodin's behavior demonstrates how the concept of natural theater was not only a trope in a rhetorical context but actually reflected a whole new approach to nature and a way to operate within it.

In this respect, "book of nature" and other common rhetorical images and metaphors have been taken more seriously. But what these ideas would mean for the rising descriptive tendency in book illustration? First of all it seems to resolve, at least partly, juxtaposition between descriptive and symbolical approaches. This notion has many parallels in art history where, for instance, Ivan Gaskell has demonstrated the iconographical complexity of Vermeer's seemingly naturalistic portraits and pointed out their rich symbolism.<sup>122</sup> In a similar way Hans Holbein's descriptive and naturalistic portraiture has

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<sup>118</sup> Peter Harrison, "'The book of Nature', and Early Modern Science," pp. 1-26 in van Berkel and Vanderjagt (eds.), *The Book of Nature in Early Modern History* (Leuven: Peeters, 2006); Peter Harrison, "Hermeneutics and Natural Knowledge in the Reformers," pp. 341-62 in van der Meer and Mandelbrote (eds.) *Nature and Scripture in the Abrahamic Religions* (Leiden: Brill, 2008).

<sup>119</sup> Crowther 2010. Crowther draws from the works of James J. Bono, "The Two Books and Adamic Knowledge: Reading the Book of Nature and Early Modern Strategies for Repairing the Effects of the Fall and of Babel, pp. 299-339 in van der Meer and Mandelbrote (eds.) *Nature and Scripture in the Abrahamic Religions* (Leiden: Brill, 2008); "Why Metaphor? Toward a Metaphorics of Scientific Practice," pp. 215-34 in Sabine Maasen and Matthias Winterhagen (eds.), *Science Studies: Probing the Dynamics of Scientific Knowledge* (Bielefeld: Transcript, 2001).

<sup>120</sup> Bono 2001).

<sup>121</sup> Blair 1997, 159.

<sup>122</sup> See for instance Ivan Gaskell's work on symbolism in Vermeer's painting: *Vermeer's Wager: Speculation on Art History, Theory and Art Museum* (London: Reaktion, 2000) "Images", pp. 43-74.

been seen to be embedded in symbolism.<sup>123</sup> Accordingly, even though a descriptive pictorial mode would (in some specific fields like cosmography) replace the openly allegorical mode, these descriptive images would continue to have symbolic features. In fact, the replacement of symbolic pictures with descriptive ones is itself a symbolical act and deeply embedded in cultural and religious beliefs of the period. Therefore, while acknowledging the importance of the ascendant descriptivism as a cultural feature in the Northern Renaissance, it seems pertinent to ask what the cultural metaphors and concepts were which endorsed this type of approach to nature. In the case of artists and scientists working in the midst of a radical spiritual transformation such as the Protestant Reformation, it seems valid to ask how Protestant hermeneutics and epistemology affected the study of nature.

Another problem in Harrison's classical formulations of the 'Protestantism and Science' thesis becomes evident as one moves to Münster's times, the first half of sixteenth century. The problem here is that the closer one moves towards the "fountainheads" of modern science, the less likely one is to find anything similar to today's practices. Although a modern reader can recognize a 'scientist' in Sebastian Münster, Münster never used the word 'science' in his letters or books. The discipline which he called 'geography' and 'cosmography' or at times 'history', was taught in the universities as a part of astronomy and natural philosophy.<sup>124</sup> Münster, despite his work as a professor of Hebrew, was, because of his cosmographical interests, also often called a mathematician. These differences simply clarify the fact that texts and actions must be interpreted in connection within the context of the historical moments which gave rise to each with their unique meanings. However, historians must also communicate, and this quite often necessitates the use of unhistorical vocabulary. Therefore, words like "science" or "scientific" are used here in this study in this communicative function. Actually it seems that, most problems in the use of the word "science" within the early modern context have arisen only from when the concept of science has been associated with practices of today and artificially opposed to religion. This study, however, is engaged with expanding the understanding of early modern science, not to limit it. With these reservations the concept of science may be preserved as a heuristic.

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<sup>123</sup> For Holbein see Chapter X.

<sup>124</sup> BSM, epp. 44. Münster to Sigismund August, King of Sarmatia and Poland. March 1550." *Nam si iuxta Plinii sententiam historia eiusmodi est, ut quoquo modo scripta sit, non solum prodesse velit, sed et delectare, qua quaeso voluptate capietur lectoris animus, si simul viderit ob oculos positam regionem, civitatem, aedificia, artificia, animalia, arbores, vetustates, facies insignium hominum, genealogias regum et principum pulchre explicatas, de quibus textitur historia?"*

Applying the Protestantism and Science thesis to Münster's case, the word "Protestantism" needs also clarification. Young Münster had witnessed the humanists' criticism of the Latin Church, Luther's protests, the deepening religious contention, and gradual confessionalization-process which ultimately lead to the split of Christendom and transformation of sporadic evangelical protesters into independent churches (which had occurred by the early 1530s.) During the 1520s, the Eucharist-debate could not have passed by Münster unnoticed, as the followers of Luther begun to estrange from the followers of Ulrich Zwingli and Andreas Karlstadt. In 1530, Zwingli explained his understanding of the Christian faith in the *fidei ratio*. That year saw also the Reichstag of Augsburg, which made clear that evangelical protesters could no longer be reintegrated to the Latin Church. The Reichstag of Augsburg also demonstrated that followers of Luther and Zwingli could not find agreement and be united in one evangelical church. The first Basle confession in 1534, and the first Helvetic confession in 1536, consolidated the reformed faith in Münster's Swiss surroundings.<sup>125</sup> These events inevitably had their effect on Münster's life, but instead of Protestantism, it seems more appropriate to talk about the Reformation. What one has here is not yet a fixed set of theological and ecclesiastical doctrines but a process of spiritual and cultural transformation. When Münster was translating Luther's texts in 1518, he was not yet a "Protestant" but a curious Franciscan friar – however, it is also true at this time, that the transformation of the Church had already started. In 1529 Münster gave up his habit, got married and converted to the evangelical faith at the newly reformed Basel. That year saw also the second Reichstag of Speyer (15.3.-22.4.1529) where Catholic estates sought to return the Catholic Mass to all parts of the Empire. Led by Elector Johann of Saxony, a group of evangelical territorial rulers protested against this proposal of the Catholic princes. In the later Protestant self-understanding the incident came to signify the birth moment of Protestantism.<sup>126</sup> Even though Münster's close colleague, Simon Grynaeus, has been assumed to have participated in this Reichstag, Münster's texts bear little evidence that the event had somehow changed Münster's self-understanding.<sup>127</sup> As a man who left his monastic order, translated reformist literature, and sought to correct the canonical translation of the Bible, his

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<sup>125</sup>See Bruce Gordon, *The Swiss Reformation*, (Manchester: Manchester University Press, 2002), 146-149.

<sup>126</sup>Thomas Kaufmann, *Geschichte der Reformation*, (Frankfurt am Main: Verlag der Weltreligionen / Insel Verlag 2009), 372.

<sup>127</sup> Münster comments his Protestantism indirectly in a letter to Konrad Pellikan in 10 May 1543, BSM, epp. 15. Somewhat characteristically this remark indicates how Münster sought to avoid difficult religious topics and because of his Protestantism did not discuss theological issues with the Pfalzgraf Johannes. *Invisit quoque me ante octavam illustrissimus princeps Iohannes Palatinus et duas horas amice mecum in aedibus meis contulit, non tum de religione, cum non admodum faveat protestantibus.*

life, however, was strongly marked by the events of the Reformation. In Münster's case, terms like Protestantism and Catholicism, science or religion, explain poorly the cultural and political realities of the early sixteenth century. Actually they themselves need explanation as an outcome of the cultural transformation of the Reformation.

### *Sebastian Münster, a Reformed Geographer?*

Sebastian Münster's engagement with the Reformation has been no secret to the historians studying him. For some reason, however, Münster's engagement and its consequences for his geography, have remained a relatively little discussed topic.<sup>128</sup> Fortunately some indicative notes have been made by these historians. Karl Heinz Burmeister, Sebastian Münster's in-depth biographer, already wrote in the 1960s that Münster's dual career in Hebrew studies and geography becomes understandable only as a part of the *philosophia christiana*, Christian scholarship. The meaning of human existence for Münster, according to Burmeister, was to know God and his Creation. Learning served these ends. Whereas the Hebrew studies gave a key for understanding Scripture, geography and history opened up God's Creation within geographical space and historical time.<sup>129</sup> Burmeister's biography of Sebastian Münster offers the basis for all contemporary scholarship on Münster, both as a Hebrew Scholar and a geographer. However, although Burmeister carefully investigated a great selection of sources on Münster and draws a very accurate portrait of the humanist, close reading and analysis of Münster's works, did not serve his biographical ends. When it comes to a closer examination of Münster's intellectual influences, Burmeister's work leaves a clear lacuna.

Matthew McLean's recent monograph, *The Cosmographia of Sebastian Münster: Describing the World in the Reformation* (2007), and Jean-Marc Besse's study on the expansion of the concept of the inhabited world in the Renaissance, *Les grandeurs de la Terre: Aspects du savoir géographique à la Renaissance* (2003), have by and large, completed

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<sup>128</sup>Karl-Heinz Burmeister, *Sebastian Münster. Versuch eines biographischen Gesamtbildes*, (Basel: Helbing & Lichtenhahn, 1969); Matthew McLean, *The Cosmographia of Sebastian Münster: Describing the World in the Reformation*, (Aldershot: Ashgate, 2007); Jean-Marc Besse, *Les grandeurs de la Terre. Aspects du savoir géographique à la Renaissance*, (Lyon: ENS Éditions, 2003); Manfred Büttner, *Wandlungen im geographischen Denken von Aristoteles bis Kant. Dargestellt an ausgewählten Beispielen*, (Paderborn: Ferdinand Schöningh, 1979 [A]); Manfred Büttner, "The Significance of the Reformation for the Reorientation of Geography in Lutheran Germany", pp. 151 – 169 in *History of Science*, vol. 17, 1979 [B].

<sup>129</sup> Burmeister 1969, 108.



Burmeister's picture. Perhaps characteristically for the revived interest in religion during the last decades, both of these contemporary scholars are more explicit than Burmeister when it comes to situating Münster's work within the context of the Reformation. Unlike Burmeister, McLean and Besse have acknowledged the importance of theological ideas to Münster's geographical approach. In this respect they have paid particular interest to the providential overtone of Münster's geographical narrative.<sup>130</sup>

The concept of providence (in Greek *pronoia*) has its origins in the ancient philosophy of Stoics and was used in Christian texts since St Augustine as a synonym of God's foreseeing and care of his creation.<sup>131</sup> During the sixteenth century stoicism and the concept of providence became the basis for lively discussion. Correspondence between Philip Melanchthon and Jean Calvin demonstrates that during this period, Protestant theologians were using the word stoic largely as a synonym for a providential world, in opposition to that of Aristotle. Melanchthon is known for having called Calvin "Zeno", after the founder stoic philosophy – but providence was actually no stranger to his theology either.<sup>132</sup> The fundamental difference between the Aristotelian and the Stoic views seems to culminate in their different concepts of causality: Christian stoicism held God's will as the necessary and sufficient cause of all actions, Christian Aristotelianism instead, stretched the causal importance of the secondary causes inherent in substance of each being. Whereas a stoic would thus say that a tree grows because, and only because of God's will, an Aristotelian would insist that it grows because of God's will *and* because of trees' own substantial task to grow. Stoicism provided a stronger legitimation for Christian investigation of nature: if everything in the world happened only because of God's will, to study nature was to study God's will. Returning to Sebastian Münster's geography, however, Jean-Marc Besse sees a providential outlook as one of Münster's key motivators and points to Münster's indebtedness

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<sup>130</sup>Manfred Büttner, "The Significance of the Reformation for the Reorientation of Geography in Lutheran Germany", pp. 151 – 169 in *History of Science*, vol. 17, 1979; McLean 2007.

<sup>131</sup> Barbara Pitkin, "The Protestant Zeno: Calvin and the Development of Melanchthon's Anthropology", pp.345-378 in *Journal of Religion* 84/3 (July 2004); T.J. Gorringer, *God's Theatre: A Theology of Providence* (London: SCM Press 1991), 4-11.; Reijo Työrinoja, "God, Causality, and Nature: Some Problems of Causality in Medieval Theology", pp.45-60 in Eeva Martikainen (ed.), *Infinity, Causality, Determinism: Cosmological Enterprises and Their Preconditions* (Frankfurt: Peter Lang 2002), 55-60.

<sup>132</sup> Barbara Pitkin, "The Protestant Zeno: Calvin and the Development of Melanchthon's Anthropology", pp.345-378 in *Journal of Religion* 84/3 (July 2004); T.J. Gorringer, *God's Theatre: A Theology of Providence* (London: SCM Press 1991), 4-11.; Reijo Työrinoja, "God, Causality, and Nature: Some Problems of Causality in Medieval Theology", pp.45-60 in Eeva Martikainen (ed.), *Infinity, Causality, Determinism: Cosmological Enterprises and Their Preconditions* (Frankfurt: Peter Lang 2002), 55-60.

to stoicism. Besse points out that Münster's hero in geography was the ancient stoic geographer Strabo. Like Strabo Münster saw that the main task of a geographer was to describe the riches of the divine creation.<sup>133</sup>

Matthew McLean's detailed account of the 1550-edition of Münster's *Cosmographia* clarifies also the deep spiritual aspirations running behind Münster's narrative:

Münster's 'book of the world' began with a paraphrase of the Genesis creation account, and concluded with a passage of Hebrew cosmography. His description was thus bracketed by Sacred Scripture and Sacred Language, and in between he finds ways to bring Jewish scholarship and pagan deities into his single providential narrative. He sought to accommodate the empirical picture of the world established by geography in the mathematical tradition, to the moralized spiritually meaningful understanding of the world current among scholars of preceding generations. He sought to teach his reader how to derive a Christian truth which was in accord with Scripture, and yet which was not restricted by dogma to a single confession or by historical partisanship to a single nation.<sup>134</sup>

New research has demonstrated the importance of theology on Münster and on his work. This has lowered the artificial barriers between Münster's geography and the medieval "spiritually driven" world view. Mclean is right in asserting that Münster continued previous generations' "spiritually meaningful understanding of the world". It is good to remember though, how Münster's spirituality *differed* from the earlier medieval approach. Münster bracketed his narrative with Biblical material, but in between there was an attempt to describe the visible natural world not the invisible spiritual world. Previous generations were often less sensitive to such divisions. As later research has become increasingly aware of the importance of the Reformation theology on natural philosophy and emerging natural science, it seems natural to assume that the possible causes for the differences between Münster's approach and that of the previous generations could be found within this landscape. Nevertheless, Münster's contacts with leading minds of the Reformation still remain unmapped. The reason for this is understandable: reformers like Oecolampadius, Zwingli, Karlstadt, and Calvin, all who lived and worked close to Münster, had seemingly little to say about geography. Among the Reformers of Münster's period it is primarily Philip Melanchthon, Luther's co-reformer, who would have something to say about this. However, usually Melanchthon, as a Lutheran, has

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<sup>133</sup>Jean-Marc Besse 2003, 182-190.

<sup>134</sup>McLean 2007, 339.

been considered theologically too different to be associated with Münster. These conventional views need another look.

The most interesting, (although not the most accurate), ideas on how the Reformation influenced Münster's geography were proposed in the 1970s by a German historian of geography, Manfred Büttner. Büttner argued that "The interest during the Reformation in the active presence of God who revealed himself with grace to mankind and who could be approached directly without ecclesiastical mediation resulted in an expansion of geography."<sup>135</sup> According to Büttner, "Catholic" geography, exemplified by Vincentius' *Speculum naturae* (a popular geographical textbook from the thirteenth to the sixteenth century), sought to make classical geographical material compatible with Biblical pronouncements and that Protestant geography, instead changed the direction of geographical research from Biblicism to a more empirical mode of research driven by a desire to know how the world functions. In this major shift in focus, Büttner saw Philip Melanchthon as the key player. Büttner proposed, that particularly Melanchthon's educational project which sought to set evangelical standards for learning, had important consequences for geography. Instead of a focus on creation, the redirected Lutheran geography was "intended to point out Providence".<sup>136</sup> It is particularly this shift from creation to providence that, in Büttner's interpretation, made the Protestant geography turn from Scripture to nature, making geography more secular and more empirical.

In this framework Büttner saw Sebastian Münster as a "reformed geographer". Much like "the Lutheran geographer", "a Reformed geographer", Büttner argued, was interested in providence, but Reformed geographers, and particularly those confessing the Calvinist creed, laid theological emphasis on "the continuous process taking place between Divine Decree, Creation, and the fall of man". This, according to Büttner, explains why Münster was as concerned with Creation as he was with the current functioning of the world.<sup>137</sup> Büttner was also greatly interested in understanding the sources of the "theological" influences in Münster's work raising a question about Melanchthon's role.<sup>138</sup> Büttner realized that Melanchthon and Münster had the same teacher of geography, Johannes Stöffler, and speculated about a possibility that Münster and Melanchthon had received some ideas of their pioneering geography from Stöffler. Here however, Büttner returns back to theological differences between "Catholic" Stöffler, "Lutheran" Melanchthon and "Reformed" Münster,

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<sup>135</sup>Büttner 1979 B, 163.

<sup>136</sup>Ibid, 157.

<sup>137</sup>Ibid, 152.

<sup>138</sup>Büttner 1979 A, 126.

and the question about similarities in Münster's and Melanchthon's thought remains unanswered.

As has discussed above, Catholic/Protestant dichotomy is largely artificial in the early stages of the Reformation, when the split Latin Christendom as a whole seeks its new religious identity. Büttner's comparison between Vincentius, and Münster and Melanchthon is also unfair – Vincentius wrote his works three hundred years before Münster. A comparison with a Catholic mathematician of Münster's period like Peter Apian would turn the whole picture upside down making the Protestants look way more “religious”. Taking seriously the fact that religious thought and theology were an essential part of the geography in the late Middle Ages as in Münster's period, it is interesting to see how these aspects changed with the Reformation. Moreover, as the case of Münster shall demonstrate, confessional juxtaposition between “Lutheran” and “Reformed” geographies is also somewhat misleading. Philip Melanchthon and Sebastian Münster do not represent two competing schools of geography. It is also good to remember that unlike Münster, Melanchthon never presented himself as a geographer and that his geographical ideas were expressed as part of his teaching of natural philosophy.

It is important to notice that in the 1530s and 1540s, during the period when Münster developed his geographical ideas, the religious identity of Basel was all but fixed. The city and the university were reformed in 1528, but already in 1531, the lost battle of Kappel changed the scene.<sup>139</sup> Zwingli and Oecolampadius were dead and the political position of Zurich had significantly weakened. Against the threat of the Emperor and neighboring Catholic cantons, Basel sought to find new political allies, particularly in the south German Lutheran princes. Religion and politics became intertwined. The first and second Basel confessions demonstrate an attempt to find balance between Lutheran and Zwinglian creeds.<sup>140</sup> The question of the Eucharist was a permanent bone of contention, but apart from that, Basel and Wittenberg were seemingly seeking contact with one another. Melanchthon, the diplomatic mind of Wittenberg, sought to maintain the unity of the evangelical movement, unlike Luther whose temper and convictions had failed earlier attempts of evangelical unity. In Basel, Lutheran ideas were supported by Oswald Myconius, and his student Simon Sulzer, as well as Sebastian Münster's colleague, Simon Grynaeus.<sup>141</sup> The correspondence between Grynaeus and Melanchthon demonstrate that beyond theological

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<sup>139</sup>Gordon 2002, 142-144

<sup>140</sup>Ibid, 145 - 190.

<sup>141</sup>Ibid, 147.

interests, these two Greek scholars were particularly interested in natural philosophy, cosmography and astrology. The letters and Philip Melanchthon's dedications of scientific textbooks tell a different kind of story of the intellectual collaboration between Wittenberg and Basel and this exchange shall be examined more closely later in this study. Here however, it suffices to point out that confessional tags give a simplified, and to some extent, even distorted picture of the realities in Basel during the 1530s and 1540s. This is vital point as we try to understand Münster's theological influences: his closest friend and primary advisor Grynaeus was in close intellectual exchange with the major Lutheran intellectual Philip Melanchthon. How "Reformed" then was his geography? But if we drop these straightforward categorizations for a while, Büttner's speculations about Philip Melanchthon's influences on Münster's geography seem even more interesting. However, in order to understand these influences better, we must forget *hypothetical* influences of Lutheran or Reformed dogma on geographical issues and take a closer look at human agency, and the ways in which Münster and his mates discussed theological issues in their letters and books.

### *Philip Melanchthon and His Natural Philosophy*

In traditional church history Melanchthon is mostly known as Luther's right hand-man, as the author of the *Loci Communes* and the first systematist of the Lutheran dogma. Melanchthon's huge influence on the development of the Lutheran educational system has been acknowledged and his honorary epithet, *praeceptor germaniae*, teacher of Germany, is commonplace in Lutheran historiography. Melanchthon came to Wittenberg to teach Greek in the University in 1518, but soon the tumult of Wittenberg made him into a theologian, the first Protestant dogmatizer and an educational organizer, a task which gained him the name *Praeceptor Germaniae*. As an educator and dogmatizer Melanchthon's influence pervaded Lutheran territories and he was also influential in the development of Reformed dogma.<sup>142</sup>

In historiography Melanchthon has long stood in the shadow of Luther.<sup>143</sup> Melanchthon's case is reminiscent of the faiths of other second generation reformers like

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<sup>142</sup>Philip Benedict, *Christ's Churches Purely Reformed: A social history of Calvinism*. (New Haven: Yale University Press, 2002) and Richard A. Muller, *Post-Reformation Reformed Dogmatics*, vol. 1, (Grand Rapids: Baker Academic, 2003)

<sup>143</sup>Like many Melanchthon scholars Hans Maier has regretted how Melanchthon research is overshadowed by Luther: "Nicht nur der lebende Melanchthon blieb lange Zeit im Schatten Luthers; auch die spätere Melanchthonforschung kam nur mit Mühe gegen die übermächtige Lutherforschung

Theodor Beza in Geneva or Heinrich Bullinger in Zurich, both whose work have long been evaluated only in terms of faithfulness and inheritance to their predecessors, Luther, Calvin and Zwingli.<sup>144</sup> Moreover, in some Lutheran countries, like Finland, Melanchthon research was for a long time hampered by the existential theology that saw Melanchthon as an outcast, who with his “order and reason” diluted Luther’s original, “mystical”, and paradoxical teachings.<sup>145</sup> However, there are two research institutes, the Melanchthon Haus in Wittenberg and the Melanchthon museum in Bretten, which patronize historical Melanchthon research with annual seminars and series of publications, which constitute an important contribution to the historical Melanchthon research.<sup>146</sup> The most important published source for Melanchthon research is the *Corpus Reformatorum* that has been published since mid-nineteenth century. Since the 1970s the *Corpus* has been supplemented with another series of Melanchthon’s texts, the *Supplementa Melanchthonia*, and with Melanchthon’s correspondence which has been edited since 1977.<sup>147</sup>

Since the 1990s, Melanchthon research has gone through an important revival which has enriched our understanding of his life and work with new perspectives.<sup>148</sup> The most important fruit of this new research has been the rediscovery of Melanchthon’s interest in natural philosophy, and his legacy to intellectuals outside the traditional Lutheran circles. The

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auf. So gibt es bis zur Stunde noch keine vollständige, chronologisch zuverlässige Melanchthon Bibliographie.“ Hans Maier, „Philip Melanchthon – Praeceptor Germaniae“ pp. 11-22 in *Philip Melanchthon als Politiker zwischen Reich, Reichsständen und Konfessionsparteien*. Gunther Wartenberg and Matthias Zentner (eds.), (Wittenberg: Editions Hans Luft, 1998).

<sup>144</sup>Karin Maag, *Melanchthon in Europe: His Work and Influence Beyond Wittenberg*, (Grand Rapids: Baker Books, 1999), 15.

<sup>145</sup>Risto Saarinen, “Philip Melanchthon – Johdatus tutkimukseen [Melanchthon – introduction to research]” pp.120-135 in *Reformaatio: Henkilökuvia ja tutkimussuuntia* [Reformation: Profiles and Research trends], Joonas Salminen (ed.), (Helsinki: Suomalainen teologinen kirjallisuusseura, 2008), 124. Saarinen points here in particular at Emmanuel Hirsch, Hans Joachim Iwand, Gustaf Aulén and Lauri Haikola. It is a fascinating bibliographical detail that, the revival of the theological research on Melanchthon was initiated in the 1970s mostly by Roman Catholic researchers, especially Joseph Ratzinger’s (later Benedict XVI) students, Siegfried Wiederhöfer and Vincent Pfnür who saw ecumenical possibilities in Melanchthon’s thought.

<sup>146</sup>Melanchthon-Schriften in Bretten –series.

<sup>147</sup>*Philipi Melanthonis opera quae supersunt omnia*, CC Bretschneider and H.E. Bindseil (eds.), *Corpus Reformatorum*, vols. 1-28 (Halle, 1834-52; Brunswick, 1856-60). *Melanchthons Briefwechsel: Kritische und kommentierte Gesamtausgabe*, Heinz Scheible (ed.), (Frommann-Holzboog: Stuttgart-Bad Canstatt 1977-). It is important to notice that *Corpus Reformatorum* pays no attention to different versions of Melanchthon’s texts.

<sup>148</sup>For more recent studies on Melanchthon see for instance, Heinz Scheible *Melanchthon. Eine Biographie*, (München: C.H. Beck, 1997); Martin H. Jung, *Philip Melanchthon und seine Zeit* (Goettingen: Vandenhoeck & Ruprecht, 2010); Karin Maag (ed.) *Melanchthon in Europe: His Work and Influence Beyond Wittenberg*, (Grand Rapids: Baker Books 1999).

focus of this study concentrates primarily on the former, although it shall contribute also to the latter. The better understanding of Melanchthon's natural philosophy has benefitted particularly from studies of Günter Frank, Sachiko Kusukawa, Dino Bellucci and Charlotte Methuen.<sup>149</sup> Günter Frank's dissertation *Die theologische Philosophie Philip Melanchthons (1497-1560)*<sup>150</sup> paved way for a new vision of Melanchthon's intellectual legacy. Importantly, Frank corrected a number of misconceptions over Melanchthon's thought. For Frank, Melanchthon's struggle to systematize and integrate different "sciences" and disciplines was not a symptom of a natural theology, but of theological philosophy. The purpose of this theological philosophy was not to provide better (logical) understanding of God, as was the case with scholastics, but to lead disciples to understand God's miraculous creation and providence in nature. In Melanchthon's case, it is vital to make a distinction between theology and philosophy: in Melanchthon's thought, theology was based on Scripture – whereas arguments in philosophy could also be based on human intellect and observations of the natural world.<sup>151</sup> More recently Frank has edited also an extensive account of Melanchthon's relationship with the sciences of his age in *Melanchthon und die Naturwissenschaften seiner Zeit*.<sup>152</sup> These studies reveal Melanchthon's huge impact on sciences ranging from geography to mathematics, and affirming his place as one of the early defenders of a rational and orderly concept of the cosmos in the early modern period. All in all, Frank's studies offer a clear and systematic picture of the philosophical structure of Melanchthon's natural philosophy and theology.

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<sup>149</sup> Hans-Georg Geyer's dissertation *Welt und Mensch: Zur frage des Aristotelismus bei Melanchthon* (Bonn 1959), is a study on Aristotle's influence on Melanchthon's anthropology and "physica". Older research seems to have discussed Melanchthon's interest in nature as a part of his theology, not as a part of his humanism. See for instance Walter Elliger (ed.) *Philip Melanchthon: Forschungsbeiträge zur vierhundertsten Wiederkehr seiner Todestages dargeboten in Wittenberg 1960*, (Göttingen: Vandenhoeck & Ruprecht, 1961). Before the 1990s only two studies paid attention on Melanchthon's "scientific" interests. These are Stefano Caroti's, "Melanchthon's Astrology", in *Astrologi hallucinati. Stars and the End of the World in Luther's time* (Berlin/New York, 1986) and Richard S. Westman's very important study on Lutheran Copernicanism, "The Melanchthon Circle, Rheticus and the Wittenberg Interpretation on the Copernican Theory", pp.164-193 in *Isis* 66 (1975).

<sup>150</sup>Günter Frank, *Die theologische Philosophie Philip Melanchthons (1497-1560)*, (Leipzig: Benno, 1995).

<sup>151</sup>On should consult also Nicole Kuroпка's *Philip Melanchthon: Wissenschaft und Gesellschaft. Ein Gelehrter im Dienst der Kirche (1526-1532)*, (Mohr / Siebeck, Tübingen 2002). Kuroпка's work is a careful contextualisation of the political extension of Melanchthon's educational interests – Kuroпка's interest, however, is more on Melanchthon's teachings on the classical disciplines such as rhetoric or biblical hermeneutics, than on nature or on "physica".

<sup>152</sup>Günter Frank and Stefan Rhein (eds.), *Melanchthon und die Naturwissenschaften seiner Zeit. Melanchthon-Schriften der Stadt Bretten 4*. (Sigmaringen: Jan Thorbecke Verlag, 1998).

Perhaps the most philosophical study on Melanchthon's natural philosophy is Dino Bellucci's work, *Science de la Nature et Réformation. La physique dans l'enseignement de Philippe Mélanchton* (1998). Bellucci which offers a minute analysis of Melanchthon's principal works on natural philosophy, *the Initia doctrinae physicae* (1549), *the Liber de anima* (1540), and the *Commentarius de anima* (1550).<sup>153</sup> Bellucci draws also interesting connections between Melanchthon's thought and that of Neo-Platonism and Scholastic theology. What a historian, (unlike a philosopher), might miss, however, would be clearer understanding of different, even conflicting phases in the development of Melanchthon's thought.

Sachiko Kusukawa's thesis, *The Transformation of Natural Philosophy: the Case of Philip Melanchthon* (1995) has put forth somewhat similar views on Melanchthon's intellectual heritage, but Kusukawa has greater awareness of the time-bound character of Melanchthon's thought.<sup>154</sup> Melanchthon's natural philosophy was not a monolith but a process that developed in a series of responses to real historical situations. Kusukawa argues that Melanchthon developed his natural philosophy as a response to social unrest, with a particular interest to use it as way to legitimize civil obedience. According to Kusukawa, Melanchthon's natural philosophy has a distinctively Lutheran character and it differs greatly from its scholastic predecessors. One distinctively Lutheran feature here, according to Kusukawa, is Melanchthon's view of natural philosophy as God's Law, in contrast to the Gospel. The Gospel and Law distinction developed in Lutheran theology during the late 1520s – and was actually Melanchthon's creation. Law, unlike Gospel could not teach salvation in Christ. The Law, however, could provide basis for civil life. In the late 1520s Melanchthon, according to Kusukawa, begins to connect the idea of God's law with the stoic concept of providence. As the omnipotent creator, God must be seen as the cause of all natural actions, which makes nature a scene that unfolds God's providence, and ultimately his Law. In the 1530s Melanchthon started to promote anatomical, astronomical and herbal studies, both in his philosophical text books, and in curricular reforms that took place in the Lutheran Universities. The ultimate goal of these studies, according to Kusukawa, was always the same: to demonstrate God's providential caring of the physical world, and his greatness in creation. Abandoning the problematic science/religion juxtaposition, Kusukawa's study highlights the uniqueness of Melanchthon's natural philosophy and the importance of the

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<sup>153</sup>Dino Bellucci, *Science de la Nature et Réformation. La physique dans l'enseignement de Philippe Mélanchton* (Roma : Edizioni Vivere, 1998).

<sup>154</sup>Sachiko Kusukawa, *The Transformation of Natural Philosophy: the Case of Philip Melanchthon* (Cambridge: Cambridge University Press, 1995).



theological thought within. Kusakawa's later research has further demonstrated how Melanchthon's thought inspired students of nature like Leonhart Fuchs who used Melanchthon's dialectics to support use of images as evidence in botany.<sup>155</sup>

Now, whereas the studies of Frank, Bellucci and Kusakawa have primarily focused on Melanchthon and his circle in Wittenberg, Charlotte Methuen's work has unveiled Melanchthon's influence on a larger scale. In this respect, Methuen's work on Johannes Kepler and his work in the Lutheran University of Tübingen, *Kepler's Tübingen : stimulus to a theological mathematics* (1998) is of particular interest. In this study Methuen demonstrates how theological concepts drafted by Melanchthon persisted at Tübingen for decades and created a positive environment for studying orderly movement of the cosmos and the heavenly bodies. Importantly, however, Methuen has also made a critical remark concerning Kusakawa's too confessional an interpretation of Melanchthon's natural philosophy. Methuen criticizes Kusakawa's emphasis on the Lutheran character of Melanchthon's natural philosophy and argues that, for instance, the concept of providence, which Kusakawa holds as a particularly Lutheran feature, is actually a rather common thing in the Neo-Scholastic natural philosophy. Although Methuen's remarks don't diminish Melanchthon's huge impact on the evangelical research of nature, they do encourage us to seek response to Melanchthon's ideas beyond the traditional Lutheran sphere. Having said this, Basel of the 1530s and 40s provides a highly fascinating case – particularly as it may prove that the natural philosophers of Basel, Simon Grynaeus in the forefront, and seemingly also Münster, developed a new approach to nature in close discourse with Melanchthon. Sebastian Münster was fortunate having stayed close to these two outstanding intellectuals.

### *Reformation and Geographical Illustration*

Spiritual concerns continued to dominate a good share of map production and illustration also in the sixteenth century. David Woodward has observed that “in the sixteenth century, the most popular country portrayed on maps was arguably the Holy Land.” “Certainly more maps”, he points out “were made of it during the century than of France, Spain, or Portugal.

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<sup>155</sup>Sachiko Kusakawa, “Leonhart Fuchs on the Importance of Pictures”, pp. 403- 427 in *Journal of History of Ideas*, Vol 58, No 3 (Jul., 1997). And Sachiko Kusakawa, *Picturing the Book of Nature. Image, Text and Argument in Sixteenth-Century Human Anatomy and Botany* (Chicago: University Press, 2012).

Almost as many maps of the Holy Land were made as world maps or maps of the African continent.”<sup>156</sup> Woodward’s observations of the map printing run along the general pattern of the sixteenth century book printing. Religious books and Bibles were unquestionably the bestselling articles in the market.<sup>157</sup> One is inclined to hypothesize that as the Reformation rocked the market in religious books, it perhaps also swayed the markets of religious maps and geographical literature.<sup>158</sup> Should Münster’s *Cosmographia* thus be set in the context of the Reformation, and what would it mean for the book’s illustrations?

An overall picture of the Reformation’s impact on the production of early modern maps and views is still lacking. Some observations, however, have been made. First of all there are clues which indicate that maps and descriptive views were a particular pictorial genre which could be accepted even by the most iconophobic puritans. Discussing the extent of the iconophobia in Jacobean England, Patrick Collinson, has referred to a household inventory of the Earl of Huntingdon, who had no pictures on his wall whatsoever; except maps, floral hangings and Bible quotations.<sup>159</sup> Although the Second English Reformation is a bit far from Münster’s period, Collinson’s observations give us some perspective: in the midst of the iconoclastic tumult maps could be tolerated.

A different kind of emphasis on the relationship between the Reformation and maps has been made in Catherine Delano-Smith and Elizabeth Ingram’s study *Maps in Bibles 1500–1600*. Examining more than 1000 early modern Bibles preserved in the most important European collections, Delano-Smith and Ingram noticed that maps were overwhelmingly present in Protestant vernacular Bibles.<sup>160</sup> In the case of some half-dozen Latin Bibles and some polyglot Bibles printed in Paris, maps in Bibles were published by printers known for reformist sympathies or being willing to print reformist literature.<sup>161</sup> Accordingly, Delano-Smith and Ingram wished to characterize the history of maps in Bibles as a part of the history of the Reformation.<sup>162</sup>

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<sup>156</sup>Woodward 2007, 10.

<sup>157</sup>Pettegree 2010.

<sup>158</sup>Ibid.

<sup>159</sup>Patrick Collinson, ”From iconoclasm to iconophobia: the cultural impact of the second English Reformation”, pp. 344-376 in Andrew Pettegree (ed.), *Critical Concepts in Historical Studies*, (London: Routledge, 2004), 348.

<sup>160</sup> Catherine Delano-Smith and Elizabeth Ingram, *Maps in Bibles 1500 – 1600: An illustrated Catalogue*. (Geneva: Droz, 1991)

<sup>161</sup>Delano-Smith and Ingram 1991, XVI.

<sup>162</sup>Ibid.

It is regrettable that Delano-Smith and Ingram's study hasn't been extended to the seventeenth century. Taking into account the considerable interest in maps in the post-Tridentine Catholic Church, manifested very visibly in the extensive map murals of the Sala Cartographica at the Vatican (1571- 1579), it seems probable that a Catholic interest in maps may have awakened later also in Bible printing.<sup>163</sup> In this respect Cardinal Gabriele Paleotti's treatise, *Discorso intorno alle imagini sacre e profane* (1582) with its positive views on maps as sacred art is highly interesting.<sup>164</sup> The lively interest in mapping and cartography among the Jesuits is today also relatively well known. Matteo Ricci's, Giulio Aleni's and Ferdinand Verbiest's remarkable cartographical ventures in China are testimonies of significant Catholic interest in maps in the Counter Reformation.<sup>165</sup> An entire chapter on sacred geography in Jesuit father Antonio Possevino's book *Bibliotheca selecta* (1593), assigning the educational outlines for the Collegio Romano, is another, unfortunately still largely unstudied, clue about the ascending Catholic interest in the Cartography at turn of the century.<sup>166</sup> Nevertheless, these overall observations seem to match with Delano-Smith and Ingram's views that Catholic interest in biblical maps wasn't developed until the last quarter of the century.<sup>167</sup>

The observations of Collinson, Delano-Smith and Ingram have indicated that Protestants, very generally speaking, were sympathetic towards maps. But could one turn the question around and ask, what expectations the Protestants had for cartography and geographical illustrations? Such considerations have recently been explored by Axelle Chassagnette.<sup>168</sup> Analysing maps in Calvinist Bibles, Chassagnette argues, that there is a connection between the austere aesthetics of biblical maps and Calvin's prohibition of devotional images. According to Chassagnette, geographical illustrations in the Calvinist

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<sup>163</sup>Fiorani 2005.

<sup>164</sup>Gabriele Paleotti, *Discorso intorno alle imagini sacre et profane*, (Sala Bolognese: Forni 1990 [1582]). See also Fiorani 2005.

<sup>165</sup>Rita Haub & Paul Oberholzer, *Matteo Ricci und der Kaiser von China: Jesuitenmission im Reich der Mitte*, (Würzburg: Echter, 2011); Fiorani 2005. Florence C. Hsia, *Sojourners in a Strange Land: Jesuits & Their Scientific Missions in Late Imperial China*, (Chicago: University of Chicago Press, 2009); Luis Sarvaiva (ed.) *History of mathematical sciences: Portugal and East Asia II: Scientific practices and the Portuguese Expansion in Asia (1498-1759)*, (London: World Scientific Publishing, 2004). Interestingly Fiorani closes her analyses of the Guardaroba Nuova as "a three-dimensional display of Gastaldi's edition of Ptolemy's Geography and Münster's *Cosmographia*."

<sup>166</sup>Antonio Possevino, *Bibliotheca selecta, Qua agitur de Ratione...* (Rome: Typ. Apostolica Vaticana, 1593).

<sup>167</sup>Delano-Smith and Ingram 1991, XVI

<sup>168</sup>Axelle Chassagnette, "Geographia sacra. Usages confessionnels de la cartographie biblique au XVIIe siècle", pp.102-122 in Kaspar von Greyerz, Thomas Kaufmann, Kim Siebenhüner und Roberto Zaugg (eds.), *Religion und Naturwissenschaften im 16. und 17. Jahrhundert*, (Heidelberg: Verein für Reformationsgeschichte, 2010)

Bibles were pronouncedly pedagogic and concrete, underlining their limited role as devices designed to transmit “positivist” knowledge. Chassagnette explains these features as by-products of Calvin’s ban of images targeted against representations in the traditional iconography. Chassagnette argues that in the context of Calvinism, cartographic images were not understood as artistic or religious representations in the traditional sense. For instance, images of Eden in Calvinist Bibles did not seek to offer any feeling of participation in spiritual reality, but simply basic information aimed at supporting a literal reading of the Bible. Chassagnette draws parallels between the Calvinist maps’ dry style and theological ideals:

Cette restriction de l’image cartographique à sa fonction pédagogique et informative dans les milieux calvinistes semble être confirmée par la simplicité de forme du document : le dessin est sobre voire fruste, aucune ornementation n’y est ajoutée. Ce choix délibéré peut être mis en relation avec l’idée, qui prévaut alors dans le calvinisme, que l’Écriture est en elle-même claire, et ne nécessite aucune élaboration ni commentaire supplémentaire. De la même manière, les cartes qui l’accompagnent doivent revêtir une certaine simplicité.<sup>169</sup>

Interestingly Chassagnette distinguishes between Lutheran and Calvinist approaches to sacred maps and geography. Whereas the role of maps in the Calvinist milieu was mainly restricted to serve as pedagogical auxiliaries for literal reading of the bible; in the Lutheran world maps and sacred geography served also as spiritual mediators (although not as direct objects of devotion). In the Lutheran milieu, Chassagnette argues, maps had particular value as mathematical objects exposing God’s providence and divine order in the world. Here the role of maps was to conduct the spectator through the sacred history, time and space where the historical events took place. Chassagnette reminds us that maps and sacred geography were frequent themes in the University of Wittenberg throughout the sixteenth century and even more so among the scholars grouped around Philip Melanchthon, who endorsed mathematical measuring of time and space as a way to study God’s Creation. The purpose of these studies was not to substitute Scripture, Chassagnette points out, but to provide better comprehension of God as the Creator guiding and nurturing his Creation. Geography in the framework of mathematics, Chassagnette observes, was frequently promoted by Philip Melanchthon and his collaborators like Caspar Peucer (1525 – 1602) and Joachim Rheticus (1514 – 1574).

On the one hand, Protestant interest in biblical maps suggests that some aspects of Reformation theology supported the making and use of geographical illustrations. On the

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<sup>169</sup>Chassagnette 2010, 109.

other, Chassagnette's observations on the maps in the Calvinist Bibles propose that these illustrations were there to match certain aesthetic ideals. They had to be simple, informative, minimalistic and without ornamentation. Similar aesthetic ideals apply also to the illustrations of *the Cosmographia*. Thinking about *Cosmographia's* illustrations however, it seems improbable that Calvin's theology could have had any impact on them, despite the fact the Münster and Calvin knew each other. By 1535 Calvin lived in Basel under the pseudonym 'Martianus Lucianus'. In Basel the reformer of Geneva studied Hebrew under the tutelage of Sebastian Münster. In this period Simon Grynaeus, Münster's close friend and scientific collaborator, became Calvin's trusted mentor.<sup>170</sup> Therefore, the question is actually, whether Calvin absorbed something from the geographical and natural philosophical discussions of Münster and Grynaeus! Calvin was 20 years younger than Münster and his student; therefore it seems more likely that the influences ran from Basel to Geneva, not the other way around. Moreover the full impact of Calvinism on biblical map-making must be dated to a somewhat later period than the making of Münster's *Cosmographia*.

### *Art Re-formed*

It seems that the Reformation may have influenced geographical illustrations in three ways, first by denying the traditional symbolical iconography, secondly by supporting concrete and minimalistic expression (Calvinist biblical mapping), thirdly by endorsing mathematical investigation of the natural world (Melancthonian approach). But how do these aspects relate with the broader questions concerning the ways in which the Reformation influenced visual arts?

Art history and Reformation history used to be for a long while like poles of magnets repelling each other. Traditional art history took the Reformation largely as a synonym of the iconoclasm, and considered its effect on art negative, if not "a tragedy for art". The didactically oriented and emotionally distant Protestant art fit poorly to the nineteenth century ideology of art for art's sake. The paucity of research on Reformation images was also due to the conception of the Reformation as a transition from visible, collective and external forms of faith to invisible individual and interior. Visual imagery was a neglected theme in the traditional reformation history, which considered the reformation as

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<sup>170</sup>Gordon 2002, 178.

rejection of popular religion and it is crassly material and superficial images of the holy. Iconoclasm was seen as a correlative act purifying worship, which left the reformed image as some sort of paradox.

Since the 1990s interest in visual arts during the Reformation has revived significantly, and fresh contributions have effectively debunked a number of misgivings in the traditional historiography. A book, recently edited by two art historians, Tara Hamling and Richard L. Williams, *Art-Reformed: Re-assessing the Impact of the Reformation on the Visual Arts* (2007), characterizes the change. The contribution of the Reformation to arts is no more seen as a sudden break in the visual tradition which, by a prohibition of religious images, channeled artistic activity into the sole permissible medium, portraiture. Instead Hamling, Williams and other writers present the reformation as an innovative and adaptive cultural transformation, propelled by a reformed society that was not “inherently hostile to the visual and material legacy of the medieval past” but rather “people living with the past, reshaping it and re-encasing it”.<sup>171</sup> According to Hamling and Williams there was also a desire to protect and preserve familiar forms and to re-shape and re-fashion them:

In this way, a specifically Protestant visual culture emerged which entered into dialogue with existing iconographies and material forms – assimilating, adapting, developing, re-inventing – to serve the needs of reformed belief and ideology.<sup>172</sup>

Papers presented in Hamling’s and William’s book demonstrate how extensively the ways in which the visual arts could be re-formed varied. But they make an important remark that the process of reforming an image did not necessarily require physical refashioning but could also take place in the “internal realm of reception.”<sup>173</sup>

The story of Münster’s *Cosmographia* is also one of reception and appropriation.<sup>174</sup> Münster’s work relied in many places on artistic work that followed esthetical ideals that were different to his. Münster had an extensive network of correspondents and he received a body of images and texts that varied greatly.<sup>175</sup> Using this material in his book Münster re-edited it

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<sup>171</sup>Tara Hamling and Richard L. Williams, *Art Re-formed: Re-assessing the Impact of the Reformation on the Visual Arts* (Cambridge: Cambridge Scholars Publishing, 2007), 11. The authors have quoted an afterword by Maurice Howard in the same book.

<sup>172</sup>Hamling and Williams 2007, 11.

<sup>173</sup>Hamling and Williams 2007, 7.

<sup>174</sup>For interesting ideas on reading and appropriation see Roger Chartier, *L’ordre des livres: Lecteurs, auteurs, bibliothèques en Europe entre VIVE et XVIIIe siècle* (Aix-en-Provence: Alinea, 1992) and Roger Chartier, “The World as Representation”, pp. 544-558 in Jacques Revel and Lynn Hunt (eds.) *Histories: French Constructions of the Past* (New York: New Press, 1995).

<sup>175</sup>For Münster’s extensive network of correspondents see McLean 2007, 38-42.

in order to clarify and strengthen his own arguments. Münster's own voice can be heard particularly in the way how he selected and presented this material, which inscriptions he used, how he framed the images and how he instructed the reader to enter his world.

But applying views of Hamling and Williams to Münster's work in this way may provoke the question: is it possible to extend observations of religious art to "secular" work and "secular" images? In comparison to earlier geographically oriented literature, say, books like Hartmann Schedel's famous and lavishly illustrated *Nuremberg Chronicle* (1493), – which because of its global focus and somewhat similar combination of geography and history, can be taken as a predecessor of Münster's work – the images of the *Cosmographia* do not actually look that *religious*.<sup>176</sup> Whereas Schedel, half a century before Münster, begins his world description with an extensive cycle of images illustrating how God created the world in seven days, Münster contents himself in picturing the Creation with a single image – moving immediately to the times after the great deluge, which he considers as the proper object of his discipline.<sup>177</sup> Descriptive views of European cities which made Schedel's work so well known are also in the heart of Münster's work, but rich directly religious symbolism of the *Chronicle*, pictures of heavenly and hellish creatures or miracles, are missing from Münster's work. Images, maps, views and descriptions, in Münster's geographical works, particularly in the *Cosmographia* have little to do with the supernatural.<sup>178</sup>

Sergiusz Michalski has argued that in Luther's time art in Northern Europe was almost exclusively religious: division into secular and religious art was not yet crystallized.<sup>179</sup> By the time of the *Cosmographia*, this process had gradually begun to take shape, the

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<sup>176</sup>Hartmann Schedel, *Liber chronicarum* (Nürnberg, 1493), For the Nuremberg Chronicle see also Elisabeth Rücker, *Die schedelsche Weltchronik: Das größte Buchunternehmen der Dürer-Zeit*. (Munich : Prestel, 1973). Illustrations of earlier medieval chronicles discussed in Janet Blackhouse, *The Illuminated Page: Ten Centuries of Manuscript Painting in the British Library*, (London: The British Library, 1997).

<sup>177</sup>Münster begins his history by discussing shortly the Creation and the Great Deluge. Passages of the Old Testament that precede the deluge are discussed very briefly. See. Sebastian Münster, *Cosmographia* (Basel: Heinrich Petri, 1544). Das erst büch, i. Elsewhere Münster writes that we can't know how the extent of man's first settlements because the Great Deluge has washed out everything. (I have consulted here a digitized 1553 edition which is by large identical with the 1550 edition), Sebastian Münster, *Cosmographie...* (Basel: Heinrich Petri, 1553). "Von der ersten ynwonungen des erdtrichs", xli. *Wie weit unnd breit die wonung mēschlichs geschlechts vor dem sündtfluss auff erden aussgestreckt/ vnnd was sie für gebeüw auffgericht / stet vnnd länder bewonet /ist vnns nitt wissen / dan es ist alles zů grundt gangen in dem sündtfluss was sie haben gebauwen vnnd zůgerust.*

<sup>178</sup>Some aspects which Münster takes as natural, however, seem quite fantastic to our eyes.

<sup>179</sup>Sergiusz Michalski, *Reformation and the Visual Arts : The Protestant Image Question in Western and Eastern Europe.*, (London ; New York : Routledge, 1993), 3.

apparent lack of religious figures and themes in Münster's illustrations being one of its manifestations. However, what is evident with Münster's work and other works of the period is that the rhetoric of the emerging differentiation was religiously motivated. Therefore, the most serious flaw of the traditional art historical approach to Reformation art has been its remaining in the scope of "religious" art. A similar tendency has continued in the history of cartography which has sought to understand the effects of religion in evident religious symbolism or propaganda. Taking seriously the unsuitability of the secular/religious – dichotomy in Münster's period, such attempts seem superficial. Fortunately art historians have become more aware of these problems during the last ten years, and recent years have seen studies which have sought to understand "secular" works in a religious context. This turn, however, demands scholars to transcend the immediate religious symbolism (or the lack of it) to arrive at the theological, philosophical and rhetorical ideas propelling the making of images.

The new insight of religious and philosophical aspects in making of "secular" images has provided new perspectives for the classical debate on descriptive naturalism in northern renaissance art. Some 30 years ago art historian Svetlana Alpers argued that Dutch realism at the turn of the Sixteenth and Seventeenth Centuries runs parallel to the map making of that period. Whereas, the Italian painters sought to create "windows" into spiritual realities, Alpers pointed out, the Dutch oil painters, like map makers, aimed at minute description of the natural environment. According to Alpers, the analogy of painting and mapping was not limited to stylistic features, but the painters deliberately sought to underline the similarities of the two fields by incorporating visual clues to geographical instruments and maps in their works.<sup>180</sup> A natural question that arises is why the map-analogies and high descriptivism took place most uncompromisingly in Dutch painting, and not somewhere else? The Dutch were skillful cartographers, but so were the Italians, Spaniards and Portuguese. The probable influence of Dutch Calvinism seems out as an attractive explanation – particularly as it is offered by one of Alpers' heroes, Constantijn Huygens who quoted by Alpers utters:

Nothing can compel us to honour more fully the infinite wisdom and power of God the Creator unless, satiated by the wonders of nature that up till now have been obvious everyone [...] we are lead into this treasure-house of nature, and in the most minute and

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<sup>180</sup>Svetlana Alpers, *Art of Describing: Dutch Art in the Seventeenth Century*, (Chicago: Chicago University Press, 1983).



disdained of creatures meet with the same careful labour of the Great Architect, everywhere an equally indescribable majesty.<sup>181</sup>

Could mapping and descriptive painting be a way to honour God's works in nature? Alpers' answer was no. The lack of religious motifs in the descriptive paintings, Alpers reasoned, downplayed the possibility of religious influences. According to her, a number of descriptive paintings also predated the Reformation, making it an improbable cause for the mapping impulse.<sup>182</sup> Yes, the Protestants did not invent mapping nor descriptive painting – but could there still be something in these arts that appealed particularly to their taste?

In the early 1980s, religion wasn't yet a topic that excited historians much. During the last few decades, however, the explanation of descriptive naturalism in the Northern Renaissance painting has gradually evolved, and the lack of religious motifs in early modern painting isn't seen any more as an indicator of religious indifference, but as an effect of religious interest. In her recent study on Hans Holbein the Younger, Svetlana Alpers' student, an art historian Jeanne Nuechterlein, has argued that the highly descriptive objective mode in Holbein's portraiture can be seen as a deliberate response to the image debate of the Reformation.<sup>183</sup> Nuechterlein suggests that the sober descriptive approach, which Holbein used in his portraiture, was intended to express that the painter was only a faithful translator of nature. In his religious paintings instead, Holbein developed an innovative and symbolical vocabulary emphasizing the allegorical quality of the paintings. According to Nuechterlein, Holbein's stylistic versatility was an attempt to moderate between the Protestant iconoclasts on one hand and the clients who remained faithful to the Old Church on the other. The lack of religious motifs and the sober naturalism could thus be interpreted as Holbein's business

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<sup>181</sup>Constantijn Huygens, quoted in Alpers 1983, 9.

<sup>182</sup> Alpers 1983, xxvi. Alpers writes: "Although they flourished in a Protestant state, the pictorial phenomena I am concerned with in Holland in many respects predate the Reformation. Neither the confessional change, nor the confessional differences that existed between people of Holland in the seventeenth century seem to help us much in understanding the nature of art. To the argument that secular subject matter and moral emblematic meanings speak to Calvinist influence, one must counter that the very centrality of and trust to images seems to go against the most basic Calvinist tenet – the trust in Word." The material which Alpers presents in her book, however, dates primarily in the post-Reformation period. Her understanding of Calvinism as a religion of Word is also simplified. Calvin, like Luther, criticized the cult use of images, not painting in itself. The Calvin scholar William Bouwsma has paid attention to how much Calvin actually valued sight. In numerous texts Calvin emphasizes the importance of seeing. Instead of gazing idols, he gives painting a new task to describe how God's wisdom is fulfilled in the world and nature. What Calvin suggests comes actually quite close to what happened in the Dutch oil painting in the seventeenth century. William J. Bouwsma, *John Calvin. A Sixteenth Century Portrait* (Oxford: Oxford University Press, 1988), 72.

<sup>183</sup>Jeanne Nuechterlein, *Translating Nature into Art: Holbein, the Reformation and Renaissance Rhetoric*, (University Park: The Pennsylvania State University Press, 2011).

policy avoiding religiously controversial issues. Similar explanation could apply to the later Dutch oil painting: in the times of religious intolerance and violent iconoclasm, descriptivism was not controversial, neither were maps.<sup>184</sup> However, Holbein's enthusiasm in materiality and his extremely careful representation of the natural appearances of his models exceeds a simple economic necessity of pleasing the clients. In the 1520s the rising tide of Reformation challenged traditional ways to make religious images. According to Nuechterlein this pushed Holbein to seek new ways to express divinity within ordinary material forms. Interestingly, as Nuechterlein also points out, Holbein's vision of sanctity of the material objects of everyday life can be connected to Lutheran theology.<sup>185</sup>

Nuechterlein situates Holbein's first experiments with excessive "materiality" to his works the *Dead Christ* (1521-22), and *Solothurn Madonna* (1522).<sup>186</sup> In these he stripped their objects of all emotional, narrative and idealistic potential. There's nothing supernatural in these religious paintings and they seem to argue that ordinary human appearance can reveal spiritual meanings: God manifests himself in forms of everyday life. In the *Solothurn Madonna* and *Dead Christ*, Holbein, according to Nuechterlein, "seeks to show how the physical matter of this world can simultaneously be "real" and spiritually meaningful." Holbein's materialism remained to be a short-lived experiment in the religious images and his later religious pictures turned away from descriptivism towards more allegorical and decorative designs. However, the objective and descriptive mode continued in his portraits, which sought create a physical encounter with the real world.<sup>187</sup> As in the *Dead Christ* and the *Solothurn Madonna* the ultimate meaning of Holbein's portraits is intimately attached to their bodily existence.

Holbein's engagement with the Reformation remains an open question but his probable interest in the Protestant theology is exciting. Nuechterlein's study opens thus a new debate: to what extent the Reformation debate on image, spirit and materiality affected painting and should one analyze the ascending naturalism in this context? Nuechterlein's observations are important also for the study of Münster's work and its illustrations. Hans Holbein was Sebastian Münster's illustrator in the early 1530s and drew images for Münster's

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<sup>184</sup>There are no overall studies on the pictorial themes which could pass through the hoops of the European Protestant iconoclasm but the investigations on the estate inventories of the English Puritans in the Seventeenth Century indicate that maps and floral representations were tolerated. Collinson 2004, 348.

<sup>185</sup> Jeanne Nuechterlein 2011, 198.

<sup>186</sup>Jeanne Nuechterlein 2011, 146.

<sup>187</sup>Jeanne Nuechterlein 2011, 151.

astronomical and calendarical works. Most importantly, Nuechterlein's study indicates that religion can no more be neglected as one aims at understanding the rise of the "mapping-impulse" and descriptive naturalism in the early modern European culture.

Alpers' attention to the descriptive mode in the Dutch painting makes a valuable contribution for the understanding of various kinds of naturalism. Paintings with maps, views and mathematical instruments sought to underline their particular relationship with the portrayed objects. The images seek to argue that they record the natural world faithfully and that physical matter of the world in itself is meaningful. They made naturalistic expression a sign of the importance of the material world. Importantly, this was not the case with much of the naturalism of the period. The ascent of naturalism in northern Europe has been traditionally conceived as a process in which the Italian "realistic" compositional principles, the linear perspective in particular, challenged the medieval tradition of "looking through" and enabled the development of the new, more objective mode. But whereas this big picture may hold in art of Hans Holbein, Burkmaier or Dürer, there are also notable exceptions such as Jörg Breu, who applied the symbolic, rhetorical and decorative potential of the new Italianate style, but used them as visual metaphor. In Breu's art the traditional process of 'looking through' continued within the new idiom of humanist taste.<sup>188</sup> Classicism or realism of the pictorial motifs per se, do not guarantee artist's interest in the natural world. What is essential with the Dutch descriptivism and the art of Hans Holbein is that the naturalism of their paintings is harnessed to argue that actual observations have taken place. In a nutshell, the transformation in visual perception does not culminate in "realism" or naturalism in itself, but in the role which the painters gave to their natural objects. In the end, the question is epistemological: is the natural world and its numerous objects something that is to be looked through, or are they valuable in themselves. The art in Münster's age, being mostly religious, meant a debate on material objects' ability to transmit the divine.

### *Conclusions*

Revived interest in religion, both in intellectual history and art history, has opened new horizons for a more subtle understanding of the role of the Reformation in the development of cosmography and cartography. In this development, Sebastian Münster's *Cosmographia* holds a special place as the first presentation of the whole world that was not directly dependent on

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<sup>188</sup>Andrew Morrall, Jörg Breu the Elder. Art, culture and belief in Reformation Augsburg. (Aldershot: Ashgate, 2001), 251.

the classical heritage of Ptolemy. Münster's maps and geographical illustrations were also very influential and spreading across Europe. The novelty of the *Cosmographia* and the religious, providential overtone of its narration offer an interesting question. How did the evangelical theology of the Reformation affect Münster's work?

A review of the history of sixteenth century map making and geography seems to suggest that, at least during the first half of the sixteenth century, the Protestant reformation accommodated and encouraged the use of maps and geographical illustrations in a way the Roman church did not. At the turn of the seventeenth century this situation seems to have changed as the Catholic interest in maps and geography revived. The question that remains, however, is why in the first half of the century, the Protestant reformers were so adaptive in geography and geographical illustrations?

Several different possibilities for this have been discussed here. Geographical illustrations could pass iconophobic restrictions and offered thus a legitimate format for artistic creativity and commercial activity. But even more interesting is the idea, that the evangelical theology itself may have supported minute describing of nature. In the history of Renaissance painting, art historians have discerned in the vast and ascending naturalistic stream, a smaller but more radical current of descriptive realism. Unlike the traditional Italian artistic realism which applied realistic features into other-worldly scenes and religious portraits, the northern descriptivism limited itself to minute recording of physical appearances of this-worldly objects. Interestingly many northern descriptive paintings seek to present themselves as an analogy to mapping: the paintings seek to convince the viewer that they represent only the physical qualities of their models, nothing added. Unlike Italian paintings that were made as windows to another reality, descriptive paintings seem to emphasize that they offer no medium to spiritual participation. Interestingly, a similar tendency is taking place in the Protestant biblical mapping – particularly in Calvinist maps, visual expression is stripped to minimum, and participation in spiritual reality is denied. Maps, even biblical, are only auxiliaries for the literal reading of the Bible. Analyzing this phenomenon, it is important to keep in mind that division into secular and religious art does not yet exist in the northern art. The descriptive impulse is not a sign of secularism. Could it thus be, that the evangelical theology, denying man's ability to reach the divine by his own capacities, endorsed a shift of the perceptual focus to the natural world, God's creation?

Manfred Büttner's studies in the 1970s have argued that in the field of geography the reformation brought about a revived interest in the natural world. The problem with his theory, however, was its inability to demonstrate any direct link between a reformer

and a geographer. A link between Münster and Melanchthon has been speculated upon, but thus far there hasn't been enough evidence of their intellectual exchange. This chapter, however, has sought to question the idea that Münster as a reformed and Melanchthon as a Lutheran thinker had represented two streams of geography. Basel had strong Lutheran influences since the very early stages of the reformation which ultimately carried into the first Basle confession.

There are many clues that Luther's right-hand man Philip Melanchthon's natural philosophy and his understanding of grammar and dialectics were one of the major influences in the early modern intellectual debate concerning man's cognitive capacities, science and nature. Jeanne Nuechterlein's recent work has demonstrated how the Lutheran influences seemingly affected Hans Holbein's descriptivism and his keen interest in the natural world. Holbein was Sebastian Münster's collaborator in the early 1530s. In the following chapters my attempt will be to show how Sebastian Münster and Philip Melanchthon should be seen intellectually closer than previously thought. In order to do that I will focus on the humanist and philosopher Simon Grynaeus, who was both Münster's close colleague and supporter, and Philip Melanchthon's philosophical interlocutor.



## Chapter III

### Sebastian Münster's Early Influences

*Gregor Reisch*

In order to understand the changes which took place in the geographical thought of Sebastian Münster it is useful to have a look at the realities of geographical education during his youth. This chapter will look at Münster's educational background in geography with a special focus on two of his teachers, Gregor Reich and Johannes Stöffler, two prominent figures who shaped geographical education during the first decades of the sixteenth century. Particular attention will also be given to Münster's school notes, the so called *Kollegienbuch*, which is a revealing document of the realities of geographical education in his youth.

Sebastian Münster was born on the 20th of January 1488 in Niederingelheim, close to Mainz, and entered the Franciscan order at an early age and was schooled in the seven liberal arts by his brotherhood.<sup>189</sup> Before 1507 Münster is known to have spent some time in Louvain and Freiburg. His time in Freiburg is considered to have been particularly important for his formation. There Münster became student of Gregor Reisch (1467 – 1525) who taught him Hebrew, theology and geography, a combination of subjects which would occupy Münster for the rest of his life (although his interest in theology proper could be debated). As his student Münster had direct, albeit brief, contact with Reisch. But even more important than that was Reisch's broader influence on the education of young men in the period. Even if Münster had never met with the famous scholar, Reisch's ideas would have had some influence on him. Reisch was an influential humanist and educator whose widely read academic textbook, *Margarita Philosophica* (Philosophical pearl), disseminated his views on educational matters throughout Europe. Münster's longtime mentor, a Franciscan friar Conrad Pellican, for instance, is known to have based his geographical lectures on Reisch's *Margarita*.<sup>190</sup> Therefore, in order to understand Münster's intellectual background, Reisch's *Margarita Philosophica* is the best place to start.

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<sup>189</sup> In Münster's biographical details I followed primarily Burmeister 1969.

<sup>190</sup> Patrick Gautier Dalché, "The Reception of Ptolemy's Geography (End of the Fourteenth to Beginning of the Sixteenth Century)", pp.285-364 in David Woodward (ed.), *The History of Cartography, vol 3, Cartography in*

Gregor Reisch (c.1470-1525) characterizes late medieval monastic scholars. His life and work formed an integral combination of committed religious practice and educational erudition.<sup>191</sup> Reisch studied in the University of Freiburg-im Bressgau where he received a master's degree in 1489. In 1496, two years after his final matriculation, he joined the Carthusian order in Freiburg-im-Bressgau where he continued to work and live almost until the end of his life. Carthusian piety emphasized commitment to silence. Quiet meditation, editorial works, copying and writing books, were seen as optimal forms of silent prayer, and formed an important part of the Carthusian practice. Reisch's advanced educational background fit well with this type of piety. Reisch ascended rapidly in the monastic hierarchy. In 1502 he was elected as a prior. Since 1508 he served as a representative of his order for the Rhenish Province and from 1509 he started as the confessor to the Emperor Maximilian I. Reisch's knowledge made him a renowned figure among learned men. Reisch knew many leading humanists of this period. Beatus Rhenanus, Huldreich Zasius, and Jacob Wimpheling, for instance, belonged to his circle of friends. Reisch worked also with Johann Amerbach's edition of the works of Saint Jerome, an editorial project, which since Amerbach's death in 1513, had been taken over by Erasmus, and Amerbach's friend Johannes Froben. Erasmus approved Reisch's editorial work and held him in high esteem as a man whose educational views had significant weight.<sup>192</sup>

Reisch's most enduring educational achievement was the *Margarita Philosophica* (Philosophical pearl), an academic textbook which he wrote during the years 1489 – 1496. The book was first published in Freiburg in 1503. The *Margarita* has sometimes

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*the European Renaissance*, (The University of Chicago Press, Chicago 2007), 352. x Bonifacius Amerbach, [Hartmann, Alfred (ed.)], *Die Amerbachkorrespondenz* (Basel: Verlag der Univ.Bibl. 1947), vol. 1, 363.

<sup>191</sup> Sachiko Kusukawa's and Andrew Cunningham's edition of three books of *Margarita Philosophica* is a sign of revived scholarly interest in Reisch's work, particularly his natural philosophy. (Andrew Cunningham & Sachiko Kusukawa eds.), *Natural Philosophy Epitomised: Books 8-11 of Gregor Reisch's Philosophical pearl (1503)*, (Farnham: Ashgate, 2010); Until this recent publication Reisch's works have received relatively little attention. Gustav Münzel, *Der Kartäuserprior Gregor Reisch und die Margarita Philosophica* (Freiburg im Breisgau: Waibel, 1938); Karl Hoheisel, "Johannes Stöffler (1452-1531) als geograph", pp 69- 90 in Manfred Büttner ed. *Wandlungen im geographischen Denken von Aristoteles bis Kant: Dargestellt an ausgewählten Beispielen*, (Ferdinand Schöninghen: Paderborn 1979). Lucia Andreini, *Gregorius Reisch. Margarita Philosophica Nova* (Salzburg: Institut für Anglistik und Amerikanistik, 2002); Lucia Andreini, *Gregor Reisch e la sua "Margarita Philosophica"* (Salzburg: Institut für Anglistik und Amerikanistik, Universität Salzburg, 1997); Robert Sbrk, Maximilian I. und Gregor Reisch, in Alphons Lhotsky (ed.) *Archiv für österreichische Geschichte*, 122. Bd. 2 (Wien, Kommissionsverlag der Österreichischen Akademie der Wissenschaften in Wien, 1961); Robert Sbrk, "Die Margarita philosophica des Gregor Reisch: Ein Beitrag zur Geschichte der Naturwissenschaften in Deutschland," pp. 83-206 in *Denkschriften der Akademie der Wissenschaften in Wien, mathematisch-naturwissenschaftliche Klasse* 104 (Wien, Hölder-Pichler-Tempsky, 1941); John Ferguson, *The Margarita philosophica of Gregorius Reisch* (London: Bibliographical Society, 1929).

<sup>192</sup> Andrew Cunningham and Sachiko Kusukawa (eds.), *Natural Philosophy Epitomised: A Translation of books 8-11 of Gregor Reisch's Philosophical Pearl (1503)* (Farnham: Ashgate 2010), introduction, xviii.



been characterized as a work in the scholastic encyclopedia tradition.<sup>193</sup> But as the term ‘encyclopedia’ becomes widely used only after the mid-sixteenth century, it is better to follow Reisch himself and to call his work as an ‘epitome’ or ‘compendium’. The *Margarita* is a work, in which the entire curriculum of the university arts course is contained excluding only metaphysics. *Margarita Philosophica* became the first widely spread printed text to discuss all the disciplines which were taught in the faculty of arts.<sup>194</sup> It was also the first major printed book to discuss academic disciplines written by a modern author. Although *Margarita* is rarely mentioned in the official university statutes, other academic documents across northern Europe have recorded it as the single most important source of academic education for young men during this time period.<sup>195</sup> *Margarita* was a popular book. In the sixteenth century alone it was republished at least 12 times.<sup>196</sup> It was used extensively, particularly before the Reformation, and continued to be used within Catholic universities for a long period after the Reformation as well.<sup>197</sup> In the Protestant universities *Margarita Philosophica* was also widely read until Lutheran Protestants started to develop their own, doctrinally more suitable equivalents, in the 1530s, a subject which shall be discussed in more detail in following chapters.

To some extent, *Margarita*’s popularity can be explained by its practical brevity and form. The book was written in a catechetical form – in a form of dialogue between teacher and student. It had numerous diagrams and illustrations and a full index, which increased its didactical value. *Margarita* paralleled the course of philosophy studied in the arts faculty. In 12 books it sought to explain rational philosophy (the seven liberal arts of the quadrivium and trivium), natural and moral philosophy. Following the arts syllabus *Margarita*’s first seven books discussed rational philosophy: Latin Grammar; Dialectics; Rhetoric; Arithmetic; Music; Geometry; and Astronomy. The next several chapters addressed natural philosophy and included : natural philosophy [proper]; Origin of Natural Objects (de origine rerum naturalium) which contained studies of minerals, metals and mining; the vegetative soul, (explained sometimes as a pre- psychological study discussing, for instance, the function of visual sense and perspective; the rational soul (focusing on immortality and

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<sup>193</sup> Lucia Andreini, “Introduzione” in Gregorius Reisch, *Margarita Philosophical Nova*, (Salzburg: Institut für Anglistik und Amerikanistik, Universität Salzburg 2002 ), xxix.

<sup>194</sup> Cunningham and Kusukawa 2010, xi.

<sup>195</sup> Ibid., xii

<sup>196</sup> *Margarita Philosophica*’s editions are listed in Cunningham and Kusukawa 2010, xxviii-xxx.

<sup>197</sup> Ibid., 2010, xiii

The *Margarita Philosophica*, as a book written by a modern author, is a chapter in the gradual movement away from original texts of ancient philosophers – a movement which had started to take place before 1500. As an epitome to philosophy, the work was nevertheless largely indebted to the rich tradition of Academic Aristotelianism. To study philosophy at the turn of the century was still, by and large, equal to studying the works of Aristotle. Sachiko Kusukawa and Andrew Cunningham have argued that the contents of the *Margarita Philosophica* are largely reminiscent of the curriculum which Reisch had followed himself in the University of Freiburg.<sup>199</sup> According to the statutes of 1463, a student aiming at bachelor's degree in Freiburg was to hear lectures and to do exercises on works of Aristotle: *Physics*, *Generation and corruption*, and *On the soul*. He was also to learn about *On the heaven and the world* (books 1, 2, 4), *Meteorology* (books 1, 2, 3) and the *Parva naturalia*. Aristotle's *Ethics* (first six books), *Metaphysica* (books 1,2,4,5,6,7,8,9,10,12), *Politics*, *Oeconomics*, *Physiognomics* and *On good fortune* were to be found on the syllabus as well. In addition to these, there were also Lectures which were not based on Aristotle. These others discussed *On the material sphere*; *Theories of planets*, the *Perspective* by John Peckham, *On*

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<sup>198</sup> Gregor Reisch, *Margarita Philosophica*, (Friburgi, 1503) [BSB, VD16 R 1033]; *Margarita Philosophica* was revised in 1508 edition with renewed illustrations and maps. These consulted early editions, however, are largely identical. in cases where the original document has no pagenumbers and has been digitized, I will refer to the page number of the digital file marked in square parenthesis. [8-9] *Aenumerantur quae in hoc opere/ dicto Margarita Philosophica: contineantur MARGARITA PHILOSOPHICA totius Philosophiae Rationalis/ Naturalis & Moralis principia dialogice duodecim libris complectens: Quorum Primus Grammaticae rudimenta per omnes eius partes & prosa & carmine continet. Secundus Dialecticae principia exemplari demonstratione abunde satis commemorat. Tertius Rhetoricae partes/ cum arte Memorandi & Epistolandi succinctim aedocet. Quartus Arithmeticae species/ theorice & practice cum diversis algorithmis pertractat. Quintus Musicas consonantias theorice & practice considerat. Et Monochordium in dyatonico genere diuisum ipsi manugamaut coaptat. Sextus Geometriae elementa primo quidem theoricae / deinde practice / cum diversis instrumentis & dimationibus exponit. Septimus Astronomiae theoremata totius mundialis machine dispositionem/ coelestium & elementalium regiones situm orbis iuxta Cosmographorum traditionem/ cum generali mappa dilucidat. Astrogiae praeterea partes omnes percurrens/ Genethliatos praecipue & fatidicos prophetarum Superstitionis sobolem/ Necromantiam / Pyromantiam/ Geomantiam/ artem Notoriam & imaginum ritum & execrationes pandit & reprobat. Octavus Naturalis philosophiae principia/ a diversis diverse quidem enumerata concorditer declarat. Nonus originem primordiale & productionem omnium rerum naturalium tam simpliciumque mixtarum explanat. Alchmiae praeterea principia & auctores commemorans Leichimistas aeliminat relaxat. Decimus Animae vegetativae & sensitivae potentias/ organa/ obiecta & operationes explicat: & circa sensum Visus perspective theoremata commemorat. Vndecimus Animae rationalis originem/ naturam/ immortalitatem futurum statum tam in miseriis infernalibusque gaudiis coelestibus per novem Campos investigat: multorum & philosophorum & theologorum positiones de natura animae enumerat. Duodecimus Philosophiae Moralis partes pertractat. Passionum/ virtutum moralium/ intellectualium & theologicalium rationes/ cum oppositis vitiis explicat. Superadditur Registrum seu inventarium iuxta litterarum ordinem: quaeque notabilia in toto opere contenta Lectoris obtutibus ostentans. Figuris quoque artificiosissime effigiatis & pene innumeris totum opus illustratur.*

<sup>199</sup>Cunningham and Kusukawa 2010, xxi

*Proportions* by Thomas Bradwardine, and *On the latitude of forms* by Nicholas Oresme. *Obligatoria* and *Insolubilia* were to be heard for logics and then some more works on music.<sup>200</sup> According to Kusukawa and Cunningham several of these texts are discussed in the pertinent sections of the *Margarita*.<sup>201</sup>

The Bible and patristic authors, especially Augustine and Peter Lombard, Gratian, John Peckham and Duns Scotus were at least as important as Aristotle.<sup>202</sup> Saint Augustine's views are particularly central. This has been explained as Reisch's deliberate attempt to find a shared doctrinal ground in the disputes between Thomists and Scotists. In the otherwise Aristotelian context the strong presence of Augustine, a theologian who drew strongly from Neo-Platonic and Stoic thought, is nevertheless surprising and demonstrates that Reisch's object was not to explain competing philosophical positions but to harmonize different views within a larger Christian framework. Philosophical ideas were not ends in themselves but instruments to serve spiritual ideals. Opinions of the ancient philosophers were discussed in a Christian framework and the educational ideals of the *Margarita* were serving Christian ends.

The Christian framework is essential to understand the way in which Reisch's *Margarita Philosophica* approached and studied nature. As Cunningham and Kusukawa have argued, Reisch's *Margarita* is a good example of what the late medieval and early modern natural philosophy was. This view is well grounded: *Margarita Philosophica* was a major popular work with a large section the author himself calls, natural philosophy.<sup>203</sup> The way Reisch presents natural philosophy makes it clear that it would be overly simplistic to take it as an ancient equivalent of modern natural science, having the same objects and methods. Nor is Reisch's natural philosophy simply about the mathematical disciplines of quadrivium or Aristotle's *Physics*. The Natural philosophy of *Margarita Philosophica* takes place in a theological context. It aims at understanding nature and everything else as something that has been *created*. This focus on the *created* world makes Reisch's natural philosophy (and all early modern natural philosophy) different from natural science: for him studying nature was a way to understand the will of its creator, the Christian God.

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<sup>200</sup> Cunningham and Kusukawa 2010, xxi, Hugo Ott and John M. Fletcher (eds.), *The mediaeval statutes of the Faculty of Arts of the University of Freiburg im Breisgau*, (Notre Dame, Ind.; Mediaeval Institute, University of Notre Dame, 1964), 46.

<sup>201</sup> Cunningham and Kusukawa 2010, xxii

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

<sup>203</sup> Ibid, xlviii

Within this cultural package the relationship between theology, geography and natural philosophy is complex. Geography, or better, cosmography, was part of astronomy and therefore belonged, at least theoretically, to rational philosophy. Nevertheless, by studying the order and structure of the cosmos, cosmography studied God's creation. Needless to say, considerations of divine aspects of nature had to be subjected to the doctrine of the church and Christian tradition. The centrality of issues concerning God and his Creation in both Geography and natural philosophy guaranteed that these disciplines were largely determined by theological concerns.

The importance of theology becomes apparent also in the disciplinary hierarchy presented by Reisch. Reisch explains the order of disciplines with two images. The first image presents the tower of learning (image 1). On the left side of the picture, Nicostrata, inventor of alphabets, shows a student a sign and holds a key to a tower that is on the right side of the image. Learning the alphabets obviously opens the door to the tower itself. The tower is made of floors of art. The lower floors are made of the Seven Liberal Arts, the lowest being that of the Trivium (Grammar, Rhetoric and Dialectic), topped by the Quadrivium (Geometry, Arithmetic, Music and Astronomy). The way of the student thus leads from learning the alphabets to the floor of Trivium and then even higher to the Quadrivium. Above the Seven Liberal Arts, Reisch's illustration sets a floor of two rooms: one of moral philosophy and another of "physics" (natural philosophy). Every discipline has also its own ancient authority, Pythagoras for music, Ptolemy for astronomy, Seneca for moral philosophy and so forth. On the top of the noble tower the student finally reaches the heights of theology and metaphysics. The highest educational character gazing down from the top of the tower is the scholastic theologian Petrus Lombardus. It is also good to notice that Reisch's disciplinary hierarchy submits "physics", the study of nature, to both metaphysics and theology.

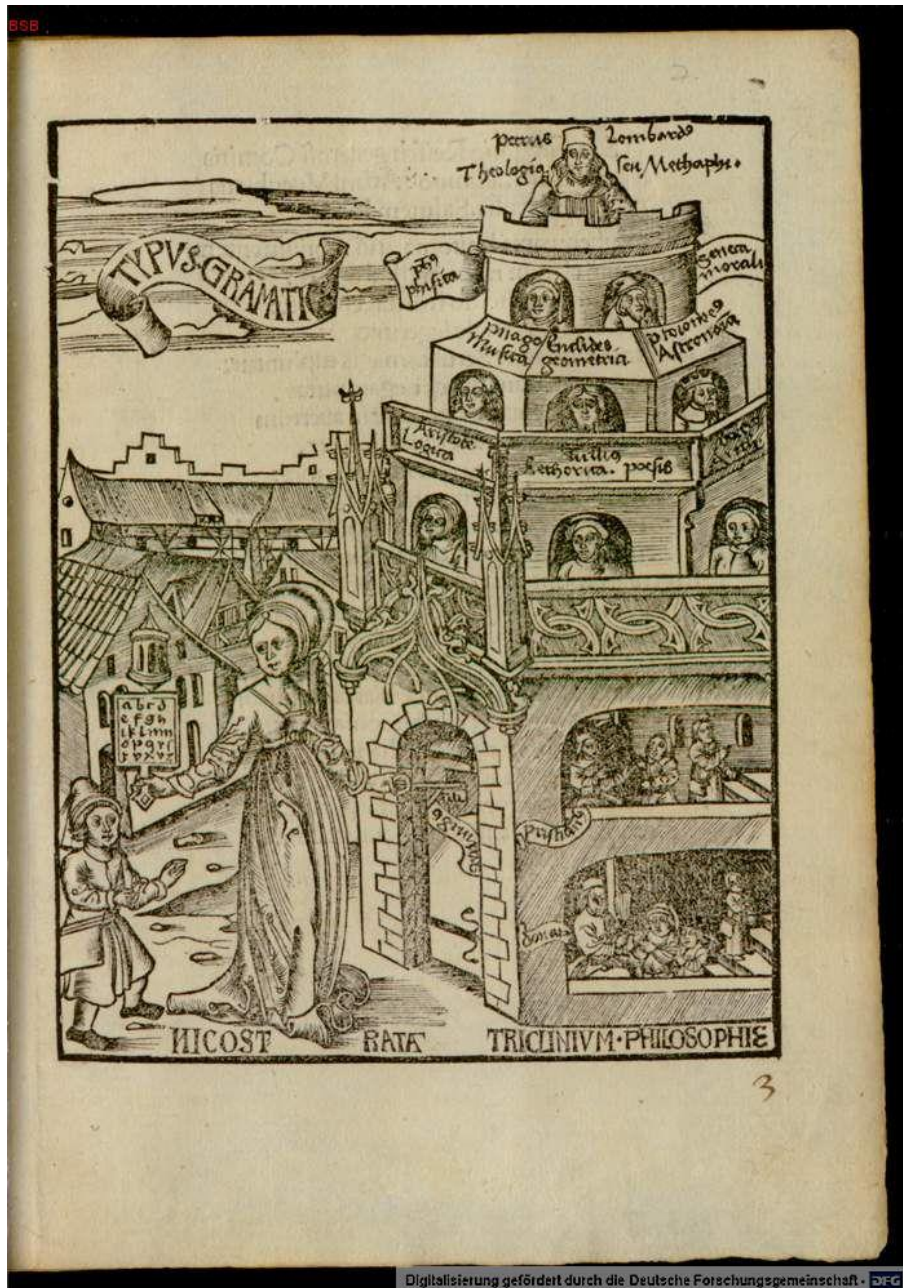


Image 1. An extract from Gregor Reisch's Margarita Philosophica Libri XII (Friburgi) 1503 (Source: Bayerisches Staats Bibliothek [VD16 R 1033])



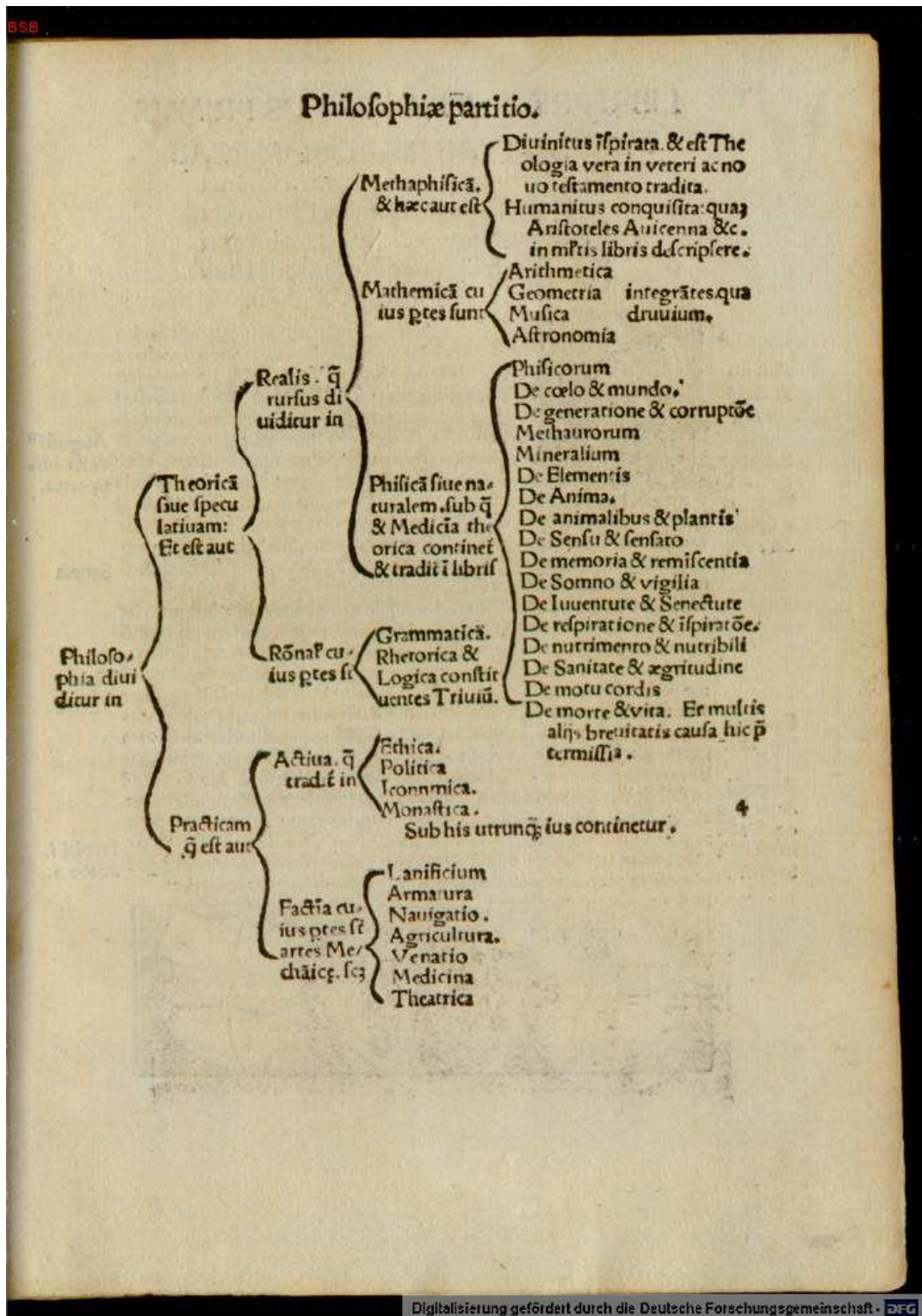


Image 2. An extract from Gregor Reisch's *Margarita Philosophica Libri XII*.

Reisch's second illustration of disciplinary hierarchy presents a tree-model (image 2), which specifies, according to Reisch, that academic philosophy could also be divided into two main parts: practical and theoretical. Practical philosophy, as the illustration shows, consists of two main branches: the first of which contains the active arts, such as

ethics, politics and economics; on the other, there are mechanical arts such as navigation, agriculture and medicine. The second branch, theoretical philosophy, is then divided into two main branches, *rational* and *real*. Grammar, Rhetoric, and Logic, i.e. the disciplines of the classical trivium, are positioned within rational philosophy. The *philosophia realis* includes metaphysics, four mathematical liberal arts and natural philosophy.

As may be seen, Reisch's disciplinary taxonomy does not present geography as a separate discipline. Topics related to geography were taught under several different disciplines: mathematical aspects of the earth were discussed as a part of astronomy, and descriptive geography as part of history and natural philosophy.

Following this disciplinary division, Reisch's *Margarita* did not contain a separate chapter on geography. Geographically related material was nevertheless treated in book seven, dedicated to

The theory of astronomy, disposition of the machine of the world, regions of heavens and the elemental [Earth], the site of Earth according to a cosmographical tradition with general maps. Treating also all parts of Astrology. Refuting astrologers and soothsayers on the basis of prophecies and opinions of the Holy Fathers. Explaining and rejecting all sorts of superstitions, necromancy, pyromancy, geomancy, notorious art and rite of specters and blasphemy.<sup>204</sup>

Following the established tradition discussed in chapter I, Reisch's *Margarita* studies the features of the earth as a part of cosmography and in close affiliation with astronomical study of the heavenly spheres.<sup>205</sup> As indicated above, the seventh book of *Margarita Philosophica*, which focuses on these topics, was divided into two parts; the first explains astronomical matters, and the second astrology. Cosmographical questions belong primarily to the former. The astronomical part has 50 sub-chapters of which 10 discuss cosmographical subjects. First Reisch maps out the most important astronomical questions concerning the heavenly spheres: the form of the world, motion of the firmament, the prime mover (*primum mobile*), the seven planets (Saturn, moon, Venus, Jupiter, Mars, sun, mercury), the meridians, the horizon, stellar constellations of the zodiac, and eclipses (these standard subjects of astronomy were usually studied from Sacrobosco's *Of the Sphere*).

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<sup>204</sup> Gregor Reisch, *Margarita Philosophica* 1503 (Friburgi 1503) [VD16 R 1033], [8], *Septimus Astronomiae theoremata totius mundialis machinae dispositionem/ coelestium & elementalium regiones / situm orbis iuxta Cosmographorum traditionem / cum generali mappa dilucidat. Astrogiae praeterea partes omnes percurrunt/ Genethliatos praecipue & fatidicos prophetarum Superstitionis sobolem/ Necromantiam / Pyromantiam/ Geomantiam/ artem Notoriam & imaginum ritum & execrationes pandit & reprobant.*

<sup>205</sup> Reisch 1503, [263], *Liber septimus de principiis Astronomiae, Cap.iii, De definitione sphaerae & mundi continentia & unitate.*

Having described the main principles of the Ptolemaic model of the universe, Reisch continues by explaining cosmographical topics. Reisch's exposition reflects well the central concerns of the Ptolemaic cosmography of the period: The structure and spherical form of the earth; the division of the earth into different climate zones; he explains basics of Aristotelian meteorology and argues, following Ptolemy that human habitation is impossible in the cold polar zones and in the dry tropical zone; the latitudes and longitudes are explained and the antipodes. By the end of the exposition, Reisch offers also a general list of principal places in the "three habitable continents", Europe, Asia and Africa.<sup>206</sup> Reisch also pays considerable attention to questions concerning the physical existence of hell and the situation of the earthly paradise. His discussion on the situation of the earthly paradise, (taking half of Reisch's subchapter on the division of climate zones) is a purely literal exercise, examining Genesis and views of Augustine, Petrus Lombardus and St William of Paris.<sup>207</sup>

Reisch's cosmographical views are based primarily on Ptolemy and Aristotle as well as other ancient writers such as Pliny the Elder and Pomponius Mela. The Bible, particularly Genesis, and texts of patristic authors like Boethius and Augustine also hold a central place in his cosmographical argumentation. Thinking about Sebastian Münster and his later cosmography it is important to notice that human geography and cultural, botanical and historical aspects, so essential for Münster's cosmography 40 years later, play no role in Reisch's exposition. The cosmographical exposition of *Margarita philosophica's* seventh book can be summarized as a Ptolemaic, astronomically driven cosmography, dominated by theological concerns.

Thinking about the *Margarita philosophica's* concept of cosmography, it is good to pay attention also to the minor role of illustrations in Reisch's cosmographical section. Reisch's astronomical overview is richly illustrated with numerous graphs and diagrams, but images are almost non-existent in the cosmographical part. The cosmographical pages in the first editions of *Margarita* contain only a world map and an illustration explaining the round

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<sup>206</sup> Reisch 1503, Liber septimus de principiis Astronomiae, tract 1, [301] De figurafione & natura terrae. Cap. xliii; [302] De terrae rotunditate. Cap. xliiii ; [304] De partibus terrae habitabilibus iuxta divisionem eius in zonas quinque. Et si sub aequinoctiali sit conveniens habitatio. Et paradus qualis aut in qua parae terrae sit. Ca. xlv; [305] De distictione climatum. Et his ã accidunt habitantibus in quinque primis climatibus, quantum ad aestates & hyemes & umbrarum variatões. Cap. xlvi; [306]Aliorum climatum distinctio. Insuper qualiter dies continue augmentetur habitantibus versus poliim arcticum donec sub ipso polo unus dies anni medietatem habere conuicitur. Cap. xlvii; [307] Climatium latitudo & longitudo describitur:& Antipodes esse in oriente illis qui occidentem habitant probatur. Cap.xlviii; [310] De divisione terrae habitabilis in Europam Asiam & Aphricam. Cap. xlviii; [311] Satrapae Europae nominatim aenumerantur. Cap. l. [312] Asiae regiones nominatim ponuntur. Cap. li; [313] Aphricae regiones numerantur. Cap. lii.

<sup>207</sup> Reisch 1503 [VD16 R 1033], Liber septimus de principiis Astronomiae, tract 1, [301] De figurafione & natura terrae. Cap. xliiii, "Infernus quadruplex", [304] De partibus terrae habitabilibus iuxta divisionem eius in zonas quinque. Et si sub aequinoctiali sit conveniens habitatio. Et paradus qualis aut in qua parae terrae sit. Ca. xlv.



form of the earth. City views or other visual testimonies do not belong to Reisch's repertoire. Geographical description, whether historical, topographical or pictorial was not part of Reisch's view of cosmography.

Reisch's world map, however, is worth of a closer look. The first editions contained a Ptolemaic map that was based on the 1482 Ulm edition of Ptolemy's *Geographia*. (When the *Margarita* was revised in 1508, new world maps were included, basing to Martin Waldseemüller's work). The world map is drawn according to Ptolemy's second projection, is decorated with 12 lively windheads and is framed by a scale of longitude and latitude (image 3).<sup>208</sup> The map raises a question of Reisch's relationship with the Ptolemaic tradition. In the north the landmass of Scandinavia continues above the Arctic Circle and continues visibly beyond the contours of the classic Ptolemaic frame. In south, a brief note has been added on the Ptolemaic bridge of land connecting the continents of Africa and Asia. The note states: "Here there is no land but sea with big islands that were unknown to Ptolemy".<sup>209</sup> Although the cartographical content of Reisch's world map is otherwise fully consistent with the Ptolemaic tradition, these small signs bear witness to increasing critical awareness of the limits of the ancient geographical heritage.

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<sup>208</sup> For Ptolemy's projections and their reception in the renaissance see, Angelo Cattaneo, "Map Projections and Perspective in the Renaissance", pp. 51-80 in Zur Shalev and Charles Burnett (eds.), *Ptolemy's Geography in the Renaissance* (London: The Warburg Institute, 2011).

<sup>209</sup> hic non terra sed mare est, in quae mare magnitudinis insulae / sed Ptolomes fuerunt inconitae.

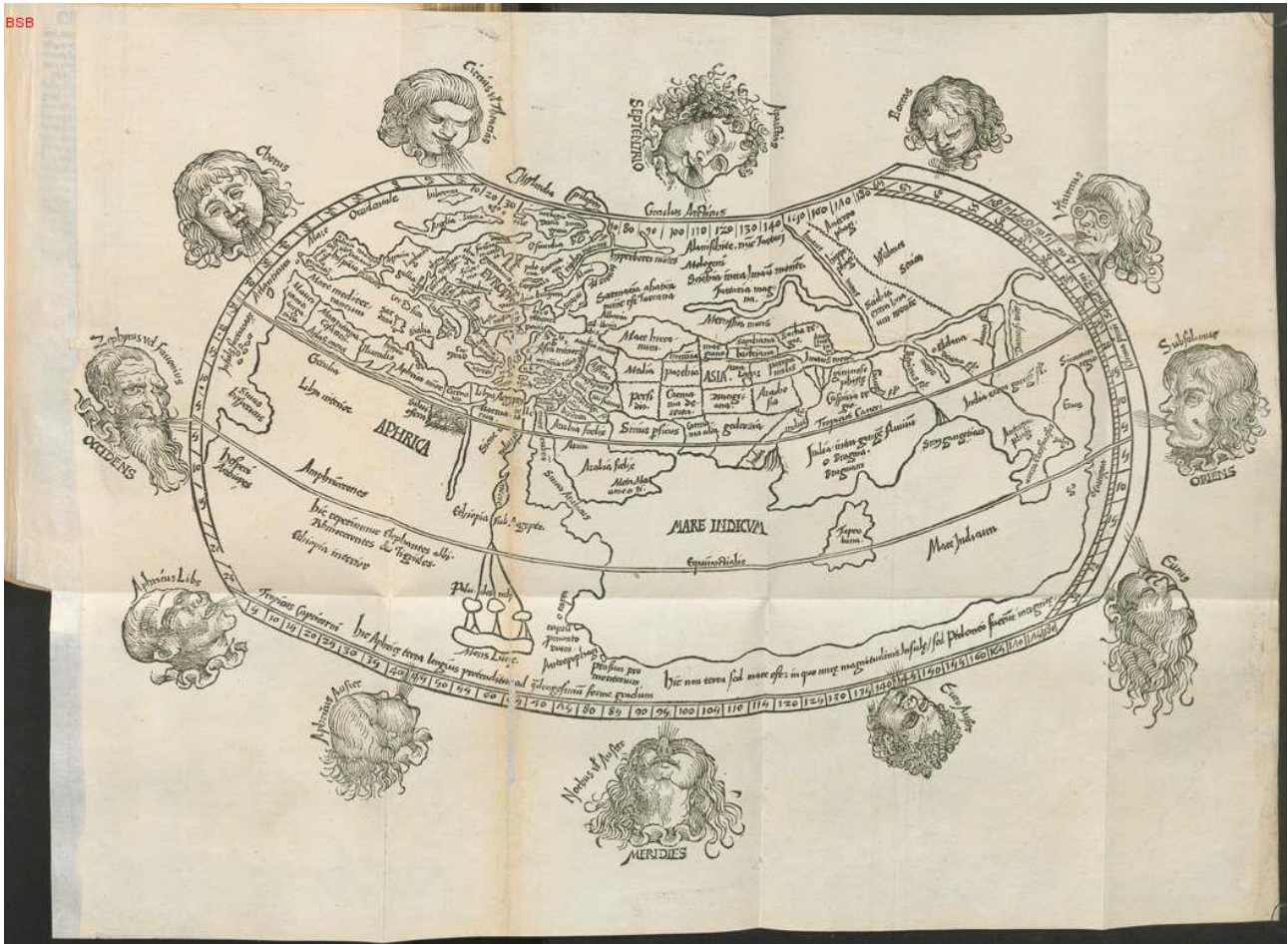


Image 3. Untitled world map basing to the 1482 Ulm edition of Ptolemy’s *Geographia*. An extract from Gregor Reisch’s *Margarita Philosophica Liber septimus, de principiis astronomiae* [308] (Friburgi 1503) (Source: Bayerisches Staats Bibliothek [VD16 R 1033]).

*Johannes Stöfler*

In 1509 Münster’s journey continued to Rufach, where he was sent by his order to continue Hebrew studies under a new teacher named Konrad Pellikan. Pellikan, one of the greatest scholars of Semitic languages of the period, became Münster’s close friend and mentor. Pellikan, ten years senior to Münster, shared also his pupil’s interest in geography, but even more, his passion for the Semitic languages. Later Pellikan became one of the leading evangelical minds of Zurich, and his strong alliance with the cause of Reformation inevitably affected his student. In 1511 Münster followed Pellikan to Basel where he studied Aramaic and Hebrew, and gave his initial sermon. The following year we meet Münster and Pellikan in Pforzheim where Münster was finally consecrated as a priest. The years between 1509 and 1514 laid the foundation for Münster’s career as one of the most important Hebraists of the time.

The years 1514 – 1518 Münster spent at Tübingen teaching philosophy and theology at the local Franciscan College. At Tübingen, Münster continued studies in mathematics, astronomy and geography under the guidance of Johannes Stöffler (1452–1531). During these years Sebastian Münster also met Philip Melanchthon for the first time. Melanchthon had been studying in Tübingen since 1512, and became Stöffler's student in 1515.

Stöffler's approach to geography can be characterized as a combination of astronomical and calendrical field work and philological editorial work. Stöffler was particularly talented in calendrical calculations. During his career he published a number of almanacs and penned a proposal for the Gregorian calendar reform.<sup>210</sup> Practical work with planetary observations interested Stöffler. He built several planetary clocks, wrote instructions for the use of an astrolabe and worked to revise and develop planetary tables that provided the necessary basis for astronomical calculations. Stöffler benefitted also from the new philological methods of the ascending northern humanism. He was one of the first to put the new opportunities to read and compare ancient sources into practice in the field of geography.<sup>211</sup>

Stöffler based his geographical lectures mostly on Ptolemy, but his interests were not limited to mathematical geography and astronomy. Stöffler lectured also on descriptive geographers and historians. He knew not only ancient authors like Plutarch, Suetonius, Caesar, Tacitus, Pliny and Cato, but also modern authors like Conrad Celtis, Hartmann Schedel's *Weltchronik* and Jacob von Bergamo's *Chronicles*.<sup>212</sup> Perhaps, unsurprisingly, all these authors pop up later among citations and influences of Münster's *Cosmographia*.

Like Reisch, Stöffler understood Geography in the framework of theology, and was convinced that geography and astronomy were leading towards God.<sup>213</sup> In this respect his understanding differed little from the mainstream scholastic natural philosophy of his period. Methodologically however, Stöffler departed from the dominant tradition: Unlike more

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<sup>210</sup> List of Stöffler's works mentioned in the *Allgemeine Deutsche Biographie* (ADB). Band 36, (Leipzig: Duncker & Humblot, 1893), 317. *Almanach nova plurimis annis venturis inservientia: per Joannem Stöfflerinum Justingensem et Jacobum Pflaumen Ulmensem accuratissime supputata...* (Ulm, 1499); *Tabulae astronomicae. Verarum mediarumque coniunctionum et oppositionum Solis et Lunae...* (Tübingen, 1514); *Elucidatio fabricae ususque astrolabii...* (Oppenheim, 1513); *Calendarium magnum Romanum* (Oppenheim, 1518); *Expurgatio adversus divinationum XXIII anni suspitiones...* (Tübingen (1523); *Ephemeridum opus...* (Tübingen, 1531); *Almanach nova* (153?); *In Procli Diadochi autoris gravissimi sphaeram mundi... Commentarius* (Tübingen, 1534).

<sup>211</sup> Karl Hoheisel, "Johannes Stöffler (1452-1531) als geograph", pp 69- 90 in Manfred Büttner ed. *Wandlungen im geographischen Denken von Aristoteles bis Kant: Dargestellt an ausgewählten Beispielen*, (Paderborn: Ferdinand Schöningh, 1979), 77.

<sup>212</sup> Hoheisel 1979, 76.

<sup>213</sup> Idem, 77.

traditional scholars like Reisch, Stöffler was more reluctant to move directly from geographical facts to theological conclusions. He was also more cautious to use Patristic writers as geographical authorities. Operating with ancient geographical works, he compared the ancient texts against each other making corrections.

As we have seen, *Margarita Philosophica*'s world map contained some minor clues of a gradually increasing criticism of inherited Ptolemaic cosmography. Also, Stöffler made critical comments about the reliability of Ptolemy. His own astronomical observations had convinced him of a number of errors in Ptolemy's positional tables and in 1513 he wrote in his treatise of astrolabe: <sup>214</sup> "It is certain that of Germany, more than one position given by Ptolemy is inexact." However, Stöffler's attitude towards the great Ptolemy was respectful, and moderating his tone he added: "let us conserve his positions as long as we do not have a more complete description of Germany."<sup>215</sup> Still, criticism of Ptolemy, even as sympathetic as this, was extraordinary. Later Stöffler sought to correct Ptolemy's errors in his catalogs of stellar positions. He also made a revised version of Ptolemy's world map and the map of Germany. Although some of Stöffler's contemporaries, like Regiomontanus for instance, went even further in their criticism against Ptolemy, Stöffler's bold attitude on ancient texts and his attempts to correct ancient sources on the basis of empirical evidence must have encouraged his students to estimate evaluate the ancient cosmographical heritage in a more critical fashion.<sup>216</sup>

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<sup>214</sup> Johannes Stöffler, *Elucidatio Fabricae Ususque Astrolabii*, (Oppenheim: Köbel 1513).

<sup>215</sup> *Verum per Germaniam in opere Ptolemaei plures locorum latitudines et longitudes debitos numeros minime habere satis compertum est; stabimus tamen cum Ptolomaeo, Quam emendatior Germaniae prodibit descriptio.* First quoted in Gallois 1890, 108.

<sup>216</sup> Hoheisel 1979, 77.

How did a talented young cosmographer like Münster appropriate the cosmographical teachings of Gregor Reisch and Johannes Stöfler? The so called "Kollegienbuch", a little known document from the initial years of Münster's early geographical career offers some answers to this question. The *Kollegienbuch* is a manuscript attributed to Sebastian Münster.<sup>217</sup> The contents of the book match well with Münster's interests and there is no reason to doubt its provenance. The dating of the document (1515 – 1518) overlaps with the period when Münster studied under Stöfler (1514 – 1518). Earlier Münster research has paid only little attention to the *Kollegienbuch*. Even Burmeister and Mclean mention it only in passing.<sup>218</sup> The main reason for this has probably been the limited accessibility of this rare source. Instead of the original document, earlier research has relied primarily on August Wolkenhauer's testimony in *Sebastian Münsters handschriftliche Kollegienbuch aus den Jahren 1515-1518 und seine karten* (1909). Fortunately the recent digitalization of the original manuscript by the Bavarian State Library now provides full access to this source.<sup>219</sup> Regrettably I came across this digitalization too late (only during the last month of my PhD – project) to conduct a thorough analysis of it. Still some, albeit brief and provisional remarks to this very exciting source can be made.

The *Kollegienbuch* is the earliest surviving piece of Münster's geographical output. It is a document which enables us to look at academic conventions, and interests in geographical education, at the turn of the century. As Patrick Gautier Dalché, has rightly argued, "The content of the book, together with subjects that are associated with geography and cartography, provides us with clear information regarding the intellectual environment within which these disciplines were practiced".

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<sup>217</sup> Sebastian Münster, "Kollegienbuch", BSB Clm 10691, (Tübingen 1515 – 1518) [BSB-Hss Clm 10691]. August Wolkenhauer, *Sebastian Münsters handschriftliche Kollegienbuch aus den Jahren 1515-1518 und seine karten*, (Berlin: Weidmannsche buchhandlung, 1909); Viktor Hantzsch, *Sebastian Münster: Leben, Werk, Wissenschaftliche Bedeutung*, (B. De Graaf, Nieuwkoop 1965 [Leipzig, 1898]); Robert W. Karrow, *Mapmakers of the Sixteenth Century and their Maps* (Chicago: Speculum Orbis Press 1993) pp. 410-434.

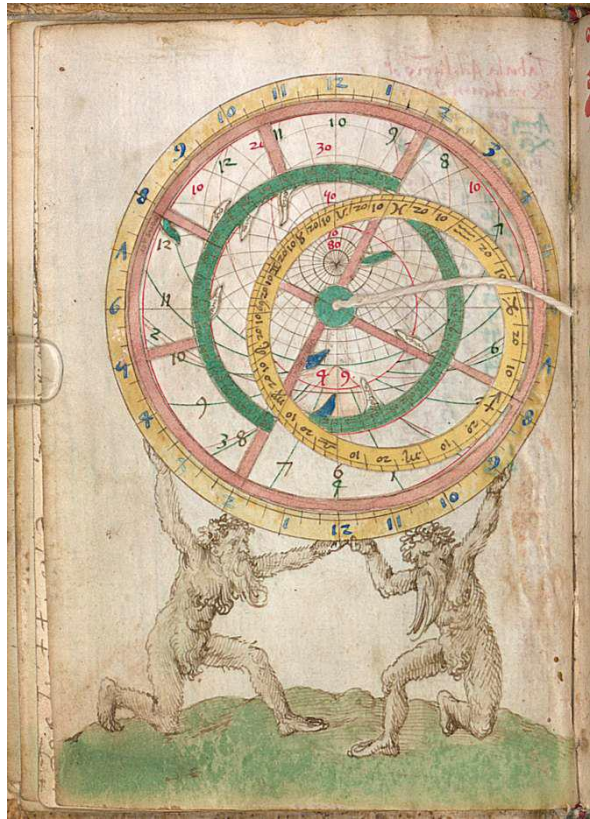
<sup>218</sup> McLean 2007, 164; Burmeister 1969.

<sup>219</sup> Münster, "Kollegienbuch".



**RII** Solis Luna

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6	16	21	x	idus	15	15	11	10	l
7	20	25	ix	nonae	14	18	8	13	z
8	24	29	viii	idus	13	21	5	16	4
9	28	31	vii	nonae	12	24	2	19	v
10	1	5	vi	idus	11	27	11	22	x
11	4	8	v	nonae	10	30	18	29	ii
12	7	11	iiii	idus	9	1	25	3	iii
13	10	14	iii	nonae	8	4	22	10	iiii
14	13	17	ii	idus	7	7	19	17	v
15	16	20	xi	nonae	6	10	16	24	vi
16	19	23	x	idus	5	13	13	31	vii
17	22	26	ix	nonae	4	16	10	3	viii
18	25	29	viii	idus	3	19	7	10	ix
19	28	31	vii	nonae	2	22	4	17	x
20	1	5	vi	idus	1	25	1	24	xi
21	4	8	v	nonae	11	28	8	31	xii
22	7	11	iiii	idus	10	1	5	7	kl
23	10	14	iii	nonae	9	4	2	14	ii
24	13	17	ii	idus	8	7	1	21	iii
25	16	20	xi	nonae	7	10	1	28	iiii
26	19	23	x	idus	6	13	1	3	v
27	22	26	ix	nonae	5	16	1	10	vi
28	25	29	viii	idus	4	19	1	17	vii
29	28	31	vii	nonae	3	22	1	24	viii
30	1	5	vi	idus	2	25	1	31	ix
31	4	8	v	nonae	1	28	1	7	x

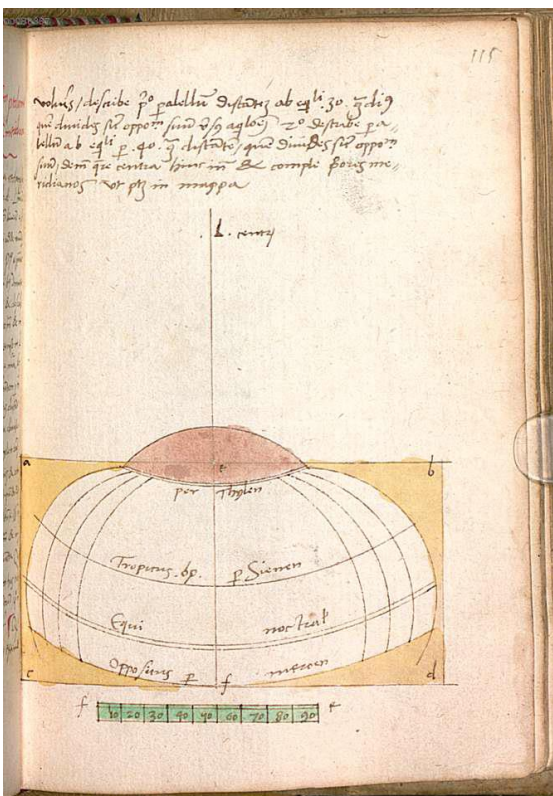


**Eclipses Luna Solis**

1497 May 1 8	1497 Octob 1 11	1498 April 1 17
1499 April 0 2	1491 february 1 14	1494 Decemb 1 10
1494 Iunij 1 21	1496 march 1 4	1498 April 10 28

*Sequuntur Eclipses & Calculantur Admiratione  
om vltimasom Act. Eleuazij 30 pch 3 q8. m. 24.*

1416 Decemb 0 3	1418 Iunij 1 11	1419 Octob 0 6
1420 Octob 0 3	1430 march 0 8	1432 Auguy 0 3
1434 Iannu. 0 4	1436 Iunij 1 7	1439 April 0 8
1440 April 1 11	1471 August 0 3	1444 Iannu. 1 11



Sebastian Münster, *Kollegienbuch*. Image 4) The month of March from a 12 pages long calendar [3r] Image 5) a sundial with moving parts [8v] Image 6) a fragment from a table of lunar and solar eclipses [14r]. 7) A diagram of Ptolemy's second map projection [115r].

The *Kollegienbuch* has 634 pages, (317 sheets recto and verso). Beginning with a 12 page long calendar it contains lengthy transcriptions of cosmographical literature, calendarical and astronomical tables, notes and calculations of movements of heavenly bodies. In addition to these, it contains drafts of astronomical instruments, and notes on astrology, bloodletting and physiognomy. The book is richly illustrated and has 44 manuscript maps and 65 very carefully drawn cosmographical diagrams (images 5 and 7). These are mostly dials made in full page size, and are oftentimes colored. Approximately one third of these dials have one or more movable parts which are fastened to the page with a thread and can be turned around like a clock.

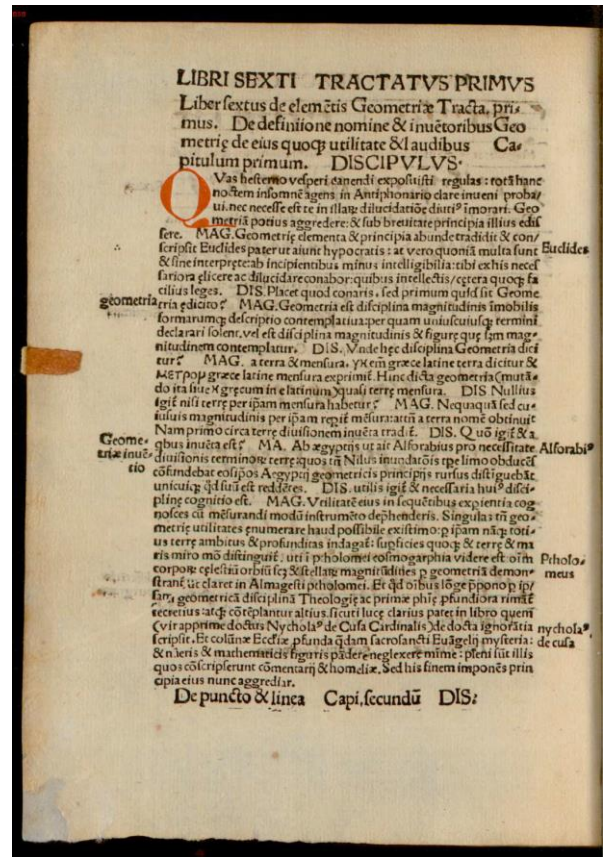
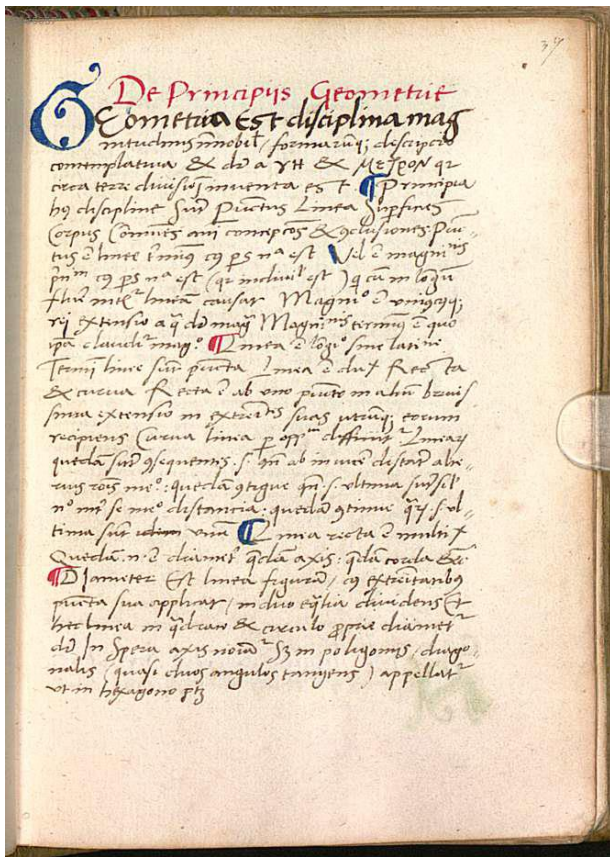
The *Kollegienbuch* is rich also in statistical data. It contains almost two hundred pages of various astronomical tables (images 2 and 6): These tables offer data about a number of astronomical phenomena: equations and declinations of the Sun and the Moon and their eclipses; accounts of motions of stars and planets and their longitudes; northern and southern latitudes.

The meticulous and detailed work of the diagrams make them look, not like average exercises, but more like actual tools made by a professional to serve in astronomical and calendarical calculations. These carefully created statistics of daily, monthly and annual variation of heavenly bodies, together with the astronomical dials could have been used as a manual for actual astronomical and calendarical observations. The instructions for the making of practical observational instruments like an astrolabe, quadrant and sundial let us speculate that these might have also been actually build and tested in astronomical and cosmographical ground work.<sup>220</sup> This hypothesis is supported by the fact that later in his career Sebastian Münster wrote several instructions on astronomical instruments (starting with the book called *Erklerung des newen Instruments der Sunnen*, which came out in 1528). Theoretical and practical instruments and statistics of astronomical phenomena also match with Johannes Stöffler's particular interests. Stöffler is known for his interest in astrolabes and planetary clocks, and his use of these with his calendarical calculations. The *Kollegienbuch* thus fits into the view according to which, while studying with Stöffler, Münster developed good skills in these areas.

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<sup>220</sup> See for instance, *Kollegienbuch* 96v, "Compo[sitio] Astrolabii / instr[ument]i nobilissimi. Astrolabium (quod a ptolomeo planisperiu[m] appellatur) [...]."





Left: image 8, Münster's "Kollegienbuch", 35r, first line."De Principiis Geometriae [...] Geometria est disciplina magnitudinis immobilis / formarumque descriptio contemplativa [...]"

Right: image 9, Gregor Reich, *Margarita Philosophica*, lib. 6 cap i. The definition of geography beginning on the line 15: "Geometria est disciplina magnitudinis immobilis formarumque descriptio contemplativa [...]"

Approximately two thirds of the *Kollegienbuch* consist of written notes on various related topics. It seems that the author of these notes has summarily transcribed lengthy fragments from several key works dealing with astronomy, astrology and geography. To know exactly which texts and which parts of these texts have been copied requires further investigation. It seems rather clear, however, that Reisch's *Margarita Philosophica* and the Ulm edition of Ptolemy's *Geographia* have been key sources. Here several formulations and definitions in the *Kollegienbuch* are highly reminiscent to those in the *Margarita Philosophica*. For instance the definition of astronomy on a page entitled as "epitoma astronomie" begins:

*Astronomia est certa lex regula / superiorum corporum magnitudines & motus considerans. Corpora superiora / coeli & astra intelligamus.*<sup>221</sup>

<sup>221</sup> *Kollegienbuch*, 49r.



The sentence is identical with the beginning of the definition of astronomy in Reisch's *Margarita*, book seven, cap ii :

*Astronomia est certa lex & regula superiorum corporum magnitudines & motus considerans. Corpora autem superiora coelos & astra intelligans.*<sup>222</sup>

The way in which the definition of geometry begins in the *Kollegienbuch* (image 8) is similarly reminiscent of that in the *Margarita*. *Kollegienbuch* argues:

*De Principiis Geometris [...] Geometria est disciplina magnitudinis immobilis / formarumque descriptio contemplativa [...]*<sup>223</sup>

*Margarita* begins (image 9):

*Geometria est disciplina magnitudinis immobilis formarumque descriptio contemplativa [...]*<sup>224</sup>

After the opening sentence, the author of the *Kollegienbuch* has reduced the expressions of *Margarita* but follows still the contents of the *Margarita* by explaining the Greek etymology of the word 'geometry'.

It would be good to know where exactly *Kollegienbuch* follows *Margarita*'s definitions and what has been omitted. Here it is perhaps sufficient to describe these connections only in a general way. Similarities between *Kollegienbuch* and *Margarita* are not limited only to their texts, there are several illustrations of *Kollegienbuch* which are also highly reminiscent of those found in *Margarita*. The sections of the *Margarita* which have interested the author of the *Kollegienbuch* the most are Reisch's books on geometry and astronomy. At first look it seems likely that almost all of the 65 astronomical diagrams in the *Kollegienbuch* originate in the *Margarita*. These astronomical illustrations have been copied very thoughtfully, sometimes improving the original or adding more details to it. For instance, the scribe of the *Kollegienbuch* has added the signs of the Zodiac and drawn sections of their pertinent places on the outer ring of the diagram (image 14), which in *Margarita* has been left with a sole note "zodiacus" on the outermost ring (image 15).

*Margarita*'s illustrations of geometry have been copied more selectively and sometimes with less detail (images 10, 11, 12, 13, 14, 15). The function of these images has of course been different, primarily demonstrative, and as such, they have not required similar

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<sup>222</sup> Reisch 1503, Liber. 7, Cap. ii. *De definitione nomnis origine ac Astronomiae primo inuentore. "Astronomia"*.

<sup>223</sup> *Kollegienbuch*, 35r.

<sup>224</sup> Reisch 1503, Liber 6, cap i. "Geometria".

precision as the astronomical diagrams. However, these illustrations have great similarities to those in the *Margarita* and follow the order of the original. Three “irregular bodies” in the *Margarita*’s section on practical geometry (image 11) “columnare pyramidale rotundum”, “pyramidale rotundum”, “pyramidale lateratum”, have been copied in the same order to the *Kollegienbuch* (10).<sup>225</sup> It seems that the author of *Kollegienbuch* transcribed lengthy sections of the *Margarita Philosophica*, arithmetic, geometry and astronomy (images), more or less faithfully.

The case of Ptolemy’s *Geographia* is even clearer. Ptolemy’s work is mentioned directly as the source in several places.<sup>226</sup> Also John of Eschenden’s astrological work *Summa astrologiae judicialis* is mentioned directly.<sup>227</sup> Astrological notes make up a significant share of *Kollegienbuch*’s content – approximately 80 pages. These notes consist of a treatise on “physonomia” which is a brief description of external forms of the human body, a treatise on bloodletting, several pages on the effects of planets on the human body, the mentioned summary of John Eschenden’s *Summa astrologiae judicialis*, and tables on the sites and movement of the signs of the Zodiac.<sup>228</sup> These notes reflect the fact that astrology was an appropriate and legitimate part of astronomy during this period. In the case of Münster, it is nevertheless interesting to have a concrete demonstration of this fact. Astrology never was an essential element of Münster’s own concept of cosmography. The *Kollegienbuch* raises the question, why? Although Münster’s calendarical works had some references to astrological medicine and to the importance of heavenly bodies in medical practice (see chapter X) he never wrote about the subject. Münster’s later texts have nothing that would signal a critical or opposing attitude to astrology. Perhaps Münster was simply drawn to maps, which ultimately lead him to focus primarily on geographical description, leaving little space for questions related to astronomy and astrology.

Münster’s interest in maps and geography is already apparent in the *Kollegienbuch*. The *Kollegienbuch* has 44 maps all meticulously drawn by hand with great detail. These maps include a copy of a pilgrimage map to Rome by Erhard Erzlaub, several maps of Germany and Italy covering approximately the geographical area of the Holy Empire and copies of Martin Waldseemüller’s maps. Most of these maps, however, originate in the Ulm edition of Ptolemy’s *Geographia* issued in 1482 by Lienhart Holl (and being the first

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<sup>225</sup> *Kollegienbuch*, 40r and 47r; Reisch 1503, book vi, cap., xi and book vi cap., xxxi.

<sup>226</sup> *Kollegienbuch*, 87v.

<sup>227</sup> *Kollegienbuch*, 284r, “Ex Summa Anglicana”.

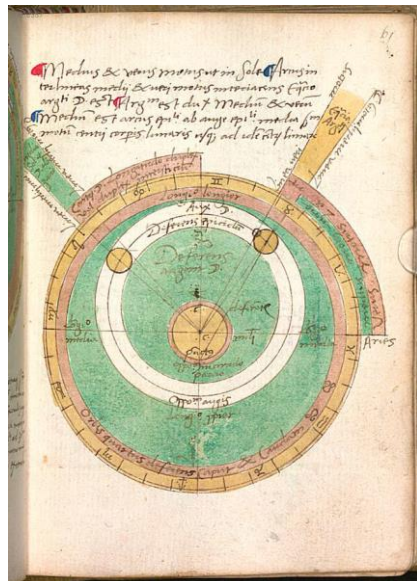
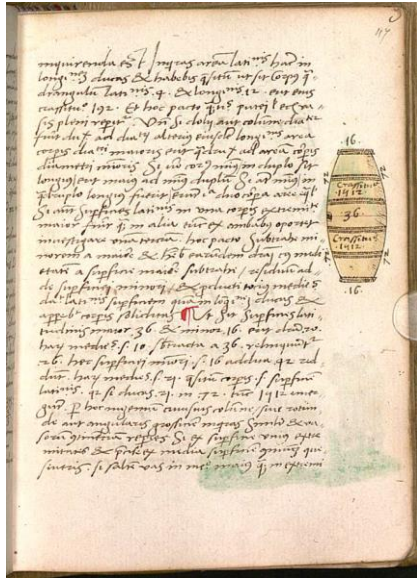
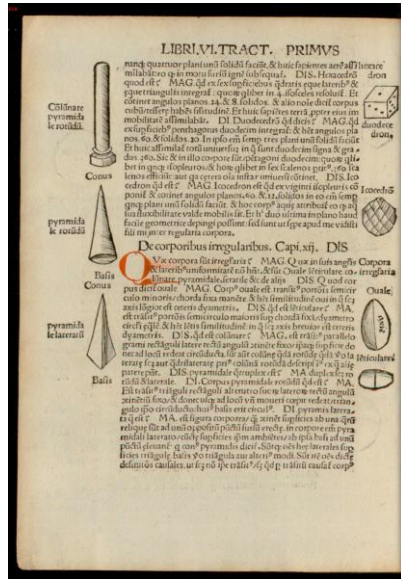
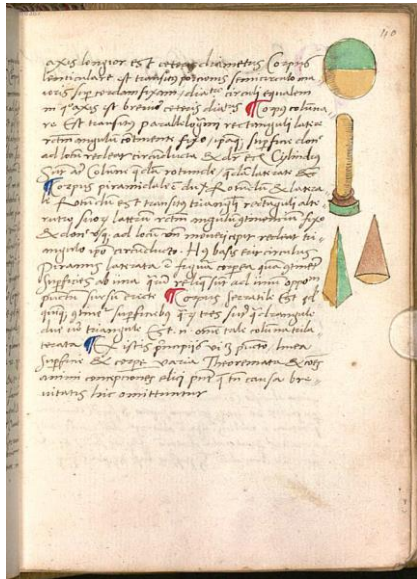
<sup>228</sup> *Kollegienbuch*, 241r- 288v.

version of Ptolemy's standard work published north of the Alps).<sup>229</sup> Ptolemaic maps have been copied with the accompanying text sheets naming the principal lands and provinces in these areas with their pertaining coordinates (See image xiv). The Ptolemaic cartographical panorama begins with a world map that is divided into two hemispheres, the western hemisphere showing northern and southern America. All twelve Ptolemaic maps on Europe are included describing Ireland, Britain, Iberian peninsula, Gallia, Germania Magna, Eastern Sean and Scandinavia, Northern Italy, Italian Peninsula, Corsica and Sardinia, Sarmatia, Dacia and Greece; in addition the *Kollegienbuch* contains also four maps of Africa, and another 12 maps of Asia.

Ptolemy's maps remained important for Münster throughout his career. Twenty years later Münster produced his own edition of the *Geographia*. The maps of *Geographia* were used again in the first version of the *Cosmographia* in 1544 – although they became mostly replaced by new ones in the 1550 -edition. Some exotic maps, however, like the map of *Taprobana* can be traced with minor changes all the way from the 1550 edition of *Cosmographia* to the *Kollegienbuch* (images 17 and 18).

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<sup>229</sup> Benjamin Weiss, "The Geography in Print: 1475-1530", pp.91-120, in Zur Shalev and Charles Burnett (eds.), *Ptolemy's Geography in the Renaissance*, 91.



Previous page:

First and second row.

Left, image 10: Münster, *Kollegienbuch*, 40r,

Right, image 11: Reisch, *Margarita Philosophica*, book vi, Geometriae practicae, cap xi.

Second row.

Left, image 12: *Kollegienbuch* 47r.

Right: image 13: Reisch, *Margarita Philosophica*, book vi, cap. xxxi [260].

Third row,

Left, image 14: Münster, *Kollegienbuch*, 61r, a diagram on the motions of the moon.

Right image 15: Reisch, *Margarita Philosophica*, book 7, cap xxxviii, De terminis tabularibus lunae.

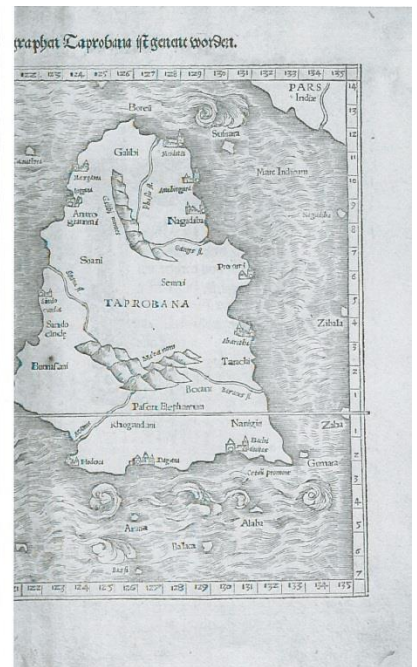
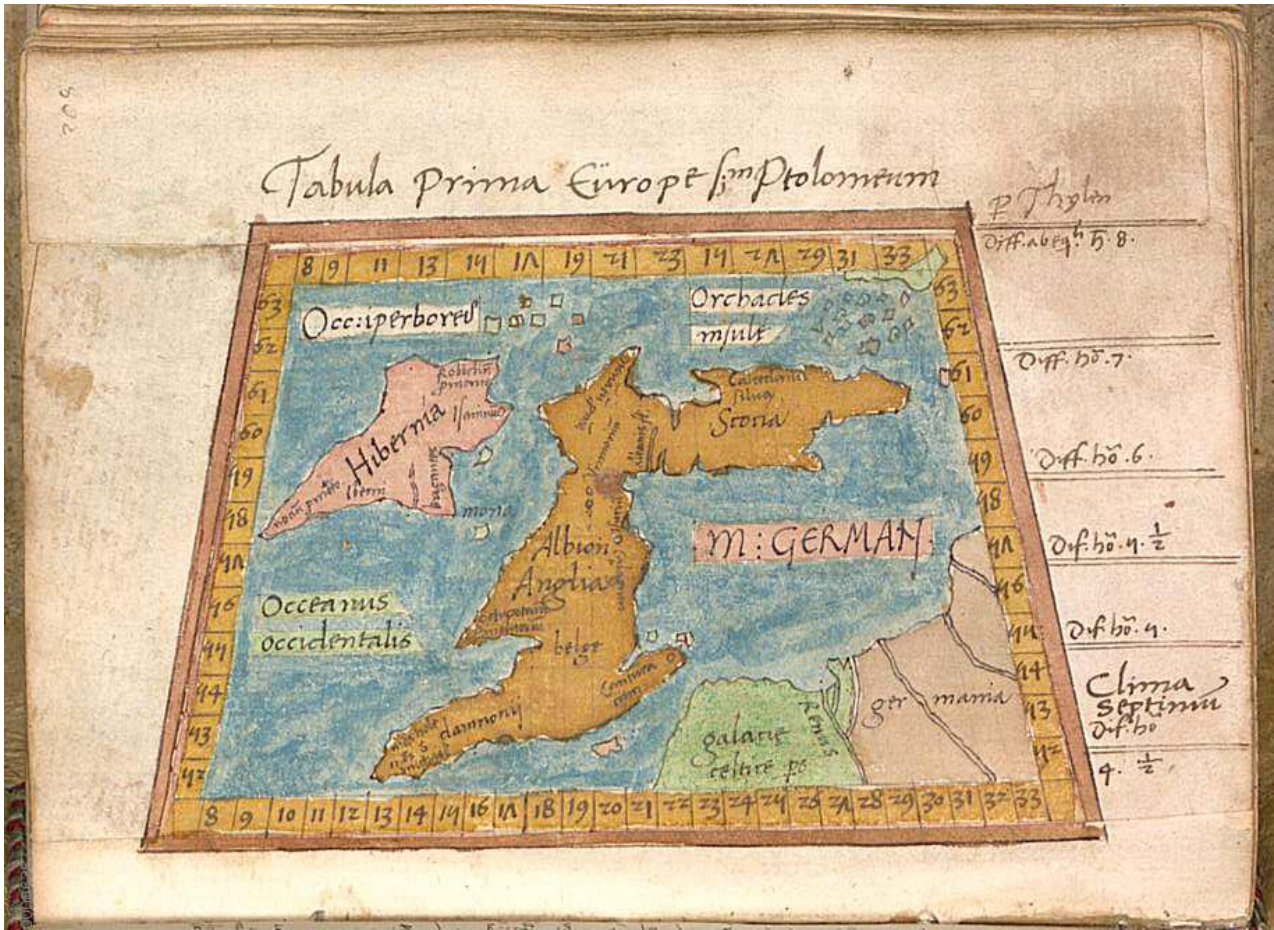
Next page:

First row, image 16: Map of Europe after Ptolemy, *Kollegienbuch*, 208r.

Second row left: Image 17: Münster, *Kollegienbuch*, 234v. *Duodecima Asie tabula, taprobana*.

Second row right: Image 18, Conrad Schnitt, *Sumatra eine grosse insel so von den alte Cosmographen Taprobana ist genent worden*. Sebastian Münster's *Cosmographia* 1544, fol.97-98.





Besides the 30 traditional Ptolemaic maps, the *Kollegienbuch* has another map section which includes a traditional Ptolemaic map of Germany, “Descriptio Germaniae

Ptolemeo”, and a handful of seemingly new regional maps of areas in Northern Italy and Germany. Perhaps the writer of the *Kollegienbuch* has sought to compare Ptolemy’s ancient geography to more recent accounts. The origin of these later surveys remains still unknown. Münster himself is not known for having conducted cartographical surveys before 1526.

The last section of the *Kollegienbuch* is a forty page long table, or “chronicle of important men”, covering 6723 years from the first man Adam to Pope Leo X in 1524.<sup>230</sup> This list is very general. It offers names of remarkable historical figures, like both rulers ancient and modern, and also important dates, such as date of birth or coronation. Following a medieval tradition the table has been divided into six world ages. These six, or oftentimes seven world ages (including the last eschatological age) were often used to give structure to medieval chronicles. Like medieval history writing in general this brief list also makes little differentiation between biblical salvation history and secular history. Particularly, in the first years of the catalogue, the focus is on the biblical heroes, the prophets and Judaic kings of the Old Testament.

The *Kollegienbuch* is more than a bundle of exercises written by a schoolboy, or a simple synopsis of quadrivium without music. Firstly, the astronomical diagrams and statistics in the book, numerous and extremely carefully realized, are clearly made by a professional. The book should perhaps be taken as a cosmographer’s toolbox that offered the necessary theories and instruments for making calendarical and cosmographical observations, drawing maps, and writing short instructional works. Secondly, it demonstrates the importance of the *Margarita Philosophica* and Ptolemy’s *Geographia* as central sources for theoretical understanding of cosmography in the early days of the century. In those sections where the *Kollegienbuch* discusses arithmetic, geometry and astronomy, similarities with Reisch’s *Margarita Philosophica* are many. It is also noteworthy that a good number of *Margarita*’s astronomical and cosmographical illustrations have been copied. It seems that the author of the *Kollegienbuch* has been most interested in *Margarita*’s general definitions and its useful theoretical instruments such as astronomical diagrams. These similarities nevertheless decrease when the author moves to study geographical issues. The most influential source here has been the Ulm edition of Ptolemy’s *Geographia*. The *Geographia* and the lively scholarly debate around it gave a more secure basis to the outline of geographical information than the relatively general cosmographical section of the *Margarita*.

The *Kollegienbuch* is carefully written and does not give the impression of being an “aimless” bundle of exercises. The combination of its various elements does not seem like

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<sup>230</sup> *Kollegienbuch*, 289r – 309v

a random assembly. Since the early fifteenth century geography and maps had become closely associated with the cosmographical branch of astronomy, but also with the mathematical methods studied in the quadrivium. Needless to say, geometry and arithmetic offered tools for defining coordinates of regions in the heavenly and elemental spheres. Simply put, the *Kollegienbuch* treats cosmography in the disciplinary framework provided by the quadrivium (save music of course). What seems to be missing? Firstly: there are no texts which would refer directly to natural philosophy. Secondly: there are no larger descriptive sections that would discuss local geography or provide descriptive portraits of local geographical realities. Perhaps these aspects have been discussed elsewhere? In Münster's case, however, no such records remain. These notions strengthen the view of the *Kollegienbuch* as a pragmatic set of instruments for calendarical and cartographical works. Moreover it clarifies the picture of Münster's earliest cosmographical roots stemming out of the Ptolemaic mathematical vein of cosmography.

### *Conclusion*

The *Kollegienbuch* provides a perspective for understanding the development of Münster's later geographical thought. Although the *Kollegienbuch* is not an original publication, it is a demonstration of how academic geography was practiced in the early sixteenth century. The disciplinary frame of this construction was mathematics, the quadrivium, to which geography/cosmography belonged as an integral part of astronomical studies. The theoretical basis of cosmography was provided by Ptolemy's ancient theories on the structure of universe, providing the key concepts for measuring time and space. In Sebastian Münster's mature works this Ptolemaic framework persisted but was remarkably expanded by additional layers of historical, cultural and ethnological material, which made the *Cosmographia* what it was, a world description. Here lies the essential difference between the view of cosmography given by the *Kollegienbuch* and the *Cosmographia*. In the *Kollegienbuch* detailed descriptions, both narrative and visual are limited to the set of Ptolemaic maps. Historical narratives and verbal chorographies are almost completely missing. That fact that copying and transcribing this material was difficult, explains a part. However, the role of historical description and chorographical narratives was minimal also in Reisch's *margarita*.

In the chronicle of remarkable men, which is the sole historical element in the *Kollegienbuch*, the concept of seven biblical world ages was applied as the structuring



principle. This system of periodization was used extensively in medieval chronicles, for instance in Hartmann Schedel's *Nuremberg Chronicle*. In the *Cosmographia* Münster decided to use a geographical structuring principle, which drew a clearer distinction between biblical salvation history and mundane world history.

Moreover, the *Kollegienbuch* strengthens the picture of Gregor Reisch and Johannes Stöffler as important figures in Münster's formative years. While the numerous statistics and astronomical tables in the book give us a glimpse of what it meant to study astronomy and cosmography under Stöffler, several sections clearly drawing from *Margarita Philosophica* demonstrate the central role of Reisch's book in Münster's cosmographical education of this period.



## Chapter IV

### Münster, Melanchthon and the Reformation

#### *Stöffler's students*

Sebastian Münster and Philip Melanchthon were both Stöffler's students. Melanchthon came to Tübingen in 1512; Münster arrived two years later and they both left Tübingen in 1518.<sup>231</sup> It is probable that their decision to leave was caused by Stöffler's lessening academic activity.<sup>232</sup> In March 1520 Conrad Pellikan wrote Martin Luther a letter, which shows that by that time Münster and Melanchthon already knew each other.<sup>233</sup> It seems natural that their acquaintance had started at Tübingen while studying under Stöffler. Although Melanchthon was 11 years younger than Münster and only 15 when he entered Tübingen, he was already an astonishingly well learned man. Melanchthon had studied in the illustrious Latin school of Pforzheim, (together with another child prodigy, Simon Grynaeus) and had obtained proficiency in classical languages. He showed a Particular talent in Greek. By the age of twelve he had entered the University of Heidelberg, where he studied philosophy, rhetoric and astronomy. Young age prevented Melanchthon from obtaining a master's degree, and he decided to leave for Tübingen. When Münster and Melanchthon supposedly met, which must have been in 1514, Melanchthon was not a fledgling, but a promising young scholar. Whether or not Münster considered this young bachelor as his equal, remains a mystery. But of these two, it was Melanchthon who first had his own work published. Melanchthon's Grammar of Greek was printed in 1518, Münster's Grammar of Hebrew was published two years later.

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<sup>231</sup> Burmeister 1969, 27.

<sup>232</sup> ADB, Band 36, 317.

<sup>233</sup> Konrad Pellikan to Martin Luther in 15<sup>th</sup> of March 1520. The letter has been printed in Ernst Staehelin, *Das Buch der Basler Reformation*, (Basel: Helbing & Lichtenhahn, 1929), 25-30. Another of our [Franciscan] brothers, lecturer of theology, Sebastian Münster, a man who is not unfamiliar to your, no, to our Melanchthon, a trilingual, an excellent professor of mathematics, and since one year also a teacher of scholastic theology to our brothers, a wonderful man full of spirit, and the most eager amongst my students has receded from all of his work to translate your interpretation of the Ten Commandments, and let it print for huge benefit of printer. *Ein andrer unsrer Brüder, der theologische Lektor, Sebastian Münster, Deinem, nein, unserm Melanchthon kein unbekannter, dreien Sprachen kundig und ein ausgezeichnete Professor der gesamten Mathematik, seit einigen Jahren auch Übermittler der scholastischen Theologie für unsre Brüder, ein wunderbar geistvoller Mann, ist unter meinen Hörern zur Zeit der allereifrigste. Der hat alle seine Studien zurücktreten lassen vor der Arbeit, Deine Auslegung der zehn Gebote ins Deutsche zu übersetzen, hat sie drucken lassen, und sie geht zum gewaltigen Nutzen für den Drucker gut ab.*

However, Stöffler had a great influence on his students: Münster honored Stöffler later as ‘præceptor fidelissimus’<sup>234</sup> and the young Melanchthon praised his teacher with an overwhelming poem:

Joyful master of Apollonian arts,  
Noble Stöffler, renowned in the entire World,  
You determine the fields of  
Silently running stars,  
These Signs, by which  
We are governed, and of which we are born.  
Your fame prompts you to make a new book to Phoebus.  
A gift that is more welcome  
Than the wings of Daedalus.<sup>235</sup>

Thinking about Stöffler’s influence on Münster and Melanchthon it is important to see that Stöffler understood geography as an integral part of astronomy, a mathematical discipline. Therefore, talking about geographical authorities, Stöffler’s emphasis was more on Ptolemy than Aristotle. Ptolemaic, mathematical, approach to astronomy and geography enabled Stöffler to get distance from theological and metaphysical questions, which continued to be essential for people like Reisch. Whatever Stöffler’s religious convictions were, he understood his task as a geographer primarily as a corrector and critical editor of texts, not as a theological commentator.

Despite his Humanistic methods, Stöffler’s study of nature remained within the traditional scheme. Stöffler understood astronomy as “natural theology” and saw it analogous to theology proper. Whereas theology, according to Stöffler, “with the supernatural faith led to

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<sup>234</sup> Burmeister 1969, 27.

<sup>235</sup> Johannes Stöffler, *Elucidatio fabricae ususque astrolabii*, Oppenheim 1513, fol. XII, First cited in Karin Reich, “Melanchthon und die Mathematik seiner Zeit” in Günther Frank and Stefan Rhein (eds.), *Melanchthon und die Naturwissenschaften seiner Zeit*, (Sigmaringen: Jan Thorbecke, 1998). *AD IOANNEM STOFFLER/ PHIL. MELANCHTHON/ PRETTANUS/ Foelix actiaçe magister artis/ Stofler nobilis: enitens probate/ Orbis, que iuga perferant volucres/ Astrorum tacito graues meatu/ Signas, hoc regimurque viuimusque/ Prognati imperio, lubente fama/ Pennis munera gratiora librum / Phoebos dedaleis nouum reponis.*

the knowledge of God”, astronomy instead, “with natural reason led to the knowledge of the divine.” Like Reisch and other scholastic natural philosophers Stöffler thought that both the supernatural and natural belonged to one indivisible system. He did not distinguish between natural truths and supernatural ones, but believed instead that natural truths were subordinate to supernatural ones. Ultimately, Stöffler thus agreed with traditional natural philosophy and urged his students to “move from the effects [movements of natural bodies] to the knowledge of causes [metaphysics and theology]”.<sup>236</sup>

New theological ideas brought by the Reformation made the distinction between physics and metaphysics clearer. However, Stöffler’s conviction of geography as way to understand God’s will, and his critical attitude towards the ancient knowledge can be seen in the geographical thought of Münster and Melanchthon.<sup>237</sup>

### *Münster Connects with Basel*

Between 1518 and 1519 Münster moved from Tübingen to Basel where he was asked to lecture by the Franciscan order. Münster remained at Basel roughly till 1520-1521. In this period one has clues of Münster’s first encounters with Lutheran ideas, but whether he continued his contact with Melanchthon, is not known. Unfortunately, Münster’s remaining correspondence leaves a lacuna, which led Münster's biographer, Karl-Heinz Burmeister, to lament: “Where are Münster’s letters to Luther and Melanchthon that we know he had written?”<sup>238</sup> Münster wrote four to six letters daily, of which only 50 letters remain. None of these remaining letters tells us directly about discussions with Melanchthon or Luther. However, the letter which Conrad Pellican sent to Luther in March 1520, leads us to assume that Melanchthon and Münster knew each other already by this period.<sup>239</sup> It is also a fact that Münster’s teacher Conrad Pellican was getting closer to the evangelical protest movement and interested in Luther’s message in this period. During this period Münster also started to work for the famous Printer Publisher Adam Petri, well-known for his Lutheran output.

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<sup>236</sup> Johannes Stöffler, *Procli Diadochi*, (Tübingen: Huldreichus 1534), 2. *Et ideo astronomia haud indigne naturalis theologia nominat. Quia sicut superior theologia ad DEI cognitionem per supernaturalem fidem inducit: sic ista tanquam inferior ancilla, eidem subseruiens, ad diuinæ cognitionis introductionem per naturalem rationem manu ducit. Nam per effectus in cognitionem causae descendimus.*

<sup>237</sup> Hoheisel 1979, 77.

<sup>238</sup> Burmeister, *Briefe Sebastian Münsters : Lateinisch und Deutsch*, (Frankfurt : Insel 1964), 9.

<sup>239</sup> Konrad Pellikan to Martin Luther in 15<sup>th</sup> of March 1520. In Ernst Staehelin, *Das Buch der Basler Reformation*, (Basel: Helbing & Lichtenhahn, 1929), 25-30.

Indeed, very early on Basel had become an important centre of Lutheran publishing, second only to Wittenberg. Over 200 texts of Luther were printed in Basel by the 1520s.<sup>240</sup> A good share of these entries was produced by the Petri family that had been the most important evangelical publisher in the town since 1518. By 1520 Sebastian Münster and Conrad Pellican were working as correctors for the Petris. Münster translated also a tract by Luther on the Ten Commandments *Decem Praecepta Wittenbergensi Praedicata Populo* which Adam Petri published in 1520.<sup>241</sup> During this period Münster was also preparing his first own published work, *Epitome Hebraicae Grammaticae*, a modest textbook on Hebrew grammar that was based on the lectures of Pellikan.<sup>242</sup> The grammar, however, was not published by Petri but by the Frobens, Erasmus' publishers. These two publications were important steps for Münster as they started his lifelong cooperation with the printer-publishers of Basel. Münster developed a close relationship with the Petri-house. Later in 1528, having abandoned his robe, Münster married Adam Petri's widow, and Adam's son, Heinrich, became responsible for publishing Münster's works, also the *Cosmographia*.

### *Time in Heidelberg*

Since 1518 Münster was thus more or less engaged with printing, and also with Luther's message, which he simply couldn't ignore while working with Pellikan and the Petri-family. In 1520, however, the debate over Luther's ideas was heating up, and attitudes hardened. In 1521 Münster left Basel and settled in Heidelberg. Burmeister believes that the reason for this was Münster's religious order's will to protect their ascending scholar from "heretic" influences. Unlike Basel, Heidelberg was a conservative stronghold which did not celebrate new unorthodox ideas. But Heidelberg offered also career opportunities for Münster, who received a chair of Hebrew at the University of Heidelberg in 1524.

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<sup>240</sup> Urs B. Leu, "The book and reading culture in Basel and Zurich during the Sixteenth Century", pp.295-319 in Malcolm Walsby and Graeme Kemp (eds.), *The Book Triumphant. Print in Transition in the Sixteenth Centuries* (Leiden: Brill, 2011), 306.

<sup>241</sup> Burmeister 1964, 95-97. "Der Zehen gebot ein nützliche erklerung Durch den hochgelerten D. Martinum Luther Augustiner ordens beschriben vnd gepredigt weltlichen dienende."

<sup>242</sup> Sebastian Münster, *Dictionarium Hebraicum*, (Basel: Froben, 1525). Ten years later Münster mentions Hieronymus Froben (son of Erasmus' printer), alongside with the professor of law Bonifacius Amerbach and Simon Grynaeus as one whom he discussed the received geographical material with. See, Münster's letter to Ägidius Tchudi in 1537 in Burmeister 1964, (epp. 4), 27. *Exhibui chartam [Lauer Bonifaz] Amerbachio, [Simon] Grynaeo, [printer Hieronymus] Frobenio et aliis doctis viris, qui omnes mirati sunt industriam tuam atque laborem antehac a nemine mortalium tentatum.*

Most of Münster's grammatical works came out during his stay at Heidelberg. Münster's linguistic output ranged from grammars and commentaries to biblical texts, and he also edited works of rabbinic scholars like Italian Elia Levita. Münster's skills were not limited to Hebrew, but he mastered also Aramaic and Ethiopian. In Heidelberg Münster's scholarly network was expanding. Münster kept close ties with his mentor Konrad Pellican, who lived now in Zurich and was getting increasingly involved with religious protesters. With Pellican also the Alsatian humanist Beatus Rhenanus and the lawyer Bonifaz Amerbach entered into Münster's closest circle. Through Amerbach's mediation Münster received Jewish manuscripts and established good scholarly connections with Jewish Scholars of Avignon, a French centre of Jewish culture. By the standards of Münster's period his connections with Jewish scholars were exceptionally good. Obviously some of Münster's fellow Christians found this worrying, ten years later Luther even assumed that Rabbis had misled Münster, making his Old Testament translation too Jewish! At Heidelberg, however, Münster came also to know the Humanist Simon Grynaeus (1493-1541), who was Münster's colleague, a professor of Greek at the University of Heidelberg. Grynaeus was to play central role in attracting Münster to the side of religious non-conformists.

Although Münster's period in Heidelberg was rich in linguistic publishing and his scholarly network was expanding, it turned out to be increasingly troubling. The reason for this was problems with the University officials of Heidelberg. Basel was radicalizing but Münster continued to maintain his close relationship with the scholars and printers of the city. The intellectual atmosphere of the Swiss town seemingly pleased him and he kept visiting the city regularly.<sup>243</sup> For the University of Heidelberg, occupied by the adherents of scholastic theology, Münster's continuous trips to Basel became a matter of frustration. Münster's intellectual activity and literary output fell in the latter half of the 1520s due to a spiritual crisis caused by his difficulties.<sup>244</sup> In 1526 Münster was already getting ready to leave his order and move permanently to Basel. He wrote to Beatus Rhenanus:

But to travel about in a monk's hood, even though it was not rare before now, is now however wholly reproachable. One is not allowed to cast aside monk's hood with ease: unless perhaps future Diet of Speyer will provide for freedom of monks, which I do not, however, believe. What shall I do now? I desire that release, and to be as other good Christians are, but that is not permitted at this time, when I am better known to the world than is my wish. I am now preparing some small books of the Hebrew and Chaldaic languages, yet

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<sup>243</sup> McLean 2007, 15.

<sup>244</sup> Burmeister 1969, 53.

I do not know whether I will obtain permission to go to Basel through my petitions to my superiors. If I am denied that, perhaps I will consider something other.<sup>245</sup>

Münster's comments about his realities are rather laconic. To leave his safe job at Heidelberg and to cast away his habit he wanted to have some security in compensation.

What happened in Heidelberg after that letter of 1526 is not well known, but by 1529 things came to an end. The spread of the evangelical movement in Swiss cities and south-German lands was obviously making the atmosphere at Heidelberg tenses. The reformation of Basel gave Münster the final push to leave Heidelberg.

### *Münster Moves to Basel*

Basel, a city on the Rhine in the north-eastern border of the Swiss Confederation, was a flourishing mercantile centre. Since 1460 Basel had also had a University, and in the first decades of the sixteenth century the city began to rise to wide European fame as a tolerant Humanist stronghold and the home of the great Erasmus. The city had famous printer publishers like Johannes Amerbach, the Froben and the Petris.<sup>246</sup> In the 1530s and 1540s the printing industry of Basel – like that of the neighboring Zurich – benefited from the book demand that was boosted by the Reformation which stimulated everyman's literacy and emphasized the importance of good education.<sup>247</sup> Zurich and Basel were both active in the printing of religious literature, importantly however, in books on medicine, science and literature, printers and editors of Basel were well ahead of its neighbor.<sup>248</sup>

After Wittenberg, Basel was the most important centre of Lutheran publishing.<sup>249</sup> The printing press, the fairly young university, and Erasmus' circle made Basel a favorable place for the seed of the Reformation to grow. But as important a factor as these, was the example of Zurich, where the evangelical movement led by Huldrych Zwingli had taken a radical course. In the Swiss lands Zwingli had become the centre of a network of likeminded

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<sup>245</sup> Sebastian Münster, a letter to Beatus Rhenanus on 9 march 1526. BSB, epp. 15. Translation in McLean 2007, 15.

<sup>246</sup> For a standard catalogue of Basel's printers and its books of the period with a particular interest in illustrations see Frank Hieronymus, *Basler Buchillustration 2, 1500 bis 1545* (Basel: Universitätsbibliothek Basel, 1984).

<sup>247</sup> Leu 2011, 319.

<sup>248</sup> *Ibid.*, 304.

<sup>249</sup> *Ibid.*, 306.



humanists and priests that spread the movement further.<sup>250</sup> It was by the theological direction of Zwingli that the image question became closely intertwined with the Swiss reformation, with historical consequences. Initially Zwingli considered himself as Luther's follower and ally, but by the mid 1520s it had become clear they had theological differences which prevented developing an alliance. Zwingli shared Luther's view of justification by faith only, but emphasized that the process of salvation was purely spiritual. According to Zwingli corporeal elements, "flesh" was of no avail in salvation. Therefore Zwingli, unlike Luther, called for complete abolition of the mass, full rejection of adoration of saints and pure and simple service.<sup>251</sup> Although Zwingli did not support "unlawful" iconoclast violence, which he believed played into opponent's side, he endorsed legal removing of the devotional objects. In June 24 of 1524 the Zurich magistrate decided to remove all religious imagery from churches.<sup>252</sup> Zurich's legalized iconoclasm became a model for authorized iconoclasm throughout reformed Europe.<sup>253</sup>

At Basel, first protests against the established church broke out in 1522. The questions of faith had gradually turned into an internal conflict which became mixed with a fight over political and economic control of the town. Basel's strong guilds worked as a motor for religious change. On 8 February 1529 eight hundred guildsmen gathered to demand from the city council a political and religious change.<sup>254</sup> The demands asked also for more power for the guilds and for the small council to be elected from the big council, targeted the old oligarchy of town. The events turned violent unrestrained iconoclastic riots in local churches. The incident in Basel has been estimated to be the largest illegal act of iconoclasm in Europe before 1560.<sup>255</sup>

It is generally assumed that Simon Grynaeus played a pivotal role in getting Münster to Basel and winning him over to the Reformation's cause. On 1<sup>st</sup> of April 1529 the so called *Reformationsordnung* was executed, and the University of Basel became officially reformed. Some teachers who were faithful to the old faith considered it better to leave. A couple of new professorships were also established. As an outcome of all this, the chairs of

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<sup>250</sup> Gordon 2002, 87.

<sup>251</sup> Sergiusz Michalski, *Reformation and the Visual Arts : The Protestant Image Question in Western and Eastern Europe* (London ; New York : Routledge, 1993), 51.

<sup>252</sup> Willem van Asselt, "The Prohibition of Images and Protestant Identity", pp. 299-312 in W.J. van Asselt, Paul van Geest, Daniela Muller (eds.), *Iconoclasm and iconoclasm: struggle for religious identity* (Leiden: Brill, 2004), 304

<sup>253</sup> Lee Palmer Wandel, *Voracious idols and violent hands: iconoclasm in Reformation Zurich, Strasbourg, and Basel* (Cambridge: Cambridge University Press, 1995), 22.

<sup>254</sup> Bruce Gordon, *The Swiss Reformation* (Manchester: Manchester University Press, 2002), 108-112.

<sup>255</sup> Lee Palmer Wandel, *Voracious idols and violent hands: iconoclasm in Reformation Zurich, Strasbourg, and Basel* (Cambridge: Cambridge University Press, 1995), 22.

Hebrew and Greek became vacant.<sup>256</sup> Johannes Oecolampadius wished to see Simon Grynaeus, already a Professor at Heidelberg, to take the chair of Greek, and the city council affirmed his proposal.<sup>257</sup> The Chair of Hebrew instead was planned for Boniface Wolfhardt, a Strasbourg based scholar. Wolfhardt confirmed and traveled to Basel in order to take the post. Soon after his arrival, however, Wolfhardt for some reason rejected the nomination, and ultimately the chair was delivered to Münster. Burmeister and McLean have reconstructed these events on the basis of Oecolampadius' correspondence. They assume that Wolfhardt's departure was largely due to Grynaeus' intention to win Münster over to Reformation's side.<sup>258</sup> In 1529 Münster travelled to Basel obtaining the chair of Hebrew which he had until his death in 1552. Moving to Basel, Münster also rejected his frock and married Anna Selber, the widow of printer publisher Adam Petri, whose son Heinrich had taken charge of the family enterprise. Since 1529, most of Münster's works, including his Bible editions and the *Cosmographia*, were published by Heinrich Petri.

His good job at Basel encouraged Münster to leave the Franciscan order and convert to a new faith. Matthew McLean has drawn a very undramatic picture of Münster's conversion. The obligations of his order to teach and travel seemingly tired Münster. Besides these burdens, McLean sees no other rifts between Münster and the Franciscans. Accordingly, the major cause for Münster's shift to the evangelical faith, McLean points out, was his close ties with Basel, its printers and scholars.<sup>259</sup> Münster was not a revolutionary theologian, nor a religious zealot or fiery demagogue. This however, did not save him from being portrayed as an example of heterodoxy by some of his Catholic critics. Münster appears for instance in a catalogue of heretics written by an Italian monk Iacopo Moronessa da Lezze: "Il Melantone, il Buciero, il Zwinglio, il Mu(n)stero, il Farello, il Lamberto, il Pellicano, et Ecola(m)padio".<sup>260</sup> Quite interestingly, Münster is mentioned here among the most important leaders of the reformation, Melanchthon, Bucer, Zwingli and Oecolampadius. Why he was estimated to be such a powerful foe is probably due to his Bible translation, which as a work of a linguist, differed from the canonized *Vulgate*. (It is good to notice however that Münster's Old Testament translation left also Luther and Melanchthon unsatisfied.<sup>261</sup> Münster's tight focus on linguistical aspects at the expence of theological concerns seemingly irritated both

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<sup>256</sup> Reformations ordnung in Stähelin, Basler Ref., 198.

<sup>257</sup> Amerbach, Bonifacius, [Hartmann, Alfred (ed.)], *Die Amerbachkorrespondenz Bd. 3. Briefe aus den Jahren 1525-1530* (Basel: Verlag der Univ.Bibl. 1947).

<sup>258</sup> McLean 2007, 32, also Burmeister 1969, 54-56.

<sup>259</sup> McLean 2007, 32.

<sup>260</sup> Burmeister 1969, 103. also Herminjard 1868, 6. Bd., 465. Iacopo Moronessa, *Il Modello di Martino Luthero*, Venezia 1556, 353.

<sup>261</sup> Münster to Heinrich Bullinger on 6<sup>th</sup> of April 1539, BSM, epp. 8.

Catholics and Lutherans) Münster appears also in the *Index librorum prohibitorum* and among 15 heretical leaders portrayed by the Jesuit Andreas Frusius in his mocking epigrams.<sup>262</sup> Yet in the midst of the rising religious controversy, it was hard to avoid being labeled as a heretic by one party or another. Münster's correspondence that transcends all religious boundaries, however, shows how little religious partisanship interested the scholar himself.

Interestingly, the move to Basel seems to have triggered off the geographer in Münster. Although Münster had studied natural philosophy and geography under such famous teachers as Reisch and Stöffler, he had remained a Hebrew scholar. By the time he moved to Basel, however, one can see his interest in the study of nature grow. This can be seen in the increasing number of publications on astronomical and geographical topics. An introduction to the use of sundials, *Erklerung des neuen instruments der Sonnen*, (1528) marks the beginning of this new era. In 1528 Münster also made his first research travels to the northern parts of the Rhine. Münster's first geographical work, *Germaniae descriptio*, was a mathematical commentary on Nicolas of Cusa's Map of Germany, and was published in 1530, a year after he had settled in Basel. In 1531 Münster prepared a world map with Hans Holbein of Simon Grynaeus' collection of travelogues of the new world. And more was to come. During the 1530s Münster edited a number of editions and commentaries on ancient natural history and geography, editing Ptolemy, Pomponius Mela, Solinus and Strabo. He also conducted new research trips: in 1537 Münster studied Hegau and Schwarzwald; in 1545 he explored western parts of Switzerland and the mines of Lebertal, and in 1546 he traveled to Schwabia. By travelling, editing ancient geography, and discussion with other scholars, he gathered a massive library of historical and geographical information which provided the foundation for the *Cosmographia*. From the late 1520s one can thus see a Hebraist Münster turning into a student of nature. During this period however, a parallel phenomenon was taking place in Wittenberg, where Luther's theological reforms had set new challenges for education. In order to respond to these, Münster's old school mate Philip Melancthon ended up developing a novel concept for natural philosophy, that was greatly influenced by Luther's theology.

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<sup>262</sup> Burmeister 1969, 103.

Münster's alliance with the new theological ideas happened relatively late, at least in comparison to his schoolmate, Philip Melanchthon, who got involved in the Reformation 12 years earlier, right after the period with Johannes Stöffler at Tübingen. As 19 year old Philip Melanchthon received his Master of Arts at the philosophical faculty of the University of Tübingen in 1517, the attention of many young scholars was caught by a peculiar episode at Wittenberg. On 26 of April 1517, an Augustinian friar, Doctor Martin Luther, nailed 95 theses on a door of the castle church of Wittenberg. He criticized the Church's practice of collecting indulgences and launched a theological debate that spread out like wildfire to all of Europe from the small University town of Wittenberg in the remote Duchy of Saxony. As is well known, Luther's opposition to indulgences was grounded on his steadfast conviction that man was saved by faith in the crucified Christ alone. In the atonement of Christ, Luther believed, man was directly before God. To save one's soul, faith in Christ was enough. No mediators, no good works, no clergy, saints or pilgrimages were needed. Luther's views stood in sharp contrast with the prevailing theological tradition which claimed that man was saved by faith and good works. Traditionally, controversial spiritual issues like this were submitted to the Holy Roman church and its head the bishop of Rome. Luther, however, had no intention to take back his arguments, believing that Christian life had to be based on the Bible alone. As he could find no biblical proof for indulgences or purgatory, it had to be the theological tradition and the Holy See that had erred. Luther and Rome contested one another and question of indulgences turned into question of theological authority, and soon Luther found himself opposing both the Emperor and the Holy See. Luther's story might have ended here, had he not found refuge and political support. However, Fredric III, the Elector of Saxony, was convinced of the correctness of Luther's ideas and protected him, thus a local conflict expanded into a European wide religious contestation, which lead gradually to the split of Western Christendom and new religious and cultural realities.

Luther was not alone in demanding a spiritual regeneration of the Church. The idea of the renewal of the Church had been a permanent theme in medieval spirituality and was brought up again by Christian Humanists like Lefevbre d'Etaples and Erasmus. Importantly, many Humanists connected the corruption of the Church with the dominating scholastic theology, which they saw as outdated and unable to meet the educational and spiritual needs of the day. "One might sooner wind himself out of a labyrinth than the entanglements of the realists, nominalists, Thomists, Albertists, Occamists and Scotists",

Erasmus wrote in 1509.<sup>263</sup> These critics wished to abandon the endless commentaries of Aristotle and of the Church fathers, and called for a better understanding of original ancient texts. Instead of cutting original texts into empty logical propositions serving theological inquiry, the Humanists wanted to have a more comprehensive understanding of classical texts, enabled by better awareness of classical rhetoric. In these critics' views, the late medieval theological system had lost contact with reality.

Luther shared the Humanists criticism of scholastic theology. Already by February 1517, before the release of the 95 theses, Luther had attacked traditional theological views in a 'Disputation against the scholastic theology'. In this set of arguments Luther criticized the whole foundation of the scholastic thought and its main architects, Duns Scotus, Gabriel Biel, William of Occam and Pierre d'Ailly.<sup>264</sup> Luther denied syllogism as a valid form of inquiry in theology, and argued that theology had to be based only, and directly, on the Bible. Studies of Greek, Hebrew and Latin were sufficient for these needs and what Luther called "vain philosophy" had to be abandoned as it could result only in oblivion of the Savior and his Gospel. Luther attacked also Aristotle. It was not only that the Scholastic philosophers had misunderstood the ancient philosopher, but Aristotle himself, Luther claimed, was to theology "what darkness was to light."<sup>265</sup>

The worst error within the scholastic approach, however, was in Luther's eyes its attempt to find rational knowledge of God. Luther was convinced that the original sin had definitely cut the bridge between man and God, and attempts to know God with mortal cognition were simply empty speculations beyond man's intellectual limits. It was impossible and even arrogant to seek aspects of God with the "whore of Reason".<sup>266</sup> Relying on Aristotle and human rationality the traditional theology had, in Luther's views, gotten lost in speculation and had turned away from its genuine object, the Christ. "All Universities of our time are ignorant of the object of theology", Luther sounded out, "They do not know, what they ought to tell about. St Paul names the object of theology him, who was promised in the Scripture and by the Prophets. The object of theology is the Christ."<sup>267</sup> For Luther, Christ and his Gospel were thus the only legitimate objects of theology. Subtle philosophical discussions about interaction between the visible and invisible worlds had to be abolished. Geography,

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<sup>263</sup> Desiderius Erasmus, *The Praise of Folly*, translated by John Wilson, (Teddington: The Echo Library, 2009), 39.

<sup>264</sup> Kusukawa 1995, 32-33.

<sup>265</sup> Ibid.

<sup>266</sup> Kaufmann, Thomas, 'Die Ehre der Hure. Zum vernünftigen Gottesgedanken in der Reformation', pp.61-91 in Jörg Lauster & Bernd Oberdorfer (eds.), *Der Gott der Vernunft : Protestantismus und vernünftiger Gottesgedanke* (Tübingen: Mohr Siebeck, 2009). [A]

<sup>267</sup> WA, Tischrede (TR) 2, 242 Nr. 1868.

astronomy, natural philosophy and metaphysics that had assisted late medieval theological inquiry, had to be excluded from theological discussions. In Luther's understanding, the true theology had only two legitimate objects: "the sinful, guilty and depraved man and the justifying Savior."<sup>268</sup> Luther's spiritual insight of the 'sola fide' worked thus as an epistemological cutter. It cut through joints which in late medieval scholastic philosophy had tied together ancient learning, patristic teachings, Scripture, nature and God. During the next few decades all these elements were united again in Luther's co-reformer Philip Melancthon's natural philosophy, but in the process, their methods and aims changed remarkably.

Luther's 95 theses launched a flow of critical pamphlets, and on 26 of April 1518, the head abbot of the Augustinian order invited Luther to Heidelberg to defend his controversial views. In Heidelberg Luther presented 28 theses which he had prepared to support his views on grace, justification and free will, and twelve others where he attacked the Authority of Aristotle. In Heidelberg Luther's break with the traditional theology became evident, but his resolute performance before the audience gained him several supporters. Among those was Philip Melancthon who decided to leave to Wittenberg in order to hear more about Luther's ideas. The gifted young humanist was warmly welcomed at Wittenberg where his talents were badly needed. Melancthon became Luther's friend and important ally. Together Melancthon and Luther started to lead an anti-scholastic campaign at the University of Wittenberg, which resulted in series of curricular reforms.<sup>269</sup>

When Melancthon held his inaugural speech as a lecturer of Greek at Wittenberg in August 1518, Luther had started his campaign for the removal of the elements which he understood as contradicting the message of the Gospel. By these elements, Luther meant here particularly the philosophy of Aristotle that was taught according to the ways of Thomism and Scotism. Luther's vision was to base the study of theology solely on Gospel, and on purely scriptural groundings. In theological matters, no philosophy was needed. Aristotle had to be eliminated from the arts faculty; studies of classical languages and rhetoric sufficed. However, these extensive curriculum changes that Luther was campaigning for, could not be realized without an agreement from the formal head of the University, the

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<sup>268</sup> WA 40/2, 327,11-328,2. First cited in Helmar Junghans, *Spätmittelalter, Luthers Reformation, Kirche in Sachsen : ausgewählte Aufsätze* (Leipzig: Evangelische Verlagsanstalt, 2001). *Die Erkenntnis Gottes und des Menschen ist die göttliche und die eigentliche theologische Weisheit. Und sie ist so Erkenntnis Gottes und des Menschen, daß sie sich eigentlich auf den Gott, der rechtfertigt, und den Menschen, der Sünder ist, bezieht, so daß der eigentliche Gegenstand der Theologie der Mensch ist, der schuldig und verdorben ist, und Gott, der rechtfertigt und der Heiland ist.*

<sup>269</sup> Kusukawa 1995.

Electoral Fredrik III. Negotiating with Electoral's secretary George Spalatin, Luther soon realized that his proposals would not be executed all at once. Some essential revisions within the arts faculty, however had taken place already in 1518: Professors of Greek and Latin were newly appointed, reflecting Luther's ideal that ancient authors were to be read in original languages. Also a pedagogium of two masters was nominated to oversee the language instruction. Several new lectures were added. These included Quintilian, Priscian, new translations of Aristotle's *Logica*, *Physica* and *Metaphysica* and Pliny the Elder's *Historia naturalis*. But to Luther's great disappointment, Spalatin was reluctant to remove Aristotle's *Ethica* and *Physica* from the requirements.<sup>270</sup>

In *the Address to the Christian Nobility of Germany* (1520), Luther articulated for the first time a clear programme for the University Reform. Here his earlier criticism of Aristotle's philosophy became ever clearer: Aristotle's books *Logica*, *Rhetorica* and *Poetica* could stay, since they were useful for speaking and preaching. Luther approved also history, mathematics and the three languages, which belonged to the syllabus of arts. But all philosophical books of Aristotle, *Physica*, *Metaphysica*, *De Anima* and *Ethica*, were to be abandoned.<sup>271</sup>

It is good to remember however, that Luther did not target philosophy in itself, but the use of philosophy within the context of theology. When a Parisian theologian Thomas Rhadinus accused Luther of abandoning all philosophy because he knew it so badly, Melanchthon defended Luther. Melanchthon asserted that Luther did not reject all philosophy but accepted philosophy as "knowledge of gems, plants and living beings, written by Dioscorides, Pliny the Elder, Theophrastus and others including Aristotle."<sup>272</sup> Although the corrupt state of the human rationality, according to Luther, prevented use of reason within the context of faith, in other fields of human activity it remained valid – in politics or economy reasoning was even suitable. Also God's law could be understood by human reason. It was only in relationship to Christ that rationality lost its mandate.<sup>273</sup>

In April 1521 Luther was outlawed in the diet of Worms and disappeared into the custody of Fredric III at Wartburg. At the castle of Wartburg Luther lived under the false identity of Junker Jörg, and being protected from the Pope and Emperor by Friedrich, he concentrated to his Bible translation. Melanchthon took charge of the curricular reforms and negotiations with Spalatin. The following changes executed by Melanchthon at the University

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<sup>270</sup> Kusukawa 1995, 34-40.

<sup>271</sup> Kusukawa 1995, 42.

<sup>272</sup> Kusukawa 1995, 43.

<sup>273</sup> Kaufmann 2009 A, 79.

followed by and large those lines that Luther had drafted in the “Address to Christian Nobility.” The reforms at the University were interrupted by public unrest and riots which broke out at Wittenberg. Melanchthon did not have Luther's charisma as a spiritual leader and was largely unable to steer the events which started to turn increasingly restless. When unrest turned into riots and iconoclastic violence, Luther saw it better to return from Wartburg and take the charge at Wittenberg. Melanchthon's educational merits, however, did not go unnoticed. In 1523 he was appointed as the rector of the University and became largely responsible for the future development of the Evangelic revision of teaching at Wittenberg.

### *Active Phase in Melanchthon's Promotion of Natural Studies*

The curricular changes which took place in the University of Wittenberg during the early 1520s made space for future innovations, but do not yet mark a positive program of natural philosophy. A more active phase in the development of natural philosophy at Wittenberg begins at the same time Münster moved to Basel, at the turn of the 1530s.

According to Sachiko Kusukawa the stimulus for a more active promoting of philosophy came largely from Melanchthon's experiences of public unrest.<sup>274</sup> The Civil disobedience of the Peasants' War and the threat of Anabaptism worked as a reminder of the necessity of sound education. As a remedy Melanchthon voiced the necessity of better religious and philosophical studies. Melanchthon agreed with Luther that training in Grammar, Dialectic and Rhetoric was essential for theological studies, but what he felt was essential for restoring peace and order, was teaching of natural and moral philosophy. By the early 1530s natural philosophy was becoming an integral part of the arts curriculum at Wittenberg.<sup>275</sup> However, what was clear for Melanchthon, being the architect of the Lutheran doctrine, was that natural philosophy could not return to its old role as an auxiliary of theology. The Gospel being the only and sufficient basis of theology was a founding tenet of Lutheran theology. In order to follow this foundational framework Melanchthon re-introduced natural philosophy as the teaching of God's law.<sup>276</sup> Accordingly, the purpose of natural

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<sup>274</sup> Kusukawa 1995, 62-66.

<sup>275</sup> Kusukawa 1995, 134-139.

<sup>276</sup> Kusukawa 1995, 27-. Also Frank 1995, 90, 95. In the *Initia doctrinae physicae* Melanchthon explained his mature understanding of the matter in this way: Wie es aber in der Lehre der Kirche nötig ist, die Menschen oft an den Unterschied zwischen Gesetz und Evangelium zu erinnern, so [Bl. 29r] erinnere ich die Hörer im voraus daran, daß die physikalische Erkenntnis von Gott eine Erkenntnis des Gesetzes und nicht des Evangeliums ist. [...]Die ganze Natur ist geschaffen, damit sie ein Zeugnis über Gott gebe, und insbesondere das menschliche



philosophy was not to prove theological truths, but to demonstrate how God's law functioned in the world.

The Gospel and law dichotomy anchored Melanchthon's natural philosophy firmly within the immanent reality. Metaphysical and transcendental arguments were considered as the business of theologians, and dependent ultimately on God's revelation in the Scripture – accordingly, they were also considered beyond the field of natural philosophy. Melanchthon's understanding of natural philosophy as an immanent field of research ultimately led him to a radical reduction of the inherited concepts of Aristotelian metaphysics, as Günter Frank has demonstrated. According to Frank, Melanchthon sought to eliminate the Aristotelian substance-based model of causal explanation by reducing causal explanation to qualities inherent in *materia*, in other words accidents.<sup>277</sup> Behind this metaphysical reduction, which Frank calls “Ent-Ontologisierung”, was obviously a theological need to follow the Law and Gospel framework, as teaching of God's law natural philosophy was limited by human rational capacity. Beyond what was said in the Bible, man could not say anything about metaphysical aspects of the world.<sup>278</sup> Although Luther and Melanchthon in this way denied that man could reach “divine truth” with thought, mortal men could at least behold God's creation before their eyes, watch God's will to fulfil in nature.

Arts like medicine, botany, history, astronomy and geography suited well Melanchthon's vision of the study of nature as a study of God's law. During the 1520s Luther's attack against scholastic theology had already diminished metaphysical teaching and books in the Wittenberg curricula. Philosophical teaching, which could not be used to “distort” theological truths, remained and even increased. Natural history, medicine, and Aristotle's natural books, Pliny the Elder, Dioscorides and Galen were accepted. During the 1530s Melanchthon prepared a number of textbooks, commentaries and sermons which endorsed moral and natural philosophy. In these texts he paid particular attention to the concept of providence.<sup>279</sup> Sachiko Kusukawa has argued, however, that Melanchthon's understanding of providence was a distinctly Lutheran one. Unlike Zwingli who's strongly dualistic theology made a clear difference between the divine *spirit* and the world of *flesh*,

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Geschlecht. Philipp Melanchthon, *Initia Doctrinae Physiae*, translated by Walter Ludwig (Rahden: Marie Leidorf, 2008 [Wittenberg 1549]), 29.

<sup>277</sup> Günter Frank, “Gott und Natur: Zur Transformation der Naturphilosophie in Melanchthons humanistische Philosophie”, pp. 43-59 in Günter Frank and Stefan Rhein (eds), in Günter Frank and Stefan Rhein (eds.) *Melanchthon und die Naturwissenschaften seiner Zeit*, (Sigmaringen: Thorbecke, 1998), 52.

<sup>278</sup> In the table talk Luther had expressed his strong skepticism of the attempts to understand God's creation and nature – this argument however, has to be taken as a criticism of the earlier speculative natural philosophy. WA, Tischreden, Bd.3, 426.

<sup>279</sup> Kusukawa 1995, 129.

Melanchthon put his emphasis on how God's power and will are present in material created things.<sup>280</sup> The difference between Zwingli and Melanchthon becomes evident in their different methods proving God's providence. In his treatise on God's providence, *De providentia* (1530), Zwingli deduces the concept of providence from the goodness of God.<sup>281</sup> In Melanchthon's understanding instead it is precisely the material world, its design and arrangement which proves the providence. In the main exposition of his natural philosophy, *Initia doctrinae physicae* (1549), Melanchthon offers five arguments which prove providence:

- 1) The order of celestial motions implies a Creator who cares for mankind.
- 2) The innate knowledge of the distinction between good and bad in the human mind.
- 3) History testifies that crimes will be punished.
- 4) Geniuses who restore the empire are divinely inspired.
- 5) Significations and predictions of future events are signs of God's care for us.<sup>282</sup>

Melanchthon's five proofs are all a posteriori judgments of state of affairs in the observable immanent reality. None of these proofs are deduced rationally from theological principles (although they obviously contain religious prejudices foreign to today's science). An essential feature in Melanchthon's approach, however, is its indebtedness to stoic thought.<sup>283</sup> Kusukawa has pointed out that seven out of nine proofs Melanchthon used to proof God's existence in the *Initia doctrina physicae* originate in stoic philosophy, and that many of these proofs were used again as proofs of Providence.<sup>284</sup> A stoic deity that was "emphatically immanent" in the world fit Melanchthon's Christian worldview better than Platonic demiurge or Aristotelian unmoved mover.<sup>285</sup>

The providential approach to natural philosophy signified that all natural

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<sup>280</sup> Ibid., 107.

<sup>281</sup> The Differences between Melanchthon's and Zwingli's concepts of providence are discussed in detail by Manfred Büttner in *Regiert Gott die Welt. Vorsehung Gottes und Geographie – Studien zur Providentialehre bei Zwingli und Melanchthon*, (Stuttgart: Calver, 1975). However, Büttner's conclusion that Zwingli's conclusions were more "scientific" than Melanchthon's is somewhat odd, taking into account Melanchthon great interest in promoting natural studies. Although one is free to speculate how Zwingli's publications might have looked like had lived longer, Büttner's consequences give us a good reminder of an old truth: Supposed logical consequences of a historical person's thought tell quite little about the past realities unless they're set in the actual context of the past. Melanchthon's concept of providence led him also to promoting study of nature in the academia.

<sup>282</sup> Ibid., 154.

<sup>283</sup> In the *initia doctrinae physicae* seven proofs of nine of the existence of God were stoic proofs taken from Cicero's *De natura deorum* –Melanchthon used later the same arguments to proof divine providence.

<sup>284</sup> Kusukawa 1995, 153.

<sup>285</sup> Ibid., 153.

phenomena could be taken as a proof of God's wisdom and might. Beholding God's creation, the movements of celestial bodies, beauty of gems, plants, animals and human anatomy, and the course of history offered a way to understand God's providence with one's own eyes, without complex conceptual work characteristic for the earlier scholastic natural philosophy.

Indirectly Melanchthon and Luther challenged the authority of ancient writers. A scholastic way to discuss a particular natural topic, as one has seen with Reisch's *Margarita Philosophica*, was based largely on ancient authors' and church fathers' opinions. In this framework the work of a natural philosopher was to use logical apparatus and harmonize these author's arguments with the accepted theological view. Luther's attack against scholastic theology, against Aristotle, and ultimately against the whole theological tradition knocked the ancient authors down from their supermundane position. A logical consequence of Luther's sola-fide argument was that, no matter how smart or good these people were, they were no closer to God than any other Christian. Just to be selected by mortal men in the canon of thinkers or theologians did not suffice to approve the quality of thinker's ideas. But Young Luther's radical theology, that attacked the authority of tradition, had kept inside a risk, which consequences he had not thought: if Christian man was free to follow his own consciousness in spiritual matters independently of traditional authors' opinions, wouldn't this freedom be granted also in the political sphere: why were princes and bishops to be respected any more than Aristotle or St Thomas? This risk realized in 1521 as the Zwickau-prophets, radical preachers and demagogues claiming to be Luther's followers defied law and public order. The Wittenberg reformers answered the challenge of public disorder by restoring moral and natural philosophy as teaching of God's law. In order to support civil obedience, natural and moral philosophy had to have certain authority. In Melanchthon's approach, this authority was not guaranteed by tradition but by creation itself, nature. Although Melanchthon was as dependent on the ancient philosophers as his forebears, (he called his natural philosophy Aristotelian, and developed his views by discussing Aristotle's books), this small change of emphasis from ancient authors to nature is essential. The classical wisdom was no longer an end in itself, but a tool to explain natural phenomena. And what is more, if one's experience contradicted the tradition, the tradition could be improved with new knowledge. Melanchthon himself, for instance, improved his commentary of Aristotle's *De Anima*, by the latest anatomical findings of Vesalius.<sup>286</sup>

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<sup>286</sup> Kusukawa 1995, 179.

### *Conclusion: Münster and Melanchthon, Similarities?*

The intellectual pathways of Sebastian Münster and Philip Melanchthon are in many respects parallel. They both received Humanistic educations which provided them with strong linguistic abilities. Münster became a Hebrew specialist; Philip Melanchthon specialized in classical Greek. Both men entered adulthood in a particular period when the Latin Christendom was entering into the greatest crisis it had thus far experienced. Humanistic approach to texts had started to shake the inherited philosophical and theological foundation of the Church. The way how ancient learning and the Christian message were intertwined came under harsh criticism. When Martin Luther attacked against the indulgences the question of right theology was politicized and turned into a question of the authority in church. The Humanistic search for the right theological and philosophical method was also absorbed as part of this broader theological debate. Melanchthon became Luther's ally and was right in the heart of the debate attacking an inherited scholastic theology, extant in the University of Wittenberg since 1518. By that time, Sebastian Münster also learned to know some of Luther's thoughts at Basel where he translated one of Luther's tracts for one of most important Lutheran printers of that time, Adam Petri. Münster's teacher Konrad Pellican was on friendly terms with Luther, and his correspondence with the reformer shows that also Münster and Melanchthon knew each other from the studying years at Tübingen.

Both Münster and Melanchthon had studied astronomy and geography under Johannes Stöffler whose work characterizes the Humanistic approach on natural studies in the period of transition between pure scholasticism and the Reformation. Comparing different editions of ancient texts Stöffler tried to get a better understanding of what the ancient authors really said. Stöffler's own observations had demonstrated errors in the knowledge of the ancient astronomer Ptolemy, but Stöffler was still unwilling to criticize the inherited wisdom.

Luther's attack against the scholastic theology triggered a profound epistemological crisis, which accelerated the collapse of the medieval epistemological system. For Luther the Bible was the sole author in theological matters. Accordingly Luther campaigned for abandoning of theological arguments based on Aristotle or other ancient philosophers. During the 1520s Melanchthon took charge of University reforms which sought to abolish scholastic philosophy from the University of Wittenberg. Meanwhile Sebastian Münster was struggling with the conservative authorities of the University of Heidelberg and longed to go to the Humanistic stronghold of Basel, that was leaning towards a religious

revolution. At Heidelberg Münster met Simon Grynaeus, a Humanist and philosopher and an old member of Philip Melanchthon's Wittenberg circle. Grynaeus had strong evangelical sympathies and like Münster, struggled with the scholastically oriented University of Heidelberg.

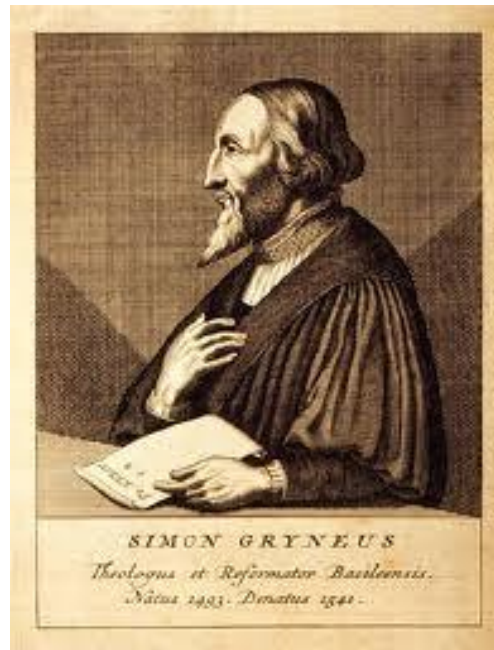
In 1529 Basel and its university were reformed. And as Simon Grynaeus was invited to teach Greek at the university he also worked to get his friend Münster in. Münster took the chair of Hebrew, converted to the new faith, and married printer-publisher Adam Petri's widow.

At the turn of the 1530s, the careers of Münster and Melanchthon demonstrate increasing interest in nature. Melanchthon begins to promote studies of nature, medicine, botany, astrology and geography as ways to unfold God's providence in nature. At the same time Sebastian Münster starts his career as a geographer. Both Melanchthon and Münster were interested in providence, and saw the natural world, history and geography as demonstration of god's will. Is this simply a coincidence, or should one take Münster's and Melanchthon's later works as different expressions of a shared interest in nature endorsed by providential natural philosophy? The following chapters shall take a closer look at Simon Grynaeus and his interesting position as Münster's collaborator and Melanchthon's interlocutor, in order to investigate the question; could intellectual exchange between Wittenberg and Basel create a shared basis for a novel approach on nature to emerge?



## Chapter V

### Simon Grynaeus



#### *Simon Grynaeus, a Humanist between the Lutherans and the Reformed*

Simon Grynaeus (1493 – 1541) is a little known and little researched figure, whose indirect influence on the development of the Swiss reformation and the natural philosophy of the mid sixteenth century, seems to have been significant.<sup>287</sup> That he was a friend of Erasmus and

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<sup>287</sup>Unfortunately the little that has been written on Grynaeus is scattered around a wide palette of different kinds of texts, which only few have focused directly on Grynaeus. With these respects I am very grateful for Dr. Arpad Blazy's dissertation *Simon Griner (Grynaeus) és Buda (1521-1523)*, (Budapest: Károli Egyetemi Kiadó, 2010), and a shortened introduction in "Der Humanist und Reformator Simon Grynaeus (1493-1541) Einführung in sein Leben und Werk" <http://church.lutheran.hu/godollo/archivum/dolgozatok/gryn.htm>. For other sources see my list of Grynaeus' works and literature on Grynaeus here: Herbert Rädle (ed.), "Simon Grynaeus (1493–1541): Briefe" pp. 37–103 in *Basler Zeitschrift für Geschichte und Altertumskunde*, 90 (1990); G.T. Streuber (ed.), *Simonis Grynaei clarissimi quodam academiae Basiliensis theologici ac philologi epistolae* (Basel, J.G. Neukirch, 1847); J.V. Pollet, *Martin Bucer* (Paris 1958-62), II, 370-400, 439-59; Theodor Beza, *Icones, id est verae imagines vivorum doctrina simul et pietate illustrium* (Geneva, 1580); G.T. Streuber, *Basler Taschenbuch* (Basel, 1853), 1-43; Amerbach Korrespondenz III ep 1434 and passim; Scheible (ed.), *Melanchthons Briefwechsel* I epp 277, 323, 587, 773. Z viii Ep 469, x Ep

Melanchthon is known, the former praising him in an epistle appended to his edition of Livy – the latter in public letters which accompanied astronomical treatises in the 1530s. Grynaeus took part in the Reichstag of Speyer<sup>288</sup> (1529), was active in transmitting and discussing the evangelical camps' views on Henry VIII's divorce (1531)<sup>289</sup>, was reforming the university of Tübingen with Melanchthon (1535), played an instrumental role in the creation of the first Helvetic confession (1536),<sup>290</sup> and was the only representative of the Swiss territory in the Colloquy of Worms (1541).<sup>291</sup> These events made him a well-known figure in the evangelical circles and enabled him to establish ties with men like Martin Bucer, Heinrich Bullinger, Leo Jud, Kaspar Megander, Oswald Myconius, Johannes Oecolampadius, Huldreich Zwingli and many others. Grynaeus is also known for his assistance to Jean Calvin during the reformers' exile at Basel in 1535-1536. Several letters from their correspondence have been preserved<sup>292</sup> and the preface for the commentary on Romans, the Frenchman thanked Grynaeus warmly for his scholarly advice.<sup>293</sup> But besides the role of religious leader, Grynaeus was a remarkable humanist and a scholar who had few equals in Greek. He edited a wide spectrum of scientific

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1043 and passim; *Matrikel wien* II – 1 383; *Matrikel Wittenberg* I 116; *Matrikel Basel* II 2, 26; Bietenholz (ed.), *Contemporaries of Erasmus*; Pietro Daniel Omodeo, “Erasmian Philology and Mathematical Astronomy. Jacob Ziegler and the Humanist Recovery of Pliny’s Natural History”, pp. 7a:1–7a:23 in *Journal of Interdisciplinary History of Ideas* 3 (2014); Nathan Ron, “Erasmus and Geography”, pp. 6:1– 6:27, *Journal of Interdisciplinary History of Ideas* 2014, vol. 3, Issue 6; Richard J. Oosterhoff, “The Fabrist Origins of Erasmian Science: Mathematical Erudition in Erasmus’ Basle.” pp. 3:1–3:37, *Journal of Interdisciplinary History of Ideas* 2014, vol. 3, Issue 6; Charlotte Methuen, *Kepler's Tübingen: Stimulus to a Theological Mathematics*, (Aldershot, 1998); Heinz Scheible, “Simon Grynaeus schreibt an Joachim Grynaeus”, pp. 141-56 in *Heidelberger Jahrbücher*, 33, (1989); M. Welti, 'Der Gräzist Simon Grynaeus und England', pp. 232-52 in *Archiv für Kulturgeschichte* 45 (1963); C. Reedijk, 'Das lebensende des Erasmus', *Basler Zeitschrift für Geschichte und Altertumskunde* 57 (1958) 23-66; W.R. Staehelin, *Wappenbuch der Stadt Basel* (Basel[1917-30]); J. Tonjola, *Basilea sepulta* (Basel 1661), 14; Max Geiger, *Die Basler Kirche und Theologie im Zeitalter der Hochortodoxie* (Zollikon-Zürich 1952), 11-12; P.S. Allen *Opus Epistolarum Des. Erasmi Rot.* (Oxford 1906); CE, II 142-46.

<sup>288</sup> Joachim Camerarius, *De vita philippi Melanchthonis narratio* (1777), § xxxv, p. 111.

<sup>289</sup> Several remarks in correspondence of Melanchthon, Bucer, Oecolampadius, Zwingli, Capito, Amerbach and Luther.

<sup>290</sup> Bruce Gordon, *The Swiss Reformation*, (Manchester: Manchester University Press, 2002)

<sup>291</sup> Bietenholz 1985-1987, 145

<sup>292</sup>Theodor Streuber (ed), *Simonis Grynaei...epistolae*, (Basiliae, 1847), Grynaeus Calvino epp. 39,40,41,42

<sup>293</sup> Jean Calvin, *Ioannis Calvini Commentarij in Epistolam Pauli ad Romanos* (Argentorati : Rihel, 1540) [BSB, Signatur: 12490339 Regensburg, Staatliche Bibliothek]. Correspondence between Calvin and Grynaeus was very lively between 1537 and 1538 while the Reformer was writing his commentary on Romans which he dedicated to Grynaeus. Six letters from Grynaeus to Calvin remain from this period. See Rädle, Herbert (ed.), “Simon Grynaeus (1493-1541): Briefe”, in *Basler Zeitschrift für Geschichte und Altertumskunde*, 90 (1990).



and philosophical works which paved way for new understanding of nature, God and man.<sup>294</sup> In natural philosophy, as I shall argue in detail later, he seems to have developed his views in a loose collaboration with Melanchthon. At Heidelberg, Grynaeus became a close friend and colleague of Sebastian Münster, accompanying him on research trips and assisting him in the making of the *Cosmographia*. When Grynaeus died in 1541, a French geographer André Thèvet testified, his death hurt Münster more than the death of a brother and Münster himself openly lamented the great sorrow of heart finding his friend having passed away.<sup>295</sup>

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<sup>294</sup>*D. Joannis Chrysostomi...opera* (Basel: Froben, 1530); *Vitae Graecorum Romanorumque illustrium auctore Plutarcho*, (Basel: Bebel, 1531); *Aristotelis summi semper viri, in quem unum vim suam universam contulisse videratur natura rerum...*(Basel: Bebel, 1531); *Titus Livius Latina Historia quinta* (Basel: Froben 1531); *Aristophanis facetissimi comoediae undecim*, (Basel: Bebel, 1532); *Novus orbis regionum et insularum veteribus incognitarum una cum tabula cosmographica...* (Basel: Johannes Hervagium, 1532); *Joannis Oecolampadii doctoris undecunque in librum Job exemata...* (Basel: Heinrich Petri, 1532); *Omnia divini Platonis opera tralatione Marsilii Ficini emendatione et ad Graecum codicem collatione Simonis Grynaei nunc recens summa diligentia repurgata*, (Basel: Froben, 1532); *Lexicon Graeco-Latinum...* (Basel: Valentina Curionis, 1532); *De Mundo Aristotelis... ad haec scholion doctissimum in Aristotelis libellum de mundo Simone Grynaeo authore*, (Basel: Joannis Valderum, 1533); *Eukleidou stoicheiōn bibl. ie'. ek tōn Theōnos synousiōn [Euclid's Elementa]* (Basel, Johann Herwagen 1533); *Platonis omnia opera cum commentariis Procli in Timaeum et Politica, thesauro veteris philosophiae maximo...* (Basel: Joannis Valderum, 1534); *Sitne rationis aliqua in bestiis vis... Plutarchi libellus perquam elegans Simone Grynaeo interprete*, (Basel: Bebel, 1534); *Julii Pollucis onomasticon hoc est instructissimi rerum ac synonymorum dictionarium...* (Basel: Balthazar Lasium & Thomam Platterum, 1536); *Organon Ὀργανον, ἡ της φιλοσοφιας χειρ* (Basel: Bebel, 1536); *Veterinariae medicinae libri duo a Ioanne Ruellio Suessionensi olim quidem latinitate donati...* (Basel: Joannis Valderum, 1536); *Oratio Hugonis Latimeri ad ecclesiasticorum conventum ante consultationem de regni statu per evangelium reformando*, (Basel, 1537); *Claudii Ptolemaei magnae constructionis id est perfectae coelestium motuum pertractationis lib XIII. Theonis Alexandrini in eosdem commentariorum lib XI*, (Basel: Joannis Valderum, 1538); *Aristotelis Stagiritae philosophorum omnium facile principis opera... Ad haec vita Aristotelis deque genere philosophiae ac scriptis eiusdem commentatio doctissima per Phillippum Melanchthonem*, (Basel, 1538); *ΓΕΩΠΙΟΝΙΚΑ. De re rustica selectorum lib. XX... Item Aristotelis de plantis libri duo Graeci nuper ab interitu liberati ac studiosorum usui hac primum editione restituti*, (Basel 1539); *Aristotelis de virtutibus libellus plane aureus nuper quidem Graece inventus, ima vero primum per Simonem Grynaeum latinitate donatus...* (Basel: Roberti Winter, 1539); *Procli Diadochi Hypotyposis astronomicarum positionum*, (Joannis Valderum, 1540); *Aristotelis. De virtutibus libellus plane aureus, ... per Simonem Grynaeum*,

<sup>295</sup> BSM epp. 11. André Thevet, *Les vrais pourtraits et vies des hommes illustres*, Paris 1584, p. 562. Thevet writes also about rumors that Grynaeus' 'few' publications wouldn't be it all, but he might have given his material to Münster. "Sur tout loy proposoit-il Simon Gryné, lequel ala de vie à trespas le premier iour d'Aust en l'année de salut mil cinq cens quarente vn. Mort, qui fut autant ou plus fascheuse à Munster, que si c'eut esté de son propre frere. Telle conionction & amitié estoit entre eux, que ie me suis laissé dire, que l'aide de ce personnage, il acquis l'esclaircissement de plusieurs points, desquels il a enrichy ses oeuvres dernieres. De sorte que d'autres sont auantage de tant, que dire, que le peu de liures,qu'on a de Griné n'est point qu'il n'en ait point composé, mais par-ce qu'il tendoit à Munster tout ce qu'il pouuoit." Thevet, though, does not agree.

Grynaeus and Münster met at Heidelberg from where they both moved to Basel in 1529, following the reformation of the University of Basel. In the post-Erasmanian period of Basel, as the humanistically oriented and liberal minded town felt between the cross currents of religious controversy and humanism, Grynaeus became an important figure. Particularly, after the death of the reformer of Basel, Œcolampadius in 1531, Grynaeus increasingly took the charge of the spiritual life of the town becoming its leading theologian.

Simon Griner was born in 1493 in the village of Veringen, today Veringedorf, in Hohenzoller's Sigmaringen.<sup>296</sup> The exact date of his birth is unknown. Griner's father was a simple farmer. His mother gave birth to three sons, Jacob, John and Simon. Simon was a gifted child and when he reached the age of 14 he was sent to the Latin school of Pforzheim where he made friends with Philip Schwartzerd, four years junior to him, and another child prodigy who in 1509 was greisized by his great uncle, the remarkable humanist Johannes Reuchlin, as Melanchthon. Reuchlin was the “spiritus rector” of Pforzheim and although he lived at Tübingen and Württemberg, he kept close ties to his former hometown and its Latin school. At Pforzheim Griner's and Melanchthon's teachers were Georg Simmler and Johannes Hildebrand –both outstanding humanists in the tradition of Konrad Celtis. Here Simon and Philip obtained proficiency in the three languages, but classical Greek became their lifelong obsession.

When Griner enrolled to the University of Vienna in 1511 he had already earned a Bachelor's degree. His studies were progressing: In 1515 he obtained the degree of magister artium. At Vienna, Griner's teacher was Johannes Cuspian, a successor of Konrad Celtis, humanist, diplomat and physician and Grynaeus' interests widened from pure linguistics to cover a the whole palette of philosophy and arts. In this period he most likely came to know Joachim Vadian, who worked at Vienna as a lecturer of rhetoric and poetics.<sup>297</sup> A decade later the two would come across each other again in the Swiss lands as prominent figures of the Swiss Reformation. Vadian, notably, shared Grynaeus' interest in geography. In 1518 a Viennese printer published Vadian's edition of Pomponius Mela's *De orbis situ libri tres*, which was printed again at Basel in 1522. Very little is known of Grynaeus before he appears again as a rector of a boy's school at Buda in 1520. However, it seems natural to assume, that

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<sup>296</sup> Following biographical details are based on Blázy 2010. I also wish to express my gratitude for Doctor Blázy for his kind help with this project.

<sup>297</sup> Emil Arbenz & Hermann Wartmann (eds.), *Die Vadianische Briefsammlung der Stadtbibliothek St. Gallen*, Arbenz, I-VII, (St. Gallen: Historische Verein in St. Gallen, 1888-1913), V /1, Nr. 710 [29]. In 1532 Grynaeus started his letter to Vadian by recalling how he listened Vadian's lectures 20 years ago.

Grynaeus' interest in geography and nature led him to establish some form of scholarly friendship with Vadian.

In 1520 a devastating plague epidemic struck Vienna. In November of the very year the city established criminal regulations against "Lutheran heretics" – Griner's will to stay in the city diminished. But what attracted him to Hungary? Perhaps the marvelous *Royal Bibliotheca Corviniana*, one of the greatest renaissance libraries had drawn Griner to Buda, perhaps it was due to his teacher Cuspius whose diplomatic career had brought him more permanently to the Hungarian capital. Buda, however, was only to be a transitory resting place for Griner. If the way how Griner abandoned Vienna simultaneously with the criminalization of the Lutherans in 1520, may speak for some Evangelical sympathies, at Buda these sympathies took Griner into real trouble. The Dominican order got him imprisoned for heretical teachings.<sup>298</sup> Dominicans' suspicions of Griner's Lutheranism were not groundless: in 1523 one meets him at Wittenberg.

On the 17<sup>th</sup> of April, 1523 "Simon Griner Alpen, Magister Wienen" had been registered in the Wittenberg matrikel.<sup>299</sup> Those days Wittenberg must have been a quite exciting place for a young humanist. Griner's schoolmate, Melanchthon, had become the Rector of the University and had risen to fame as author of the seminal work on Protestant doctrine, *Loci Communes* (1521). Smoke from the iconoclastic riots of the Wittenberg movement had still not cleared, though the situation had calmed considerably after Luther returned the previous year. If Griner took lessons he would have realized that the Arts Faculty of Wittenberg had gone through some remarkable revisions. As has been seen, by 1523 Luther and Melanchthon had already executed a series of changes in the arts syllabus – aiming at abandoning Aristotelian philosophy à la Schoolmen – the Elector being less enthusiastic about any bigger changes at his University. At Wittenberg, it should also be mentioned, Griner latinized his name following the example of his successful mate Schwartzerd and several other humanists like Hausschein (Oecolampadius), Koepfel (Capito), Kammermeister (Camerarius) and Geisshüsler (Myconius).<sup>300</sup>

Grynaeus' sojourn at Wittenberg, however, was short. Already in June 1524, he left to take up a Professorship of Greek at the University of Heidelberg. The rapidity of Grynaeus'

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<sup>298</sup> ADB, Band 10 (1879), s. 72-73.

<sup>299</sup> According to Blázy.

<sup>300</sup> Arpád Blázy, "Der Humanist und Reformator Simon Grynaeus (1493 – 1541): Einführung in sein Leben und Werk. <http://church.lutheran.hu/godollo/achivium/dolgozatok/gryn.htm>.

visit at Wittenberg has raised some doubts about his relations with the Lutheran reformation. And indeed setting it in the larger canvas of the history of the reformation, Grynaeus' departure from Wittenberg unquestionably, demonstrates a dramatic shift. In the aftermath of the Wittenberg movement, Luther and Melanchthon discovered the dangers of radicalism and the need to codify and direct the reformation movement consistently. The rise of Anabaptism and the political tension caused by the Peasants' War (1524-25) gave strength to these observations, making them concrete. Obviously the situation was not made easier by the cracking unity of Luther's supporters. Luther's relationship to Andreas Karlstadt, his colleague, supporter, and a professor of theology at Wittenberg had worsened since Luther's return from Wartburg. Relying on mystical teachings, Karlstad had been one of the leaders of the iconoclastic violence in Wittenberg and his teaching had begun to take a path that was way more radical than Luther thought necessary. In 1524, Luther thus attacked his former ally, forbidding him to preach, causing Karlstadt to leave Wittenberg. The most important theological watershed, however, between the Wittenberg reformers and the newcomers, was made of the question of Christ's real presence in the Eucharist. The energetic preacher Huldreich Zwingli, who since 1524 had gained remarkable success in his native Zurich and who had gradually extended his Evangelical message to the neighboring Swiss towns of Bern, Basel and Schaffhausen, had made an interpretation, slightly different to that of Luther's, of Christ's words in the setting of the sacrament: "this is my body." Luther understood the message of Bible as Gospel, as a promise of the salvation that was announced in the Old Testament and fulfilled in the historical Jesus, the word made flesh. The crucial aspect in Christ for Luther was that in him God became a man and died on the Cross as a man. Jesus' divinity, for him, was thus manifested in his incarnation and sacrifice as a mortal man. Zwingli's salvation theology departed from a verse 6:63 of John: "It is the spirit that gives life, the flesh is of no avail." This led Zwingli to a sharp dualism between the spirit and flesh – for him it was Christ as God, where the saving faith resided – Christ's physical body had no salvational value. Consequently, where Luther highlighted the corporeality of Jesus, Zwingli laid the emphasis on the spirit. The dispute of Christ's real presence in the Eucharist became the dividing momentum between the two movements which were to develop into the Lutheran church and into the reformed churches and has kept employing theologians and researchers ever since. Zwingli and his followers adopted an interpretation according to which the significance of the communion was to commemorate Christ. Luther instead persisted that Christ's body was transformed into bread and wine becoming *physically* present in the Eucharist, as a real sacrifice over the sins of the partaker's body and soul. But what has Grynaeus to do with all this?

The Eucharist debate has generally been seen as a demarcation line, from which point, the Evangelical world split away and became starchy in the 1530s as a permanent border between the Lutherans and the Reformed. This split has been seen so essential that even some historians of natural philosophy and geography have been willing to characterize their historical protagonists and their works as definitely “Lutheran” (as Sachiko Kusukawa has done in the case of Philip Melanchthon),<sup>301</sup> or “Reformed” (as Manfred Büttner’s view about Sebastian Münster’s geography).<sup>302</sup> Faced with these rather conflicting descriptions, Simon Grynaeus appears as a peculiar anomaly who stands close to Zwinglians (and Münster), but still seems to have enjoyed the unreserved appreciation of Melanchthon. Two facts should be raised here accordingly: the first is clearly the fact that Grynaeus had indeed moved closer to the views of Zwingli. This became evident rather early from as early as 1525, as Grynaeus represented Zwinglians in the conversations on Lord’s Supper,<sup>303</sup> and fully clear in 1529 as Grynaeus accepted the chair of Greek at the University of Basel, one of the strongholds of the Zwinglians, a town that’s evangelization was led by Zwingli’s closest ally Johannes Oecolampadius. Working at Basel, Grynaeus’ differing stance in such an important question as the Eucharist could not have been possible – even more so as in 1531 he began lecturing on theology together with Oecolampadius himself.<sup>304</sup> Similarly, one of the few strictly theologically directed printed texts of Grynaeus is a preface to Oecolampadius’ exegesis on the Book of Job (1532), which affirms again Grynaeus’ accord with the broader Zwinglian theological scheme.<sup>305</sup> However, the second point, none of these issues seems to have hampered Grynaeus’ friendship with Melanchthon which continues unbroken from the school years of Pforzheim until Grynaeus’ death in 1541.

The earliest surviving remains of direct correspondence between Melanchthon and Grynaeus date back to 1524.<sup>306</sup> In May 1524, Melanchthon paid a visit to the faculty of arts at the University of Heidelberg where he received a gift, a goblet worth 9½ Guldens, from

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<sup>301</sup> Kusukawa 1995.

<sup>302</sup> Büttner 1979 B.

<sup>303</sup> Walter Köhler, “Das Religionsgespräch zu Marburg 1529”, in *Zwingliana, Mitteilungen zur Geschichte Zwinglis und der Reformation*, (1930 Nr.1). Band V. Nr.3., 91.

<sup>304</sup> Grynaeus’ role in these lectures was to clarify linguistic aspects, as Oecolampadius professed theological issues. See Oecolampadius’ letter to Martin Bucer in 5<sup>th</sup> of August 1531, (printed as n. 904 in Staehelin, *Briefe*, 1934). *Lectionem theologiam aliter institutum, omnium fratrum consensu: una hebdomanda in veteri praeleget Munsterus, textum enarrandum Hebraice, iuxta grammaticen; altera in novo gryneus; mihi iniunctum, utrunque Latine enarrando mentem, quod fieri potest, scripturne eruere; Paulo incumbet, epilogo vernaculo sermone afferre.*

<sup>305</sup> *Joannis Oecolampadii doctoris undecunq̄ue doctissimi in librum Job exemata, eruditum sane opus ac omnibus divinae scripturae studiosis utile.* (Basel: Heinrich Petri, 1532).

<sup>306</sup> MBW, epp. 277, 323, 359, 415, 587.

Grynaeus and his colleagues.<sup>307</sup> Yet even though Grynaeus' support for the symbolic view of the Eucharist had become obvious during the discussions of 1525, there's no sign of any cooling off of his relationship with Melanchthon. In 1527 Grynaeus rose in Europe-wide fame for finding the lost decade (books 41-45) of Titus Livius' book *Ad urbe condita* in a monastery at Lorsch. Grynaeus immediately told Melanchthon about his discovery.<sup>308</sup> The remarkable discovery enabled Grynaeus to establish scholarly ties also with the brightest star of the firmament of humanism, Erasmus, and it was Erasmus' close collaborator Hieronymus Froben who in 1531 printed and published the new edition of Livy's decades appended with Grynaeus' discovery and the Humanist's respectful laudation for its discoverer.<sup>309</sup> Grynaeus' own intention, however, had been to supply the book with Melanchthon's preface and he was disturbed to find it replaced by the piece of Erasmus.<sup>310</sup> The scholarly collaboration between Grynaeus and Melanchthon thus continued strong. In Melanchthon's earliest biography, *De Vita Philippi Melanchthonis Narratio*, Joachim Camerarius testifies that during the Reichstag of Speyer (started on 3<sup>rd</sup> of February in 1529), Grynaeus stayed as a guest at Melanchthon's hostel.<sup>311</sup> This is interesting, although it becomes more understandable taking the Reichstag of Speyer as one of the events that brought the divided Evangelicals together against a shared foe. At Speyer, the evangelical estates had gathered in order to defend their cause before the Emperor, as the Catholic estates had pleaded with him to repeal the remaining *ius reformandi* and the edict of Worms of 1521. A lot was at stake for the evangelicals since the banning of the *ius reformandi* had practically meant banning all evangelical action. The tension between the camps was considerable. Camerarius tells us that after a sermon held by the Bishop of Vienna, John Faber, Grynaeus had embarrassed him before the crowd asking: "How such a learned man could announce so many false teachings?" Faber had acted tactfully, taking the question in a friendly manner and asking Grynaeus for a visit the next day, in order to discuss the points of contention in a more peaceful environment. The same evening, however, soldiers, following Emperor's orders, had appeared at Melanchthon's lodging, seeking

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<sup>307</sup>MBW, epp. 323.

<sup>308</sup>MBW, epp. 587.

<sup>309</sup>Erasmus' foreword in Livius' *Decades Tres* (Basileae: Hervagius, 1539 [Froben 1535]), 2. "Verum ne tibi fabulam istam saltanti, nihil aliud quàm hortator applausorque uidear, sed ut nonnihil etiam opis adferam, uisum est tuo nomini dicare TITVM LIVIUM, Latinae historiae principem, iam quidem frequenter excusum, sed nunquam antehac uel magnificentius uel emendatius, si hoc parum est, quinque libris modò repertis auctum: quos bono quodam genio in bibliotheca monasterii Laurisseni, aut, ut uulgò, Lorschensis, repperit SIMON GRINAEUS, uir ut in omni genere literarum citra supercilium eruditus, ita prouehendis liberalibus studiis natus."

<sup>310</sup>Manfred E. Welti, "Der Gräzist Simon Grynaeus und England, Ein Beitrag zur Geschichte der baslerischen Renaissance", pp. 232-242 in *Archiv für Kulturgeschichte*, n. 45 (1963), 233

<sup>311</sup>Joachim Camerarius, *De vita Philippi Melanchthonis narratio* (1566/1777), §xxxv, 111.

Grynaeus, but with a little help from the friends he managed to flee on the other side of the Rhine and saved his life.”<sup>312</sup>

Grynaeus' acquaintance with Melancthon continued despite the theological division between the followers of Luther and Zwingli. Already by the mid 1520s Grynaeus had come close to Zwinglians, Ecolampadius, Bucer, Capito and other reformers who had carried the reformation further in the Swiss and south-German lands. Two confessional groups had begun to emerge in the aftermath of the catastrophe of the Marburg colloquy in 1529, as it became clear that no compromise could be found between the religious leaders of Wittenberg and Zurich. After 1531, as Sachiko Kusakawa has argued, all Melancthon's theological works went through a revision, targeting to clarify the Lutheran message in contrast to Zwinglians and Anabaptists. The doctrine of the trinity for instance, was included in *Loci Communes* for the first time in 1535. And still, all during the 1530s the situation was relatively unclear, and new attempts were being made to bring the Evangelical cause together. After the deaths of Zwingli and Ecolampadius in 1531, the Swiss camp, Basel in particular, became readier for compromises. In the attempts to find a working consensus, Grynaeus played an important role: he was a person who was able to handle different views beyond narrow theological border lines. During his trip to England in 1531, these qualities became employed: with Erasmus' recommendation in pocket he visited the great Rotterdamer's English friends and patrons meeting Thomas More, John Claymond, Jossa Tielmann at Cologne, and finally the King of England, Henry VIII. In the early summer of 1531, the King had wished to divorce Catherine of Aragon and sought advice from theologians and lawyers. Grynaeus set out mediating continental reformer's views and seems to have been again rather impartial, acceding to both the Zwinglians and Melancthon.

Living and working at Basel between 1529 and 1541, Grynaeus' became the theological strongman of the town. In 1537 he received Myconius' chair of the New Testament, working at the same time as the Dean of the philosophical faculty and holding the chair of philosophy. Before his death in 1541 he became the rector of the university. Grynaeus personified the theologically eclectic and tolerant atmosphere of Basel, and his tolerance was particularly evident towards the Lutherans. Bruce Gordon has written: “Simon Grynaeus was the theological force behind the Basle church, and his commitment to unity with Germans was manifested in his presence, representing Basle, at the religious colloquies in the early 1540s between Lutherans and Catholics. Grynaeus was also a friend of Calvin and despite his

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<sup>312</sup>Ibid., 113.

Lutheranism was influential in the Frenchman's return to Geneva in 1541.<sup>313</sup> Gordon is unquestionably right characterizing Grynaeus as the leading force of the Basel theology but although he points in the right direction, he may go bit too far characterizing Grynaeus as Lutheran. Grynaeus' openness to Lutheranism, however, was such that it makes theological pigeonholing very difficult. The first Swiss Confession of 1536 provides a good example<sup>314</sup>: In the mid 1530s all the reformed Swiss cities had different church orders. On 30 of January 1536, following the initiation of Martin Bucer, the towns of Zürich, Bern, Basel, Schaffhausen, St. Gall and Biel, represented by theologians Bullinger, Myconius, Grynaeus, Leo Jud and Kaspar Megander assembled to Basel in order to form a single confession. The first Swiss confession followed largely Lutheran forms, even in the sacrament, and was warmly greeted by Luther. In the mid 1530s the relations between Lutherans and the reformed seemingly warmed and a theological agreement that had broad the whole camp came near.<sup>315</sup>

### *Grynaeus Moves From Heidelberg to Basel*

As Grynaeus in 1524 entered Heidelberg he had a relatively strong interest, not only in letters and language, but also in astronomy and geography, which obviously had deepened as he between 1511 and 1520 had stayed close to the circle of Viennese humanists, who in the tradition of Conrad Celtis cherished studies of history and geography. At Heidelberg Grynaeus met the Hebrew scholar and Franciscan friar, Sebastian Münster, who with Melancthon had been educated in mathematics, astronomy and geography by Johannes Stöffler. The meeting of the two fellows at Heidelberg seems to have fed their mutual interest in Gospel and nature. A research trip that Münster carried out in 1526 over the Mittelrhein-region, and which resulted in a map of Heidelberg and it's surrounding in 1528, started a new period for Münster: the Hebraist became a geographer. It seems probable that Grynaeus had accompanied Münster during the trip – at least his discovery of Livy at Lorsch in 1527 and Münster's discovery of the oldest “Bücherkammer, die ungefährlich am Rheinstram erfunden

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<sup>313</sup>Bruce Gordon, “Switzerland” pp.70-93 in A. Pettegree (ed.) *The Early Reformation in Europe*, (Cambridge: Cambridge University Press, 1992),87.

<sup>314</sup>Rudolf Pfister, *Kirchengeschichte der Schweiz* (Zürich: Zwingli Verlag, 1964), 197-9.

<sup>315</sup>[It is interesting to speculate to which extent this ephemeral season of detente affected young Calvin who in this period resided at Basel. The abundance of Lutheran elements in the first edition of Calvin's institutes (Basel 1536) is no secret, but the standard narrative has emphasized Bucer's role behind this Lutheran impact. It should be also remembered, that Grynaeus assisted Calvin in this period and the Frenchman probably also followed his lectures.]



würd” at Lorch during his voyage, intertwine fascinatingly.<sup>316</sup> If Münster had done a favour to Grynaeus directing him to Lorsch, his friend paid back by supplying material to Münster's Hebrew grammar and bringing him in contact with the Froben printing house at Basel, that printed both Münster's edition of Elia Levita's Hebrew Grammar and Grynaeus' edition of Livy.<sup>317</sup> At Heidelberg Grynaeus became Münster's trusted friend who tirelessly assisted his colleague in geographical matters and the bond strengthened even more as they both left the town in 1529 to take up chairs in the newly reformed University of Basel.

If Melanchthon and Luther had set the University of Wittenberg on novel tracks, Heidelberg was still a Bastion of the schoolmen. All teaching that could arouse suspicions of heretic seasoning was banned. The intellectual narrowness of the university seems to have affected both Grynaeus and Münster. Münster continued maintaining close ties to Basel, its humanists and printing presses, and his continuous trips drove him at odds with the university officials. Strange quietness and paucity of intellectual activity characterizes his last years 1527 to 1529 at Heidelberg, leading to speculations about a spiritual crisis.<sup>318</sup> Grynaeus shared a similar destiny: His close ties with reformers earned him the antipathy of the university – his work was badly payed and in order to survive with accumulating debt, he had to teach, besides Greek also quadrivium. In 1526 he was given also the chair of Latin – but the burden became too heavy.<sup>319</sup> In 11<sup>th</sup> of March 1527 Grynaeus complained to the Academic senate about his health problems caused by the overload of work.<sup>320</sup>

How much Grynaeus' weakening health was a symptom of frustration can only be speculated about. Grynaeus' correspondence with Œcolampadius, however, as the preparation for his move to Basel was on its way indicates, that more than instructing rudiments of mathematics and languages Grynaeus' was into mastering Galen, and Aristotle's natural books.<sup>321</sup> Grynaeus thus was well on the tracks of the Wittenberg reforms which had

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<sup>316</sup>Burmeister 1969, 124.

<sup>317</sup>Bietenholz 1985-1987, 143.

<sup>318</sup>Burmeister 1969, 53.

<sup>319</sup>Dagmar Drüll, *Heidelberger Gelehrterlexikon 1386-1651*, vol 3, (Berlin: Springer, 2002), 190

<sup>320</sup>Theodor Streuber (ed.), *Basler Taschenbuch, Vierter Jahrgang*, (Basel: Schweighauser'sche Verlags Buchhandlung, 1853), 11.

<sup>321</sup>Simon Grynaeus to Œcolampadius, Heidelberg 1<sup>st</sup> of April 1529, epp. 649 in Staehelin (ed), *Briefe und Akten zum Leben Oekolampads, Band II 1527-1593*, (Leipzig: H. Heinsius Nachfolger 1934), 302. Atque ut intelligas non ita pridem captum hoc mihi deserende professionis huius consilium, libros Galeni dudum omnes comparavi et in Aristotelicis de natura libris ita iam aliquandiu fui occupatus, ut qui serio medicinam sequi et vitam omnem in pulcherrima rerum illarum cognitione traducere decreverim, non quaestus gratia, Deus novit (sic enim de pectore meo solum testari possum), sed quia gravis illa profitendi ratio molestaque esse videbatur et maior omnino, quam cui diu praeesse possem,

emphasized the necessity to abandon Aristotle's philosophical books but to retain his natural books and other useful knowledge written by medics.<sup>322</sup> At this point, in 1529, however, Galen was not yet discussed at Wittenberg, but his texts were adopted but four years later, as Melanchthon, with the assistance of Joachim Camerarius, Jacob Milich and Leonhardt Fuchs began to elaborate the Lutheran concept of the human soul.<sup>323</sup>

By the end of the 1520s Grynaeus' correspondence with Œcolampadius gets more intense. The reform of the Basel university was drawing close and Œcolampadius intended to back it up by hiring new staff of the highest calibre and reliably sympathetic for his reforms. But the reformation was not the only thing that made Basel an exciting and attractive place for humanists like Grynaeus and Münster. With Paris, Venice and Frankfurt, Basel, unquestionably, was one of the most important printing centres in Europe, and in the 1520s it had become the birthplace of Erasmus' works. In the 1530s and 40s the city's presses would have the honor to bring out such groundbreaking but risky ventures as Calvin's *Institutes* (1536), Andreas Vesalius' *De humani corporis fabrica* (1543), Sebastian Münster's *Cosmographia* (1544) and Leonhart Fuchs' *New Kreüterbuch* (1543) (only to mention the extremes of the wide spectrum of the catalogues), and perhaps something could already be anticipated in the late 1520s. The beneficial situation of the city on the corner of the Swiss, French and German regions, obviously, alongside with its heralded tolerance and religious eclecticism, had a lot to do with creating favourable conditions for new kind of printing. In 1501, the mostly German speaking Basel had joined the Swiss confederation, which after the involvement of Appenzell (1513), consisted of 13 cantons. The confederation was a loose union and each city kept its autonomy. Basel was thus politically rather independent – notwithstanding Zurich's occasional attempts to rule over its neighbors. But besides this relative political independence, Basel was, in the sixteenth century standards, an international city. Its location made it the most receptive of all Swiss cities for the German influences,<sup>324</sup> and it had an important French community. Before the rise of Geneva, Basel was the most important sanctuary for the French refugees, and the émigré community was a considerable advantage for the print industry and the book trade.<sup>325</sup> On this background it is small wonder

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et hoc studium simul et pium et multis utile futurum et ad vitam reliquam sustinendam satis idoneum putavi, tum ad ingenii mei rationem proxime accedens.

<sup>322</sup>See Kusukawa 1995, 42-43.

<sup>323</sup> Kusukawa 1995, 83-92.

<sup>324</sup>Hans R. Guggisberg, 'Das Reformierte Basel als geistige Brennpunkt Europas im 16 Jahrhundert', in H.R. Guggisberg, *Ecclesia Semper Reformanda*, (Basel, 1980), pp. 50-75.

<sup>325</sup>P.G. Bietenholz, "Basel and France in the sixteenth century: The Basel Humanists and Printers in their Contacts with Francophone Culture", (Geneva, 1971), pp.55-164.

that Basel kept attracting humanists, and Erasmus of Rotterdam living and publishing in the city from 1514 to 1529 became almost iconic for its learning.

By the end of the 1520s, however, the tolerance of Basel was put in a serious test. The humanist atmosphere, relative liberty, and the flourishing printing press, had provided a suitable environment also for the radical voices criticizing Church's abuses and calling for a radical spiritual change. Münster's early Luther-translation illustrates that the Wittenberger's message had permeated the city already in 1518. The Swiss reformation, however, was to not follow Luther but its own distinct path, broadly due to its charismatic champion Huldreich Zwingli (1484 – 1531) who in 1522 had turned Zurich into the leading centre of the Swiss spiritual renewal. Zwingli, although highly influenced by the Luther's evangelism, did not, as has been discussed, agree with the Wittenberger's view of Christ's real presence in the Eucharist and the question of the Lords Supper constituted a perennial dissonance between the two Reformers and the two evangelical movements. Since 1522, however, Zwingli's message was spreading out in the Swiss cantons and had strengthened considerably at Basel where since 1523 it had been voiced by Zwingli's colleague and close ally Johannes Œcolampadius (1482 –1531). Unlike Zurich, however, Basel was strongly infiltrated by the Erasmian humanism and the city council tried long to balance between Œcolampadius' supporters and the Catholic forces gathered around the bishop and the inner core of the council.<sup>326</sup> In February 1528 the rising pressure from the guilds and the risk of popular unrest forced the counsel to officially take up Œcolampadius' cause. The conditions in the city evolved rapidly to uncontrollable direction. And as the unrestrained iconoclastic riots took place, many humanists, including Erasmus, fled the city.

The introduction of the Reformation in Basel in 1528 and the following wave of violence denoted a severe crisis in the political and cultural relationships of the formerly neutral city. Erasmus with a whole group of learned Humanists were gone. The destruction of the sacred images was the last straw for the infuriated Catholics who were sharpening their teeth for counter action. And at the same time the Marburg Colloquy in October 1529 had made it clear that no compromise over the disagreement on the Lord's Supper was to be found between Zwingli and Luther. With a religious and political alignment with Zurich, Basel had broken its relations with the Catholic humanism and Lutheranism and come under a serious threat of war.

During 1528 and 1529 as the University of Basel had become overshadowed by the growing evangelical movement, several professors had left their posts. On 1<sup>st</sup> of April

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<sup>326</sup>Gordon 1992, 82.

1529 the *Reformationsordnung* was executed and the University became officially reformed. Several new professorships were established, and the chairs of Hebrew and Greek became vacant.<sup>327</sup> Oecolampadius assured that the eminent Graecisist Simon Grynaeus was appointed to the chair of Greek. A possibility to teach medicine as well seems to have worked him as an incentive. On 8<sup>th</sup> of May 1529 the city council officially called Grynaeus to accede. With a presumed support from Grynaeus, Sebastian Münster was nominated as the chair of Hebrew and moved to Basel by the end of July 1529.<sup>328</sup>

Grynaeus and Münster were now both at Basel. The messy situation at the university, however, caused a delay to its reopening, and Grynaeus' decided to benefit from the situation by making a trip to England, where he, supported by Erasmus, met numerous important humanists and broad back important manuscripts.<sup>329</sup> While Grynaeus was away, the politically sensitive situation at the confederation escalated.

But Zurich that was at the peak of its powers was fully charmed by Zwingli's dreams to unite the whole confederation under the evangelic faith – with force when necessary. On the 29<sup>th</sup> of May 1529 a reformed minister Jakob Kaiser was burned at stake at Schwyz and the incident offered a formal reason for the military action. In early June 1529 the first war of Kappel broke out as Zurich declared war against the catholic states. But its evangelical allies Basel and Bern were not very eager to support the city to expand its regional might – and, as the Catholics, to their disappointment, received no support from the Habsburgs – the following first war of Kappel was to be brief and bloodless. The peace treaty, however, left Zurich and Zwingli unsatisfied and an economic blockade was soon established in order to coerce the Catholic inner states to surrender and convert. In September 1531 the Catholics decided rather to take up arms than starve. Between the 9<sup>th</sup> and the 11<sup>th</sup> of October 1531, to their great amazement, the outnumbered Protestant league was defeated and sued for peace by the Catholic forces. Amongst the 500 fallen soldiers of Zurich lay also Huldrich Zwingli. As Oecolampadius, Zwingli's lieutenant, at Basel shortly after died, the Swiss reformation had suddenly lost two of its most important leaders.<sup>330</sup>

The situation of Basel after the two wars at Kappel in the 1530s should be kept in mind when the religious aspects of Grynaeus' and Münster's works, and particularly their similarities with Melanchthonian natural theology are considered. The defeat of the two

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<sup>327</sup>Reformations ordnung in Staehelin 1929, 198.

<sup>328</sup>McLean 2007, 32, also Burmeister 1969, 54-56.

<sup>329</sup>Wolti 1963.

<sup>330</sup>Gordon 1992, 85.

Battles of Kappel and the deaths of Zwingli and Œcolampadius mark a new era in the history of Basel. This era was obviously marked by an urgency to come to terms with the defeat, disruption and despair of the Swiss Protestant camp. Amidst these challenges Grynaeus emerged as a splendid mediator fixing the damaged bridges between the Swiss reformation and Lutherans on one hand and the Erasmian erudition and the Protestant theology on the other. Perhaps continuous setbacks in the negotiations aiming at a single evangelical creed made the leading humanists to look elsewhere: if theology could offer no shared foundation, what had the philosophy to offer? Natural philosophy seemingly offered one way for creating this kind of confessionally neutral basis for humanists and theologians to communicate and discuss – no matter what one's opinion about the Holy See, or sacrament was, as long as one discussed “nature”, every Christian could agree about God's omnipotent guidance and his providential care: what a splendid legitimation for studying and discussing “worldly” matters in a painfully quarrelsome religious environment.

### *Changes in the 1530s*

The Eucharist debate, culminating in the failure of Marburg in 1529, had divided the Evangelical camp in two and Melanchthon and Grynaeus, old schoolmates and inspired humanists found themselves standing on opposite banks of the stream. In the case of these fellows, however, the negative effects of the dispute should not be overestimated: Late in the year 1531 many things came to an end with the bitter defeat of the second war of Kappel and the following deaths of Zwingli and Œcolampadius. Besides loss of the two champions of the Swiss reformation, the war weakened Zurich and changed the Swiss power balance. In such circumstances Basel, where Grynaeus and Münster, following the reformation of the University held their chairs, was in need of allies and obviously more receptive for novel influences. Despite the gap between the two Evangelical camps the intellectual exchange between Grynaeus and Melanchthon speeds up in the 1530s. Besides their mutual interests for religio-political cooperation, their growing interest in education and nature seems to have accelerated the correspondence.

Largely due to Melanchthon, the topics of nature and education had risen into sight at Wittenberg. As has been discussed above the University of Wittenberg went through series of revisions after Luther stood against the scholastic theology. During the reformer's custody at the Wartburg Melanchthon had taken charge of these reforms, and his position as

the main architect of the Lutheran educational reforms was confirmed in 1523 as he was nominated as the rector of the University of Wittenberg. In the early 1520s Luther's and Melanchthon's curricular reforms sought to eliminate obstacles on the way of Gospel and biblical theology. Scholastic philosophy and the Latin commentaries were replaced by studies of rhetoric and classical authors read in original tongues. In these first reforms, philosophy was dismissed as something of lesser importance: Luther fiercely attacked "the vain speculation" of the schoolmen and Aristotle. At the earliest stage of the Wittenberg University reforms all the philosophical books of Aristotle: *Physica*, *Metaphysica*, *De anima* and *Ethica* were abandoned.

In the late 1520s, however, philosophy reentered Wittenberg. Scholars seem to agree that this revival, and in particular the revival of the moral philosophy, was triggered by the unrest of the peasant's wars and the threat of Anabaptism. As Luther, following his insight of 'sola fide' retained the authority of church to mediate between parishioners' consciences and God, the Wittenberg Reformers were to find another foundation for civil obedience. Due to Melanchthon's labors, the Aristotelian moral philosophy returned as the cure for ail. But in the current situation where the scholastic theology and philosophy were still an unpardonable choice, the reverting philosophy had to return in new clothes. Sachiko Kusukawa has convincingly asserted how Melanchthon took pains dissociating philosophy from the field of theology (that was to be founded on an exclusively scriptural basis), and defined philosophy as demonstration of God's law. The new dichotomy of philosophy and theology followed Luther's constitutive division between law and Evangel. Nonetheless, it must be admitted, in the mundane cast philosophy never was lost from Wittenberg, and in a way the new definition only gave a name for an existing practice. Already in 1521, as Luther had become under an attack being accused of rejecting philosophy because he knew so little about it, Melanchthon had defended him by pointing out that he did not reject all philosophy, but approved "knowledge of gems, plants and living beings written by Pliny the Elder, Dioscorides, Theophrastus and others, including Aristotle, as they were necessary for sacred studies."<sup>331</sup> "Purged" from metaphysics, acceptable philosophy thus, rather practically, meant medical knowledge, astronomy and natural history. The outcome of this theological reduction was that the focus of philosophical studies shifted remarkably towards "nature": As early as 1526 the resolution of the arts faculty obliged the Bachelor candidates to know mathematics and *physica*, in order to "judge correctly and certainly about the whole nature and conducts" and to "explain complex and weighty matters perspicuously".<sup>332</sup> In a nutshell, Luther's antipathy

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<sup>331</sup>Kusukawa 1995, 42.

<sup>332</sup>Kusukawa 1995, 61.

towards the use of philosophy in theology but **not** in the practical matters like politics, economics or medicine, and his will to found theology on purely scriptural basis was leading into gradual abandoning of the speculative theological philosophy, and to the rise of a new kind of philosophy that focused itself on the realization of God's law in nature.

On the basis of the remaining correspondence of Simon Grynaeus and Melanchthon one cannot form a complete picture of their discussions. It is rather clear, however, that Grynaeus was aware of the curricular reforms introduced at Wittenberg. His lengthy sojourn at the University in 1523 certainly gave him a view what was to follow as his mate became appointed as the rector of the school.<sup>333</sup> After Grynaeus left Wittenberg in 1524, there are interesting similarities in his and Melanchthon's preferences and activities. Much like Melanchthon, Grynaeus wrestled with the advocates of conservative theology, even dangerously and perhaps in a ruder manner than reserved Melanchthon. At Heidelberg Grynaeus fell in quarrels with the adherents of Scholastic thought (a matter of fact that someone could have predicted knowing something about of his walks at Buda or Vienna), and during the Reichstag of Speyer in 1529 he accused the Archbishop of Vienna, John Faber, of false teaching only having to hide from imperial troops.<sup>334</sup> Like Melanchthon, Grynaeus was an unshaken Hellenist. Besides the classical languages, first of all Greek, but also Latin, however, Grynaeus was able to teach quadrivium (arithmetic, astronomy, geometry and music). Grynaeus and Melanchthon thus appreciated classical languages and mathematics, but besides these interests, at the end of the decade they both became increasingly engrossed in natural history and medicine. Grynaeus letters to Ecolampadius shows that in the late 1529 he was reading and comparing Galen and Aristotle's natural books,<sup>335</sup> perhaps not only coincidentally anticipating Melanchthon's endeavours two or three years later to undertake a

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<sup>333</sup>Blázy 2010.

<sup>334</sup> Joachim Camerarius, *De vita philippi Melanchthonis narratio* (Halae: Gebauer 1777[1566]), 111-114.

<sup>335</sup>Simon Grynaeus an Oekolampad. Heidelberg 1. April 1529. Epp.649 in Staehelin 1934."Atque ut intelligas non ita pridem captum hoc mihi deserende professionis huius consilium, libros Galeni dudum omnes comparavi et in Aristotelicis de natura libris ita iam aliquandiu fui occupatus, ut qui serio medicinam sequi et vitam omnem in pulcherrima rerum illarum cognitione traducere decreverim, non quaestus gratia, Deus novit (sic enim de pectore meo solum testari possum), sed quia gravis illa profitendi ratio molestaque esse videbatur et maior omnino, quam cui diu praeesse possem, et hoc studium simul et pium multis utile futurum et ad vitam reliquam sustinendam satis idoneum putavi, tum ad ingenii mei rationem proxime accedens. Natura enim scrupulosiore et exacta rerum cognitione gaudeo, et quae ab ostentatione quam longissime absit. Ad eam rem plurimum educatio illa rustica et fortunae tenuitas fecit. Istuc igitur dum animo volvo, relinquere meam illam conditionem cogitabam et in istis comitiis quaerere patronum aliquem, qui mea mihi studia triennium saltem foveret aleretque. Sperabam hoc pacto, imo polliceri possem, minime protritam vulgaremque rerum medicarum cognitionem indipisci. Multum refert, quo te ferat ingenium.

commentary of Aristotle's *De Anima*, improving it with medical passages from Galen.<sup>336</sup> Perhaps they talked about these issues, for instance during the Reichstag of Speyer, where Grynaeus, relying to Camerarius' testimony, spent time at Melanchthon's pension.<sup>337</sup> The most important ideas seemingly travelled between the two humanists.

### *Grynaeus, Erasmus and the English Erasmians*

In these years, Grynaeus is clearly associated with a group of Evangelical humanists, nevertheless, much like Sebastian Münster, this did not prevent him making contact with the adherents of different schools of faith. The deepening religious discord, however, made the latter harder. The fact that Erasmus chose to leave Basel just before the Reformation is but one example. Interestingly however, just before he left, Erasmus gave the young Hellenist a push in a certain direction.

Whereas Wittenberg at the turn of the decade had become an exciting place, where Luther's spiritual and Melanchthon's scholarly renewals kept attracting young minds, at Basel instead, intellectual life had momentarily jammed. After the unrest of the reformation and the first Kappel war the University was paralyzed, and in the early year 1531 Grynaeus decided to take stimulation from a research trip to England, where he stayed from the end of March until the early summer. His sojourn in England turned out to be a truly inspiring one laying foundation for his forthcoming publications. Grynaeus was greeted by Thomas More and stayed as his host; he consulted manuscripts at the Corpus Christi College of Cambridge, and was received by the king Henry VIII, whose divorce problems he reported to the continental reformers.<sup>338</sup> On the top this, Grynaeus was given valuable manuscripts which he brought to Basel, and which served as auxiliaries for his editions of Plato and Euclid. Such success was not possible, had Grynaeus not had in his purse a recommendation of the greatest scholar of the age, Erasmus of Rotterdam. The collaboration of Grynaeus and Erasmus, indeed, is an interesting yet little known story, despite the fact that it brought forth some of the most beautiful examples of scholarly erudition, not least the second princeps editions of the works of Aristotle (1531) and Plato (1532). Unfortunately the friendship was hampered by the religious dissonances from the very beginning.

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<sup>336</sup>Kusukawa 1995, 83.

<sup>337</sup>Camerarius 1777[1566], 111-114.

<sup>338</sup>Welti 1963. Melanchthon's preface in Grynaeus' book is printed in SP VI 380 ff.



Erasmus, although the unrest of the reformation had driven him from Basel to Freiburg, had continued to maintain close ties to his former base, in particular to his printer Froben. Under these concerns he also got together with Grynaeus. Grynaeus' edition of Livy's decades was being prepared to print at Froben only some months before his departure to England. Grynaeus himself had planned to furnish the work with a foreword of Melanchthon, with whom he had shared the joy of the rare discovery already in 1527, as the lost decade was found at Lorsch.<sup>339</sup> The reformer had gladly penned a prefatory letter.<sup>340</sup> High-handed Froben, however, removed Melanchthon's text and replaced it by a confessionally less burdensome (and thus perhaps more lucrative) foreword of Erasmus.<sup>341</sup> Grynaeus was annoyed, but calmed down soon. Thinking of his departure to England, Froben had actually done him a favor: Could Grynaeus have possibly prepared a better gift, recommendation and visiting card, than the completed edition of Livy's Decades embellished with Erasmus' forthcoming praise to its editor? And if he had presentiments about the great scholar's sincerity to smooth his way – there was no room for misunderstandings: In addition to the preface Grynaeus received a letter of recommendation and was free to use Erasmus' contacts. The ice melted. In the late March 1531, accompanied by the printer-publisher Johann Bebel, another friend of Erasmus, and armed with the Great Scholar's recommendations Grynaeus travelled to England.

The welcome in England was warm. Grynaeus was hosted by Thomas More himself, who shored him with money, wrote Grynaeus another reference, and even told a boy to guide him to Oxford, his destination.<sup>342</sup> At Oxford, John Claymond, the president of the Corpus Christi College, was no less helpful. Several medieval manuscripts were handed out to Grynaeus, giving him reason to thank Claymond later in the prefaces to his Plato and Euclid editions. Perhaps Erasmus' dedication to Claymond in an edition of Chrysostom's *De Fato et Providentia Dei* (1526) had paved the way for the generosity. All in all, that Claymond is known to be Thomas More's friend, together with the dedication he received from Erasmus, confirm the impression that in England Grynaeus was amongst the friends of Erasmus. But there was obviously more to it. Claymond's generosity can be also explained by his apparent intentions to have manuscripts printed at the Basel's renowned presses. Accompanied by the printer publisher Bebel and familiar with the Froben and Petri houses Grynaeus was an appropriate messenger. If such intentions existed, Grynaeus fulfilled them using the Oxford

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<sup>339</sup>MBW, epp 587.

<sup>340</sup>Welti 1963.

<sup>341</sup>Ibid.

<sup>342</sup>Ibid.

manuscript of Proclus's commentary in his Euclid edition (1533). Interestingly Claymond was also a passionate reader of Pliny the Elder, and was preparing a commentary on the *Historia naturalis*.<sup>343</sup> Here Claymond shared the passion of the young Hellenist. A year after Grynaeus had left England, 1532, Claymond wrote him to inform that Bebel had returned there in order to deliver several works to be printed – Claymond added that he could ‘polish up’ his own work on Pliny – obviously wishing to have it published at Basel.<sup>344</sup> The Letter reveals that Grynaeus had sent Claymond a copy of Jacob Ziegler's pioneering mathematical commentary on the *Historia naturalis*.<sup>345</sup> There certainly was room for cooperation. What Claymond did not know, however, was that Grynaeus' mediation between the English and continental Erasmians had already come to an end.

Just before Grynaeus' return to Basel he was invited to discuss with the Henry VIII. The King had a problem. The marriage of Henry and Catharine of Aragon had not broad a boy child, a potential heir for the throne, but the unhappy situation was ever complicated by King's fears, that having married Catherin, widow of his brother he had violated the Scripture, and was now suffering the admonished punishment of childlessness (Leviticus 18:6, 20:21).<sup>346</sup> The King wished to divorce from Catharine, in order to remarry and produce a legitimate heir – but divorce again was against the Scripture. King sought desperately an interpretation of Scripture that would give theological support for his anxieties to assure the continuity of dynasty. The Holy See, however, had taken a stance against such interpretations and opposed Henry by insisting on the legitimacy of the marriage. The result was tension between the Pope and the King, which obviously made it beneficial for Grynaeus to bring Protestant views on the table. In order to respond to the King Grynaeus wrote to the leading Evangelical theologians. Zwingli, Ecolampadius, Bucer and Capito were asked to reflect the case, as was Bonifatius Amerbach, the theologically moderate lawyer and Grynaeus' colleague from Basel. But Grynaeus did not content himself with asking only the Zwinglians. This required some diplomacy. Henry, “the defender of faith”, had taken a strong stance against Luther, fearing that the great heretic leader's views on Church might encourage disobedience among his

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<sup>343</sup>Jonathan Woolfson, “John Claymond, Pliny the Elder, and the Early History of Corpus Christi College, Oxford.” pp.882-903 in *English Historical Review*, Sept. 1997.

<sup>344</sup> Woolfson 1997, 894, ‘Decrevit Bebelius (uti ad me scripsit) paucos intra dies, Londini prelo committere autores. Quod si fecerit, limabo fortasse meas in Plinium ineptiunculas, ut a iuventute saltem inspiciantur, etiamsi fastidiantur ab eruditoribus.’

<sup>345</sup> John Claymond's letter to Grynaeus (in German translation) in Herbert Rädle (ed.), “Simon Grynaeus (1493-1541): Briefe”, in *Basler Zeitschrift für Geschichte und Altertumskunde*, 90 (1990), Epp. /Nr. 13.

<sup>346</sup>John Schofield, *Philip Melancthon and the English Reformation*, (Aldershot: Ashgate, 2006), 57 – 67.

subjects. Luther was appalled – and the relations between the court of Henry and Wittenberg continued cool. On this background it is interesting to see that Grynaeus also checked the Lutheran view on the issue.<sup>347</sup>

Whether Grynaeus' wish to inform also Melanchthon about the King's schemes was an act of astute diplomacy, or a sign of personal confidence, it demonstrates Grynaeus' ability to bridge the gap between the Zwinglians and Lutherans. But in his relations with the Humanists keen to the old faith Grynaeus' diplomatic capacities came short. During his English sojourn, if one may count on Protestant references, Grynaeus' showed his gratitude to More, by "lecturing" him about the virtues of reformation.<sup>348</sup> What a splendid way he found to please his catholic host and old opponent of Tyndales! This time Grynaeus' behaviour did not cause controversy: in More's company, unorthodox beliefs could be tolerated. However, two years later Grynaeus crossed the line. The situation in England had become volatile. Henry had stood against the head of the Holy Roman Church, and different religious fractions were combating for their fate in the kingdom. Perhaps unaware of the situation Grynaeus had revealed his contacts with More and friends to English heretics. The breeched confidence had an immediate effect on Grynaeus' work at Basel. Alarmed by the Britons, Erasmus withdrew his dedication to More from Grynaeus' Plato edition (Froben 1532), stating that More was not happy to hear praise in a book of a Zwinglian. The links to English Erasmians had broken up. Erasmus asked Grynaeus not to write in a confidential tone for persons who would detest his religious beliefs.<sup>349</sup>

### *Two Commentaries on Pliny*

Although Grynaeus' breach with "Erasmus and friends" was, as it seems, primarily caused by his lack of sensitivity, in a fortuitous manner, the incident also accentuates the difference between the two generations of humanists. More was 15, Claymond 25 and Erasmus 27 years older than Grynaeus (born in 1493). The new generation of men like Grynaeus, Sebastian Münster and Philip Melanchthon had become even more critical towards the traditional theology, and the split of the Church had forced them to define their position in clear terms. But it was not only the faith that mattered: The idols of the earlier generations were largely

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<sup>347</sup>MBW, epp 1180. Melanchthon to Grynaeus Wittenberg 23 August 1531.

<sup>348</sup>Wolti 1963.

<sup>349</sup>Ibid.

becoming infallible. Aristotle had come under attack by Luther, and gradually other ancients were taken down from the podium. Accordingly the contention had spread from theology to arts and education. The new, more critical approach, towards the ancients was a fruit of the century long project of correction and edition: the generation of Grynaeus, Münster, and Melanchthon had something the earlier generations of humanists had only desired: corrected editions of the classical authors available in original tongues. Their own contribution to this business was also considerable. Grynaeus by himself brought to life Greek editions of Ptolemy's *Almagest*, Plato's and Aristotle's works, the *editio princeps* of Euclid's *Elementa* and many others. But as these ancient works appeared now in new editions, their shortcomings could not be ascribed to fragmentary transmission. The paradoxical result of the industrious editing-project was that the past achievements suddenly lost some their authority.

It would be false to say, however, that the interest in ancients had ceased suddenly: that was and could not be the case. The scholars of all fields were still largely dependent on the knowledge and methods of the classical authors. However, an increasing number of more advanced commentaries was gradually challenging the classical heritage. The observed difference between the two generations of humanists comes out in ways which the works of the ancient authors were read: for the new generations the ancient texts were not only noble goals in themselves but became to be treated as tools. The difference between these two approaches becomes perhaps most discernible in books which sought to discover nature, like Ptolemy's, Pliny's or Aristotle's natural books. As has been discussed above, when the teacher of Sebastian Münster and Philip Melanchthon, Johannes Stöffler, criticized Ptolemy in 1513, his annoyance resulted from the inaccuracies of Ptolemy's positional tables. The unreliability of the information was revealed in practice. The incident is minor and Stöffler did little to replace the ancient geographer, but it is still easy to see some symbolism here: The world of things had started to take the place of world of books as the ultimate point of reference.

At the turn of the 1530s the natural world had gradually arisen upon the literal horizon. The half-accidental consequences of the abandoning of the scholastic philosophy have already been touched above, but a shift towards "nature" can be distinguished even in such a literal genre as the commonplace books. Whereas the context of Juan Luis Vives' and Erasmus' commonplaces was a verbal environment, Ann Moss has argued, Melanchthon talked of things before he talked of words, and of things in the world before he talked of

things in books.<sup>350</sup> The methodological difference between Erasmus and Melanchthon is marked: whereas commonplace *sententiae* in Erasmus were “typically forms of words, linguistic expressions either quoted from literary texts or, like adages, found embedded in the Latin language”, for Melanchthon, commonplaces were “indistinguishable from general heads, ‘capita’ or ‘tituli’,” and were “much more tightly related to the world of things, to systematic divisions latent in the universe of the knowable.”<sup>351</sup> For Melanchthon, Moss observes commonplaces were “not only ‘sedes argumentorum’, but ‘sedes naturae’.” In Melanchthon’s approach the headings in the student’s commonplace-book were to be taken as a “key to chapters in the book of nature itself.”<sup>352</sup>

If no attention is paid on the ways how the classical authors were suggested to be read, the picture of the early sixteenth century loses some important hues. Pliny the Elder’s *Historia naturalis* exemplifies the case. The natural history or *naturalis historia* of Gaius Plinius Elder (23 B. C. – 79) received a relatively wide success in the renaissance. The ancient Roman author’s ambitious work and perhaps the earliest example of a systematic encyclopaedia fascinated scholars, who drew inspiration from the cornucopia of ancient medicine, art, geography, and myth. The way the humanists dealt with the book, however, showed little interest for its particularity as a piece of natural research. A Pliny-specialist, Charles G. Nauert has pointed out importantly, that up to the 1530s all commentaries of natural history were textual in kind: The learned treated the *Natural History* as a classical text applying to it their knowledge of classical Latin, other ancient authors and old manuscripts. That *Historia naturalis* was a work of a mathematician made no exception to the rule – a standard humanist edition aimed at literal restoration.<sup>353</sup> Erasmus’ friend John Claymond’s

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<sup>350</sup> Ann Moss, *Printed Commonplace Books and the Structuring of the Renaissance Thought*, (Oxford: Clarendon Press, 1996), 120

<sup>351</sup> Ibid.

<sup>352</sup> Ibid.

<sup>353</sup> Charles G. Nauert, “Humanists, Scientists, and Pliny: Changing Approaches to a Classical Author.” pp. 72-85 in *The American Historical Review*, Vol. 84, No. 1 (Feb., 1979). Nauert’s more extensive survey and collection of early modern Pliny commentaries is: Charles G. Nauert, “Caius Plinius Secundus” pp. 297–422 in Ferdinand Cranz (ed.), *Catalogus translationum et commentariorum : Mediaeval and Renaissance Latin translations and commentaries, Vol IV* (Washington: The Catholic University of America Press, 1980) Analyzing these commentaries and glosses Nauert argues that they “reflect the concentration on textual questions which characterized most commentaries except those produced by Melanchthon and his followers. (p. 315) According to Nauert these Wittenberg commentaries on Pliny’s *Historia naturalis*, often by-products of classroom teaching, are of little importance in the textual history of Pliny. However, recent studies on natural history have paid more attention on the complex interplay between observational interests and philological methods of early modern naturalists. Within this context a medical debate between two Italian scholars Niccolò Leonicensi and Angelo Poliziano received particular interesting. Tensions in Italian culture between

commentary on the natural history that Simon Grynaeus was leafing at Oxford in the early summer 1531 was in line of typical humanist production. It applied philological methods on Pliny by comparing different manuscripts and citations of ancient literature in Claymond's large collection of books. It perhaps was "one of the significant achievements of Tudor humanist scholarship"<sup>354</sup>, but not a study of nature.

The central role of Pliny's work at Wittenberg has often been acknowledged. Analyzing the reception of Pliny, also Charles G. Nauert made a remark that Melanchthon had put the *Natural History* in use as a textbook causing a whole generation of academics to produce Pliny commentaries as by product of the lectures. This interest in Pliny, however, has been downplayed as a meaningless side effect of the anti-scholastic university reforms. Also Nauert disregards it this way, explaining Pliny's centrality in Wittenberg only as Melanchthon's solution to replace Aristotle, as an oddity that became reversed in the later Aristotelian revival.<sup>355</sup> In the light of later research such a juxtaposition of Aristotle and Pliny seems artificial: The *historia naturalis* continued to be lectured at Wittenberg continuously up to the 1540s, and even after. Also the eclectic nature of Melanchthon's Aristotelism is now better understood: The Stagirite was hardly a goal in its own right, but served better as a starting point in reformer's research of God's guidance and order in nature. Melanchthon replenished his commentaries on Aristotle's *De Anima* with elements from Galen and Vesalius.<sup>356</sup> In the textbook on natural philosophy, the *Initia doctrinae physicae* (1549), Melanchthon called his system "Aristotelic", only to cut down the whole Aristotelian ontological dimension, and to reduce all substantial forms back to material qualities.<sup>357</sup> It was the study of nature, not Aristotle, that Melanchthon was campaigning for, and with these respects Pliny's *Historia Naturalis*, particularly its second 'mathematical' book was a useful tool. One can only regret the paucity of research on the Pliny commentaries of Wittenberg, but as Melanchthon seemingly was informed of Grynaeus' occupations one has good grounds to assume that he read Pliny's work as a study of nature.

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different concepts of method and of its purpose have been seen reaching a focal point in this controversy of Leonicensis and Poliziano about Pliny in 1490s. As Peter Godman has argued "both sides acknowledged a role for philology and assigned a place to natural science or medicine", but "evaluated them differently in the light of incompatible objectives and their views of the relative importance of the Greek and Latin traditions.(p. 104) Peter Godman, *From Poliziano to Machiavelli: Florentine Humanism in the High Renaissance* (Princeton: Princeton University Press, 1998).

<sup>354</sup> Woolfson 1997, 882.

<sup>355</sup> Nauert 1979, 80.

<sup>356</sup> Kusukawa 1995, 118-120.

<sup>357</sup> Frank 1998, 52.

Jacob Ziegler was a German humanist, astronomer and Geographer who had studied at Ingolstadt and Vienna. Between 1521 and 1531, before he converted to Evangelical faith, he was in Italy invited by the Pope Leo X. He resided mostly in Rome, but frequented often Ferrara, hometown of his good friend a humanist, Celio Calcagnini. The distinctively novel attitude to the ancient texts separates Ziegler's work *C. Plinii de naturali historia librum secundam commentarius* (Basel 1531) from its contemporaries. According to Pietro Daniel Omodeos recent study, these commentaries “showed not only philological competences but also and foremost astronomical and mathematical expertise.”<sup>358</sup> Indeed, Ziegler was the first to argue that the *Historia Naturalis* could not be taken as a literal text only, but was a piece of natural philosophy. Accordingly Ziegler proclaimed the necessity of the commentators be competent in the field. In the dedicatory epistle of his work Ziegler wrote that Pliny is difficult to understand because the text has been damaged, but added that “the most serious cause of the difficulty is that those who have undertaken to understand Pliny were concerned with knowing and interpreting other types of subjects: humane letters, grammarians, poets, orators, historians, even philosophers. But they have studied astronomy [only] in passing, from popular authors...”<sup>359</sup>

The two different commentaries by John Claymond and Jacob Ziegler on Pliny the Elder's *Historia Naturalis* demonstrate an interesting transition in the ways to read the ancient works on nature, a shift from purely linguistic to mathematical point of view. But even more interestingly Grynaeus seems to stand close to Ziegler in this period. Besides that Claymond had vended his work to be printed at Basel, Grynaeus had obviously discussed about it with him during his sojourn at Oxford. Although Grynaeus did not undertake Claymond's work, he showed his gratitude for the Englishman by sending him Jacob Ziegler's mathematical commentary. The book was printed in August 1531 at the presses of Heinrich Petri, Sebastian Münster's son-in-law. Grynaeus had collaborated with Münster since the Heidelberg years, and although Münster wasn't strongly involved in his step-son's businesses, the printing of an astronomical book must have been a pleasing case. On 11<sup>th</sup> of August, Ziegler wrote to

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<sup>358</sup> Pietro Daniel Omodeo, “Erasmian Philology and Mathematical Astronomy. Jacob Ziegler and the Humanist Recovery of Pliny's Natural History”, pp. 7a:1–7a:23 in *Journal of Interdisciplinary History of Ideas* 3 (2014).

<sup>359</sup>Jacob Ziegler, *Iacobi Ziegleri, Landavi, Bavari, In C. Plinii De Natvrali Historia Librvm Secvndvm Commentarivs* (Basel: Heinrich Petri, 1531), f. A4r. Translation in Charles G. Nauert, *Humanists, Scientists, and Pliny: Changing Approaches to a Classical Author*. pp. 72-85 in *The American Historical Review*, Vol. 84, No, 1 (Feb., 1979). p.84.

Œcolampadius, asking news of Grynaeus.<sup>360</sup> In an earlier letter he had asked Grynaeus to send him two copies of complete works of Pliny to Ferrara. They hadn't arrived. Grynaeus remained still in England, but his letters to Martin Bucer reveal that he was trying to get in contact with Ziegler and Ziegler's Pliny commentary interested him.<sup>361</sup>

The two other contributors to Ziegler's commentary, Joachim Vadianus and George Tanstetter or Collimitius, can also be connected to Grynaeus. With the humanist and reformer Joachim Vadianus, Grynaeus had acquainted with during his Vienna years,<sup>362</sup> and in the following year 1532 Grynaeus dedicated his and Sebastian Münster's work on the discovery of the new world, *Novus Orbis*, to Collimitius.<sup>363</sup> Vadianus and Collimitius had both taken part to the circle of humanists in the court of Maximilian I at the turn of the 1520s. In this period also Ziegler and Grynaeus had resided at Vienna.<sup>364</sup> Ziegler's pioneering commentary thus begins to look like a collaboration of a bunch of mathematically oriented humanists, old friends of Vienna. It has to be said, though, that Collimitius' and Vadian's pieces on Pliny were less original than the one of Ziegler, and paid less attention to mathematical aspects.<sup>365</sup>

The details are one thing and the big picture another. A few clear landmarks, however, stand out of the obscure clouds of petty incidents. In the 1530s Melancthon's and Grynaeus' correspondence continues despite the broader religious discord between the Zwinglians and the Lutherans. The promising collaboration between Grynaeus and Erasmus' circle, in turn, fails. At the beginning of the decade Grynaeus and a loose circle of evangelical humanists around him were dissociating themselves from the previous generation of

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<sup>360</sup>Jakob Ziegler an Oekolampad. Ferrara 11 August 1531. Epp. 907 in Staehelin 1934. Scripsi de mense Junio, sicut memini, Simoni Grineo, quod is curaret, quo absoluta opera Pliniana duo plurave eius exemplaria ad me Ferrariam mitterentur. Ea sub finem Julii expectabam, sed cum audiam hominem domi non esse peregre profectum, ut bibliothecas perlustret, te oro, suscipe occupationem istam curaque, ut haec ad me in Italiam perferantur.

<sup>361</sup> Grynaeus to Bucer, November 1531. Nr. 516; December 1531, Nr. 529; January 1532, Nr. 522; Nr. 638. in Berndt Hamm, Reinhold Friedrich, Wolfgang Simon (eds.) *Martin Bucer, Briefwechsel - Correspondence* (Leiden: Brill 2008)

<sup>362</sup>Emil Arbenz & Hermann Wartmann (eds.), *Die Vadianische Briefsammlung der Stadtbibliothek St. Gallen, Arbenz*, I-VII, (Historische Verein in St. Gallen: St. Gallen 1888-1913), Vad.Br. V /1, Nr. 710 [29] In 1532 Grynaeus began his letter to Vadian by recalling how he listened Vadian's lectures 20 years ago.

<sup>363</sup>Simon Grynaeus, *Novvus orbis regionvm ac insularum veteribvs incognitavm...* (Basel 1532), "Excellenti viro georgio collimitio danstettero artis medicae et disciplinaru Mathematicaru omnium facile principi, simon grynaevs."

<sup>364</sup> "Ziegler, Jakob", ADB, Band 45 (1900), 175–177.

<sup>365</sup> Nauert 1979, 84.



humanists. In the appreciation of the younger generation, interest in nature and mathematics was increasing along with philological erudition.<sup>366</sup>

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<sup>366</sup> Some very recent studies (*Journal of Interdisciplinary History of Ideas* 3 (2014)) seem to support my views. In an article “Erasmus and Geography”, Nathan Ron argues for instance that Erasmus’s “[...] scholarly interest in geography was limited and marginal, and that the fact that he took upon himself to prepare Ptolemy’s *Geography* for print in its original language was for him more of a textual-philological task than a truly geographical challenge. This should raise a question mark over any alleged “Erasmian science”. In the same issue, Richard J. Oosterhoff observes: Although he [Erasmus] supported the Greek edition of Ptolemy’s *De geographia*, and quite possibly encouraged such learning at the new trilingual college in Louvain, on balance Erasmus presented a view of erudition that minimized the more systematic knowledge of Aristotelian natural philosophy or even the mathematical portion of the liberal arts. My suggestion is that this configuration of erudition was at odds with that presented by Lefèvre and Grynaeus.” Nathan Ron, “Erasmus and Geography”, pp. 6:1. – 6:27, *Journal of Interdisciplinary History of Ideas* 2014, vol. 3, Issue 6; Richard J. Oosterhoff, “The Fabrist Origins of Erasmian Science: Mathematical Erudition in Erasmus’ Basle.” pp. 3:1. – 3:37, *Journal of Interdisciplinary History of Ideas* 2014, vol. 3, Issue 6.



## Chapter VI

### Discussions on Natural Philosophy

This chapter will focus on intellectual exchange between Simon Grynaeus and Philip Melanchthon. It shall take a look at prefaces of several textbooks that these scholars wrote during the 1530s. These texts reveal how these men's understanding of natural philosophy developed during this period, and how these texts eventually seem to have influenced one another. This chapter shall also take a look at the reformation of the University of Tübingen which took place between 1534 and 1535. Grynaeus, Melanchthon's ally Joachim Camerarius and ultimately also Melanchthon himself got involved in these curricular reforms. The case of Tübingen is particularly interesting because it shows that Grynaeus, Camerarius and Melanchthon could agree on educational ideals also on the practical level of real reforms.

#### *De Sphaera: Visions of Divine Wisdom*

As mentioned in the third chapter, the Peasants' War and the spread of Anabaptism in the late 1520s had significantly altered Luther's and Melanchthon's opinions on the purpose of philosophy at Wittenberg. Abandoning scholastic theology necessitated a new understanding of the different roles of theology and philosophy. Although absolutely against the idea of tarnishing God's Word with fallen human reason, Luther in principle had nothing against the use of rationality in the practical spheres of life.<sup>367</sup> While the philosophical theology of scholars was under attack at this time, 'knowledge of nature' as it was then known (i.e., economy, politics, and medicine) remained legitimate. At the same time the fundamental idea of a division between God's Law and Gospel emerged. In Philip Melanchthon's thought, philosophy became associated with God's law. Accordingly philosophy became the study of God's law in nature. The concept of nature being regulatory and trustworthy had obvious

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<sup>367</sup> Kaufmann 2009 A.

similarities with Stoic thought, particularly with the concept of *pronoia*, or providence.<sup>368</sup> From the 1530s the idea of providence appears more and more frequently in Melanchthon's natural philosophy.<sup>369</sup>

With this in mind, Melanchthon's preface to *De Sphaera* has particular resonance. The curricular changes that Melanchthon and Luther had negotiated with the University of Wittenberg's Elector in the 1520s had elevated the status of philosophy to a study of nature, yet *De Sphaera* was nonetheless the first natural philosophy textbook to be edited and published at Wittenberg.<sup>370</sup>

*De Sphaera* had, in fact, been circulating among universities from as early as the late thirteenth century. Johannes Sacrobosco's work was based on the texts of Ptolemy, Macrobius, Al-Battani and Al Fraghani and had become a standard manual of cosmology. It sought to represent the structure of the universe and provided a summary explanation of planetary movement, eclipses, and zodiacal inequalities. Explaining how to divide various zones, parallels and climates, *De Sphaera* provided the primary precepts of cosmography. But it is perhaps significant that no part of the work discussed the validity of astronomy and astrology, nor their religious and moral consequences.<sup>371</sup> Melanchthon, however, provides a Christian apology for astronomy and astrology quite forcefully in the preface, and this was well received. The book, accompanied by Melanchthon's preface, came out in tens of different editions right up to the 1630s, and the preface itself was often mentioned separately in the title page.<sup>372</sup>

Melanchthon begins his apology by sending greetings to his learned old friend Simon Grynaeus,<sup>373</sup> and expresses his gratitude for the learned men who have written the

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<sup>368</sup> For Stoicism in early modern academic culture and philosophy, see. Margaret J. Osler (ed.), *Atoms, pneuma, and tranquility. Epicurean and Stoic themes in European thought* (Cambridge: Cambridge University Press 1991).

<sup>369</sup> Kusukawa 1995, 129.

<sup>370</sup> Karin Reich, "Melanchthon und die Mathematik seiner Zeit" pp. 105-135 in Günther Frank & Stefan Rhein (eds.), *Melanchthon und die Naturwissenschaften seiner Zeit*, (Sigmaringen: Jan Thorbecke, 1998), 116.

<sup>371</sup> Isabella Pantin, "La Lettre de Melanchthon a S. Grynaeus" pp. 85-101 in *Divination et controverse religieuse en France au XVIe siècle* (Paris: Ecole normale superieure de jeunes filles 1987).

<sup>372</sup> Many printers, like the Venetian Sabio brothers, ornated the title page with a note "*Addita est in eundem librum Philippi Mel. ad Symonem Grynaeum*". Tightening censorship, however, caused the addition to be removed from Parisian and Venetian editions in the 1540s, even if, as a part of Albertus Hero Scholia (1581), Melanchthon's defense of astrology continued to be circulated in the Catholic world, under the pious protection of the Jesuit emblem. See. Pantin 1987.

<sup>373</sup> MBW 1176. "*Philippus Melanchthon Simoni Gryneo, viro doctissimo et amico veteri S.D*".

earlier works in astronomy and cosmography.<sup>374</sup> In Melanchthon's view, Sacrobosco's much referenced and broadly approved work deserved to be handed down to following generations. Having thus opened the discussion, Melanchthon then turns to the necessity for studying these arts. He maintains that if the knowledge of cosmography and astronomy is to be considered useful in life, an effort should be made to preserve the books that prepare the way to them.<sup>375</sup> Then Melanchthon moves on to rhetorically explain his theological view that these arts are necessary:

Who is so hard-hearted, and so without feeling, that he does not sometimes, when looking at the sky and beholding the most beautiful lights within, admire the variations produced by their movements, and does not will to know their tracks which plainly manifest the fixed divine reason?<sup>376</sup>

Nature, and stellar combinations in particular, seemed to be a visible manifestation of God's order for Melanchthon. However, he hastens to add that "the eyes are given for the sake of astronomy", i.e., these magnificent phenomena would not have been investigated to begin with, had not God first roused the attentions of remarkable men who would then study them in more depth.<sup>377</sup> Nature thus also requires divine will in order to be investigated, by virtue of it being a visible manifestation of God's reason. Melanchthon then hardens his tone by quoting Plato's *Timaeus* dialogue:

Therefore those who disdain these related lights [or stars] do not contemplate the work of nature, and for that reason deserve to have their eyes plucked out, since they do not want to use them for the purpose for which they are chiefly made - especially since that knowledge puts us in mind of God and of our immortality.<sup>378</sup>

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<sup>374</sup>MBW 1176. "*Maxima profecto debetur gratia viris optimis et eruditissimis, qui harum pulcherimarum disciplinarum, videlicet astronomiae et cosmographiae, isagogas nobis composuerunt*"

<sup>375</sup>MBW 1176. "*Nam si existimamus illarum artium cognitionem utilem in vita esse, magnopere nobis haec monumenta conservanda sunt, quae aditum ad eas patefaciunt*".

<sup>376</sup>Here longer quotes of *De Sphaera* follow an English translation in Philip Melanchthon's, *Orations on Philosophy and Education*, (Cambridge: Cambridge University Press, 1999) MBW 1176. "*Quis est autem tam ferreus, tam sine sensu ullo, ut non aliquando suspiciens coelum et pulcherrima in eo lumina intuens, admiretur tam varias vices, quae motibus conficiuntur, nec cupiat quasi vestigia illorum motuum, videlicet certam rationem divinitus ostensam, cognoscere?*"

<sup>377</sup>MBW 1176. "*Neque enim res tam variae tamque procul positae aut inquisitae essent aut acie ingenii humani perspectae, nisi deus studia quorundam summorum virorum et excitasset er provexisset*".

<sup>378</sup>MBW 1176. "*Itaque, qui cognata illa lumina fastidiunt, non considerant naturae opificium eamque ob causam digni erant, quibus eruerunt oculi, cum his ad hanc rem uti nolint, ad quam precipue*

For Melanchthon astronomy was an art that sought to grasp a better knowledge of God, therefore he judged its critics to be atheists and epicureans who chose to deny the existence of a divine will and immortal soul.

Melanchthon's preface is particularly interesting in that it presents the fundamental principles of his natural philosophy (or his theory of "physike") for the first time. Many of these principles remained intact throughout Melanchthon's career. Sachiko Kusukawa has observed that half of Melanchthon's text *Physicae seu naturalis philosophiae compendium* (1543), not only provides a prototype for his ultimate textbook on natural philosophy, *Initia Doctrinae Physicae* (1549), but is also based on the same defense of astrology and astronomy as contained in the preface to *De Sphaera*.<sup>379</sup> Although the piece, also known as the Grynaeus letter, still lacks a comprehensive view and systematic methodological inquiry, which are characteristic of the mature work, it shares its fundamental tenets: nature is a manifestation God's will, and is orderly and trustworthy.

But let's focus on the Grynaeus letter. It is no coincidence that Melanchthon ends his letter by thanking Grynaeus for his labors, which show "the genuine face of Aristotle", as compared to scholars who "rather than teach philosophy - the knowledge of speaking and judging wisely - would crush it with empty and idle subtleties, of no use for important or public matters".<sup>380</sup> Melanchthon's discussion on nature and astronomy in the Grynaeus letter also has strong Aristotelian influences.

Melanchthon argues implicitly that scientific knowledge of heavenly things brings us closer to divinity than an ordinary understanding of earthly matters. He is largely indebted to Aristotle for this view, and makes no attempt to deny this. "I judge that Aristotle spoke rightly when he said that this lower world is governed by the higher, and that the higher things are the cause of motion in the lower. [...] Since motion comes from the heavens, it follows that the motion of the heavens is also the cause of motion in everything else".<sup>381</sup> Later on, particularly in the *Initia doctrinae physicae*, Melanchthon moves further from the traditional Aristotelian conception of causality. Here Melanchthon emphasizes God as the

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*conditi sunt, presertim cum illa cognitio admoneat etiam nos de deo et de immortalitate nostra*".

<sup>379</sup>Kusukawa 1995, p. 145.

<sup>380</sup>MBW 1176. "*Accipio enim te libros aliquot longe foelicus enarrasse, quam solebant isti, qui paulo ante hanc aetatem non nativam Aristotelis faciem, sed vix exiguum umbram nobis ostendebant, nec tradebant philosophiam, hoc est sapienter dicendi et iudicandi scientiam, sed hanc oppresserant ociosis et inanibus argutiis, quae nihil ad iudicandum de civilibus aut aliis magnis rebus proderant*".

<sup>381</sup>MBW 1176. "*Ideoque recte dixisse Aristotelem iudico, cum ait, hunc inferiorem mundum a superiore gubernari et superiora causam motus in inferioribus esse et addid rationem prudentissima cogitatam; cum initium motus sit a coelo, consequi motum coeli et reliquis causam motus esse*".

immediate cause of every movement diminishing the status earlier given for the substantial forms.<sup>382</sup> In the Grynaeus letter, however Melanchthon has some difficulty combining the idea of God's omnipotent providence with Aristotelian causality, yet he nevertheless convincingly argues that there's no disagreement with the Christian doctrine, since the fact that "things are governed by providence, does not make natural actions any less important". Thus, although God is ultimately responsible for bestowing or removing life in human bodies, people still need to know how to physically support themselves (i.e., how to eat and drink).<sup>383</sup>

Melanchthon aims to solve the difficulty of there being both divine and natural sources of causation, by specifying three kinds of event: (i) those that are due to a divine and natural interaction (*communes actiones dei et naturae*); (ii) those in which the divine takes precedence over the natural (*supra naturam positae*); and (iii) those in which the human soul is lured by the devil to act against nature (*animi contra naturam a diabolo impelluntur*).

Categories (ii) and (iii) are therefore in effect "supernatural" and thus beyond the scope of his natural philosophy alone.<sup>384</sup> The third category, in particular, is of marginal importance here, while the second category would explain events like Moses crossing the Red Sea or an angel assisting Peter to escape from prison. In these cases, God has "corrected nature" or has allowed there to arise "different outcomes to those which nature intended."<sup>385</sup> It seems apparent, he explains, that these are not dependent on natural causes, and thus "...no one fails to understand that God is to be considered exclusively responsible for such works".<sup>386</sup> The spiritual and symbolic meaning of these "supernatural actions" is twofold: they should not only lead Christian minds to understand that the pious are protected and governed by God<sup>387</sup>, but ultimately they are given to elevate mind "up above this entire corporeal nature" to the Word of God.

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<sup>382</sup>For Melanchthon's later explanation of causality, see Frank 1995.

<sup>383</sup>MBW 1176. "*Atque haec non dissentiunt a christiana doctrina, quae etsi docet nos omnia divinitus gubernari, tamen non tollit naturales actiones ac significationes rerum, sicut in alendis corporibus apparet, quibus vitam ac motum deus impertit, tamen ea foveri ac pasci cibo, potu et aliis rebus ad vitam tuendam coditis iubet*".

<sup>384</sup>Melanchthon is seemingly pointing at problems related with astrology concerning determinism, free will and divination. These philosophical problems were discussed by Ficino and other Florentine Platonists.

<sup>385</sup>MBW 1176. "*Etsi autem ita gubernat deus, ut naturae suas partes etiam aliquo modo reliquat, tamen multa corrigit in natura et multarum rerum eventus concedit alios, quam quales proponit natura*".

<sup>386</sup>MBW 1176. "*Talium operum causam proprie ad deum referendam esse nemo intelligit*".

<sup>387</sup>MBW 1176. *Hoc est enim christianae mentis intelligere ac sentire, divinitus homines custodiri atque gubernari.*

The second category of actions refers primarily to Gospel, events above the corporeal nature. Gospel and nature thus belong to different realms, accordingly reformer's distinction between the Law and Evangel has moved here further in comparison to Melanchthon's earlier formulations, for instance in the *Scholia on Paul's Letter to Colossians* of 1527. Where as in the *Scholia* Melanchthon strived to explain God's activity in nature on an exclusively biblical basis, here God's "natural" activity denotes to regulatory movements and Biblical material on movements above nature.<sup>388</sup> In the preface to *Sacrobosco* Melanchthon does not aim at biblical exegesis, but at making room for astronomical calculus and divination. The scope of these arts is the natural sphere, or actions of "God together with nature". These are things which in God's government are left for nature.<sup>389</sup> These are things and actions, Melanchthon seems to think, which are studied by medics, astronomers and cosmographers. Similarly to a good number of his contemporaries, Melanchthon sees astrological element as inseparable from these arts. For instance he portrays human behavior as a consequence of a mixture of qualities and temperaments related to ascending or descending stellar elements. Interestingly Melanchthon associates these powers with the geographical realm:

If anyone contemplated the character of different regions and the minds of various peoples, what other cause for this difference could he show than the nature of heavens? From this one can judge easily that in the mixing of the temperaments of bodies and minds the nature of light also concurs, among other things.<sup>390</sup>

Melanchthon draws an analogy between the human body and the cosmic realities studied by geography and astronomy. The actions of human mind and body and larger natural things like regions or peoples are in Melanchthon's opinion dependent on the mixtures of temperaments and of the representative heavenly bodies. Proper understanding of these things requires both close observation of the actual phenomena and the heavenly constellations. Matters such as education, habit, custom, laws and advice, Melanchthon adds contribute also to these inclinations. Springing from nature they should also be put into the category of natural actions.<sup>391</sup> Melanchthon's comment is interesting also in a sense that it elevates geographical

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<sup>388</sup>It would be interesting to adapt Melanchthon's categories to reading of Hans Holbein's art and to, say, compare paintings depicting acts of Gospel being natural or again above nature.

<sup>389</sup>MBW 1176. ...ita gubernat deus, ut naturae suas suas partes etiam aliquo modo relinquat...

<sup>390</sup>MBW 1176. Si quis autem considerabit diversas regionum naturas et diversarum gentium ingenia, quam aliam causam huius dissimilitudinis ostendere poterit quam coeli naturam. Unde facile iudicari potest in miscendis temperamentis corporum atque ingeniorum inter alias causas etiam luminis naturam concurrere.

<sup>391</sup>MBW 1176. Neque ego nihil educationem, consuetudinem, institutionem, leges atque consilia in



knowledge as a paradigmatic example of actions of “God with nature”, alongside with astronomy and medicine. Accordingly Melanchthon’s conception of the natural philosophy consists primarily of the disciplines of cosmography (astronomy, astrology and geography) and medicine.

Perhaps something should be said also about Melanchthon’s third category, the peculiar group of actions where the human mind is driven against nature by the devil. The reformer has a couple of reasons for adding this supplementary case. “Unnatural desires and murders of tyrants”, Melanchthon argues, are to be attributed “to the devil and not to stars or other natural causes.”<sup>392</sup> Simply put, the stars are not to blame. This inevitably fits to Melanchthon’s bigger picture. God as the ultimate cause of the natural actions has to be saved from being the cause of evil. The third category works also to save the freedom of human actions, as, although Melanchthon thinks that the inclinations of individuals are influenced by the stars, he still argues that heavens do not fully determine these actions: “human minds are not moved by one kind of cause only”<sup>393</sup>, Melanchthon asserts. This obviously has an effect to divinations. “The laws of faith” can be hindered in various ways, for instance by divine inspiration, or devil. Accordingly Melanchthon thinks the astrologer’s predictions do not force people to obey and the freedom of will is saved.

Melanchthon’s preface to *De Sphaera* was not only a powerful eulogy to astrology and astronomy, but it was the first printed manifesto of his ideas about natural philosophy. Perhaps there was nothing new in defending the study of stars – but what was new was Melanchthon’s theological drive to do so. For him astronomy stood out as means to grasp knowledge of God’s providence. The art was therefore to be seen as an accomplishment of human vocation. Natural philosophy, astronomy in particular, had a huge moral and ethical value for Melanchthon since they provided knowledge of the divine law. Those who denied the importance of these arts were in Melanchthon’s eyes Epicureans and atheists, deniers of providence and the immortality of souls.

Melanchthon’s idea to divide natural actions into three categories is also important. Once miracles and other exceptional phenomena were considered to be God’s works above nature, they were left beyond the scope of natural philosophy. The same is true for “unnatural” actions or accidentals which could be understood as workings of the devil. These

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regendis inclinationibus istis proficere iudico, sed haec quoque pono in hoc genere actionum, quod a natura proficiscitur.

<sup>392</sup>MBW 1176. Neque enim aut astris aut aliis naturalibus causis, sed diabolo recte tribuentur Neronis et similium tyrannorum prodigiosae libidines atque parricidia.

<sup>393</sup>MBW 1176. humani animi non uno tantum genere causae moveantur

exclusions limited the scope of natural philosophy to actions of *God with nature*, i.e. law-like and regular phenomena which could be measured and explained rationally. Understanding this development as some sort of “Entzauberung”, however, is problematic since although Melanchthon eliminated supernatural actions from the study of nature he nevertheless retained and even emphasized the symbolical and moral value of natural actions. Moreover one should pay attention to the great importance given to the eyes and seeing in Melanchthon’s letter. Following Plato Melanchthon praised the great affinity of the eyes with the stars, and drew an analogy between the light of nature, the stars and the sun that shines in the world, and the light of man that shines through the eyes.<sup>394</sup> In later works like *Loci Theologici* (1535), *Initia Doctrinae physicae* (1549) or *Commentarius de Anima*, Melanchthon developed these ideas further making the theory of “natural light” a central element of his epistemological thought. Light came to be understood as the medium through which knowledge is intermitted from creation (cosmos) to human mind (micro cosmos).<sup>395</sup> In the Grynaeus letter, however, this later theory of “lumen naturale” was not yet fully articulated. However, there’s no doubt he was convinced that it was particularly through the eyes that the human mind reaches the divine mind. “If the atheists and Epicureans had reached (astronomical) knowledge”, he argued, they would have “perceived the manifest traces of God in nature, and, having noticed them, they would have been forced to acknowledge that the universe is made and governed by mind.”<sup>396</sup> Similar ideas about seeing, about the importance of cosmography and providence became expressed in Simon Grynaeus’ preface to *Novus Orbis* a year later in 1532.

#### Novus Orbis: *Reason Exceeds Perception*

The first results of the ground breaking trips of Columbus and Amerigo Vespucci to America had been collected to the vaults of the Venetian ambassadors and Florentine bankers, and their accounts had been edited and turned into brief pamphlets. The very first collection of these stories was a book *Paesi novamente ritrovati e Novo Mondo da Alberico Vesputio Florentino*

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<sup>394</sup>MBW 1176. Ac mihi quidem oculi ipsi cognitionem vel maximam cum sideribus habere videntur. Ut enim in mundo lucet sol, ita in homine, quem non nulli propter plurimas similitudines μικρόν κόσμον vocaverunt, sua quaedam lumina velut sydera condita sunt.

<sup>395</sup>For Melanchthon’s theory of light see, Frank 1995, 133-136. For Frank’s later interpretation of Melanchthon’s theory with a specific emphasis on Neo Platonic influences see Günter Frank, “Melanchthon and the tradition of Neoplatonism”, pp. 3–18 in Jürgen Helm & Annette Winkelmann (eds.) *Religious Confessions and the Sciences in the Sixteenth Century* (Leiden: Brill, 2001).

<sup>396</sup>MBW 1176. Proinde ex philosophis soli isti, qui astronomia aspernati sunt, ex professo fuerent ἄθεοι et sublata providentia etiam immortalitatem animorum nostrorum sustulerunt; qui, si attigissent hanc doctrinam, manifesta dei vestigia in natura deprehendissent, quibus animadversis coacti fuissent fateri mentem aliqua hanc rerum universitatem et conditam esse gubernari.

*intitulato* that came out in 1507, and was edited by a professor of literature at Vincenza, Fracanzio da Montalboddo. Montalboddo's book was a collection of 15 stories, ranging from letters of Spanish merchants describing the treaties of the King Portugal to descriptions of Columbus' voyages. The book was a relative success: It had five successive Italian editions in Milan (1508, 1512, and 1519) and Venice (1517, 1521), followed by a German edition and also a French edition that was printed six times. The *Novus Orbis*, or better, as the full title goes, *Novus orbis regionum ac insularum veteribus incognitarum una cum tabella cosmographica et aliquot aliis consimilis argumenti libellis quorum omnium catalogus sequenti pagina patebit*, was the second great collection of the narratives of maritime discoveries and voyage accounts to the New World.<sup>397</sup> The *Novus Orbis* reproduced fully the Latin version of *Paesi Retrovati* and supplemented it by other narratives, which all except one were already published somewhere else.<sup>398</sup> *Novus Orbis* was a fruit of team work. The compilation and editorial work was done by Johann Huttich and Simon Grynaeus. Grynaeus contributed also to the preface and Sebastian Münster provided the work with a world map (and a related description) that was drawn by Hans Holbein the younger. *Novus Orbis* appeared in March 1532 at Basel, printed by Hervagius' presses. Already in October a Parisian edition popped up, printed by Galliot du Pré, who had substituted Münster's and Holbein's world map by Oronce Finé's (royal professor of mathematics) superior work.<sup>399</sup>

*Novus Orbis* is an interesting work in many respects. It is a printed testimony to Simon Grynaeus' and Sebastian Münster's collaboration, which otherwise can be traced out only in scattered notes in Münster's letters. Secondly, the similarities between Grynaeus' preface and Melanchthon's piece to Sacrobosco indicate the intellectual exchange between Wittenberg and Basel, of which Münster must have been aware. Thirdly the book gives us clues to the nature of Hans Holbein and Sebastian Münster's collaboration, which may help to clarify the stylistic and visual choices Münster made later in *Cosmographia*. It seems Münster admired and appreciated Holbein's work, and his correspondence reveals that for long he wanted to the great artist to do the visual part of *Cosmographia*.<sup>400</sup> These issues shall be discussed in detail in the following chapter.

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<sup>397</sup> Arthur Tilley, "Rabelais and Geographical Discovery. I. The 'Novus Orbis' of Simon Grynaeus." pp. 316-326 in *The Modern Language Review*, Vol. 2, No. 4 (Jul., 1907).

<sup>398</sup> Tilley 1907.

<sup>399</sup> Ibid.

<sup>400</sup> Münster's letter to Conrad Pellican, on 29 of July 1542. BSM epp.13. Münster writes to Pellican that he wished to have more images finished for the *Cosmographia*, but has lost his illustrators. Conrad Schnitt was dead and Holbein in England. "Nam parandae sunt adhuc multae figurae in eam et nos amissimus pictorem nostrum Conradum nec Holbein adhuc rediit ex Anglia."

By the time when *Novus Orbis* came out, both Grynaeus and Münster had been living in Basel for four years. These years had seen the renowned Hebraist Münster's first geographical book, *Germaniae descriptio* to appear in 1530. *Germaniae descriptio* was a modest publication, an extended explanation of Nicolas of Cusa's map of Germany, which Münster supplied with his own observations in the Upper Rhine, partly by classical geographer's remarks. In the preface of the *Germaniae descriptio* Münster balanced carefully between the two major schools of geography, the mathematical school of Lorraine represented by Apian and Schöner, and the descriptive school of Nuremberg. Münster's world map in *Novus Orbis* was an important step: Münster's geographical horizon extended from Germany to the whole world. Münster's description that accompanied the world map reveals the geographers lively interest in the travels and discoveries of the European explorers like Marco Polo, Amerigo Vespucci and Columbus. This material that was first gathered and elaborated for the *Novus Orbis* served later Münster in the *Cosmographia*.<sup>401</sup>

Simon Grynaeus, as has been seen, had taken an important step towards mathematical arts and geography. And his Livy discovery and his outstanding Greek editions of Aristotle's (1531) and Plato's (1532) Works had made him famous among fellow humanists. The Aristotle edition had perhaps given Philip Melanchthon the final push to honor Grynaeus in the preface to *De Sphaera*. There are interesting similarities between Grynaeus' preface to *Novus Orbis* and Melanchthon's piece on *De Sphaera*, and with some respects Grynaeus even seems to take his friends ideas further. Now I shall discuss these aspects in detail.

Having dedicated the preface of *Novus Orbis* to Georg Tanstetter, or Collimitius, medical doctor and mathematician, who had contributed to Jacob Ziegler's mathematical Pliny-commentary a year earlier, Grynaeus opens up the discussion by a praise of nature. Grynaeus, like Melanchthon, appeals to the evident visuality of God's creation: "The whole spectacle of nature offers itself brightly for the human consideration like a living book"<sup>402</sup> out

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<sup>401</sup> Burmeister 1969, 114.

<sup>402</sup> The expression "book of nature" was very common in early modern European culture. Many scholars and poets interpreted it in different ways. The idea of comparing God's creation to a book, a theatre, or a mirror has a complex history with its roots in both classical philosophy and Christianity. Within the Christian framework, the metaphor of the world as a book goes back to Augustine's theology in the fourth and fifth centuries. These views reflect Augustine's larger philosophical framework which held that the world was created on the basis of (Platonic) ideas that were judgments in God's mind. The whole of creation and all the creatures within it reflected these divine ideas, and these same divine ideas were also planted within the human soul. The divine origin of human reason thus gave it the means to access the deeper divine reason behind all of creation. (14) In the Protestant context of the early modern period, the book of nature metaphor also posed the theological question of

of which one should learn about the maker of things.” Grynaeus points to the stars “daily ascending and descending”, “ceaselessly renewing phases of heavens”, “changing magnitude of the day and night” and “the altering power of the cold and warm.” Because of these alterations the spectacle of nature thus “never palls or frays its contemplators and appears in full dignity, where ever eye and mind may behold.”<sup>403</sup> Despite everything said, Grynaeus laments, idle ignorance seems to be a vice of mankind, so that nature is not admired: “It is difficult to remember just how few mortals are excited about nature’s high majesty and miraculous diversity.”<sup>404</sup>

Having regretted the common stupidity of men vis-à-vis the visible marvels of creator, Grynaeus turns to the cure:

As a remedy to this disease of humankind, divine providence offers up writers and inventors of every ilk, whose task it is to expose the powers of nature to the ignorant; and in so doing, they provide a means for the maker to enter human minds.<sup>405</sup>

These learned men appear to Grynaeus as a providential gift that enables the ignorant mortals to admire Creator’s works. Again the emphasis is on the visuality: the powers of nature should be brought to daylight (Luce).

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whether a Christian could accept other sources of knowledge than the Bible. Whereas Melanchthon uses the trope within Augustine’s limits (the book of nature should be understood alongside the Bible), Grynaeus’ stance is more ambiguous. Eric Jorink, *Reading the Book of Nature in the Dutch Golden Age, 1575-1715* (Leiden: Brill 2010), especially pp. 37-45; Ann Blair, *The Theatre of Nature. Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997); Ernst Robert Curtius, *European literature and the Latin Middle Ages* (New York: Pantheon Books 1953); Herbert Grabes, *Speculum, Mirror und Looking-glass* (Tübingen: Niemeyer 1973); Lynda G. Christian, *Theatrum mundi* (New York: Garland, 1987; Klaas Van Berkel and Arie Johan Vanderjagt (eds.), *Book of Nature in Antiquity and in the Middle Ages* (Leuven: Peeters 2005); Erich Rothacker and Wilhelm Perpeet, *Das "Buch der Natur"* (Bonn: Bouvier Verlag Herbert Grundmann, 1979), particularly the note 386.

<sup>403</sup>Simon Grynaeus, *Novus Orbis*, (Hervagium, Basel 1532), *prefatio Simonis Grynaei ad Collimitium*. “QVANQVAM hoc totum nature spectaculum, ex quo uelut uiuo libro condisci opifex ille rerum debebat, luculenter considerationi hominum offert sese: & quo minus uel euile scere, uel fastidium & satietatem parere contemplantibus se posset ullam, plenum dignitate maiestateque, quocunque oculos & animum coniecisti, occurrit, & nouis assiedue coeli uicibus, iucundissime nos inuitat, dum alia aliaque quotidie sydera & occidunt et oriuntur, noctis dieique alia quotidie magnitudo, caloris & frigoris alia quotidie uis, alia quotidie aut senescentis aut reiuuenescentis anni forma”.

<sup>404</sup> Ibid. “tamen ignaua esse uitio & socordia hominum uidetur, nec quicquam admirationis habere facies illa naturae, estque incredibile memoratu, quàm pauci mortales uel maiestate eius summa, uel uarietate mirabili excitentur.”

<sup>405</sup> Ibid. “Adversus hunc morbum hominum, omnis generis scriptores & inuectores rerum, diuina prouidentia ueluti medicos commenta obiecit, qui imperitis & inertibus istis uim naturae eruerent, & tanquam in lucem profferrent, & per eam opificis admonerent.

In Melanchthon's view, cosmography (astronomy and astrology) and medicine had stood for proper arts to reveal God's creation. Proper to an introduction of geographical story-collection, Grynaeus praises cosmography. "Among the many and various arts which deal with the parts of nature", he writes:

there is none as authoritative or suitable for making way for admiration of things of nature [naturae rerum], than the one which describes, jointly and separately, the sites of heavens and the earth (that Greeks call astronomers, geographers and cosmographers), and which constitutes certain and evident knowledge for many difficult arts. Without [these arts] and the good will of God, it was impossible for the human species, not only to go to heavenly spaces with mind and cognition, but also to view the earth and go around the World.<sup>406</sup>

Grynaeus shares Melanchthon's view of the scope of natural philosophy. Different to scholastic theologians he excludes theological and metaphysical speculations beyond the sphere of natural. Natural philosophy in Grynaeus' understanding consists of arts like medicine or cosmography which studied God's creation and nature of things. As noted the idea of visuality plays a central role. Nature is a "spectacle", which should be viewed and it is particularly through the eyes that human beings can catch a glimpse of the divine light present in the Creation. Because so many people still ignore wonderful nature, the noble task of practitioners of the natural arts is to bring these phenomena to daylight to unfold them for all to see.

How then, according to Grynaeus, "the spectacle of nature" could be turned more intelligible? The reformer mentions two types of learned who "have returned from the rich theatre of wonderful nature their spirits agitated like being bit by a gadfly and being wounded by the most profound admiration"<sup>407</sup>: The first ones who, "compelled by the gust, started to strive towards even greater achievements and begun to study nature more closely." These, Grynaeus writes, "are called *sofos*."<sup>408</sup> The other group, he writes, are the

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<sup>406</sup> Ibid. "Ac ut artes caeteras, quae uariae & multiplices sunt, aliam aliamque unaquaeque naturae partem tractantes praeteream nunc, nullae plus uel sibi ipsi autoritatis, uel naturae rerum admirationis parant, quam quae coeli & terrae situm, quem illa & seorsim & quem inter sese habent, descripserunt (ἄστρονομικὴν [sic], γεωγραφικὴν, κοσμικὴν Graeci uocant) non absque certa & euidenti multarum & difficilium artium notitia constitutas. Quae postquam iuuentae non absque singulari benificentia dei, & proditae literis fuerunt: rem prius impossibilē generi humano: ire non solum mente & cogitatione per coeli spatia, sed terram oculis circuire, & mundum perambulare licebat."

<sup>407</sup> [Novus Orbis]Ibid. "Nam ex hoc pleno rerum mirabilium naturae theatro, quum studiosi omnes, animis uelut oestro, concitis, & profundissima admiratione sauciis rediissent"

<sup>408</sup> Ibid. "alii hoc impetu impulsī, maiora conari coeperunt, & intimius naturam scrutari, σόφος [sic]

mathematicians, who having engrossed in this contemplation [of nature] with great spiritual and intellectual effort, defined the limits of the earth by their acumen, and reduced its extensions, prior to taking these bodies of heaven under their scrutiny.<sup>409</sup>

These rather poetic phrases imply a program. The philosophers, the wise, *sofos*, must study wonderful nature closely, intimately. And the mathematicians must turn the inconceivable measures of natural bodies into understandable extensions. Two ideals are thus taken up: minute description and mathematical analyses. Through these two methods the visible wonders of God's creation could be brought into light and made understandable. Grynaeus' explanation of the work of mathematicians points explicitly to map making:

Inspired by these enormous things, they [mathematicians] dared to go with their eyes wherever their intellect had first gone and to clear a path of reason through all difficulties; to circle and wander across the mighty earth [terrarum orbis], that was now permeable to their spirit, and accessible from every direction.<sup>410</sup>

It is remarkable that in a preface to narratives of maritime travel and the discovery of the new world, stories of concrete travelling, Grynaeus emphasizes most, the importance of the intellectual work. For him it was particularly the work of the mathematicians – reasoning – that had made the world accessible to travelers. His opinion is not targeted to downgrade the importance of the practical navigation in the discovery of the new world, but should be taken as a comment on the classical geographical heritage. The most shocking geographical changes were in Grynaeus' days all more or less related to Ptolemy's geography. Rediscovery of Ptolemy's conception of map making, and space, as a mathematical grid had made it possible to reconsider the image of the world. As a mathematical model the extensions of the globe could be drawn further than where "the eye had forgone" – and suddenly there were blank spots all over the world map. Grynaeus' description of method bears a resemblance to Ptolemy's texts. In the *Geographia* Ptolemy divided the art of cosmography into two sub disciplines, geography and chorography. The task of geography, after Ptolemy, was to describe larger geographical bodies such as countries and continents, whereas chorography was to consider smaller units such as towns or fortifications.

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uocant".

<sup>409</sup> Ibid. "alii (hi sunt μαθηματικοί) quum & ingenii & animi ope summa in hanc solam contemplationem incubuissent, & acie mentis finibus iam suis terrarum orbem circumscripsissent"

<sup>410</sup> Ibid. "in angustum uastitate eius, prae coeli & maiorum corporum consideratione, redacta, inuentione tantarum rerum excitati, ire oculis quocunque mentis acies praeiuisset, & animi cogitationem per omnes difficultates exequi, ac molem terrarum orbis dudum animo suo permeabilem, & undique accessibilem circuire lustrareque ausi.

Geography was a task of the mathematician, but good chorographers had to be good painters in order to describe their objects faithfully. Grynaeus' word of the *sofos*, those who study nature closely and the *mathematikoi*, those who reduce natural bodies into comprehensible forms, can be read as a stylistic clue which enabled the contemporary readers to connect his work with Ptolemy's concept of geography.

After these theoretical matters Grynaeus moved swiftly to praise the discoveries which had brought forth new seas and land. His description is rather general and limited to an overall praise, making space for the later descriptions of the explorers themselves. His message however becomes clear: praise is, particularly, due to mathematicians and authors who write about the miraculous things of nature. Because of the corrupted nature of men and common stupidity, wonders of nature were not perceivable without the noble labors of the wise.<sup>411</sup>

Sebastian Münster's introduction to the cosmographical map follows Grynaeus' introduction. It is a short, standard presentation of the geographical thought of his days. Unlike Grynaeus, Münster gives little attention to religious or philosophical issues. Discussing the division of the earth into continents, he points out that because of the discoveries of Amerigo Vespucci and Christopher Columbus, the fourth continent that was unknown to Ptolemy, is now known.<sup>412</sup> The issue may seem small but it conceals a broader epistemological problem that the contemporaries of Münster were facing. Like his teacher Stöffler who had found errors in Ptolemy's astronomical tables, also Münster had come to realize that the new observations contradicted the given knowledge of the ancient authors. The situation was difficult. The classical heritage was still understood as a liberating force from the scholastic thought. If the classical authors must be contested, how to proceed, how to set firm ground for the philosophy of mundane knowledge?

The collaboration with Grynaeus in *Novus Orbis* had enlarged Münster's geographical purview from Germany to the whole orb – This was the scope of his

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<sup>411</sup> Grynaeus, *Novus Orbis*, (1532), praefatio Simonis Grynaei ad Collimitium. “Degeneres homines, qui ut naturae lucem, qua uiuunt & qua utunt per omnia, nullam uident, ita sapientum inuenta & mirabilium rerum autores, idcirco quia eas iam usu contriuerunt, pro nihilo habent.”

<sup>412</sup> Simon Grynaeus, *Novus Orbis*, (1532), Typi cosmographici et declaratio et usus, per Sebastianum Munsterum. TERRAE DIVISIO. Sic si ad Austrum spectes, magna pars terrae nostra tempestate explorata est, quam Ptolemaeus ut incognitam reliquit: ab Hispanis uero quum in orientem nauigio contendunt, obambulatur & circuitur, ut paulo post differemus. Quin & in oceano occidentali fere nouus orbis nostris temporibus ab Alberico Vesputio & Christophoro Columbo, multisque aliis insignibus uiris inuentus est, qui non abs re quarta orbis pars nuncupari potest, ut iam terra non sit tripartita, sed quadripartita”



*Cosmographia* twelve years later. The *Novus Orbis* was a modest but interesting opening, but during the five years after it, Münster contributed only little to geographical discussions. He was, so it seems, concentrating on another achievement of his double career, the full edition of the Old Testament in the original Hebrew, with his Latin translation, that was published in 1534/5 and awakened a lively debate particularly in the Protestantizing humanist circles. But while Münster was engrossed in problems of Hebrew, the debate on the nature of natural philosophy was taken further by Grynaeus and Melanchthon.

### *Euclid's Elementa: on Method and Mathematics*

Assessing the intellectual development of the humanist debate at Basel in the post Erasmanian era, Ziegler's Plinius commentary and *Novus Orbis* should be seen as important contributions. They paved the way for a new approach, as the focus of these scholars began gradually to shift from text to nature. However, none of these works had explicitly articulated the epistemological problems that had appeared following the novel intellectual currents. Whilst Melanchthon and Grynaeus had both emphasized the sanctity and necessity of the study of mathematics and nature, the essential question of how this project actually was to be achieved and by what methods, remained intact. On this point, Simon Grynaeus' edition of Euclid's classical textbook on the first principles of geometry, *Elementa*, and particularly its highly philosophical preface, marks an important opening.

Grynaeus' edition of Euclid's work was the editio princeps of *Elementa*, the first edition of Euclid's work printed in the original Greek tongue. It was accompanied by a commentary of Proclus, the prime ancient commentator of Euclid. Grynaeus edited Euclid's work on the basis of manuscripts that were sent to him at his request from Venice by Lazarus Bayfius and from Paris by John Ruellius. The commentary of Proclus was based on manuscripts that Grynaeus had received in England from John Claymond, the president of Corpus Christi College at Oxford (For Grynaeus' trip to England see the Chapter III). The ancient Greek mathematician Euclid's (around 300 B.C.) treatise of the rudiments of geometry is one of the cornerstones of occidental mathematics. In the middle ages the work was circulated widely in manuscript form, and, since Erhard Ratdolt's first Latin edition (Venice in 1482), a handful of Latin editions had appeared.<sup>413</sup> The mathematical diagrams of

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<sup>413</sup> Charles Thomas-Stanford, *Early Editions of Euclid's Elements*, (London: Bibliographical Society, 1926).

the work gave a great typographical challenge for the printers. The earliest Venetian editions that could overcome the problem still stand amongst the most beautiful examples in the history of print. Ratdolt's edition was followed by Bartholomeo Zamberti's new Latin translation (printed by Joannes Tacuinus in 1505) and A. Paganini's superb typographical masterpiece in 1509 and Venice dominated the production of printed editions of *Elementa* for three decades.

In 1516 Henry Estienne printed the first French *Elementa*, a version edited by the humanist Jacques Lefevbre. Lefevbre's work marks a great transition. Around this time the initiative moves north; notwithstanding some minor Italian translations no Euclid is printed at Venice after 1510.<sup>414</sup> After Lefevbre's version, Grynaeus' editio princeps is the next notable venture in the history of *Elementa*. The book was published in September 1533 by the press of Johann Herwagen, a man who like Grynaeus and Münster had migrated to Basel in the eve of the reformation of the town in 1528. Herwagen's sense of commerce and profit, made the book's appearance striking. The book was printed in expensive folio size, and for the first time in the history of Euclid editions the typographically challenging diagrams were not printed in the margins but were inset in text. Perhaps because of the limited market for such a scholarly edition in Greek, Herwagen compromised the eloquence of the earlier Euclid editions, and his "businesslike" book "lacking distinction" has disappointed esthetic expectations of some critics.<sup>415</sup>

The uniqueness of Grynaeus' Euclid edition was not its appearance but its contents. Scholars who read Greek could now consult the original text. Grynaeus' preface was targeted to these learned readers. The preface takes up the use of mathematics as a tool for interpreting experimental observations. Whilst scholars still largely relied on Aristotle's principles of syllogistic logic, Grynaeus' piece was a truly rare attempt to promote geometry as an axiomatic founding principle of philosophy, Giorgio Valla's discussion on Euclid's method in a Venetian treatise *De expetendis et fugiendis opus* being perhaps the only exception<sup>416</sup>. Grynaeus' piece is little studied but its importance for the development of Melanchthon's methodological thought has been acknowledged. Günther Frank for instance has argued that Melanchthon's interest in methodological uses of geometry should be seen in

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<sup>414</sup> Thomas-Stanford 1926, 7.

<sup>415</sup> Ibid.

<sup>416</sup> Hanna-Barbara Gerl-Falkovitz, *Einführung in die Philosophie der Renaissance*, (Darmstadt: Wissenschaftliche Buchgesellschaft 1995), 138-139. See also Anthony Grafton, *New Worlds, Ancient Texts : the Power of Tradition and the Shock of Discovery* (Cambridge: Harvard University Press, 1992).

a historical connection with Grynaeus' commentary on geometry in the edition of Euclid.<sup>417</sup> Despite this awareness, however, only one historian of science, Charlotte Methuen, has understood the uniqueness and importance of its arguments and made a closer study, which my interpretation largely follows.

Both Melanchthon and Grynaeus discussed the use of mathematical demonstration in philosophy. In an oration named *Praefatio in Geometriam* (CR III, 107-114), in August 1536 Melanchthon praised geometry. According to Melanchthon geometry ranked among the disciplines (*ordo disciplinarum*) and prepared students for the study of philosophy. Melanchthon argued that the meaning of geometry was not limited only in mechanical arts but it was useful and practical in all liberal arts. According to Melanchthon also philosophy received a lot from geometry that form the basis of study of *natura (physica)*.<sup>418</sup> Although Melanchthon later, for instance in his preface *Arithmetice praefatio Georgii Ioachimii*, called mathematical proof the clearest since it demonstrated how complicated things could be revealed and understood, he did not discuss the mathematical method itself. In *Initia doctrinae physicae* Melanchthon's discussion of syllogism was limited in settling the basic concepts of moral philosophy and founding the concept of natural law, dear to Melanchthon. In the preface of Euclid's *Elementa* Grynaeus takes the discussion of the use of geometry in arts and philosophy much further than Melanchthon.

Grynaeus emphasizes the great importance of mathematics. It is important to notice, however, that he did not do so for mathematics' own sake, but he wished to connect mathematics better to other arts. Mathematics is important, Grynaeus writes, because it enables the precision of proofs and arguments. According to Grynaeus it is an erroneous view to take mathematics as a "sterile discipline of lines and points."<sup>419</sup> "Those who study mathematics properly", he argues, "appreciate the clarity of its examples and its normative

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<sup>417</sup> Frank 1995, 176, 'Melanchthons geometrisches Methodenverständnis muss im historischen Zusammenhang der Edition des proklischen Euklid- Kommentars gesehen werden, die Simon Grynaeus 1533 in Basel besorgte und in deren Folge eine Fülle methodologischer und logischer Schriften in Europa erschienen.'

<sup>418</sup>CR III 107-114. Methuen 1998, 166.

<sup>419</sup> Grynaeus (ed.), *Elementa* (1533), fol a2r, Quoting Grynaeus' Latin preface to Euclid's *Elementa* in this chapter, I followed Charlotte Methuen's English translation in Methuen 1998. "vulgus nostri seculi studiosorum de Mathematicis non recte sentire, illos ipsos etiam propemodum qui profitentur constat: dum in illa figurarum sterilitate plerique praeter mutos linearum ductus nihil cernentes, etiam usum inesse eut omnino nullum, aut praeter eum quem in mundi contemplatione simplicem habet, nullum putant".

nature as the basis of all other disciplines.”<sup>420</sup> Mathematics constitutes the basis of many kinds of arts hence, Grynaeus argues, it should be the first subject to be taught.

Grynaeus’ examples connect astronomy, geometry and visual arts: Mathematics enable the measuring of longitudes and latitudes, the extensions of hills, fields and islands, and the use of instruments for observing stars (per instrumenta syderum observatio). In other words mathematics is necessary for managing the diversity of visual apparitions and pictures.<sup>421</sup> Grynaeus’ argumentation connects the geometrical demonstration to map-like visuality of the world. With mathematics man is allowed to comprehend the machine or theatre of the World (machinae mundi & mundi theatrum) and to explore the whole figure of the orb (orbis figura totius explorata).<sup>422</sup> In this way one’s mind is enabled to understand the “most beautiful works of God” and free to “venerate God’s most miraculous spectacles”.<sup>423</sup>

Grynaeus’ rather general ideas about the benefits of mathematics differ little from Melanchthon’s similar rhetoric. But when Grynaeus and Melanchthon develop these arguments further, as Charlotte Methuen has pointed out, the differences in their emphases

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<sup>420</sup>Grynaeus, *Elementa* (1533), fol a2r, ”...cum solae hae, supra quam ex professo docent, recte disciplinas omnes caeteras perfequendi, illustre maxime claritate sua exemplum, & velut normam prebeant.”

<sup>421</sup>Ibid., fol a2v, ”Quae doctrina in primis perfectisque periclitata corporibus, ut illa superior in figuris primis, in caeteris uim deinceps eandem servat. Atque haec hactenus στοιχεια [Euclid’s *Elementa*] rerum sunt mathematicarum omnium, ut quorum uis in omnibus certa uersetur. Quemadmodum enim qui legere uult, elementa discit prius, & iis assidue recurrentibus utitur in uocibus oibus experimendis, sic qui metiri quidquam instituit, figurarum omnium in quas primas formae resoluuntur naturam teneat prius necesse est. Ex his elementis velut fonte uberrimo quidem, sed recondito, & non cuiuis scaturiente, omnis latitudinum, longitudinum, profunditatum, omnis agrorum, montium, insularum mensio, omnis de coelo per instrumenta syderum observatio, & gnomonice tota, omnis machinarum uis et ponderum ratio, omnis in cogendo spiritu, omnis apparitionum qualis in speculis, in pictura, in phantasmatis est, diuersitas manat. Quibus de rebus omnibus propemodum, authoris eiusdem libellos eruditissimos, & in sua eosdem lingua, mox aedemus. Leuiora sunt haec, sequitur fructus admirabilior.

<sup>422</sup>Ibid., fol a2v, ”Inuersum est enim in clarissimum mundi theatrum hac disciplina genus hominum admissum, machinae totius mundanae inuento medio, cardinibus inuentis, orbis figura totius explorata, tum unius cuiusque praecipuorum corporum, & terrae in medio mundi, situ uastitateque deprehensis, idque ex ista rerum immensitate, disciplinae unius ui”.

<sup>423</sup>Ibid. fol a3r, ”Cum ex isto toto disciplinarum, nulla sit meo quidem uidere, etiam pia & diuinis rebus consecrata mente, magis digna, magis accommoda, quam quae in operis Dei conspectum animum pulcherrime traducit, & coeli terraeque positus profundissimo stupore, mentem complet. Ac quanquam usus hic primus magnificus, tot tamque mirabilium huic disciplinae subiectarum rerum cognitione, talis est: ut hunc praeter, omnis caeterarum artium notitia ueluti caeca, nubibusque, inclusa, & inter densa terrarum illiberaliter, & subtilitate mentis humanae indigne haereat, nec unquam in aperta mundi progrediatur: tum admirabilis est arbitrator, quae ista in pectore humano sit uis, quae in ista, loca tot millibus myriadum seposita, sese penetrarit, quae illa tam stupescenda ratio, animum per summa naturae spectacula circunducat”.

begin to appear.<sup>424</sup> Unlike Melanchthon Grynaeus does not develop the theme of the divinity of mathematics any further. Although he quotes Plato to highlight the importance of mathematical studies, he refers to Plato's claim of its beauty and clarity, not its divinity.<sup>425</sup> Grynaeus is interested in the power of mathematical proof. His primary concern is how to found a reliable philosophy, based on a rigorous method that does not fall into the monstrous absurdities of scholastic philosophy and theology.<sup>426</sup>

Like Melanchthon Grynaeus cites Aristotle, presenting geometry as the clearest and surest method to learn reasoning in philosophy.<sup>427</sup> Unlike Melanchthon, however, Grynaeus proceeds to discuss how geometrical reasoning should function in philosophy and what can be achieved with it. As Charlotte Methuen has argued, Grynaeus is here particularly concerned of the role of philosophy in the interpretation of knowledge brought by senses.<sup>428</sup> Grynaeus maintains that all works of nature are subject to the eyes of the mind and points out that because the observations do not implicitly contain interpretation, it is necessary to have clear principles which guide the interpretation of what is observed, and prevent subverting tendencies.<sup>429</sup> These tendencies have erroneously guided philosophy to discuss for instance the immortality of God, upon which, physics, according to Grynaeus, has nothing to say.<sup>430</sup>

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<sup>424</sup>Methuen, Kepler's Tübingen (1998), 167

<sup>425</sup> Grynaeus, *Elementa*, fol a5r, "Plato igitur quoties ab incunabulis format studium, quod facit non semel, suscitandae mentis, & ad rerum omnium speculationem rite comparandae, uiam hanc unicam esse clarissime & copiosissime pluribus in locis docet: de republica septimo, de legibus iterum & iterum, in Epinomide, in Thaeteto commemorare enim locos diserte lubet. ne quis testem in re tanta desiderare posset".

<sup>426</sup>Ibid., fol a5r, "Eos contra retroactis etiam seculis, quicunque ad has disciplinas uelut anchoram sacram, non diligenter respexerunt, totum hoc turbulentum & tumultuarium philosophorum genus inquam, in monstrificam absurditatem relapsos videmus: dum alij, tale quidque esse quale appareret, solem etiam hunc pedali non maiorem, alij nil prorsus posse percipi: quidam nil esse prorsus, ac ne deum quidem ipsum, non sentirent solum, quod faciunt multi, sed propalam contenderent. Horrendum est, discendi peruicacia & temeritate, seipsam necessario ludificante, in lucis operum & sapientiae dei execrationem, homines euehi".

<sup>427</sup>Idem., fol a3v, "Quid quod ipse Aristoteles, lucem disputationibus omnibus suis, non aliunde cumque e geometricis infulsit? Locos mille proferre possem, cum abstrusissimae res demonstrationum geometricarum ui prosus erutae & in lucem prolatae sunt".

<sup>428</sup> Methuen 1998 166-170. Grynaeus, *Elementa*, fol a4r, "Rerum aliae sub sensum cadunt, in quibus idcirco euidens notitia nulla est, quoniam causis intus abditis omnia fiunt. Ingem esse calidum indicat sensus, caussa latat. Atqui scientiae consecutio, causae notitia tota constat. Aliae ab omni procul sensu positae, mente sola intelliguntur: aptae contemplationi quantum in ipsis est, sed ob debilitatem animi, per sensus tamque discendi rudimenta sese attollentis, difficillimae".

<sup>429</sup>Grynaeus *Elementa.*, fol a2v, "Igitur totum hoc naturae opus mentis oculis subiectum tenemus".

<sup>430</sup>Idem., fol a3v, "In Physicis nullum artificem, cum artis principia subuertente obligatum esse congregi, & illud in quod tam multi impegerunt, communibus fabricatam demonstrationem, fidei non firmatae satis esse, deum immortalem cumque abstrusam rem, quam clare unius tantum exempli monitu quale utrunque sit ostendit. Iam ipsa principia, demonstrationem non ingredi, sed eorum ui confici

Mathematical principles are the best means to proceed from observation to interpretation because they leave from few principles and progress by clear testimonies. This is how mathematics can bring clarity to obscure points.<sup>431</sup>

In the preface to *Elementa*, as Charlotte Methuen has observed, Grynaeus strives to find a definition of proper philosophy, a definition that would assist the mind to interpret what has been experienced through the senses. A similar concern for mathematics as the means to interpret sensorial experiences is not present in Melanchthon's thought. Although Grynaeus does not address explicitly the question of the relation between cosmological observations and the authority of ancient philosophers, his concern for the proper interpretation and his search for a method, Methuen has argued, raise naturally a question about the relationship of the received classical knowledge to contemporary observations. Striving to find a reliable authority in philosophical matters, both Melanchthon and Grynaeus turned to mathematics.

#### *Concordia in Artes: Reformation of the University of Tübingen*

Simon Grynaeus stands in the history of Swiss reformation as a connecting figure between the Lutherans and the Swiss reformed. He was an apt negotiator and able to ease the tense relations between the two camps, that had suffered from the sacramental quarrels of Luther and Zwingli. Although he wrote little on theology he supported openly Ecolampadius' theology, a fact which should erase the speculations about his crypto-Lutheranism. Amongst the Swiss, however, he obviously was the one who Melanchthon could trust, and both men worked hard to find a durable concord – if not in theology then at least in the educational matters. The reformation of the University of Tübingen provides an example of educational cooperation and of concord between these reformers.<sup>432</sup>

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tantum, exemplis hic mille patet. quo loco satis imperfectum sese inscitia saepe detexit”.

<sup>431</sup>Ibid., fol a3v-a4r, “Ac quid ego unum alterumue dialecticae praeceptum memoro, cum nullius omnino non evidens hic imago reperiatur? Ut si quis mentis humanae morem, simulacro quodam expressam uelit, nullo possit melius, quam geometricae, quae methodi totius absoluta & perfecta formula est, domestica insuper luce sua mirabiliter fulgens. Ergo discredendi uis penes dialecticam est quidem, sed obscura tantisper, dum mathematicarum disciplinarum claritate iuuetur”.

<sup>432</sup>Regrettably little has been written about Grynaeus' role in the reformation of Tübingen and the passages have to be reconstructed from scattered testimonies. See. Methuen 1998; Richard L. Harrison Jr. “Melanchthon's Role in The Reformation of the University of Tübingen. Norbert Hofmann, Die Artistenfakultät an der Universität Tübingen 1534 – 1601 (Tübingen: J.C.B.Mohr, 1982); Gauss, Karl,

In May 1534 Ulrich of Württemberg regained his ducal throne. He had been in exile since the Schwäbische wars (1519) and during this period he had been converted to the evangelical faith. Appealing to the freedom of religion act of the Diet of Nuremberg (1532) Duke Ulrich began to reform his country. The division of the evangelical camp complicated the situation. The Duke's own loyalties were divided between Lutheranism and the high German/Swiss style Protestantism. Ulrich was converted by Oecolampadius and Zwingli, but his restoration of power was significantly supported by his Lutheran cousin Philip of Hesse. In order to conduct the reformation Duke appointed ducal commissioners that represented the two mainstreams of Protestantism: Lutheran Chancellor Knoder and Erhard Schnepff were to administer the reformation of the Northern half of the country (unter der Steig). The responsibility of the Southern half (ob der Steig) was given to Ambrosius Blarer, an ally of Bucer and Zurich.

The University of Tübingen which belonged to Blarer's responsibilities had remarkable catholic opposition and as the centre of education of future priests, its reform was a necessity. The primary aim of the reformation of the University was thus to consolidate both the Evangelical faith and obedience to the Duke. Such an operation required vision and strength. There was too much for Blarer only. Advised by Chancellor Knoder and Erhard Schnepff, Duke Ulrich sought to hire the most remarkable humanist of the evangelical camp, Philip Melanchthon.<sup>433</sup> To the disappointment of these men Elector John Frederick of Saxony was not willing to let his brightest start leave Wittenberg: Melanchthon refused. Next Ulrich turned to Simon Grynaeus. It has been suggested that Grynaeus had been recommended by Blarer, obviously with an intention to strengthen the impact of the Swiss camp.<sup>434</sup> However, given the discussion of the lively exchange of ideas between Wittenberg and Basel, it seems right to assume that Melanchthon had nothing against the idea of Grynaeus replacing him.<sup>435</sup> Earlier research has been so busy highlighting the tension between Zwinglians and Lutherans that it has paid no attention to Grynaeus' and Melanchthon's correspondence.

In November 1534 Grynaeus showed his ducal mandate to the University senate and the reforms took off. Some first steps in remodeling the University had already been taken. The University orders of 1532 had directed the students of dialectic and rhetoric to

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Die Berufung des Simon Grynäus nach Tübingen 1534/1535 (Basel : Helbing & Lichtenhahn, 1910), s. 88-130.

<sup>433</sup> Harrison 1978, 270.

<sup>434</sup> Hofmann 1982, 11.

<sup>435</sup> MBW Bd 2, 1481, 1487, 1492, 1503, 1505, 1510, 1545.

study more Latin letters and declamations. These reforms were limited to educational issues only and problematic religious issues were not handled.

Grynaeus opposed received scholastic teaching and worked to strengthen the Evangelical faith, humanist virtues, knowledge of classical languages and the study of nature. He could not accept that philosophy was taught at Tübingen after two *viae*, antique and modern and wished the faculties to be united as one philosophical faculty. Similarly he moved to make the lectures of catechisms and Old and New Testament obligatory for all. Accordingly not only the students of theology, but also those aiming to bachelor or magister of arts were to hear Evangelical orations. In the humanities Grynaeus objected to the reading of Latin compendiums and commentaries and endorsed reading texts in their original tongues. Here his suggestion to make Greek and Hebrew compulsory from the beginning led to problems with the senate. What seemed a neutral question of languages had implicit religious significance, because the studies of Hebrew and Greek could be seen as tool implied to evangelical Bible exegesis. The senate resisted bringing questions of faith in arts courses and opposed exegetical and catechetical lectures and compulsory Hebrew.

It is obvious that Grynaeus' program was aimed at strengthening the dominance of Evangelical faith, but it is important to note that his focus was almost completely on the faculty of arts. Besides the fierce propagation of religious issues, the emerging debate on nature was pertinent to the initiatives. Grynaeus did not only endorse Evangelical lectures but also compulsory studies of 'physica' and mathematics. It is also known that Grynaeus himself was responsible for teaching Euclid's *Elementa*. The post was taken up next by Joachim Camerarius, a Lutheran scholar of Greek and mathematics who, invited by Grynaeus, arrived in Tübingen in June 1535.

Grynaeus' time at Tübingen ended suddenly in July 1535. Perhaps the arrival of Camerarius enabled him an honorable exit, without endangering the reforms. Grynaeus left to Basel and never came back. It is not known whether his "escape" was caused by personal problems or because of the constant wrestling with the University senate. The reformation of the University, however, had become a severe crisis. The Senate opposed Grynaeus initiatives and the reformer himself disappeared. Paulo Phrygio was temporarily appointed to continue Grynaeus' work, but he was more a theologian than a reformer and could not succeed.

The University of Tübingen held its breath until the lead was taken up by Camerarius. Based on Grynaeus' work Camerarius penned an ordinance "Reformation vnd neue ordnung", that was put into effect by Duke Ulrich in the autumn of 1535. The ordinance



confirmed Grynaeus' work: The two philosophical faculties were united and lectures on Catechisms, Old and New Testament made obligatory for all. The school life in Württemberg was remodeled as well. A clearer difference was drawn between the University, the trivial schools and the pedagogium that prepared to academic studies.<sup>436</sup> At pedagogium boys were taught the basics of grammar and rhetoric in Latin, and now also Greek. At university level students below bachelor were mainly to hear dialectic, rhetoric, New and the Old Testament and Greek. The ones aiming at the Master's degree continued then with dialectic, the Old Testament and 'physica'. Mathematics and lectures of Cicero's *De Officiis* were made obligatory for all students below the master's degree. Lectures of piety, rhetoric, and (against Grynaeus' will) Hebrew formed the 'lectiones liberae'.

These reforms, as they appeared in the ordinances of 1535 had parallels to Melanchthon's educational program at Wittenberg.<sup>437</sup> The evangelical overtone was certainly there, but interestingly most of the changes considered the studies of arts, emphasizing their importance. One can discern a fresh interest in nature in the choices made. All students were to do the master of arts, but even more, the old syllabus was reinforced with lectures of physics and history. There's also a great temptation to read obligatory orations on Cicero's *De Officiis* as an example of the revived interest in stoic moral philosophy and natural law, these two topics being as central to both Cicero's book and to Grynaeus' and Melanchthon's vision of nature as God's providential theatre.

Grynaeus' educational reforms at Tübingen largely followed Melanchthon's tracks. How did the reformer react? Although there remains no direct correspondence of Melanchthon and Grynaeus from this period, Melanchthon's letters to other humanists and reformers suggest that the two men were relatively well informed of each other's walks.<sup>438</sup> Joachim Camerarius seems to have been the person with whom Melanchthon shared the news about Grynaeus. Remarks of Grynaeus get more frequent on the eve of the reformation of Tübingen. There were two reasons for this. Grynaeus was going to take charge of Tübingen, the job that Melanchthon was forced to reject.<sup>439</sup> He was also editing a remarkable book, Ptolemy's *Almagest*, that both Camerarius and Melanchthon expected with great excitement. In October 1534 Melanchthon informed Camerarius that Grynaeus' *Almagest* was soon to

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<sup>436</sup> Hofmann 1982, 11.

<sup>437</sup> Methuen 1998; Karl Hartfelder, *Philipp Melanchthon als Praeceptor Germaniae* (Niuwkoop: B. de Graaf 1964).

<sup>438</sup> MBW, epp. 1210, 1413, 1426, 1482, 1505,

<sup>439</sup> MBW, epp. 1482. In August 1534, Grynaeus was already asked to take Melanchthon's place. Melanchthon, however, was to hear from Bucer that Grynaeus was still at Basel.

come.<sup>440</sup> It is probable that he received the news from the editor himself. In 1531 Melanchthon had dedicated to Grynaeus the preface of *De Sphaera*. In 1535 the reformer honored Grynaeus with another preface, written again for an astronomical textbook, this time George Peurbach's *Theoricae novae planetarum* (Josef Klug: Wittenberg).<sup>441</sup> The prefatory letter is dated November 1534, when Melanchthon must have been aware that Grynaeus was taking charge at Tübingen. The painful schism inside the evangelical camp must be seen in the background, although, perhaps not in the way it is often portrayed. The reformation of the University of Tübingen has sometimes been portrayed as another competition between the Lutheran and the upper German/Swiss parties, where, as Richard L. Harrison put it, Melanchthon used his influence to eclipse the Bucerian Swiss-reformed emphasis, causing Tübingen to become one of the greatest centres of Lutheran orthodoxy.<sup>442</sup> This approach that ends up portraying Grynaeus as Melanchthon's "Bucerian" foe, whose work the Wittenberger tried to hamper, is not accurate. Soon after the failure of the Kappel wars, the Swiss reformers had started to improve the relations to Wittenberg. The Strasburg theologians Capito and Bucer were at the forefront of the reconciliation, but also Basel reformers like Oswald Myconius were attracted by the idea of rapprochement with the Lutherans and Grynaeus as Myconius' adviser has been seen as initiating the move. Little was achieved despite continuous attempts to find a concord between the two evangelical camps, and the situation among the Swiss Churches between the Lutheran and Zwinglian heritage remained unclear until 1536.<sup>443</sup>

In November 1534 Melanchthon wrote a piece to his friend, "the most learned man Simon Grynaeus", who had only then arrived at Tübingen in order to take charge of the University reforms. Referring to Plato, Melanchthon opens his story with an anecdote of the civil war in ancient Greece. When the Oracle of Delos was asked how to get rid of the conflict, the Oracle spoke that when the size of the Altar was doubled, the quarrels would end.<sup>444</sup> Resolving the mathematical problem ended the calamities, and gave Plato a reason to hold that the future of Greece would be peaceful if people would "convert" to philosophy: by

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<sup>440</sup> MBW, epp. 1505, Melanchthon to Camerarius on the latter half of October 1534.

<sup>441</sup> MBW 1509.

<sup>442</sup> Harrison 1978.

<sup>443</sup> Gordon 2002, 147.

<sup>444</sup> Philip Melanchthon to Simon Grynaeus, Preface to George Peurbach's *Theoricae novae planetarum*, (Josef Klug: Wittenberg 1535), MBW, epp.1509, 228. "Cum Graecia longo et civili bello undique arderet et malis vexaretur omnibus, quae praesertim civile comitari solent, Apollo consultus in Delo, quando tantarum calamitatum finis futurus esset aut quibus modis dii facti placatiores praesentes aerumnas depulsuri essent, respondit tum demum Graeciam tranquillam fore, cum sibi aram, quae ibidem erat, duplicassent."

studying it they would leave their bad habits and fights and find love of peace and moderation.<sup>445</sup> “Plato’s wise oracle comes to mind, my Simon, when I consider our own terribly tumultuous times”<sup>446</sup>, Melanchthon wrote. He took Plato’s story and advice as pertinent. Converting to philosophy would light a love of studies and admiration of things, make minds moderate, Melanchthon argued. It was the one and only remedy for the current calamities and public discord.<sup>447</sup> Melanchthon’s complaints about the unrest and aggression against the learned men can be interpreted as criticism against the unlearned Anabaptists and the rioters of the peasant’s wars. At the same time it can be taken as an attempt to find reconciliation within the acute religiopolitical crisis: The question of the Eucharist had brought an unresolved discord amidst the Evangelical humanists, and after numerous failures in attempts to find agreement, Melanchthon and many others began to realize the concord was perhaps unachievable task. Grynaeus, Melanchthon and many others were starting to get divided by the emerging wave of confessionalism.

Despite his awareness of these problems, Melanchthon’s message to Grynaeus was optimistic. Amidst religious contention, ‘real’ philosophy offered a solution. The ‘real’ philosophy appeared to him as something that Grynaeus had been building. The young people should be directed to studies of optimal arts and authors whom Grynaeus’ editions of Aristotle, Euclid and Plato had done a great service. Melanchthon lauds also Grynaeus’ editorial work on Ptolemy’s *Almagest*. From anticipation of the *Almagest*, an astronomical work, Melanchthon moves to the work at hand. Peurbach’s *Theoricae novae planetarum*, the Reformer writes is of high importance because it provides the picture of the celestial orb. Accordingly Melanchthon wishes to dedicate Jacob Milichius’ new edition of Peurbach’s *Theoricae novae planetarum* to Grynaeus, so that his renowned name would protect the work from those who despise the divine art of astronomy and astrology.<sup>448</sup>

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<sup>445</sup> Ibid. “Ceterum admonet hanc oraculi sententiam esse: ita demum Graeciam futuram tranquillam, si se ad philosophiam Graeci convertissent, quia haec studia animos ab ambitione et caeteris cupiditatibus, ex quibus bella et cetera mala existunt, ad amore pacis et moderationem in omnibus rebus abducerent.”

<sup>446</sup> Ibid. “Huius mihi Platonici oraculi saepissime venit in mentem, mi Simon, cum horribiles horum temporum tumultus considero.”

<sup>447</sup> Ibid, 229. “Nam mihi quoque unum hoc remedium videtur publicarum calamitatum fore, si se nostri homines ad veram veteremque philosophiam convertant, quae cum incendat animos amore ac studio veritatis et ad intellectum atque admirationem optimarum rerum exuscitet, una efficit viros bonos ac moderatos ac dissimiles horum, qui nunc cum propter incertiam bellum veritati et rectae doctrinae indixerint et in homines studiosos horribilem crudelitatem exercent, publicas discordias praecipue alunt atque inflammant.”

<sup>448</sup> Ibid. “Nec alius libellus magis necessarius est quam *Theoricae*, ut vocant, seu picturae orbium celestium, quas cum hic diligentia viri optimi ac veteris utriusque nostrum amici ornatas, Iacobi

The rest of Melanchthon's address is quite similar to his preface to *De Sphaera*. Melanchthon approves that nature reveals God's will and therefore criticizes Epicureans who do not admire the most beautiful movements of the heavenly bodies. In addition to these themes, however, Melanchthon is now more inclined to present medical aspects, and the effects of the stars to the elements of human body. All in all, Melanchthon gives a rather clear example of what he thinks the 'real' philosophy consists of.<sup>449</sup> Knowledge of nature and its mathematical research go hand in hand with piety. Arts, philosophy and mathematics were the means by which Melanchthon believed the religious discord could be overcome.

Despite Grynaeus' and Camerarius' university statutes of 1535, serious tensions remained at the University of Tübingen. Camerarius had not succeeded in resolving the discord between the Lutheran, Swiss and Catholic factions while the curricular reforms raised new problems. Concerned for the state of his University, Duke Ulrich turned in 1536 again to Melanchthon asking him to come to teach, reform, organize and discipline.<sup>450</sup> Melanchthon refused again, but promised to pay a shorter visit in order to discuss the difficult matters. Melanchthon informed Camerarius the Duke's initiative and told that in his view the problems were not that much about the university itself but about the Lord's Supper, and thus did not need his presence. Melanchthon was also suspicious about Blarer's achievements in the University issues – inevitably giving full support to his trusted friend Camerarius.<sup>451</sup>

Melanchthon's unofficial visit to the University of Tübingen took place on Sunday 24<sup>th</sup> of September 1536. Melanchthon spent three weeks of his holiday at Tübingen, visiting Camerarius and considering the reforms of the University. During this time Blarer arranged a meeting where Duke Ulrich could discuss the needs of the University with him. Melanchthon stayed a couple of days at the ducal residence at Nürtingen. The meeting was unofficial and left no records. However, on 15<sup>th</sup> of October Melanchthon wrote a letter to the Academy of Tübingen and its rector, which can be taken as a summary of his

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Milichii, in vestibulo hanc ad te epistolam addidimus, non solum quod tui memoriam nobis subinde renovat harum artium tractatio, sed magis eo, quia libellum sperabam plus habiturum gratiae apud studiosos propter tuum nomen, quod propter egregias virtutes tuas apud omnes literatos admodum gratiosum est.”

<sup>449</sup> Ibid. 233. Sed generosae naturae degustatis his iniciis ad cetera ingenti animo contendere debent, ut pulcherrimam et suavissimam philosophiae partem absolutam ad vitae usum accommodare possint et causas videre, unde sint illi rerum circuitus, quos ita vocat Plato, in naturis corporum et in rebus publicis, qui ortus, incrementa, inclinationes et interitus continent. Ad haec si accesserit liberalis aliarum doctrina et religionis scientia, quid potest cogitari tali viro, qui ista consecutus est, beatius?

<sup>450</sup> Harrison 1978.

<sup>451</sup> Harrison 1978.

recommendations.<sup>452</sup> Melanchthon's message was that the ordinances of 1535 were sound and should be enforced without further delay. Additionally he recommended two new appointments: a chair for the medicine Leonhard Fuchs, a man who had assisted Melanchthon in anatomical matters,<sup>453</sup> and another for Johannes Brenz, pastor at Schwäbisch Hall, who should take charge of the reformation of the University. The recommendation of Brenz was an explicit "vote of no confidence" to Blarer. A letter that Melanchthon wrote to Brenz reveals that the reformer campaigned to get rid of Blarer, who, in his view, was an offence to the university.<sup>454</sup> That Brenz was a firm supporter of Luther probably did not disturb Melanchthon at all.

Melanchthon's short visit had a permanent impact on the reformation of the University. The new Academic ordinances were promulgated by Duke Ulrich on 3<sup>rd</sup> of October 1536. They followed largely Melanchthon's proposals. In basic points they confirmed the 1535 ordinances prepared by Grynaeus and Camerarius. Some changes took place in the theological faculty which, by Melanchthon's influence moved towards systematic theology. The size of the theological faculty was also increased from two to three professors. Greek and Hebrew were to be used in lectures of the Old and New Testament and the instructor of Hebrew should hold a degree in theology.

Melanchthon had little to say about the program that Grynaeus and Camerarius had prepared for the arts faculty. He was satisfied with the work: the ordinances of 1535 were to be enforced. The replacement of Blarer with Lutheran Brenz, on one hand, seems to affirm Richard L. Harrison's claim that the influence of Melanchthon at Tübingen meant the eclipse of Bucerian Swiss-reformed emphasis. But Melanchthon's positive relations with Grynaeus, reminds us of the complexity of the situation – perhaps Blarer's achievements in reforming the university simply were not satisfactory. In the case of this study, Tübingen highlights the deeply grounded agreement between Grynaeus and Melanchthon in educational affairs – Grynaeus' vision of sound education followed Melanchthon's models, and Melanchthon had no difficulty affirming it.

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<sup>452</sup> CR, III, 1473.

<sup>453</sup> Kusukawa 1995, 92.

<sup>454</sup> Harrison 1978.

Melanchthon's and Grynaeus' contacts continued after Grynaeus' "escape" from Tübingen. In the latter half of the decade their shared interest seems to have centred on Ptolemy's works. Already in 1534 there were rumors about Grynaeus' forthcoming edition of Ptolemy's *Almagest*, a work which presented in best detail the ancient astronomical concepts. In October 1534 Melanchthon wrote to Camerarius that *Almagest* was being prepared at Basel by Grynaeus.<sup>455</sup> Camerarius, who was penning his own edition of Ptolemy's *Tetrabiblos*, an important astrological supplement to *Almagest*, had obvious interests to know how Grynaeus' work was doing. Remarks in Melanchthon's correspondence witness that Camerarius knew about Grynaeus' passion for the ancient geographer, but there is every reason to speculate that he postponed publishing *Tetrabiblos* intentionally until he had a chance to meet Grynaeus at Tübingen in midsummer 1535. At the same time Camerarius' passion to Ptolemy and the forthcoming *Tetrabiblos* may have encouraged Grynaeus to invite the man to the Chair of Greek.

As has been discussed above the encounter of Camerarius and Grynaeus at Tübingen was a short one: the former came to Tübingen in June 1535 – the latter left in July. In the autumn Camerarius' *Tetrabiblos* was ready and on the 5<sup>th</sup> of November 1535 Melanchthon wrote to his friend to thank him for his edition and to share the latest news about Grynaeus' still forthcoming astronomical book.<sup>456</sup> Too little remains of the correspondence of Camerarius and Grynaeus in this period – Camerarius' contribution to Grynaeus' edition of *Almagest* in 1538, though, is a solid testimony of an ongoing collaboration around Ptolemy.

Melanchthon's interest to Ptolemy's work was also great. Camerarius' *Tetrabiblos* seemingly pleased him, but even more excited he was about Grynaeus' *Almagest*, a matter of fact that comes apparent in numerous anticipating comments in his correspondence and in his preface to Grynaeus in *Theoricae Novae planetarum*.<sup>457</sup> But to speak of truth, for some reason, later in the 1530s similar remarks cannot be found anymore. On second of March 1537 Melanchthon tells to Jacob Milich, a professor of mathematics at Wittenberg, about a friendly letter from Grynaeus, but its contents are not known.<sup>458</sup> A letter from Grynaeus to Melanchthon, dated on 26<sup>th</sup> of March 1538, instead, discusses only political

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<sup>455</sup>MBW epp. 1505. Melanchthon to Camerarius, on the latter half of October 1534.

<sup>456</sup>MBW epp.1659. Melanchthon to Camerarius on 5th of November 1535.

<sup>457</sup>MBW epp. 1509. Melanchthon's preface to *Theoricae novae planetarum* (Basel 1535).

<sup>458</sup>MBW epp. 1860, Melanchthon to Jacob Milich on second of March 1537.

issues: Although *Almagest* was finally in print and Melanchthon contributing (a biography of Aristotle) to Grynaeus Latin edition of the Stagirite's collected works<sup>459</sup> –more than Greeks Grynaeus wished to hear about the Habsburgs and whether they might be changing their attitudes to the reformation.<sup>460</sup> Vital issues came first.

Grynaeus' edition of *Almagest* (Basel 1538) is one of his most important publications. The book had been in preparation for more than four years and the subsequent astronomical and astrological publications of the 1530s, *De Sphaera*, *Theoricae novae planetarum*, and *Tetrabiblos* set great hopes for this edition of Ptolemy's major astronomical work. *Almagest* belongs apparently to a set of successive Ptolemy editions, a group to which, alongside with *Tetrabiblos*, Sebastian Münster's edition of Ptolemy's *Geographia* (Basel 1540) must be included. *Almagest* was a remarkable work and a closer scrutiny of its contents, rudiments of Aristotelian cosmology, classical geocentric planetary models and astrological instructions would defend its place anywhere. Here, however, it is Grynaeus' preface that is of particular interest: The seemingly modest piece that Grynaeus dedicated to the King of England, Henry VIII gathers a good number of ideas expressed in the 1530s by Melanchthon, Grynaeus and friends. The preface of *Almagest* summarized ideas upon which Sebastian Münster's conception of geography could be built on. In the preface of *Almagest* one can see the high point of the discussions on natural philosophy and mathematics, and a bridge to Münster's new geographical approach.

### *Visuality takes centre-stage*

Grynaeus opens his preface in highly rhetorical terms asking King Henry “whether it were somehow possible to publish and recommend for the public the noble and ancient work of King Ptolemy”. Then he continues with his actual topic: the noble work of Ptolemy “with God's excellent benevolence leads to the highest theatre of the visible world.”<sup>461</sup>

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<sup>459</sup>Simon Grynaeus (ed.), *Aristotelis Stagiritae, Philosophorum omnium facile principis, Opera omnia quae quidem extant, iam olim latinitate vel, vel nunc recens a viris doctissimis donata, & ad copy graecum diligentissime Recognita. Accesserunt in singulos libros optimistic ex autoribus argumenta, vice commentarij Studiosis futura. Item Io. Lodovici Vivi Valentini de Libris Aristotelis censura, nunc recens & nata & edita. Ad haec De Vita Aristotelis, deque genere philosophiae, ac scriptis eiusdem, commentatio doctissima, per Philippum Melanchthonem. Basel: [Johan Bebel inter alia] 1538.*

<sup>460</sup>MBW epp. 2010, Simon Grynaeus to Melanchthon on 26th of March 1538.

<sup>461</sup> [Almagest]ΚΑ ΠΤΟΛΕΜΑΙΟΥ ΜΕΓΑΛΗΣ ΣΥΝΤΑΞΕΩΣ ΚΛΑΥΔΙΟΥ ΠΤΟΛΕΜΑΕΙ [...]*Magnae*

Now, in the early 1530s Melanchthon and Grynaeus had gradually come to argue that natural phenomena were to be seen as manifestation of God's will and majesty. In 1531, in the so called Grynaeus letter, Melanchthon, following Plato had promoted the great importance of beholding nature. Contemplation of stars, he uttered was the purpose that eyes were chiefly made for, since contemplation of nature could lead men to understand God's works. In Melanchthon's opinion the whole nature of things was a theatre which God wished to be watched.<sup>462</sup> In 1532 in the geographical book *Novus Orbis* Grynaeus followed in Melanchthon's tracks calling nature a "spectacle" that offered itself "brightly for human consideration."<sup>463</sup> Grynaeus' talk in the *Almagest* about the highest theatre of the visible world followed this earlier rhetoric.

In an eloquent phrase, Grynaeus wonders how some people are not interested in the "variety and amount of things [*rerum*], nor moved by their beauty, utility and elegance, nor entranced by their majesty, reverence, light and splendour." In Grynaeus' view, it is astonishing that all this diversity, utility and beauty in creation, would not "draw [man] to the Creator and kindle within [him] admiration of the power of divinity and the eternity of His creation."<sup>464</sup>

Grynaeus sees the beauty of creation as a powerful demonstration of God's existence, and appeals to a somewhat common sensical ocular testimony for it. He argues that it is not possible to forget the Creator "unless the whole world would itself vanish and die before our eyes [*ex oculis*], and the visioned spectacle of nature lie faded and forgotten in our

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*Constructionis, Id est Perfectae coelestium motuum pertractationis [...] THEONIS ALEXANDRINI in eosdem Commentariorum [...]*, (Basel, Ioannem Vvalderym 1538), AD HENRICVM EIVS NOMINIS OCTAVVM, ANGLORVM REGEM INVICTISS. SIMONIS GRYNÆI PRAEFATIO, 'Qvarenti mihi Henrice Rex inclyte, uestustu(m) ac nobile Ptolemaei regis opus, quod in supremu(m) mundi uisibilis theatrum genus hominu(m) singulari beneficentia Dei ducit, quonam pacto mitti, commendariq(ue) in publicum sic posset'

<sup>462</sup>Kusukawa 1995, 150.

<sup>463</sup> Grynaeus, *Novus Orbis* (1532), prefatio Simonis Grynaei ad Collimitium. "QVANQVAM hoc totum nature spectaculum, ex quo uelut uiuo libro cōdisci opifex rerum debbat, luculenter co(n)siderationi hominum offert sese: & quo minus uel fastidium & satietatem perere co(n)templantibus se posset ullam, plenu(m) dignitateq(ue), quocunq(ue) oculus & animum coniecisti, occurrit, & nouis addiedue coeli uicibus, iucundissime nos inuitat, dum ali aliaq(ue) quotidie sydera & occidu(n)t et ori(u)n(t)ur, noctis dieiq(ue) alia quotidie magnitudo, caloris & frigoris alia quotidie uis, alia quotidie aut senescentis aut reiuuenescentis anni forma:"

<sup>464</sup> [Almagest], 3r."Nominis fuisse oblitos quosdam sui, memoriae pro miraculo proditum est: at enim varietate & copia rerum tantarum non excitari, pulchritudine & elegantia non moueri, commoditate & necessitate non teneri, maiestate & reverentia non capi, luce & splendore non accendi, diuinitate & aeternitate operis tanti in opificem non corripiti & inflammari, supra omnem admirationem est."



souls.”<sup>465</sup> One needs to be nevertheless careful not to interpret Grynaeus highly rhetorical appeal to the eyes as a evidence of “observation” in a modern sense. He does not clearly distinguish between the perceiving man, and the perceived world, but argues instead that the theatre of nature lays in our souls. This reference to the soul nevertheless demonstrates Grynaeus’ awareness of the need for some sort of cognitive effort to be made by man to properly perceive the world. And yet, whatever attitude one has, no one can forget the spectacle of nature itself which, according to Grynaeus, meets us at every place and every time, is always necessary, useful, fresh and new.<sup>466</sup> In Grynaeus’ view man immersed within the all-encompassing spectacle of nature. He writes that “[i]n this way [the spectacle of nature] is set opposite to our eyes, touching and covering all of our senses from all sides”. The spectacle of nature thus surrounds man, and via the all pervading bright light provided by this sense of the world [*sensus mundi*], “our intellect understands the creator”.<sup>467</sup>

The *sensus mundi* here is a term that is difficult to translate. In traditional texts it can also refer to the soul.<sup>468</sup> This fragment, however, seems to play with the idea that Christ provides the reason and light through which the creation of the world is made possible, also used by Melancthon in his earlier texts like *Scholia on Paul’s Letter to Colossians* of 1527. This view receives further confirmation by Grynaeus’ argument that our lives are also dependent on this aspect, as life moves through it and is based on it. Thus Grynaeus would seem to be referring to an awareness of God.<sup>469</sup>

Grynaeus describes the spectacle of nature as a primordial all-encompassing and fundamentally vital state of matters upon which human life is built and of which the sensorial experience received via senses gives a clear testimony. But although man has the requisite intelligence and sensorial ability to behold God’s treasure, it too often occurs that man, who is “posited to view the mighty order of nature” and set to “admire everything that God has created”, is blinded by ignorance which, “like the darkness of soul”, hinders him from

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<sup>465</sup> Ibid. “Nam si opificis quidem nec alia de causa, nec prius oblivisci contingit, quàm cum ipse mundus totus ex oculis evanuit occiditque, & visendum naturae spectaculum oblitteratum abolitumque in animis nostris mortuum iacet,”

<sup>466</sup> Ibid. “id autem locis ubique obvium, temporibus ubique praesens, rebus ubique necessarium, modis omnibus perfectum & admirabile, vicibus omnigenis semper recens & novum,”

<sup>467</sup> Ibid. “sic oculis oppositum nostris est, ut ipsum quidem sensibus omnibus sese undique infudens palpetur, opifex uero è mundi sensu aequè clara magnâque luce intelligentiae sentiatur,”

<sup>468</sup> For “sensus mundi” see. Stephen Gersh, “Theological Doctrines of the Latin *Aclepius*”, pp. 129-66 in Richard T. Wallis (ed.), *Neoplatonism and Gnosticism* (Albany, N.Y. : State University of New York Press, 1992), 147n184.

<sup>469</sup> Ibid. Since the prepositions that Grynaeus is using here can have a number of meanings, the term “per illum ex hoc” can have several interpretations. It can refer to opifex, spectaculum and even sensus. “uitamq(ue) ipsam per illum ex hoc omnem trahamus.”

realizing, recognizing or understanding anything.<sup>470</sup> Although ignorance has blinded man, Grynaeus points out, “God’s goodness and providence” does not let “understanding of religion and knowledge, which both are directed to God, to fade in our minds” Accordingly God “eliminates and remedies” human ignorance by revealing secrets of arts and sciences “through holy prophetic inspiration” and “using the most illustrious men as his intermediaries.”<sup>471</sup>

In Grynaeus’ view, arts thus were to be taken as providential gifts and a necessary means to transform dull perceptions into knowledge. The transformation of perceptions to knowledge proceeds in the following stages: In practicing the good arts [artibus bonis], Grynaeus argues, we are “first admitted to perceive things,” which Grynaeus understands interestingly as some form of participation. Through this participation “we shall be familiarized” with objects. And in the familiarizing process “we shall be transformed.” Transforming, Grynaeus argues, means becoming to some extent “enlightened”.<sup>472</sup> Grynaeus’ cryptic language about ‘transformation’ and ‘enlightenment’ points to an old epistemological idea of “natural light” (*lumen naturale, lux naturale*), that was familiar to Melanchthon but which had already appeared in various forms in Platonic, Neoplatonic, Jewish, Augustinian and Nominalist thought. The theory of natural light was an epistemological explanation which sought to answer how it was that man had innate knowledge. Influenced both by Stoic and Platonic ideas, Philip Melanchthon thought that ideas like good and bad, existence of God, numbers and figures, and knowledge of natural philosophy were received through this natural light. As all of these ideas were considered divine, man could have access to them only by his ability to perceive divine light, a gift given to him as part of Creation. Later in the 1540s, Melanchthon developed this idea further, adding that the capacity to rejoin the divine light, and the ideas conducted by it, had been somewhat corrupted in the fall.<sup>473</sup> Grynaeus

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<sup>470</sup> Idem, 4r. “*Rerum naturae*” is translated above as the order of nature – Grynaeus seems to use the term synonymously with “*opera divina omnia*” referring to God’s works, the creation. ‘*Nam si omnis inscitia, quaedam animi ueluti tenebra est, eaque sit, ut homo tametsi in illustri rerum naturae spectator admiratorque diuinorum operum omnium positus, nihil usquam cernat, nihil sentiat, nihil intelligat, nulla re afficiatur, denique nihil ac nusquam ut sit*’

<sup>471</sup> Idem, 3r. ‘*Hanc tantam caecitatem non tulit, nec penitus omnem numinis notitiam sensusque religionem nostris mentibus extinguere prouidentia bonitasque Dei passa est: sed ita semper occurrit, ut operis quidem contemptum, artium disciplinarumque reuelatione, sui uero sancta propheticaque inspiratione illustres semper per uiros, maxima semper per ingenia tolleret ac emendaret.*’

<sup>472</sup> Idem, 4r. ‘*artibus bonis contra fieri necesse est, ut in conspectum rerum primum admittamur, admissi imbuamur, imbuti transformemur, transformati ac illustrati luce iam aliqua, lucis amplius ampliusque semper acquiramus,*

<sup>473</sup> Frank 1995, 132-140.

apparently associates all knowledge of nature with the natural light. His idea seems to be that practicing natural philosophy meant restoring this innate knowledge:

I know well, that our [art] – by conducting his servants through the God’s most beautiful and excellent Creation and by leading the wandering mind to study the whole machine, like King’s house, so that all knowledge of the miracles of nature would not be dependent of the perceptions of the eye only – this light, that follows and posits itself second to the Sun of the Scriptures, together with the miracles of most excellent things and objects, is able to fulfill human mind completely<sup>474</sup>.

If the Holy Scriptures were the light of God or the sun that enlightened human minds so that they could perceive and understand the goodness of God, the arts which studied nature properly were smaller sparks of the same light. Posited before the Creation, man was set to perceive and familiarize himself with the objects of world. This way his mind could become transformed and he could rejoin the knowledge of creation offered to him in the divine natural light. Next to the highest light of the Word of God, Grynaeus thus posited that the arts could be developed and perfected by suitable men.<sup>475</sup>

### *Virtues of Cosmography*

Having defended the status of arts, Grynaeus opens a discussion of the benefits of the arts he values the most “What could be higher knowledge, after the light of Holy Scriptures, than that human mind sees such great works, [like for instance] how [the Earth] stands from its centre up until the poles.”<sup>476</sup>. The allusion to cosmography is obvious, and apparently well said. One finds Sebastian Münster using a similar phrase in the preface of the German Cosmographia in 1544, and again in several places like in a letter to Emperor Ferdinand in 1550: “After the

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<sup>474</sup>[Almagest], 4r.’Haec uero nostra, que cum subiectis ancillantibusque sibi perfectam pulcherrimi prestantissimique Dei operis mundi lustrationem tradit, ac in totius machinae uelut domus regiae considerationem peregrinantem animum sic ducit, ut tantum non oculis omnia naturae miranda subiicia, sat scio quod post diuinas literas uelut solem & exortiuam lucem, illa secundaria decisaque lux omnium praestantissimarum rerum miraculis mentem amplissime perfundere potest’

<sup>475</sup> Idem, 3r.’Igitur historia gentium omnium saeculorumque constat, quod non solum divinae scripturae magis magisque semper temporibus reuelatae, ac postremum ad summum perductae luce, sed illis ipsis disciplinarum igniculis per idoneos primum quidem inchoatis, deinde perfectis consummatisque, in admirationem cum sui pater Deus, tum operis ipsius tempore hominis perduxit.’

<sup>476</sup> Idem, 4v.’Quae enim maior post diuinarum literarum lucem potest esse notitia, quam cum in conspectu operis tanti qualiter à cadinibus ipsis ad mediam mundi metam stat, mens uenit.’

Holy Scripture, there's nothing more glorious, more useful or more pleasant than turning to historical and cosmographical texts"<sup>477</sup>. Having moved to cosmographical themes, Grynaeus returns to a familiar theme from the preface of *Novus Orbis*: the discoveries. "Isn't it miraculous to narrate, O mighty King, how these things were invented and written down, how a road opened upon the wayless seas and on immeasurable depths of skies, and how it was possible to travel by thought and reason through the dangerous machine of the World"<sup>478</sup> These arts, Grynaeus declares, allow to travel with reason through the entire world, but even more, the rationally created visions enable actual traveling:

Having engrossed to consider [this art], men dared to go across the circumference of the World, that's limits were now calculated on the basis of the heavenly bodies and found concise and easily permeable; and ventured the furthest seas, following by eyes all the possible routes which the sharpness of the mind had foregone.<sup>479</sup>

Now, more than in *Novus Orbis*, Grynaeus emphasizes the commercial aspects. The trade on land, then trade on seas followed this art, he argues, "which expanded by the domination of mind to cover the whole World." Similarly, all navigation is necessarily based to it, since "what else would it mean to sail without it, than to institute wandering".<sup>480</sup> Like the arts of cosmography and astronomy which had enabled the lucrative trade and maritime travel, these businesses themselves are divine gifts:

It is an amazing matter, which few mortals consider closely, that the ways of the seas which enable men to travel across them are revealed to men by heavenly revelation. This is the clearest explanation for the ancient authority [*veteris imperii*] that God gives us. An exalted crowd sees the sailors and ships return from the sea – but much greater, and more secret is the power that leads them across the sea's vastness. Through the revelation of these miraculous arts, another captain, the Holy Spirit, indicates new seas,

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<sup>477</sup> Sebastian Münster to Emperor Ferdinand in February 1550. BSM epp. 43. 'post sacram scripturam, nihil gloriosus, nihil utilius, nihil gloriosus iucundiusque magis quam versari in historiis et cosmographorum scriptis'

<sup>478</sup> [Almagest], 4v. 'Incredibile memoratu, Rex potentissime sit, cogita res haec proditaque literis ubi suit, & expedita per inuia maria, per immensa coeli spacia ratione uia est, ireque cogitatione ac intelligentia, per infestam mundi machinam licuit'.

<sup>479</sup> Ibid. 'cum hanc cogitationem incubissent, terrarum orbem finibus circumscriptionum iam suis, angustumque & facile permeabilem coelestium corporum collatione redditum, percurrere, maria extrema circuire, ac quocunque mentis acies praeiussit oculis sequi fuerunt ausi.'

<sup>480</sup> Ibid. Itaque consecutum primum quidem terrarum, deinde maris totius commercium disciplinam hanc fuit, ditioque menti per totum orbem ampliata. Huius industria clauum sic regit, ut ne momentum quidem professionem suam absque hac defendere possit nauta. Nam quid aliud sine illa nauigare, quam errare instituire est.

new peoples, new kinds of life, new regions, and the most remote corners of the world. It is easy to realize, and should not be buried under the laziness and torpor of ignorant people.<sup>481</sup>

In a nutshell Grynaeus' preface is a manifest of cosmography. He calls for research on the machine of the World, because it is the best way to unfold God's will in nature. Drawing out the relations of the heavenly bodies, the contours of continents, new seas, new species, new peoples, is a task divinely set. On one hand, investigation of the World was a providential quest set for human intelligence by the will of God. On the other, mathematics and philosophy had to turn from abstract questions to serve research of natural things. "If someone would ask me", Grynaeus announces, "what is the objective and target of all mathematical arts and to what they aim at, I would answer with one word (!): [their goal is] that we would know better ourselves and our Lord Creator, and thus measure precisely and correctly all lands and fields and also the machine of the World."<sup>482</sup>

### *Epilogue*

Simon Grynaeus died of pest on the first of August 1541. He was buried next to Johannes Oecolampadius, the reformer of Basel. Also Melanchthon remembered his deceased friend:

I received news of the interring of Simon Grynaeus, one of the best and most learned men with the bitterest pain. For he was a man happily allied with the whole world of arts, not with the Christian doctrine only but with a piety that sparked fire and zeal to both Church and letters. He studied and reasoned the divine things and all parts of

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<sup>481</sup> Ibid. 'Res utique stupore digna, quam que mortales pauci perpendunt uiam per maria de coelo artis cuiusdam reuelatione hominibus expediri [...] ueteris imperii nobis à Deo concessi clarissimum argumentum. Nautas uulgas nauesque ab oceano reduces inspicit attonitum, maior secretiorque uis est, quae per mare ducit quaeque cursum per immensa dirigit. nauclerus alius spiritus Domini artis scilicet mirandae reuelatione, noua maria, nouas hominum & animantium figuras, nouos angulos, remotiores mundi recessus monstrantis & ingnauia hominum torpore sepultumque nobis mundum esse non sinentis.'

<sup>482</sup>[Almagest]5r.'ut si quis me quidem roget, quisnam artium mathematicarum omnium finis ac scopus sit, ac quorsum omnes tendant, uerbo uno sim responsurus, uera exactaque non solum terrae agrorumque nostrorum, sed machiae mundi mentione, de nobis, deque opifice Deo melius rectiusque ut sentiamus.'

philosophy, igniting the fire of learning also to others, and edited us books that founded arts. Missing such a man and a leader of learning is a remarkable loss to the Church.<sup>483</sup>

Grynaeus was a man who after Erasmus' departure had singlehandedly lead the intellectual life of Basel and its humanists to a new direction. Grynaeus was an untiring editor who brought to life some of the most important editions of his time, and his contemporaries associated him with the complete works of Plato and Aristotle, but also with the name of Euclid and numerous other publications which took discussions of nature, philosophy and theology further. Together with Philip Melanchthon, Grynaeus had in numerous orations and prefaces, re-elaborated the aims and ideals of the renaissance philosophy. In evangelical Europe, the intellectual research of these men had consolidated astronomy, medicine and mathematics as proper and legitimate means for unfolding God's providential creation in nature. In these tumultuous times of religious intolerance and violent irrationalism, securing humanism and developing it further must be seen as a remarkable achievement.

Grynaeus was not unaware of his marvelous deeds. In 1538 he made a modest note of his success:

My confidence is strengthened. Having edited recently ancient Euclid's *Elementa*, the source of mathematics and insuperable in rigor and precision, I happily heard that my advice had been received well and the book was everywhere taken off the hands of the learned. Even the elementary schoolmasters had set it as part of their ordained lectures.<sup>484</sup>

Grynaeus' had inevitably gained fame amidst the humanists but can his influence somehow be measured? The following chapter is going to discuss his impact on Sebastian Münster, but did he have any influence on Melanchthon? Perhaps some remarks could and should be made here. At the University of Wittenberg, Sachiko Kusukawa has observed, the arts faculty had

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<sup>483</sup>MBW, epp. 2780, lines 201-209. Haec scribenti mihi dolor acerbissimus renovatus est, quem ex interitu Simonis Grinaei, viri optimi et doctissimi accepi. Hic enim foelicissime copularat cum toto orbe artium non solum doctrinam Christi, sed ipsam etiam pietatem, qua accensus ardebat studio iuvandae ecclesiae et rei literariae, eruditissime disserebat et de rebus divinis et de omnibus philosophiae partibus, docebat et accendebat ad eadem studia alios, instruebat nos libris optimis ac fontibus artium. Tali viro, tali gubernatore studiorum amisso ingens detrimentatum ecclesia accepit.

<sup>484</sup> [ALMAGEST 1538],2r. 'Auxit fidutiam hanc, quod idem nuper in opere non dissimile faciens, ac ueteris Euclidis elementa mathematicarum disciplinarum fontem opusque, quo nullum aut iudicio subtiliore, aut diligentia maiore elaboratum extat, studiosis commendans, ita meum consilium cecisise foeliciter audiam, ut ubique; iam liber studiosorum manib. distrahatur, ac à non obscuris scholis interstatae lectiones referatur.

received a new set of statutes in 1545.<sup>485</sup> These statutes addressed among other issues, the number of lecturers and topics of their lectures giving some light over subjects that were taught. Half of the 10 lecturers at the faculty were to discuss Latin grammar, Latin literature, Hebrew, dialectics and rhetoric. The other half lectured on natural philosophy, moral philosophy and mathematics<sup>486</sup> – subjects which the humanists of Melanchthon and Grynaeus' generation were arguably viewing from a new angle. The first lecturer of natural topics was named 'physicus'. 'Physicus' offered lectures on the second book of Pliny the Elder's *Historia naturalis*. The first mathematical commentary of this book was authored by Jacob Ziegler in 1531, who was assisted by Grynaeus. The work of the second natural lecturer was to point out herbs. The third lecturer taught Greek, Aristotle's *Ethica*, Homer, Hesiod, Euripides and Greek. The great variety of topics of this post has been explained by an assumption that the lecturer was Melanchthon himself.<sup>487</sup> The rest of the staff were mathematicians who were to lecture on Euclid's *Elementa*, Sacrobosco's *De Sphaera*, Peurbach's *Theoretica planetarum* and Ptolemy's *Almagest*. These textbooks popped up in the curricula during the 1530s while Melanchthon and Grynaeus discussed about and contributed to the emerging novel natural philosophy. In this period two of these mathematical textbooks were taken up by Grynaeus who produced a Greek edition of both the *Elementa* and the *Almagest*. The rest, *Theoretica planetarum* and *De Sphaera* were taught as editions which Melanchthon had dedicated to Grynaeus. Thus half of the material founding the lectures in the philosophical faculty of Wittenberg was material somehow related to Grynaeus.

Sachiko Kusukawa has argued that the essence of Melanchthon's natural philosophy remained unchanged between 1543-49. This argument is based on a comparison of the main presentation of Melanchthon's natural philosophy *Initia doctrinae physicae* that came out in 1549 to its prototype from 1543, *Physicae seu naturalis philosophiae compendium*, which today is preserved in the Vatican library. However, the roots of Melanchthon's natural philosophy can be traced to an even earlier period. According to Kusukawa, half of the prototype manuscript is a reproduction of Melanchthon's defense of astrology in the Grynaeus letter of 1531, the rest (is based on) Melanchthon's lectures on Ptolemy.<sup>488</sup> Accordingly, it is perhaps not too much to sum up Melanchthon's central ideas of natural philosophy having been born during the intense period between 1531 and 1543 and having been influenced by Simon Grynaeus coeval thought.

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<sup>485</sup> Kusukawa 1995, 175.

<sup>486</sup> Ibid, 176.

<sup>487</sup> Ibid, 176.

<sup>488</sup> Ibid, 145.

How do Grynaeus' ideas fit the framework of Evangelical theology? It has been argued that Philip Melanchthon's concept of natural philosophy was based on the Lutheran dichotomy of Law and Gospel: Gospel on one hand being the realm of faith where reason lost its mandate, God's law on the other hand, was seen as being the realm where human reason and philosophy could explore, observe and rationalize. Although Simon Grynaeus arguably wasn't a Lutheran in a strictly confessional sense, he certainly approved of this concept of Gospel and Law portraying Scripture as, "the light that leads to the highest" and the arts as "sparks" operated by human occupations. The question, however, is not perfectly clear. Grynaeus on one hand is very careful placing the Word of God on the highest place in his rhetoric, on the other hand he also seems to labor hard to smooth out the contrasts between the importance of the Scripture and the arts. For instance, discussing the difference between prophets and practitioners of arts he argues that they are both God's mouthpieces. "Prophets", Grynaeus wrote, "wish not to be called by any other name, because they utter commands of God, not of their own." "The practitioners of arts", again "no matter how difficult it is to make them confess it, still quite often admit that all arts are auspices of divine."<sup>489</sup> Grynaeus doesn't deny the prophets speaking with God's mouth, but added that also the practitioners of arts do follow divine calling. Also Galen, Grynaeus writes, "the summit of humanity and ambitiousness, reluctantly admits that his most outstanding works are deeds [auspice] of Gods."<sup>490</sup> Cunningly Grynaeus turned the worthlessness of human spirit to an argument proving the divinity of arts.

Grynaeus' case brings new hues to Sachiko Kusukawa's classical study of Philip Melanchthon's natural philosophy. Kusukawa argues, that in many respects, Melanchthon's natural philosophy should be taken as a distinctively Lutheran one. Kusukawa explains her view by pointing out different conceptions of providence in Zwingli's and Melanchthon's thought. Zwingli deduced the idea of providence, logically, from the goodness of God – Melanchthon tried to proof providence a posteriori, from natural phenomena. Zwingli's

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<sup>489</sup> [Almagest], 3. 'Prophetae non alio nomine recipi uolunt, quàm quia non sua, sed Domini iussa ferant. Prophani, utcunque confessionem hanc illis extorquere difficile est, tamen non raro artes omnes auspicii diuini esse fatentur.

<sup>490</sup> Ibid, 4. 'Galenus utcunque ambitioso & humano maxime ingenio est, tamen uel inuitus praestantissimorum operum suorum auspicia numini palam tradit.'



theology, according to Kusukawa, drew an insuperable gap between flesh and spirit and argued accordingly that God's governance in the world was invisible. In Luther's theology such a sharp dualism of flesh and spirit, according to her, did not exist. That the Word had become flesh in Christ was crucial for Luther. By analogy, Kusukawa argues, Melanchthon emphasized the God's visible governance in the world.

Now, is it possible to put Grynaeus within this framework? First of all, Oecolampadius' Basel, where Grynaeus worked, was not the same thing as Zurich – the Zwinglian orthodoxy never fully infused this relatively international town where the lively printing press and close connections to German and French intellectual centres held back desires of doctrinal homogeneity. Secondly, Melanchthon and Grynaeus developed their natural philosophies during a period, when the lost Battles of Kappel and deaths of the two charismatic reformers Zwingli and Oecolampadius, drove the leaders of Basel to seek new partners. In the 1530s the relations between Basel and the Lutherans warmed up. Simon Grynaeus, as an old friend of Melanchthon, had a vital role in this development. These men were perhaps divided by their conceptions of Eucharist, but were also united in their passion for the arts and nature. The reformation of the University of Tübingen is a good example of the depth of their unanimity in educational matters. In the faculty of arts, Simon Grynaeus built up a reform which followed the example of Wittenberg: more Gospel, more classical languages and more mathematics. His initiative was carried out by the Lutheran, Camerarius and was approved by Melanchthon himself. Despite the confessional differences, these men kept writing to each other and collaborated closely in publications which dealt with nature, astronomy in particular.

Grynaeus' texts prove that he believed in God's visible government of the World. Like Melanchthon he thought that God's providential guidance was for all to see. Like his mate, he strived to legitimate arts and philosophy as means to reach the knowledge of God's creation. In this respect, there's a huge temptation to call Grynaeus' natural philosophy a Melanchthonian, or a Lutheran one – but I wish to resist doing so. Labelling the thought of these humanists with confessional tags one may gain in clarity but lose in detail. It could well be that Grynaeus' bold prefaces and publications affected Melanchthon as much as his did the former, but Melanchthon's natural philosophy still could not be called a Reformed one. On the contrary, taking them as separate would make us blind to the huge interaction they had between one another: dedications and astronomical and philosophical books were sent back and forth and these texts undoubtedly had more in common than has been noted.



## CHAPTER VII

### The Emerging *Cosmographia*

The previous chapters have sought to demonstrate how Melanchthon's natural philosophy was supported also beyond Lutheran Wittenberg. At Basel, Simon Grynaeus, Münster's close collaborator and friend was seemingly well aware of the development that was taking place at Wittenberg. Letters and publications of Grynaeus and Melanchthon witness a mutual interest in mathematical study of nature, to such an extent that one may even speak of a discussion. But if Grynaeus was well aware of Melanchthon's ideas, what about Münster?

This chapter shall analyze a set of clues which suggest that the origins of the *Cosmographia* may be seen as emerging from the discussions of Grynaeus and Melanchthon. In this respect, this chapter shall discuss where Münster got his idea of preparing such a massive cosmographical compendium. Was his book, as some scholars have argued, a fruit of lifelong occupation with geography and thus a work that was piled up cumulatively – or should one better take the *Cosmographia* as an outcome of discussions on nature which took place in the 1530s?

#### *The Emerging Cosmographia*

When did Münster invent the idea of the *Cosmographia*? Was the work simply a pinnacle of many years of cumulative geographical research or the fruit of some intellectual breakthrough? Münster's correspondence would be a natural place to start the search for the first sparks of the *Cosmographia*. Unfortunately no letters have survived from the period between 1529 and 1537. Following Münster's own testimony in the 1544 edition of the *Cosmographia* and a letter he wrote the same year to Andreas Masius, Münster's biographer Karl Heinz Burmeister has come to support a rather early dating: "As Münster in 1544 writes that he has worked with the *Cosmographia* 18 years, one comes to the year 1526 as the year of the beginning of the *Cosmographia*. But this start seems to be too late and one should go back

to 1524.<sup>491</sup> Burmeister's early dating must be seen as an attempt to stress Münster's great experience with geography and the great amount of work that was necessary for preparing the *Cosmographia*. However, Münster's testimony in the Masius letter, which Burmeister is referring to, is not fully reliable. Münster writes: "You have perhaps heard about my *Cosmographia* that I published in German in the last [Frankfurt book] fairs. I have sweated over this work almost 18 years but not in continuing successive hours, since I have published Ptolemy and Hebrew works in between and now I am preparing a new edition of the Old Testament".<sup>492</sup> Firstly, Münster's comment is not a timely document of his activities, but a testimony of a man looking back to his youth years. Secondly, it is hard to avoid the temptation to read his comment as sheer advertisement. What is at stake here is a scholar listing his greatest achievements: Hebrew works, Bible translation, Ptolemy edition and last but not least, the *Cosmographia*, a magnificent fruit of 18 years of hard work! The impression of self-fashioning gets further confirmation by the fact that Münster used a similar phrase some months earlier in the dedicatory letter to Gustav Wasa, that furnished the first edition of the book:

I wished to write here a compendium and short description of all lands of the Earth for a common man,<sup>493</sup> for he would read it with joy, and for the learned, to show them a way, since how much after so many German Chronographies [Chronicles] it would still be useful to write also cosmographies and topographies, like I, following the erudite man Strabo, began this work and have been occupied with it 18 years.<sup>494</sup>

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<sup>491</sup> Burmeister 1969, 111. Wenn Münster 1544 schreibt, er habe 18 Jahre an der Kosmographie gearbeitet, so kommen wir auf das Jahr 1526 als Jahr des Beginns der Kosmographie. Dieser Ansatz erweist sich aber noch als zu spät; wir werden sehen, dass wir bis 1524 zurückgehen müssen.

<sup>492</sup> BSM epp. 23. to Andreas Masius on 7. November 1544. "Audisti fortassis de mea *Cosmographia*, quam proximis nundinis Germanice evulgavi, cui operi insudavi fere 18 annis, non quidem continuo et successivis horis, cum interim et Ptolemaeum et Hebraica quaedam publicaverim et iam quidem denuo editio veteris testamenti a me paratur".

<sup>493</sup> Following in the tracks of Peter Blickle and Bernd Moeller, Lyndal Roper has emphasized how important the idea of the "common man" was to early modern German social ideals. The "common man" was both the head of a family and household, as well as the embodiment of agricultural work and power. A characteristic feature of the Reformation was the unity of its various demands – religious, economic, and social – in one movement. These ideals crystallized into the principles of Christian brotherly love and obedience to God's law; and the actor in this context was the "common man". In political language the term was thus both a political and religious concept standing often in polar opposition to the government. Lyndal Roper, "The Common Man', 'The Common Good', 'Common Women': Gender and Meaning in the German Reformation", pp. 1–21 in *Social History*, Vol. 12, No. 1 (Jan., 1987).

<sup>494</sup> Sebastian Münster, *Cosmographia: in welcher begriffen aller Volcker Herschafften, Stetten und namhafftiger Flecken Herkomēn, Sitten, Gebreuch, Ordnung, Glauben, Secten und Hantierung durch*

Both of these testimonies were addressed to important persons who Münster needed to impress, and the dedicatory letter, even more so, was inevitably there to emphasize the weight of Münster's labors.

Interestingly Münster gives a slightly different testimony in a letter which he wrote to his friend Conrad Pellican in 1542: "Almost ten years now I have worked on the German *Cosmographia*, and many noblemen are waiting for its publication."<sup>495</sup> Pellican was Münster's teacher and friend, someone who knew him well, and who he did not need to impress. If one believes this intimate letter more than Münster's public statements, the beginnings of the *Cosmographia* must be postponed from 1526 to 1532! It is natural that under immense commercial pressure the imagination of Münster changed 18 years of cosmographical studies into 18 years of preparation of his book. In 1548, having sold two full editions of the *Cosmographia*, Münster sighs relief and gives another testimony which clarifies his earlier remarks:

For 18 years I have been occupied to print the Hebrew and Latin Bible with my annotations. And it is 24 years that I have devoted myself to cosmographical studies asking assistance from the good and learned men. No one can do everything.<sup>496</sup>

Now Münster brings up the year 1524 as a time when he started his cosmographical studies. Although these studies had their summit in the *Cosmographia*, there's no independent corroborating evidence that Münster had begun to study convinced that he would publish a grand book 22 years later.

All in all, Münster's different memoirs give us two periods: 1526 (or 1524 as he sometimes remembers) as the year when he began his cosmographical research, and 1532 when he began to prepare the *Cosmographia*. Indeed, both years mark important turning points in Münster's geographical career. In 1526 Münster made his first research trip which

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*die gantze Welt und furnemlich Teutsche Nation*, (Heinrich Petri: Basel 1544), 'Dedicatory epistle', no page numbers, [fol 8]. "Ich hab hie ein Cependiũ vn kurtzẽ begriff vo allẽ lendn des erttrichs dẽ gemeinẽ man wo[e]llẽ fur schreibẽ / sich darin mit lesen zũ erlustigẽ/vn[d] den gelertẽ ein weg an zeigẽ / wie man nach so vil Teutschẽ Chronographiẽ / auch gar nutzlich Cosmographiẽ vn Topographiẽ schreibẽ mo[e]chte / wie ich dan solichs vor 18. jarẽ hab vnderstanden vn angefangẽ mit disem werck / nach gefolgt dẽ hochgelertẽ man Straboni." Münster repeats this argument in the 1550 edition with mere ortographical changes.

<sup>495</sup> BSM, epp 13. to Conrad Pellican on 29. July, 1542. "Haereo iam in decimum fere annum Cosmographiae Germanicae et multi nobiles expectant illius editionem."

<sup>496</sup> BSM, epp. 33 to Stanislaus Laski on 6. April 1548. "Dedi ante octennium et decennium operam excudendis sacris Bibliis Hebraicis et Latinis cum annotationes meis. Iam annus est quartus et vicesimus quam cosmographico studio me ad tempus mancipavi requiroque bonorum et doctorum virorum suppetias. Nemo enim omnia potest."

took him to the northern parts of Rhein and regions around Basel, Heidelberg and Mainz.<sup>497</sup> In 1532 he collaborated with Simon Grynaeus and Hans Holbein produced a world map and a geographical commentary to Grynaeus' travelogue anthology *Novus Orbis*. If Münster started to prepare his *Cosmographia* in 1532, the beginnings of the book situate it in the same period as Melanchthon's and Grynaeus' discussions.

### *Münster's First Scientific Publications*

Münster's career as an author of scientific books began in 1528 and 1529 as he edited two instructional treatises on astronomical instruments.<sup>498</sup> These works seem to have enjoyed relative success because Münster edited and published similar works also later in 1531, 1534 and 1536.<sup>499</sup> In these treatises Münster provided his readers with instructions for building and using sundials and other astronomical instruments. The use of astronomical instruments can be related, at least indirectly, to geography. Before the *Cosmographia*, however, Münster contributed also to six proper geographical works. Grynaeus' *Novus Orbis* (1532) has already been mentioned. The five other works are *Germaniae descriptio* (1530) and *Mappa europae* (1536), an edition of a geographical text *Raetia* (1538), editions of the classical geographers Solinus and Mela's works in one volume (1538) and Ptolemy's *Geographia* (1540).

The *Germaniae descriptio* and the *Mappa europae* are closely related. The *Germaniae descriptio*, Münster's first geographical publication was intended to be a commentary on a map of Germany by Nicolas Cusanus. Münster's remarks, however, grew larger than simple annotation. In the *Germaniae descriptio*, Münster is still looking for his way as a geographer, and his commentary wavers between a mathematical commentary in the fashion of Schöner and Apian and a descriptive historical manual in the manner of the Nuremberg school.<sup>500</sup> A few years later Münster completed his work on Germany with descriptions of Turkey and Eastern Europe.<sup>501</sup> Although this extended version was entitled with a Latin name, *Mappa europae*, it was written in German. This modest book was

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<sup>497</sup> Burmeister 1969, 112.

<sup>498</sup> Sebastian Münster, *Erklärung des neuen Instruments der Sonnen*, (Oppenheim 1528). *Erklärung des neuen Instruments über den Mon*, (Worms 1529)

<sup>499</sup> *Compositio horologiorum* (Basel 1531); *Horologigraphia* (Basel 1533); *Canones super novum instrumentum luminarium* (Basel 1534). *Organum uranicum* (Basel 1536).

<sup>500</sup> Burmeister 1969, 113.

<sup>501</sup> Burmeister 1969, 114.

published by printer-publisher Christian Egenolff and was presumably intended for the Frankfurt fairs. Unlike *Germaniae descriptio* and *Novus Orbis*, *Mappa Europae* did not have a written commentary, only a short supplement. Burmeister has thus seen the *Mappa europae* only as a translation and popularization of the *Germaniae descriptio*.<sup>502</sup> Nevertheless the *Mappa Europae* had some new elements, like a description of Tartaria that was based on two sources published in Grynaeus' *Novus Orbis*: Haythou de Courcy's *de Tartaris liber* and Marco Polo's narrative *de regionibus orientalibus*. The *Mappa Europae* was also relatively well illustrated. It had 22 vignettes and three maps. These illustrations and a word "Cosmographie" in the title of the second edition have inspired views according to which the *Mappa europae* could be taken as the first precursor of the *Cosmographia*. Burmeister, however, has downplayed these claims. According to Burmeister, similarities between *Mappa europae* and *Cosmographia* are only superficial. Unlike the *Cosmographia*, *Mappa europae* was just a "Werbeprospekt", a purely commercial product intended for a broad audience and lacking scholarly importance.<sup>503</sup> Münster's descriptions of Western and Eastern Europe are short and of little value, and although the descriptions of Tartaria, Turkey and Germany, had some geographical value, they only emphasize the work's dependence of its precursor the *Germaniae descriptio*.<sup>504</sup>

These first geographical publications of Munster should be seen as minor works in the margins of his Grand Oeuvre as a Hebraist. Indeed, it is not before 1537, as Burmeister has pointed out, that Münster was to become more a geographer than a Hebraist.<sup>505</sup> What made a Hebraist a geographer is quite a puzzling question. Münster was one of the most important Hebrew scholars of the period and his Hebrew works, most importantly his translation of the Old Testament (in two volumes in 1534 and 1535), had earned him fame and respect amidst his fellow humanists. A translation of the Old Testament alone is a spectacular achievement – so why did Münster take such pains to also edit a massive geographical description of the whole world? Among Münster's colleagues, however, such a surprising career move was not unusual: Grynaeus, Camerarius, and Melanchthon were all theologically oriented philologists who turned into natural philosophers. Münster's career follows a similar pattern.

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<sup>502</sup> Burmeister 1969, 115.

<sup>503</sup> Burmeister 1969, 116.

<sup>504</sup> Burmeister 1969, 115.

<sup>505</sup> Burmeister 1969, 110.

The year 1537 stands out as a turning point in Münster's geographical career. It begins a period of more active geographical publishing, but it is also a period when Münster in his relationship with classical texts begins to disengage from a purely philological methodology and blind loyalty to ancient authors.

In 1537 Münster took part in a joint venture of two Basel-based printer-publishers who sought to bring Aegidius Tschudi's book of the Swiss lands, the *Rhaetia*, to the market. A letter which Münster wrote to Aegidius Tschudi on 17 August 1537 asking for his permission for the project is Münster's first survived letter after eight years' gap. The letter reveals interestingly the role of Münster's friends in the editorial processes. Münster tells Tschudi: "I have shown [your] the map to Amerbach, Grynaeus, Froben and other learned men, who've all been impressed of your industriousness upon the work – such an effort has no mortal [human being] done before."<sup>506</sup> Münster's letter describes for us a circle of humanists and the way how these men assisted each other in editorial projects. In the case of Tschudi's work, a humanist Heinrich Glarean is portrayed as the man who first thought that the book should be published, lawyer Bonifaz Amerbach, Simon Grynaeus, and Erasmus' publisher, Hieronymus Froben, are discussing and commenting on Tschudi's map; printer-publishers Michael Isingrin and Heinrich Petri are in charge of practical matters.

Did these men, discussing maps and views, also take up new ideas in natural philosophy? Grynaeus' at least might have shared his memories of the reforms at Tübingen where he had worked with Joachim Camerarius. Printers like Petri, Isingrin and Froben may have been interested in Camerarius' edition of Ptolemy's *Tetrabiblos* that had appeared just few years earlier in 1535. Grynaeus' edition of Ptolemy's *Almagest* that appeared a year later in 1538 may have been also one object of interest. A revived interest in Ptolemy and maps was going on. It would be strange had these Basel scholars not talked about *Tetrabiblos*, Melancthon's educational reforms or Grynaeus' fresh editions of *Euclid* and *Almagest*. But this is of course only speculation.

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<sup>506</sup> BSM, Epp 4. to Aegidius Tschudi on 17. August 1537. "Exhibui chartam Amerbachio, Grynaeo, Frobenio et aliis doctis viris, qui omnes mirati sunt industriam tuam atque laborem antehac nemine mortalium tentatum."



What can be clearly proved, however, is that these Humanists were talking about images. Münster had shown Tschudi's map to Froben, Petri, Grynaeus, and "other learned men", whoever they were. Münster's letter to Tschudi reveals that he had intentions to send him back four freshly cut maps, but was delayed because the maps were not printed yet. What these maps described is not known. Münster also tells that he is preparing a fresh description of the regions around the Rhein-river, basing to his own expeditions and new material he has received from regional sources. The outcome was to be published in Münster's forthcoming Solinus edition. Münster also tells Tschudi that by adding his map and also maps of England, Switzerland, Greece and Italy, he wanted to make Solinus more understandable.<sup>507</sup>

Tschudi's original German text came finally out from Heinrich Bebel's press in 1538. Münster's Latin translation was printed by Michael Isingrin the same year. Notwithstanding its small size and rather general nature, the *Rhaetia* has been characterized as one of the most important geographical and historical works on Switzerland in the period. Burmeister has seen in *Rhaetia* a model for Münster's regional descriptions in the *Cosmographia*.<sup>508</sup> Interestingly, Münster supplied his own translation with a map of Switzerland in scale 1:350 000. This map is the oldest known map of Switzerland, and served as a model for many later works.<sup>509</sup> This map of Switzerland is another demonstration that Humanists, with Münster in forefront, were beginning to compare and supplement ancient learning with their own findings – and how important images were in this process.

At the turn of the 1540s Münster's correspondence offers increasing witness of scholarly interest in images. In June 1538 Münster had sent the Swiss map to Joachim Vadian, but the printer publisher Christoph Froschauer had also sent one and Vadian had thus two copies.<sup>510</sup> Münster reflected upon the size of his forth coming "cosmographia" – not yet *The Cosmographia Universalis* but Ptolemy's *Geographia* which he calls by another name:

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<sup>507</sup> Münster's to Aegidius Tschudi, 17 August 1537. BSM, epp 4. Quis ut tales Schüdos haberent omnes Europae regiones, praesertim Germania in suis nationibus? Doleo vicem meam, qui iamdudum coepi describere lineam Rheni et nondum compleverim. Misit ad me superioribus annis Johannes dux Palatinus, dominus regionis, quam Hunssruck vocant, descriptionem suae dicionis; misit et Achilles Lindoviensis chorographiam suae habitationis et ego hac aestate exploravi Hegoiam, ortum Danubii et bonam partem Nigrae silvae, quam investigationem Solino adiciam una cum multis aliis tabulis parvis, puta Angliae, Helvetiae, Graeciae, Italiae etc. Sic enim is auctor clarior evadet.

<sup>508</sup> Burmeister 1969, 116.

<sup>509</sup> Burmeister 1969, 117.

<sup>510</sup> BSM, epp. 5 to Joachim Vadian on 2. June 1538. "Volueram tibi mittere, clarissime vir, unam ex tabulis Helveticis, quas curavi hic imprimere, nisi Froschouerus me monuisset tibi unam ex Tiguro misisse."

We have decided, me [Heinrich] Petri and [Michael] Isingrin, to publish the *Cosmographia* of Claudius Ptolemy, but not in a size as large as this [the Mela and Solinus work] but in the same form as your Mela-commentary.<sup>511</sup>

Münster's comments about the format and size of the book demonstrate that technical and visual aspects were discussed among scholars. Image was becoming the centre of discussion and this seems to have taken place amid a growing dissatisfaction with the ancient learning.

### *Ancient Knowledge and New Knowledge*

A more critical attitude towards ancient learning ascends in the early 1530s, particularly in natural philosophy and astronomy. Jacob Ziegler's Plinius-work was one example of the new voices arguing that philological skills only did not suffice, but that commentators of ancient natural texts had to be astronomically and mathematically educated. The call for more mathematics meant that ancient authors' knowledge was being increasingly submitted to new observations.

The growing tension between the ancient knowledge and fresh observations can be discerned in Münster's double-edition of Solinus and Mela (1538) and Ptolemy's *Geographia* (1540). Münster's Solinus and Mela -edition is the first one with maps. Münster made changes also to the original texts of these ancient authors. Karl Heinz Burmeister has observed that in Münster's *Solinus/Mela* the description of South-West Germany had become both quantitatively and qualitatively weightier than the description of the Mediterranean regions. According to Burmeister this disparity was so great that Münster must actually be seen as writing a new work inside an old one. Burmeister views this as preparation of the forthcoming German *Cosmographia*:

Münster's work on the *Cosmographia* affects so strongly the editorial process of Solinus and Mela that Münster forgets his original mission, a philological and critical edition of Solinus and Mela. Accordingly history of classical philology plays no role in Münster's

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<sup>511</sup> Ibid., *deliberavimus ego, Henricus Petri et Michael Isengrinus hoc pacto excudere Cosmographiam Claudii Ptolemaei, non quidem in tanta forma ut hactenus a multis fuit impressa, sed in ea forma qua annotationes tuae in Melam sunt impressae.*"

Solinus and Mela -edition. His commentary is neither an interpretation of Solinus and Mela, but merely a transfer of [geography of] modern states over an ancient author.<sup>512</sup>

However, as a way to describe these prevailing circumstances, the map provided an unsurpassable medium. Münster supplied his editions of Solinus and Mela with new maps – which as he uttered “Sic enim is auctor clarior evadet” – made the author more understandable!<sup>513</sup>

Münster’s edition of Ptolemy’s *Geographia* resembles of that of Solinus and Mela. Münster's relationship with Ptolemy, however, was way more respectful, and he paid more attention to philological detail. As a source text, Münster used Erasmus’ Greek edition of *Geographia* (1533), but also a wide range of Latin editions and commentaries which he compared with the Greek original: The editions of Ulm (1486) and Lyon 1535 (Michel Servet), Vadian’s *Scholia* (1518 Wien), Johannes Wernher’s preface to Ptolemy’s first book, the edition of Jacopo Angeli and commentary of Willibald Pirckheimer were available to Münster.<sup>514</sup> Münster’s edition of *Geographia* was more careful work than the *Solinus/Mela* and demonstrates better awareness of different text types and their proper treatment. Although Münster left Ptolemy’s original text intact he expressed his own perceptions and improvements in a supplement. Münster added to *Geographia* a 40 page long commentary. In this additional commentary Münster offered an overview of the latest geographical knowledge binding together his earlier commentaries of *Germaniae Descriptio* and *Mappa Europae* and his annotations to the World map in *Novus Orbis*. Münster supplied the Ptolemy-edition also with a 48 page long map appendix. These maps became recycled in the *Cosmographia* almost unchanged.<sup>515</sup>

Accordingly, Münster’s works on Solinus, Mela and Ptolemy were not just philological commentaries. Editing these classical books, Münster developed his own views and observations between the lines. Here he had a model to follow. The teacher of Münster and Melanchthon, Johannes Stöffler, had criticized the inaccuracies of Ptolemy’s positional

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<sup>512</sup> Burmeister 1969, 117. Die Arbeit an der Kosmographie wirkt sich so stark auf die Ausgabe des Solin und Mela aus, dass Münster das eigentliche Anliegen, die Philologisch-kritische Ausgabe von Solin und Mela, darüber vollkommen vergisst. So spielt Münsters Ausgabe von Solin und Mela in der Geschichte der klassischen Philologie keine Rolle, wie auch sein Kommentar keine Interpretation des Solin und Mela ist, sondern eine Übertragung moderner Zustände auf einen antiken autor.

<sup>513</sup> Münster’s to Aegidius Tschudi, 17 August 1537. BSM, epp 4. [...]quam investigationem Solino adiciam una cum multis aliis tabulis parvis, puta Angliae, Helvetiae, Graeciae, Italiae etc. Sic enim is auctor clarior evadet.

<sup>514</sup> Burmeister 1969, 118.

<sup>515</sup> Burmeister 1969, 118.

tables already in 1513. At Wittenberg the whole foundation of Aristotle and ancient learning had come under attack in Luther's theological reforms. As an educational branch of these reforms Melanchthon had since the 1520s developed a novel approach to natural philosophy, within which nature displaced ancient texts as the highest authority in natural studies. Ancient authors were gradually losing their position as the sole assurance and proof of truth. Münster's early geographical works demonstrate this process, but they also show how images were emerging as a new medium of proof.

### Geographia Universalis: a Maturing Concept

Münster's edition of Ptolemy was ultimately titled, following the well-established tradition as *Geographia Universalis*<sup>516</sup>, in his correspondence, however, one finds Münster more often talking about it with a Greek-rooted Latinized word "Cosmographia". In 1538 Münster wrote to Vadian about "Claudius Ptolemy's *Cosmographia*"<sup>517</sup>, a year later Münster calls the work as "Ptolemy's *Geographia*"<sup>518</sup>, but in 1542 again as "*Cosmographia of Ptolemy*"<sup>519</sup>.

Now, was Münster considering his own *Cosmographia* as a parallel to Ptolemy's *Cosmographia*, as the same names suggest? Münster's correspondence shows that the way he talks about his work changes over time: A book that seems first like a vernacular little brother of Ptolemy's work, a "German *Cosmographia*"<sup>520</sup>, grows up to be "the great cosmographical work in German"<sup>521</sup>, then "the *Cosmographia of the whole world*"<sup>522</sup> and finally "the *Universal Cosmographia*"<sup>523</sup>. The reference to the *Universal Geographia* of Ptolemy is rather clear. In the first edition of *Cosmographia* Münster is open about the example of Ptolemy's work, writing: "Because this work is printed following Ptolemy's title, it is not unworthy that also I, in my first book, explain what Ptolemy takes up in his first book."<sup>524</sup>

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<sup>516</sup> Sebastian Munster, *Geographia universalis, vetus et nova, complectens Claudii Ptolemaei Alexandrini enarrationis libros VIII*. (Basel: Heinrich Petri 1540).

<sup>517</sup> BSM, epp. 5 to Joachim Vadian on 2. June 1538.

<sup>518</sup> BSM, epp. 8 to Heinrich Bullinger on 6. April 1539.

<sup>519</sup> BSM, epp. 11 to Conrad Pellican in 1542.

<sup>520</sup> BSM, epp. 13 to Conrad Pellican on 29. July 1542. *cosmographia germanicae*.

<sup>521</sup> BSM, epp. 18 to Christian Morsing on 23. November 1543. *magnum cosmographicum opus in Germanica lingua*.

<sup>522</sup> BSM, epp. 33 to Stanislaus Laski on 6 April 1548. *Cosmographia totius mundi*.

<sup>523</sup> BSM, epp. 44 to Sigismund the King of Poland in March 1550. *Cosmographia universalis*.

<sup>524</sup> Münster, *Cosmographia* 1544, 120/X "[D]ie wyl dis bu[e]ch furderliche vnder dem tittel Ptolemei vszghat /ist ni[?] onbillich das ich auch in mynem ersten bu[e]ch meldung thu[e] vn[d] dem

The preface of the *Geographia*, however, is the first place where Münster explains his geographical motives explicitly. Münster's arguments remind greatly of those used by Melanchthon and Grynaeus. Münster writes that "the heaven and earth and everything in them, are a mirror, representing to man the Creator himself and inviting man to know Him."<sup>525</sup> The way how Melanchthon crystallized the leitmotif of his natural philosophy in 1549 expresses the same idea:

This whole most beautiful theatre, heaven, lights, stars, air, water, earth, plants, animals, and everything else in the world's body, is created with such a great art, and decorated with beauty and form, harmony of movements, efficiency of forces and sympathy, and divided so orderly, that it is a shining testimony of God the Creator.<sup>526</sup>

Münster and Melanchthon were both convinced that the natural world was a mirror or a theater that led man to know God. In the preface of the *Geographia* Münster interprets Psalm 104, which Karl-Heinz Burmeister has seen as a summary of the contents of the *Cosmographia*: Münster:

This psalm demonstrates how industrious a godly man gets thinking about nature, that brings forth such a great variety of things in the world and its parts. It [nature] produces in the world, mountains, valleys, streams, fields, trees, fruit, legumes, and fruit of trees, fish, birds, beasts, insects, mollusks, marble, jewels, metals, peoples and so forth. All

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ongelerte[n] leyen anzeigu[n]g ga[e]b /was Ptolemeus im erste[n] bu[e]ch syner Cosmography handelt." Similarly in the 1550 edition, Kurtzer begriff vnd inhalt des ersten büchs Ptolemei, xxi, "Die weil diß Büch fürderlich vnder dem titel der Ptolemaischē Cosmography außgaht/ ist nit vnbillich das ich auch in meinem erstē büch meldu[n]g thu[e]/ vnd dem vngelerten leyen anzeigungen geb /wz Ptolemens in dem ersten büch seiner Cosmography handelt."

<sup>525</sup> Sebastian Munster, *Geographia Universalis...* (1542 edition) praef. first quoted in Burmeister 1969, 108 – (the English translation is mine). "coelum et terra et omnia quae sunt in eis, specula sunt creatorem ipsum homini repraesentantia invitantiaque ad eius cognitionem." Medieval encyclopaedic natural books, which aimed at visual contemplation and moral edification, were oftentimes called "mirrors" or "speculum". The mirror-title referred also to a summa of an encyclopaedic scope, such as Vincent of Beauvais' four specula: doctrinal, natural, historical and moral. The medieval mirror metaphor nevertheless included also a possibility of a negative interpretation: the mirror could be a distorted and indirect reflection of reality. In the sixteenth century, on the side of mirror-metaphor, there emerged another powerful concept, which became similarly used in the topics of natural books, "theatre." According to Ann Blair, the concepts of the theatre of world and the theatre of nature continued the medieval mirror and book of nature metaphors. See chapter I. and Ann Blair, *The Theatre of Nature. Jean Bodin and Renaissance Science* (Princeton: Princeton University Press, 1997, 153.

<sup>526</sup> Philipp Melanchthon, *Initia Doctrinae Physicae Dictata in Academia Vuitebergensi* (Vuitebergae 1549), preface. "Totum hoc pulcherimum theatrum, Coelum, Lumina, Stella, Aer, Aqua, Terra, Planta, Animantia, & cetera mundi corpora, ideo tanta arte conditum est, ornatum specie, figura, harmonia motuum, efficacia uirium, συμπαθεία, & ordine distributum, ut illustre testimonium sit de Deo opifice."

these innumerable forms, species and colors it has arranged and created [effinxit can also be translated 'drawn'].<sup>527</sup>

Like Burmeister has pointed out, Münster's commentary on the Psalm is indeed a list of contents of Münster's forth-coming *Cosmographia*. What is essential here, however, is Münster's emphasis on material forms and things. In this respect, his stance is similar to Melancthon's view: it is precisely the material world where God's guidance is unfolded. However, a careful reading of Münster's preface to *Geographia* reveals Münster's even deeper indebtedness to Grynaeus' ideas.

Münster wrote that, "the heaven and earth and everything in them, are a mirror, representing to man the Creator himself and inviting [man] to know Him." Then he continues: "There are no species or actions that would be tiring or boring to contemplate but always fresh and pleasing they provoke the human spirit to praise the creator." "The stars are rising and setting daily, the length of the night and day changes, like the daily power of warm and cold, winds and vapors rising from the earth and move in the air, the year gets old and a new one begins, and as long as the heavens move, the inferior world shall never cease its motion", Münster sums up.<sup>528</sup> In the preface to *Novus Orbis* Grynaeus had written: "The spectacle of nature, like of a living book of which we should learn about the Creator, offers itself in a clear light [...] and so that it would not pall or fray its contemplators it represents itself [...] by daily renewing phases of heavens, the stars daily ascending and descending, the magnitude of the day and night changing, altering power of warmth and cold and the circulation of the year getting old and growing again."<sup>529</sup> The similarity between Münster's and Grynaeus' arguments is evident. Grynaeus continued:

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<sup>527</sup> Münster, *Geographia* (1542 edition), praefatio, first cited in Burmeister 1969, 109. ostendit hic psalmus in quantam administrationem duxerit virum sanctum naturae ipsius consideratio, quae tantam in mundo et partibus eius facit varietatem. In terram produxit montes, convalles, flumina, campos, arbores, herbas, frumenta, legumina, poma, pisces, aves, bruta, insecta, conchas, marmora, gemmas, lapides, metalla, homines etc. etc. in has diversas formas, species, coloresque innumerabiles excogitavit ac effinxit.

<sup>528</sup> Ibid., "Coelum & terra & omnia qu(a)e sunt in eis, specula sunt, creatorem ipsum homini repr(a)esentantia, inuitantiaq(ue) ad eius cognitionem, & id no(n) specie aut operatione una, ne uel fastidiu(m) aliquod & satietatem parerent co(n)templantibus se ullam, sed nouis assidue uicibus animu(m) hominis iucundissime ad laude(m) conditoris ceu uoce quada(m) prouocantia. Sic enim alia aliaq(ue) quotidie sydera occidunt & oriuntur, noctis dieiq(ue) alia quotidie magnitudo, caloris & frigoris alia quotidie uis, uentorum & uaporu(m) ex terra ascendentium alia quotidie in aere operatio, alia quotidie senescentis aut reuiuuescentis anni forma, et un in summa dica(m), quamdiu coelus istud suu(m) tenuerit motum, inferioris mundi cursus & quotidiana mutatio nunquam cessabunt."

<sup>529</sup> Grynaeus, *Novus Orbis* (1532), praefatio Simonis Grynaei ad Collimitium. "QVANQVAM hoc totum nature spectaculum, ex quo uelut uiuo libro codisci opifex rerum debebat, luculenter co(n)siderationi hominum offert sese: & quo minus uel fastidium & satietatem perere

But the indolent ignorance seems to be the vice of men and this face of nature awakens no admiration. It is inconceivable to remember how few mortal is excited about [nature's] highest majesty and miraculous diversity. Against this disease of human kind, the divine providence offers, like a remedy, writers and inventors of all things, whose task is to dig out these powers of nature for the ignorant, as though they would bring it [the power of nature] to the daylight, and by it, conduct the Creator to human minds. Among the many and various arts which deal with the parts of nature there's non as authoritative or suitable for making way for admiration of things of nature (*naturae rerum*), than the one which describes, jointly and separately, the sites of heavens and the earth (that Greeks call astronomers, geographers and cosmographers), and which constitutes certain and evident knowledge for many difficult arts.<sup>530</sup>

Münster follows Grynaeus' wording closely:

But because of the human idleness and ignorance, there are only few who admire this face of nature, [its] highest majesty and the miraculous diversity. Against this evil, the providence of God raises some talented men, who dig out these powers of nature for the ignorant, and by it conducts the Creator to human minds. But among those who traced the parts of nature, no other won such an authority than he who described the sites of the heaven and the earth. And amongst these many who have ventured [this art] there's nobody who had studied the inaccessible parts of nature in a more perfect and excellent manner than Ptolemy.<sup>531</sup>

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co(n)templantibus se posset ullam, plenu(m) dignitateq(ue), quocunq(ue) oculus & animum coniecisti, occurrit, & nouis addiedue coeli uicibus, iucundissime nos inuitat, dum ali aliaq(ue) quotidie sydera & occidu(n)t et ori(u)n(tur, noctis dieiq(ue) alia quotidie magnitudo, caloris & frigoris alia quotidie uis, alia quotidie aut senescentis aut reiuuenescentis anni forma”

<sup>530</sup> Ibid., (Hervagium, Basel 1532), *prefatio Simonis Grynaei ad Collimitium*. “Tamen ignaua esse uitio & socordia hominum uidetur, nec quicquam admirationis habere facies illa nature, estq(ue) incredibile memoratu, quam pauci mortales uel maiestate eiussomma, uel uarietate mirabili excitentur. Adversus hunc morbum hominum, omnis generis scriptores & inventores rerum, divina prouidentia ueluti medicos commenta obiecit, qui imperitis & inertibus istis uim naturae eruerent, & tanquam in lucem proferrent, & per eam opificis admonerent. Ac ut artes caeteras, quae uariae & multiples sunt, aliam aliamq(ue) unaquaeq(ue) naturae partem tractantes praeteream nunc, nullae plus uel sibiipsis autoritatis, uel naturae rerum admirationis parant, quam quae coelis & terrae situm, quam illa & seorsim & quem inter sese habent, descripserunt (*αστρονομικοι, γεωγρααθικοι, κοσμικοι* Graeci uocant) non absque certa & euidenti multarum & difcilium artiu(m) notitia constitutas.

<sup>531</sup> Münster, *Geographia* (1540). Sed socordia & ignauia hominum accidit, ut facies illa nature apud mortales ne quicquam admirationis habeat, cum pauci sint, qui uel maiestate eius summa uel uarietate mirabili excitentur. Contra quod malu(m) prouidentia dei homines quosdam ingeniosos suscitauit, qui imperitis & oscitantibus istis uim nature eruere(n)t et per eam opificis admonerent: inter quos alii alias natur(a)e tractauerunt partes, sed nemo propius accessit et plus autoritatis sibi con ciliauit quam hi, qui

What Münster and Grynaeus are writing here about the ignorance of man comes very close to Melanchthon's words in the preface of *De Sphaera*.<sup>532</sup> The similarity between Münster and Grynaeus, however, is even more apparent. Although Münster has simplified Grynaeus' complex Latin he follows his argument almost word for word. It is clear that these men agreed on certain basic ideas: Firstly, that the providential vocation of the learned was to "dig out" the miracles of God's creation for the ignorant. Secondly, that Ptolemy's heritage, the arts of astronomy and geography, were the best means to follow this divinely set task. Whereas Grynaeus in the *Novus Orbis* spoke about the Ptolemaic disciplines in more general terms, Münster took up Ptolemy as the hero of geographical perfection. Grynaeus agreed with him: In the preface of the *Almagest* Grynaeus lauded the "ancient and noble work of King Ptolemy, which leads mankind to the highest visible theatre of the world with God's excellent benevolence".<sup>533</sup>

In the 1530s Grynaeus, Melanchthon and Camerarius shared an increasing interest in Ptolemy's astronomical works. Typically for the period however, all these men, like Münster as well, emphasized how astronomy and geography were connected to one other. Melanchthon was very explicit about this in an oration held at Wittenberg on astronomy and geography in 1536: "The science of the heavenly movements and geography are connected with one another, and they cannot be torn apart."<sup>534</sup> In the preface of *Almagest* Grynaeus brought up the importance of maps and navigation discussing the benefits of studying stars. In the preface of *Geographia*, Münster follows in his colleagues' tracks praising the study of the firmament, which demonstrates the future events and stellar phenomena. In this Ptolemaic discourse however, Münster puts his own emphasis on geography. Once the "upper world" was made comprehensible, he stated, one could move on to the study of the Earth, and "calculate longitudes and latitudes, to point out the equators, the heights of the poles, the line of the horizon and different climates. One could name the known lands, mountains, rivers,

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coeli & terrae situm descripserunt. Et quanquam plurimi fuerint qui id conati sunt, nemo tamen perfectius excellentiusque hanc inaccessam naturae attigit partem quam Ptolemeus.

<sup>532</sup> MBW 1176. Melanchthon: "Therefore those who disdain these related lights [or stars] do not contemplate the work of nature, and for that reason deserve to have their eyes plucked out, since they do not want to use them for the purpose for which they are chiefly made - especially since that knowledge puts us in mind of God and of our immortality." *Itaque, qui cognata illa lumina fastidiunt, non considerant naturae opificium eamque ob causam digni erant, quibus eruerunt oculi, cum his ad hanc rem uti nolint, ad quam precipue conditi sunt, presertim cum illa cognitio admoneat etiam nos de deo et de immortalitate nostra*".

<sup>533</sup> Grynaeus, *Almagest* (1538). "vetustu(m) ac nobile Ptolemaei regis opus, quod in supremu(m) mundi uisibilis theatrum genus hominu(m) singulari beneficentia Dei ducit"

<sup>534</sup> Melanchthon, 'On Astronomy and Geography' (1536), CR XI, 292-8. Translated in Philip Melanchthon, *Orations on Philosophy and Education* (Cambridge University Press: Cambridge 1999), 116.



seas, island, cities and every site on the face of the earth.”<sup>535</sup> In the preface of *Geographia* Münster brought Grynaeus’ and Melanchthon’s astronomical discussion of God’s providence down on Earth. This is the starting point for his magnum opus, the *Cosmographia Universalis*.

### *Conclusion*

It is perhaps not a big surprise that Münster followed Grynaeus’ line of argument, even word for word. Grynaeus and Münster were colleagues and close friends and Grynaeus assisted his friend in scientific matters. The fact that Münster approved these ideas, however, and adopted them as such for the basis for his own concept of geography, can also be taken as further evidence of his awareness of the discussions between Melanchthon and Grynaeus. Grynaeus’ views on nature and science were not just accidental opinions, but a response to the epistemological crisis brought up by the Reformation. Grynaeus and Melanchthon were working their way towards a Protestant alternative for the traditional scholastic natural philosophy in the 1530s. On this historical background the transformation of natural philosophy was mostly about rethinking the relationship between nature and classical learning. In the field of astronomy and geography the author to be discussed was Ptolemy. Münster’s idea of a universal cosmography seems to emerge from the preface of Ptolemy’s *Geographia*, almost like a contribution to the very discussion.

Münster had a life-long occupation with the art of geography, and this inevitably benefitted his geographical main work, the *Cosmographia*. In the *Cosmographia* Münster used his earlier publications and investigations as source material. However, on the basis of the analysis of Münster’s early geographical publishing it seems quite unlikely that he had conceived the idea of universal cosmography already in 1526 as Burmeister has suggested. Indeed, Münster’s other reminiscences situate the beginnings of the *Cosmographia* in 1532, a time when the preparations of the *Novus Orbis* start Münster’s scientific collaboration with Grynaeus. Grynaeus’ ideas had a profound influence on Münster – to such an extent that

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<sup>535</sup> Münster, *Geographia* (1540). “Porro ubi hec superioris orbis inaccessa pars lustrata & numeris suis signata co(m)prehensa fuit, facile licuit deinde correspondentem & concentricam terra(m) eisdem illis coelestibus cancellare lineis & circulis, & ex recta obliquaque horizontis & aquatoris intersectione & poli diuersa altitudine designare climata, parallelos, latitudines & longitudes, atque eisdem inscribere cognitae terras, montes, flumina, maria, insulas, urbes, castella, solitudines & reliqua id genus, quae in superficie terrae & marium eminent.”

Münster's conception of nature and geography, as expressed in the preface of *Geographia*, follow carefully Grynaeus' line of argument in the *Novus orbis*. Münster's understanding of cosmography and its meaning for a Christian man was deeply indebted to Grynaeus' thought.

Whenever the idea came, however, the first stages of the making of the *Cosmographia* still cannot be situated any earlier than 1537. Münster's first geographical works *Germaniae descriptio* and *Mappa Europae* were minor works, and it is only by 1537 that the Hebraist in Münster gives space for his scientific interests. By the end of 1530s Münster focused on ancient geography. Münster's edition of Solinus and Mela was published in 1538 Ptolemy's *Geographia* came out in 1540. These books took Münster's geographical knowledge and methodology further. Working with Ptolemy's *Geographia*, Münster's concept of his *Cosmographia* matured. By this time, however, Münster was not alone with his interest in nature but Grynaeus' *Novus Orbis* (1532), *Euclid* (1533) and *Almagest* (1538), Camerarius' *Tetrabiblos* (1535), Melanchthon's *De Sphaera* (1531) and a number of other texts were already there to show him the way.

These publications, together with the related correspondence of these men, bear witness to an evangelical discussion on natural philosophy. The most important outcomes of this discussion was natural philosophy's gradual liberation from the absolute authority of ancient texts. The idea of nature as God's providential theatre, mirror and book gave the material world, at least in principle, the highest authority in questions concerning knowledge. Although Grynaeus and Melanchthon were practically speaking, still greatly dependent of the ancient works, this concept gave them courage to compare and improve classical learning with new observations. Münster's later geographical publications demonstrate similar development. Münster's attitude towards the ancient texts follows the example of Melanchthon and Grynaeus. Münster was more than a faithful philological conservator. In the context of natural studies, Münster saw the treasure house of ancient knowledge as means, not an end.

Once Münster applied this attitude to Ptolemy's standard work of geography and began to improve it with new knowledge, particularly with maps, and when he legitimated what he did by arguing that the divine task of a geographer was to unfold God's omnipotent providence in nature, we can begin to perceive the ascending *Cosmographia*.

## Chapter VIII

### The *Cosmographia* in a Comparative Context

In the 1530s this exchange of ideas on nature, natural philosophy and theology brought about a growing interest in astronomy and astrology which culminated in new editions of Ptolemy's works. As a part of this trend, Sebastian Münster published in 1540 his own carefully prepared edition of the *Geographia*, Ptolemy's main geographical work. In the preface of this book, Münster developed his views on natural philosophy and geography following in Melancthon's and Grynaeus' tracks, and promoted the study of nature as a scholars' providential task of unfolding God's will in nature.

This chapter takes a look at Münster's main work, the *Cosmographia*, in order to show similarities between his unique approach to geography and the evangelical natural philosophy. It shall also discuss how the new natural philosophy gave Münster three theological principles, and how these principles ultimately seem to have shaped the method and the contents of his *Cosmographia*. These principles argued, firstly, that the *whole world* was a testimony of God the Creator; secondly that the proper object of natural studies was *God's law, not Gospel*; and thirdly that the best way for a natural philosopher to study these things was to *focus on the divine providence in the course of nature and history*.

Because it may be difficult to see how these ideas worked in Münster's book unless one sees what the other options were, Münster's *Cosmographia* shall be compared with other geographical and historical books of his period – Works of “his period” meaning books that were published during Münster's lifetime, 1488 – 1552. A time span of over 60 years may seem long, but it is good to remember that the circulation of books in the Renaissance was remarkably slower than today. Humanists kept editing over thousand years old manuscripts; Melancthon considered Johannes Sacrobosco's 300 years old *De Sphaera* still as a valid textbook; and the *Cosmographia* itself persisted in the book market over 80 years. Although the development of geography was relatively rapid in the first half of the sixteenth century, at least in comparison to previous centuries, old ideas did not disappear that easily. The visions and innovations of Münster, Grynaeus and Melancthon must be considered to be the “cutting edge” of their day. They included radical ideas that could be adopted only by few. For a

broader audience, as has been discussed in the chapter I, markets offered different kinds of literature, fantastic tales and imaginary travel accounts which do not demonstrate a similar dramatic change in the worldview as Münster's book did.

As the main features of the sixteenth century geography have been drafted out in Chapter I, this chapter focuses primarily on the particular relationship which the *Cosmographia* had with the prevailing geographical tradition. Although some repetition is unavoidable, the purpose of the following is not to provide another presentation of the sixteenth century geography, but to highlight the particular character of Münster's work, in contrast to other publications of the period.

### *The Cosmographia and "warring traditions"*

The first version of the *Cosmographia* came out in 1544 after years of hard work. It had 770 pages, 520 woodcut illustrations and 24 double page maps.<sup>536</sup> Fear of competition had urged Münster and Heinrich Petri to publish the work before it was fully finished. During the next 6 years however, Münster kept editing his work diligently and in 1550 Heinrich Petri published a new, fully revised version of the *Cosmographia*, a book that had grown to 1233 pages, having 910 woodcuts and 54 double page maps.<sup>537</sup> Illustrations of the book, which had suffered the most in the earlier compromises, were now almost completely renewed. The idea, method and structure of Münster's book, importantly, remained mostly the same between 1544 and 1550.

In its very essence, Münster's *Cosmographia* was a combination of mathematical geography and descriptive history-writing. In the title page of the 1550-edition Münster defined the object of his work:

Cosmography. Description of all lands by Sebastian Münster, embracing the origin, customs, habits, [religious] orders, sects and occupation of all peoples, domains, cities and notable places in the whole world and principally of the German nation. Whatever

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<sup>536</sup> McLean 2007, 173. McLean reports of 640 pages basing his estimate probably on Münster's page numbers – my number is based on the total number of folio-pages [VD 16 M 6689, BSB Digital] – the difference is caused by the first hundred unnumbered pages.

<sup>537</sup> McLean 2007, 174.

may be found or have occurred in each nation. All illustrated and shown to the eye by figures and fine maps.<sup>538</sup>

Moving from country to country, Münster offered his readers an extensive display of peoples and lands of the whole world. Accordingly, the *Cosmographia* incorporated, not only maps and regional descriptions, but also descriptions of remarkable places and people's habits, descriptions of temples and forests, portraits of remarkable men, genealogies of kings and princes, and pictures of animals and faraway peoples. The *Cosmographia* can be characterized as an encyclopaedic work: although its main focus was on geographical and historical knowledge, it also discussed extensive ethnographical, zoological, and botanical aspects. In describing these things, Münster relied on the best sources available, making use of his wide scholarly network. Therefore the *Cosmographia* can be characterized, following Karl Heinz Burmeister, as a book made by scholars for scholars – and, at least since the 1550-edition, a scientific book.<sup>539</sup>

The *Cosmographia* was divided into six books. In the first book Münster focused on more general and theoretical issues; in the following five he discussed cultural and historical aspects of each country and geographical unit respectively. Manfred Büttner has summed up the contents of the *Cosmographia* in the following way, (synopsis of the first book is mine):

Book 1: Creation of the world, General geography, Ptolemy's theories, considerations on habitation of the world and on the change in the course of history.

Book 2: Europe and England, Spain, France and Italy.

Book 3: Germany, beginning with German tribes, geographical site and religion then with particular focus on Switzerland, the regions of Rhine, Schwabia, Bavaria, Austria, Hessen, Thuringen, Pommer and Schlesia.

Book 4: The Nordic countries and Eastern European countries.

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<sup>538</sup> Münster, *Cosmographie* (1550) translated in R.Oehme, "Introduction" in R.A.Skelton and A.O. Viator (eds.) *Mirror of the World, First series, vol. v*, "Sebastian Münster, *Cosmographie*", XVIII. "COSMOGRAPHIA. Beschreibu[n]g aller Lender Durch Sebastianum Munsterum in welcher begriffen, Aller vo[e]lker, herschafften, Stetten, vnd namhafftiger flecken/ herkom[m]en: Sitten/ gebreuch/ ordnung/ glauben/ secten/ vnd hantierung/ durch die gantze welt/ vnd fürnemlich Teütscher nation. Was auch besonders in iedem landt gefunden vnd darin beschehen sey. Alles mit figuren vnd scho[e]nen landt taflen erklert/ vnd für augen gestalt.

<sup>539</sup> Burmeister 1969, 161.

Book 5: Asia, with a particular interest in Palestine. America and China under the new name “New India”.

Book 6: Africa, with a particular focus on the Northern Africa. A description of the city of Alexandria along with a special chapter on Ptolemy.<sup>540</sup>

In these geographical descriptions Münster followed a relatively stable formula: He focused first on the continents providing an overview on their size, shape, fertility, population, climate, mountains and rivers. Then he discussed smaller areas, like political entities such as kingdoms and principalities, natural entities like islands and peninsulas, and ethnic and religious units like German tribes.<sup>541</sup> Germany, particularly the Upper Rhine region which Münster knew particularly well, receives lots of attention. According to the calculations of Matthew McLean, descriptions of Britain, Spain, France and Italy make up 18 percent of the work, Nordic countries 15 percent, Asia and the “New World” 12 and Africa 4 percent. The description of Germany takes up 48 percent of the book.<sup>542</sup> The “overweight” of the German lands gave some contemporary critics a reason to call Münster’s book a *germanographia*. Importantly, however, as Burmeister has pointed out, Münster cannot be taken by any means as a nationalist in the nineteenth or twentieth century sense. Münster describes Germany, not as an ethnic unit but as a natural entity, which he took as an inseparable part of the Europe and the World.

Comparison of Münster’s work with other geographical books of the period is challenging. This is particularly due to the difficulty in finding anything that would be commensurable and directly comparable with it. Sixteenth century geography was divided, as Margaret Small has pointed out, into two warring traditions: mathematical and descriptive.<sup>543</sup> But in addition to this fundamental split, geographical publications varied greatly by their publishers’ intentions to educate or entertain, by their authors’ attachment to either classical or medieval traditions and by many other factors which fragmented the field and make it difficult to speak of just one or even two geographies.

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<sup>540</sup> Summed up in Büttner 1979 A, 119.

<sup>541</sup> Büttner 1979 A, 119.

<sup>542</sup> McLean 2007, 193

<sup>543</sup> Margaret Small, “Warring traditions: Ptolemy and Strabo in the Geography of Sebastian Münster”, pp. 167-186 in Zur Shalev & Charles Burnett (eds.), *Ptolemy’s Geography in the Renaissance* (London: The Warburg Institute, 2011).

But let's simplify this picture a little and characterize the geographical publishing of Münster's days with just two variables. The first of these variables is the methodology used. On one end of this spectrum are *mathematical* textbooks which were based on Ptolemaic theory, discussing spheres and climate zones and, most importantly, the theory of grid of longitudes and latitudes – about cultural or historical matters these books had very little to say. On the other end of the spectrum are *descriptive* geographies, shorter or longer stories of particular places and humanistically driven rhetorical descriptions of cities and countries. With good will one may also count late medieval works in this group.<sup>544</sup> Characteristic for these narratives was their rhetorical force and splendour. Here mathematics played no part. Münster's *Cosmographia* has elements of both ends of this variable: his work consists mostly of descriptive narration, but offers also mathematical guidelines for representing the world.

As the other variable I would like to take up the scope, in other words how extensive geographical area a particular text sought to represent. This spectrum varied from representations of the whole world to minute descriptions of a single town. Textbooks on mathematical geography usually focused on the whole globe but these observations were obviously not very detailed. In this context, the global focus meant primarily an analysis of different projections of the Globe. Instead, authors of descriptive geographical texts like Humanists Poggio Bracciolini and Enea Silvio Piccolomini, aimed at rhetorically elegant descriptions of limited geographical areas. Their texts rarely described anything larger than an individual country. In the framework of this variable, Münster's book stands out as an oddity. The *Cosmographia* must be held as the first early modern piece of descriptive geography to focus on the whole world. In the descriptive tradition, Münster's global framework and the grand narrative within which he arranged his information is an anomaly which demands explanation.

The *Cosmographia*'s exceptional global focus has usually passed unnoticed in the post-World War II historiographies. For instance, Gerald Strauss, emphasizing the “overweight” of Germany, took the *Cosmographia* to be a typical product of humanist patriotism in the tradition of *Germania illustrata* movement, following on the tracks of Beatus Rhenanus and Konrad Peutinger.<sup>545</sup> The share of Germany in the *Cosmographia* is notable. In contrast to Münster's earlier geographical works, however, a book like the *Germaniae*

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<sup>544</sup> Bernhard Breidenbach's *Peregrinatio in Terram Sanctam* (1488) and Hartmann Schedel's *Nuremberg Chronicle* (1493), for instance.

<sup>545</sup> Burmeister 1969, 162.

*descriptio* (1530) or *Mappa europae* (1536)<sup>546</sup>, which focused primarily on German lands, the *Cosmographia* stands out precisely because of its global focus. This growth from local descriptions into a global work was not easy. In the *Cosmographia* one finds Münster wavering between the World and the German nation.<sup>547</sup> In the preface of *Cosmographia* Münster confesses: “the dear reader should know that my first object was the German nation”.<sup>548</sup> In order to explain why he nevertheless ended up describing the whole world Münster offers us a theological answer:

I wish to leave no land unexamined, so that we would acknowledge what rare and miraculous things God has created on the wide Earth, giving to every land something that shall not be found in another, his gifts being so wonderfully shared that we would thereby learn, that man and land need each other in every way, and no one has received all things in heaps.<sup>549</sup>

Münster’s explanation refers to the providential overtone of his narrative. Natural riches and their variation should be seen as divine benefaction. Münster takes up also morals: Flourishing lands mirror virtues of the people cultivating it. Global focus enables mirroring God’s creation as whole unfolding its spatial and temporal extensions.

At first sight, however, Münster’s religious explanation for the global focus of his book and the “overweight” description of Germany on the other, seem conflicting: If Münster wanted to offer a moral account of God’s creation *in toto*, why did he sacrifice so much ink

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<sup>546</sup> Strauss, Gerald, *Sixteenth Century Germany: Its topography and topographers* (Madison, University of Wisconsin Press, 1959).. Strauss’ views can probably be returned to Viktor Hantzsch’s late 19<sup>th</sup> century portrait of Münster. At the heights of German nationalism Hantzsch wrote: “Als Historiker ist er [Münster] in einer Zeit ärgster staatlicher und kirchlicher Zersplitterung mit patriotischer Begeisterung für die Idee eines grossen, freien, mächtigen und einheitlichen deutschen Vaterlandes eingetreten und hat durch seine anregende Darstellung der deutschen Geschichte Tausende zu liebevollem Versenken in die Vorzeit unseres Volkes angeregt.” Viktor Hantzsch, *Sebastian Münster: Leben, Werk, Wissenschaftliche Bedeutung*, (B. De Graaf, Nieuwkoop 1965[Leipzig, 1898]),6.

<sup>547</sup> This is evident already in the title of 1544 edition. *Bescreibūg aller lender dūrch Sebastianum Munsterum in welcher begriffen Aller vōlcker / herzschaftten/ Stetten/ vnd namhafftiger flecken/herkomen: Sitten/gebreūch/ ordnung/ glauben/ secten/ vnd hantierung/ durch die gantze welt/ vnd fürnemlich Teütscher nation.* (Heinrich Petri: Basel 1544).

<sup>548</sup> Sebastian Münster, *Cosmographie* (1550), vorred, no pagenumbers [6], “Weiter solt du freüntlicher leser wissen /dz mein erst fürnemē ist gewesen Teütsch nation”.

<sup>549</sup> Sebastian Münster, *Cosmographie* (1550), vorred, no pagenumbers [5],” Also wōllen mir kein land onersūcht lassen / do mit wir erkennen was Gott für seltzame vnd wunderbarliche ding auff dem weiten ertrich erschaffen hat / vnd je einem land etwas geben / das in dem andern nit gefunden wirt / vnd seine gaben also wunderbarlich ausz getheylt / das wir dar bay lernetē / das ein mensch vnd ein land des anderen al[w/m]egen bedarff / vnd keins alle ding über ein hauffen empfangen hab.”



for provincial issues? This apparent conflict disappears if one sets the *Cosmographia* in the context of the evangelical natural philosophy. As has been noticed above, the intellectual development of Grynaeus and Melanchthon demonstrated an emerging juxtaposition between the ancient texts and nature as God's work. The conception of nature as God's theatre, which man was to behold encouraged evangelical natural philosophers to make observations which deviated from the inherited views of the ancient authors. In the *Cosmographia*, the extensive description of Germany was the part that was best grounded in Münster's own observations and research travels. Focusing on divine providence and wishing to show the divine blessings which Germany had received, Münster described his native lands as closely as he could. At the same time, the providential framework encouraged Münster to extend the focus of his book to cover the whole miraculous creation of God. The evangelical natural philosophy may thus offer one explanation for Münster's untypical move to extend the focus of descriptive geography from a single region to the whole world.

#### *The Cosmographia and the Mathematical Tradition*

Münster's concept of cosmography matured while he was working with an edition of Ptolemy's *Geographia*. Therefore it might be suitable to ask how his work was related with the renaissance tradition of mathematical geography. The early modern history of mathematical geography in the West began by the end of the fourteenth century as Greek manuscripts of the *Geographia* arrive in Florence from the Byzantium. During the early fifteenth century the *Geographia* was translated into Latin, the first printed first edition appearing in 1475 in Vincenza, Italy. By the 1530s the *Geographia* had been printed on both sides of the Alps, gradually becoming commonplace in geographical education.<sup>550</sup>

*Geographia* was vital in the new geographical, and particularly cartographical thinking. Although *Geographia*'s maps did not survive in the manuscripts from antiquity, map-making was essential for the later success of the book. Ptolemy defined his work, which he called in Greek *Geōgraphikè Hyphégēsis* (*Guide to Cartography*), as an imitation of the known part of the world through drawing.<sup>551</sup> The *Geographia* offered instructions for obtaining geographical data and taught basic principles of different map projections. Besides

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<sup>550</sup> Zur Shalev & Charles Burnett (eds.), *Ptolemy's Geography in the Renaissance* (London: The Warburg Institute 2011), 5.

<sup>551</sup> *Ibid.*

the cartographic theory, the *Geographia* offered also a significant amount of cartographical data. Two thirds of Ptolemy's book was taken up by a lengthy catalogue of 8000 places and their coordinates and the book offered also written instructions for drawing a world map and 26 different regional maps.<sup>552</sup> During the middle ages the co-ordination system had been lost. Ptolemy's book, offering scholars a mathematical concept of space, was a remarkable step in renaissance geography.

During the first half of the sixteenth century most publications of mathematical geography were handbooks which sought to clarify or make specifications to the ancient geographer's heritage.<sup>553</sup> Peter Apian's three popular and influential cosmographical text books demonstrate these realities. In its briefest a cosmographical text book, like Apian's *Cosmographiae Introductio* (1531), drafted out basic principles of astronomy and geography, offering principles (but not yet practical advice) of various mathematical map projections.<sup>554</sup> A description of the grid of longitude and latitude was presented, though in short, as was Ptolemy's concept of different maps and the ancient geographer's division of the world into different regions. Then, those who wanted to advance their cosmographical knowledge could consult something like Apian's *Cosmographicus Liber* (1524). This book offered a guide to astronomical observations and different surveying techniques, being supplied with a list of geographical coordinates making the book a real toolbox for a beginner cartographer. For the scholarly audience there was Apian's *Introductio Geographica* (1533), a book which claimed to be offering an introduction to the first book of Ptolemy's *Geographia*, but which actually consisted of highly sophisticated exercises in geometry and astronomy. Apian's *Introductio Geographica* was also supplied with geometrical treatises on diverse map projections, descriptions of world maps and practical instructions for astronomical devices, making it a subtle and learned interpretation of the ancient geography.<sup>555</sup>

Before starting with the *Cosmographia*, Münster had elaborated his own edition of the *Geographia*. He knew the ancient Ptolemy well. The central place that Ptolemaic mathematical geography occupies in the *Cosmographia* demonstrates that Münster approved its principles. In the first leaves of the compendium, right after the foreword, Münster had set two world maps, one based on Ptolemy's knowledge, another based on the latest information available to him. The juxtaposition of these two maps is somewhat typical for Münster's

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<sup>552</sup> Ibid.

<sup>553</sup> Benjamin Weiss, "The *Geography* in Print: 1475-1530", pp. 91-120 in Zur Shalev & Charles Burnett (eds.), *Ptolemy's Geography in the Renaissance* (London: The Warburg Institute 2011), 91.

<sup>554</sup> Ibid., 93.

<sup>555</sup> Ibid., 94.

relationship with the old master: The ancient map honored Ptolemy, while the modern map, with its newly discovered lands, demonstrated the limitations of the ancient master in the light of later geographical progress. Despite this critical awareness, Ptolemy's influence on the *Cosmographia* was significant. Münster's maps and the extensive cartographical section of the *Cosmographia*, particularly in the 1544-edition, are largely identical with those Münster had used in his edition of *Geographia*. Also the structure of *Cosmographia* follows loosely the order of *Geographia*, Münster's descriptions of individual lands moving from Western Europe eastwards.<sup>556</sup>

The part of the *Cosmographia* that is most indebted to Ptolemy is its first book, where Münster explains the common principles of geography. "Because this work is printed following Ptolemy's title", Münster writes, "it is not unworthy that also I, in my first book, explain what Ptolemy takes up in his first book."<sup>557</sup> Like Peter Apian in the *Introductio Geographia*, Münster bases his exposition of geographical principles on the first book of the *Geographia*. Here, in the best mathematical tradition, Münster explains the difference between geography and chorography; he writes about the circumference of the Earth and offers practical directions for measuring extensions and locations of towns. Münster also offers practical guidance for using a compass, explains principles of triangulation, and tells how to describe different lands. Parallels and climates and principles of cartographic projection are also introduced.<sup>558</sup>

In the first book of the *Cosmographia* Münster offers his reader good basic knowledge of Ptolemaic geography: principles of map-making, parallels and other central aspects of mathematical geography. In the 1544 edition, the length of this discussion, however, is only 20 pages long and grows only to a few pages more in the 1550 edition. However, although Münster accepted and integrated mathematical geography as an important feature of the *Cosmographia*, it is not the Ptolemaic geography but the descriptive content which characterizes his book. Like Ptolemaic geographers Münster was interested in putting places on the map, but the ultimate meaning of this mapping resided in exploring historical and cultural features of these places.

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<sup>556</sup> Büttner 1979, 119.

<sup>557</sup> Münster, *Cosmographia* (1544), fol. 120, x. [D]ie wyl dis bu[e]ch fürderliche vnder dem tittel Ptolemei vszghat /ist ni[t] onbillich das ich auch in mynem ersten bu[e]ch meldung thu[e] vn[d] dem ongelerte[n] leyen anzeigu[n]g ga[e]b /was Ptolemeus im erste[n] bu[e]ch syner Cosmography handlet.

<sup>558</sup> Münster, *Cosmographia* (1544), fol. 121, x. "Was Geography"; "Was Chorography". 122, xi. "Die lenge des ertrichs zû fûschen". 126, xv. "wie man ein landt beschriben soll". 130, xix, "Was clima", "Was parallel". 131 xx. "Beschrybung einer kugel uff der ebnc."

Münster's ambitious goal was to create a comprehensive world description and to represent the whole world. In the realities of his period, it is quite understandable that our geographer could base only a small amount of his descriptions on his own research. The rest relied on various literary sources. In general terms, these sources can be labelled as descriptive geography, although one must be aware that in reality these texts belong to a number of different literal traditions which did not necessarily always have so much to do with geography. This, however, is what makes the relationship between Münster's work and the descriptive geographies so interesting. In order to produce his massive world description Münster had to make good use of the existing descriptive geographies and histories, stories, travelogues and chronicles. In some cases it was only Münster's selective and editorial work which made a text "geographical". In the case of some other texts, particularly with the ancient geographer Strabo, the choice of the source text was a deliberate decision that was made to support Münster's stoic and providential vision of history.<sup>559</sup>

According to Burmeister's calculations Münster had, all in all, approximately 70 collaborators and 70 literal sources.<sup>560</sup> The literal sources, which interest us here, Burmeister has divided into three groups: modern, classical and medieval.

Descriptions of modern authors were important for Münster. Like most German history writers of this period, Münster admired Italian humanism and humanists. In this group

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<sup>559</sup> Actually Münster's relationship with Stoic natural history can be traced back to 1520 when Münster prepared a German translation of Cyrill's Latin book of animal fables "Speculum Sapientiae". Cyrill's moral stories were strongly influenced by the stoic moral philosophy, first of all by Seneca and Cicero. In his preface Münster agrees with the ancient author and makes an argument which could well have served also in his cosmographical works 30 years later: "Wjewol nach dem spruch Arestotelis / in sitlichen underwysungen / man lustig ist züzunemen / so man bequeme byspil fürhelt / so ist doch das noch anmu[e]tiger wenn man die tugent anzeigt mit glychnussen und eygenschaffen der creature / glych als seht einer vor jm die tugent gemalet / nemlich so das menschlich leben sich mag bilden nach naturlichen sitten und eingeschaften der thiern / als nach lebendigen bilden / ia die gantz sichtbarlich welt sol dem menschen ein zuchtschül [] sin / so alle ding darinn mit wyßheit sind verordnet." The idea of the world as a mirror is based on Augustin's sign theory. In the 12<sup>th</sup> and 13<sup>th</sup> century the idea of the division of the world into God's two books, the Book of nature and the Book of Scripture become systematized and united with allegorical interpretation of the world as means of knowing God. This idea was used particularly by the Franciscans. For instance in Bertholds von Regenburg's book of preaching or spiritual mystical tract of Bonaventura, the "Itinerarium mentis in Deum". Sebastian Münster, [Romy Günthart] Spiegel der Wyßheit, Band II: Kommentar (München: Wilhelm Fink Verlag, 1996), 33 & 10.

<sup>560</sup> Burmeister 1969, 157.

the pioneer of descriptive chorographies, Enea Silvio Piccolomini, was above all the others.<sup>561</sup> Also Marco Polo and other Italian Viaggiatori, were important sources for Münster's descriptions in the *Cosmographia*.<sup>562</sup> Describing the Nordic countries, Münster consulted emigrated Scandinavians Olaus Magnus and Jacob Ziegler, whose maps gave Münster vital information. But Münster made also extensive use of German humanists' texts. He cited Bernhard von Breidenbach, Conrad Celtis, Willibald Pirckheimer and Franz Irenicus – and surprisingly, even the controversial Anabaptist writer Sebastian Franck.<sup>563</sup> In his divine quest for geographical knowledge Münster seems to have had very few prejudices. Citing another Anabaptist writer, Michel Servet's bitter views of Spain, Münster, through pious ignorance, gained many enemies.

Generally speaking, Münster was relatively open about his sources, giving the reader an opportunity to verify the sources he used. Münster's lack of criticism, particularly with some ancient authors, instead has received criticism.<sup>564</sup> But as Burmeister has pointed out on the grounds of fact, Münster did not always have a possibility to check the source material.<sup>565</sup> Moreover, whenever Münster found a need to correct views of ancient authors, particularly from his native lands, he consulted other, modern authors or based the description on his own views.

The significance of the descriptive tradition for Münster's *Cosmographia* is more meaningful than just raw material. This is most evident in the case of ancient Greek and Roman authors which form the most important group of Münster's source material. Münster knew well the texts of antiquity and also used them to support his own scientific views.<sup>566</sup> Münster cited ancient Greeks like Ptolemy, Prokop, Diodorus and Berosus. The most

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<sup>561</sup> Burmeister 1969, 156.

<sup>562</sup> Burmeister 1969, 155.

<sup>563</sup> Burmeister 1969, 157.

<sup>564</sup> Jean Bergevin, *Déterminisme et Géographie: Hérodote, Strabon, Albert le Grand et Sebastian Münster*, (Sainte-Foy : Les Presses de l'Université Laval, 1992), 126. *Devant les sources utilisées, Münster conserve souvent une attitude naïve. En fait, il les critiquera assez peu. Dans le cas de la Bible, le contexte de l'époque et son propre cheminement spirituel expliqueraient son manque de critique.[...]En cela il se démarque de ses plus proches prédécesseurs. Cela dit, en règle général, il transcrit scrupuleusement ce qu'il lit chez les Anciens. Si cette confiance lui permet d'offrir à ses lecteurs de riches informations sur les villes, pays ou animaux qu'ils ne connaissent pas directement, ce manque de sens critique l'amène aussi à ponctuer son ouvrage d'un bon nombre de faussetés parmi lesquelles les créatures monstrueuses de l'Afrique et du Nord de l'Europe, ou encore les fantômes hantant l'Islande, restent les meilleurs exemples.[...] En outre, nous verrons, le théologien allemand est trop empreint de foi religieuse pour arriver au niveau « scientifique » atteint dans la Géographie de Strabon.*

<sup>565</sup> Burmeister 1969, 157.

<sup>566</sup> Burmeister 1969, 152.

important Roman authors for him were Pliny the Elder, Solinus and Mela, Tacitus and Quintus Curtius. Editorial works of Ptolemy, Solinus and Mela had provided Münster with a firm understanding of the ancient geography, which he obviously applied also to the *Cosmographia*. The most important ancient authors for Münster were Strabo and Plinius. *Cosmographia*'s description of the Mediterranean was mostly based on Strabo and Plinius.<sup>567</sup> As has been discussed, Pliny the Elders' works, especially the *Historia Naturalis*, were becoming very popular among natural philosophers. In Wittenberg *Historia Naturalis* had become part of the curriculum in Melanchthon's first educational reforms of the 1520s. Pliny's stoic vision of the world emphasizing the role of providence fit well into the new theological expectations of natural philosophy. In the case of Strabo, his stoicism is even clearer.

Münster announces that he follows the example of Strabo in the very first pages of the *Cosmographia*.<sup>568</sup> Münster's hero Strabo (64 BC -19 AD.) was an ancient geographer, philosopher and historian, whose two massive works, the *Universal History* and *Geography* influenced the descriptive approach greatly. Like the most of the ancient descriptive geographers, Strabo also was influenced by Stoic thought, Posidonius in particular, and understood geography as a part of philosophy.<sup>569</sup> Strabo's geographic books were essentially geocentric, offering descriptions of geographical and cultural features, myths and historical information. In Strabo's stoic vision, the character of a particular place and its inhabitants had moral value and reflected a more profound plan. The beneficial situation of say, the city of Toulouse, in a crossing of a river and sea, benefiting hugely its trade, was for Strabo, no coincidence, but a testimony of providence, the greater plan in nature. Contemplation of a particular landscape and the harmony of its different physical elements could, in Strabo's geographical narratives, lead to contemplation of a higher plan. In Strabo's stoic vision of geography, the supernatural explained both natural and human features.<sup>570</sup>

Münster had not discussed Strabo in his earlier works and Ptolemy must have been much more familiar to him, particularly as he had prepared a full edition of the *Geographia*.

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<sup>567</sup> Burmeister 1969, 153.

<sup>568</sup> Münster, *Cosmographia* (1544) Dedicatory epistle, no page numbers, [fol 8].” Ich hab hie ein Cöpendiū vñ kurtzē begriff vō allē lendn des ertrichs dē gemeinē man wo[e]llē für schreibē / sich darin mit lesen zū erlustigē/vn[d] den gelertē ein weg an zeigē / wie man nach so vil Teutschē Chronographiē / auch gar nützlich Cosmographiē vñ Topographiē schreibē mo[e]chte / wie ich dañ solichs vor 18. jarē hab vnderstanden vñ angefangē mit disem werck / nach gefolgt dē hochgelertē man Straboni.”

<sup>569</sup> Jean Bergevin, *Déterminisme et Géographie: Hérodote, Strabon, Albert le Grand et Sebastian Münster*, (Les Presses de l'Université Laval : Sainte-Foy 1992), 76-78.

<sup>570</sup> Ibid., 77.

Thinking about the heritage of descriptive geography Münster was similarly well acquainted with Mela and Solinus and it can be assumed that via Grynaeus he could have had Ziegler's mathematical commentary of Pliny if he only had been interested. That Münster still wished to use Strabo as his most important example, must be taken due to Strabo's providential stoic vision of history that suited well Münster's ideas. According to Matthew McLean idea of providence was a central and uniting feature of Münster's compendium:

The *Cosmographia*, despite its part in disseminating the 'new' geography and mathematicised Weltbild, is a text which in many ways retains the values of the medieval model of the cosmos. It is an attempt to reconcile the two; to make room for wonder and a sense of God's immanence even as the unknown parts of the world contracted and man's empirical knowledge grew. That immanence is legible in the arrangement of the landscape, the disposition of nature and the direction of human affairs throughout history. All are unified in divine providence, which runs throughout the *Cosmographia*, a forceful undercurrent; being able to interpret this providence is to be able to understand Münster's geography, history and descriptions of nature.<sup>571</sup>

Münster's geography moved in the crossroads of "new" and "old", mathematical and medieval. The idea of providence, however, provided Münster with a tool to maintain the endogenous tensions of his work. Providentiality gave Münster an opportunity to stay within empirical knowledge and follow the Christian framework. Like Strabo's stoic geography, Münster also let his reader know that behind the natural order there was a higher reason. The divine foreseeing, providence, became visible in the order of heaven that changed seasons and the length of the day, giving the blessings of the sun to all sides of the Earth.<sup>572</sup> But also the fertility and richness of the Earth gave Münster occasion to praise:

What thinkst thou about the force on Earth, that every year yields such a quantity of crops, wine and fruit, feeding beasts and men: This is verily the unspeakable good and the blessing of the living God, who opens his hand and giveth nourishment for all living creatures.<sup>573</sup>

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<sup>571</sup> McLean 2007, 323.

<sup>572</sup> Münster, *Cosmographie* (1550), Das erst büch, Von den circckeln die man parallelen ne[m]pt, xviii, "Dan Gott hat durch sein hohe vnd übertreffliche weiszheit die himmel vnnnd sonn also geordnet / dasz sie in einem ieden jar auff beiden seiten durch ire bewegung solten bequeme einflüsz vnnnd noturfftige vorsehung dem ertrich zufügen."

<sup>573</sup> Ibid., Das erst büch, von fruchtbarkeit vnd reichthummen des erdrichs, v. "Was meinestu steckt für ein krafft im ertrich/ das jårlichen ein solich menge korns / weins vnd obsz herfür bringet / daruõ thier

The natural issues, like a good harvest, thus had great spiritual and moral value but even more, Münster saw the Earth as the mother of all the living beings, who took affectionate care of their needs:

Like the heaven is God's abode, the Earth is the dwelling of men and animals and their mother. It receives and yields us so that we are born, it feeds us and lets us drink while we live, and finally embraces us, concealing our body until the Last Day, when together with the soul the body is taken to Heaven, has he only, in his own way, known his Creator and Redeemer in this time.<sup>574</sup>

K. H. Burmeister has crystallized *Cosmographia's* philosophy of history into two theologically based ideas. The first of these is Münster's profound faith in progress, which becomes particularly evident in Münster's descriptions of Germany, Poland, Sweden and Hungary. Münster stresses how these areas were barbaric and uncivilized in the ancient times but nowadays demonstrate remarkable progress in culture and manners. Here Münster also disagrees with his ancient sources. Attacking Tacitus' antipathy towards Germany, Münster declares that his native land is "not a cruel and awkward land, but a paradise and garden of joy."<sup>575</sup>

The other guiding idea of the *Cosmographia* is change. This becomes demonstrated in the description of the Palestine. "For ages the holy land flooded with milk and honey, but is now a cruel, bitter and poor land."<sup>576</sup> Münster believed in an eternal change between civilization and Barbary where skillful people replaced the untalented ones. In the course of history, things that are esteemed and appreciated become contemptible and despised things in turn: Only God remains. According to Burmeister, these moral observations were by no means coincidental, but had a central place in Münster's thought. Burmeister situates the origin of these philosophical ideas in the Bible's teachings of the four kingdoms and the stoic

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vnd menschen geleben: Warlichen das ist die onauszsprechliche güte vñ der segē des lebendige gottes / der seine hand auffthût vnnd gibt narung allen lebendigen creaturen"

<sup>574</sup> Ibid., Das erst bûch, von fruchtbarkeit vnd reichthummen des erdrichs, iiii. "Gleich wie der himel gottes wonung ist / also ist dz ertrich der mēschen vñ thieren behausung / ia ire mûter. Dan es empfahet vns so wir geboren werdē / es erneret vns vñ trengt vns die weil wir leben /vñ zû letzt empfahet es vnsz in sein schosz / behelt vnsern cōrpel bisz zū iüngstē tag / do er sampt d[ie] selen in himel genomen wirt / hat er anderst in diser zeit nach seiner art erkent seinen schöpffer vnd erlöser."

<sup>575</sup> Münster, *Cosmographia* (1544), praef. First cited in Burmeister 1969, 161. "nit rauch ungeschlacht landt sunder eyn paradyss und lustgarten."

<sup>576</sup> Ibid. "Das heylig land hat vor zeiten geflossen mit milch und honig, aber jetz ist es ein ruch, bitter, ungeschacht erdrich".



thought of Strabo and Posidonius. In the *Cosmographia*, Burmeister states, Münster wanted to write a moral portrait of the world as God's creation.<sup>577</sup>

Burmeister is right. Münster's alliance with descriptive geography must be interpreted also as a philosophical commitment with stoic ideas. Historical and cultural descriptions gave Münster an opportunity to offer lectures in morality and to demonstrate how divine moral order governs nature. These aspects would hardly be realized within a purely mathematical framework. Münster found support for his opinions in ancient natural philosophers' views. Strabo and other stoic writers were very important for him. Münster's focus on providence and his particular interest in moral teachings of history, however, become more understandable when they are set within the context of the emerging evangelical natural philosophy. Taking the idea of providence as the leading thread of his geographical fabric, Münster was not alone, but following in the tracks of Melancthon and Grynaeus.

#### *The Cosmographia and the Nuremberg Chronicle*

Medieval authors clearly make up the smallest group in Münster's sources, covering only 10 percent of the used material. Burmeister has connected this with the fact that Münster's geographical and linguistic career was mostly independent of the medieval tradition.<sup>578</sup> Münster's education and intellectual development was closely tied to the rising tide of Northern Humanism. The antagonism between evangelical humanism and scholastic thought has probably also influenced Münster's contempt for medieval sources. However, thinking Münster's *Cosmographia* as less of a geographical work and more as a piece of history writing, a comparison with Hartmann Schedel's classical World Chronicle becomes unavoidable. Despite the fact that Schedel's book appeared in 1493, 51 years before the *Cosmographia*, the similarity between these two works is great and Schedel's work has often been taken up as an exciting parallel to the *Cosmographia*. Burmeister has argued that, "although Schedel has not become known as Münster's source, many similarities demonstrate Schedel's direct influence on the *Cosmographia*." The unique combination of geography and history bring Schedel and Münster together, although as Burmeister points out, the fundamental difference between these authors is that, whereas Schedel illustrates history with geography, Münster seasons geography with history. Burmeister has also pointed at Schedel's

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<sup>577</sup> Burmeister 1969, 161.

<sup>578</sup> Ibid., 154.

city views as forerunners of Münster's images.<sup>579</sup> All in all, Schedel's chronicle is an interesting work of reference letting us see the uniqueness of Münster's *Cosmographia* in the long tradition of medieval chronicles.

The polyhistor Hartmann Schedel's book (1440-1514) has become known by many names, the *Liber chronicarum* or *World Chronicle* (Weltchronik), or after its "place of birth" as the *Nuremberg Chronicle* (Nürnbergische Chronik) and after its main author as the *Schedel's Chronicle* (Schedelsche Chronik). The book was printed for the first time in 1493 in both Latin and German and received relative popularity among the contemporary audience leading to two additional editions. Like the *Cosmographia*, Schedel's *Chronicle* was a visually stunning piece and a beautiful example of the art of book making. Its large extended pages were decorated by 1809 woodcuts. Schedel's role in the editorial process of the book was not only to write, but also to compile and edit other people's material. Because of its overwhelming and costly illustrations and the plurality of sources used, the existence of the *Chronicle*, must also be seen also due to the work of the printer publisher Anton Koberger (1440/45-1513), the main illustrator of the book, Dürer's teacher, Michael Wolgemut (1434/37-1519), and the two humanists, doctor and geographer Hieronymus Müntzer (1437-1508) and the arch-humanist Conrad Celtis (1459-1508).

Schedel worked at Nuremberg as a municipal physician, but had gathered a remarkable collection of patristic and humanist literature. On Schedel's bookshelves there were not just medical books, but also mathematical, cosmographical and philosophical literature which directly benefited his grand opus. Schedel's interest in Latin literature ranged from the ancient authors to Church fathers, including Plautus, Cicero, Vergil, Horace, Tacitus, Ambrosius, Hieronymus and Augustine. Schedel knew Italian Renaissance literature like Dante, Petrarch and Boccaccio, Poggio Bracciolini and Enea Silvio de' Piccolomini, and also contemporary German authors like Sebastian Brant, Jacob Locker, Jacob Wimpheling, Christoph Scheurl, Conrad Peutinger, Joseph Grünbeck, and to some extent even Erasmus.<sup>580</sup> To some extent Schedel's and Münster's sources are reminiscent of each other, the decisive difference being the absence of Strabo and Pliny from Schedel's list.

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<sup>579</sup> Ibid., 157. Schedel wird von Münster nicht als Quelle genannt, viele Parallelen beweisen aber den direkten Einfluss Schedels auf die Kosmographie. Grundsätzlich unterscheiden sich Schedel und Münster aber darin, dass Schedel die Geographie zur Illustration der Geschichte, Münster die Geschichte zur Illustration der Geographie gebraucht. Auch die prächtigen Städteansichten aus Schedels Weltchronik sind als Vorläufer der Münsterschen anzusehen

<sup>580</sup> Elisabeth Rücker: *Die schedelsche weltchronik: Das größte Buchunternehmen der Dürer-Zeit.* (München: Prestel-verlag 1973), 16-20.

The realities of the book trade at turn of the century were hard. Therefore it is less stunning that the enterprises of Schedel and Münster stand alone as densely illustrated world histories. The amount of images in these works posed a massive economic risk for their publishers. Although art historians have observed that printed image was a rising trend in the book trade at the end of the fifteenth century, before 1500 still only one third of printed books were illustrated.<sup>581</sup> Books that were illustrated were usually well-selling scriptural and devotional works.<sup>582</sup> In this company Schedel's illustrated chronicle is a rare bird. That it exists must be credited to its publisher Koberger's original and ingenious financing methods. In order to carry out the costly drawing and cutting of over 1800 illustrations Koberger sought sponsors who were willing to take the risk of the preparation of individual images or sheets. By these special contracts Koberger was able to minimize the risks and finance the whole printing of the book independently from the publisher.<sup>583</sup>

Matthew McLean has coined the Nuremberg Chronicle as "visibly medieval in both organizational model, and historical method".<sup>584</sup> Unlike the *Cosmographia*, Schedel's chronicle was not organized geographically but upon biblical world ages: In the first chapter Schedel discusses the creation of the world. The second chapter instead ranges from the exit of the Arch until the doom of the city of Sodom. The third chapter describes the stories of Abraham, Moses, Josef and Saul. Schedel's fourth chapter begins with the Kingdom of David and ends with the destruction of Jerusalem. The fifth chapter covers time from the captivity of Babylon to the decapitation of John the Baptist. The sixth discusses history from the birth of Christ until the present. The seventh offers eschatological scenes and describes the Antichrist. Besides these seven chapters Schedel adds also two extra chapters; one dedicated for considerations of the End of times, the other for cultural issues.<sup>585</sup> The sixth age is the most extensive one and gives Schedel an opportunity to discuss events of secular history: the histories of Roman, Greek and Persian empires interest Schedel the most.

The structure of Schedel's book reveals the dominance of the sacred history over his narrative. A lion's share of the chronicle is dedicated for Biblical stories. As a matter of fact, Schedel incorporated into his spiritually driven framework also secular motifs like

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<sup>581</sup> David Landau & Peter Parshall, *The Renaissance print, 1470-1550* (New Haven: Yale University Press 1994).

<sup>582</sup> *Ibid.*, 32.

<sup>583</sup> *Ibid.*, 40-42.

<sup>584</sup> McLean 2007, 117.

<sup>585</sup> Detlef Haberland "Die Kosmographie – Typologie und Medienstrategie", 125-159 in Karl A.E. Enenkel & Wolfgang Neuber (eds.), *Cognition and the Book. Typologies of Formal Organisation of Knowledge in the Printed Book of the Early Modern Period* (Leiden; Boston: Brill, 2004), 129.

biographies of remarkable men and genealogies of ruling dynasties. Nevertheless he made no difference between sacred and secular events. Biblical and mundane histories intertwined in his book into a single spiritual narrative.

A mixture of biblical and secular history was as typical for Schedel as it was for the late medieval history writing in general. According to Matthew McLean, Schedel's approach was common to the cosmographical works of the period: "the inclusion of the entire world across its entire history, according to an orderly, reassuring scheme. Conferring upon the reader a vantage point of remarkable elevation, recent history and the familiar landscape are to some degree sacralised by association, and the distant events of the Old Testament are made more immediate."<sup>586</sup> But if religion and biblical history were vital to Schedel's chronicle, it would be false to say that Münster was completely free of them. Religion was an integral part of the *Cosmographia* too. Therefore more interesting than just measuring column inches given for religious issues is to focus on the difference in the ways in which this is done. Let us thus have a look on one of the parallels between Münster's and Schedel's works.

Both Schedel and Münster begin their narratives by illustrating the story of God's creation. What is striking with Schedel's story of the creation is how richly it is illustrated. With 11 images Schedel depicts each day of the creation and offers his reader a detailed visualization of the biblical story. Schedel's visual interpretation is based on nested circles which unite Biblical material with Ptolemaic model of the cosmos (images 19, 20 and 21). The world in the beginning is represented as a void circle. The creation of light and the separation of waters increase the number of layers in the circle. Schedel's visual panorama peaks in a picture of the seventh day. The Christian elements of the accomplished creation are combined with the Ptolemaic universe: God and his angels are seated in the utmost outer circle of the cosmos; with zodiac signs, the sun, moon and planets orbiting in the next inner circles. Then follow the three strata of the elements fire, air, and water, and finally the earth seated in the innermost nucleus of the universe. After the creation of the universe Schedel continues his illustrated biblical history with pictures of the creation of Adam and Eve, and the expelling from the paradise.<sup>587</sup> The accompanying text follows rather faithfully the biblical narrative in the first book of Moses.

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<sup>586</sup> McLean 2007, 115.

<sup>587</sup> Hartmann Schedel, *Liber chronicarum* (Nürnberg, 1493).



Images 19, 20 & 21. Hartmann Schedel, *Weltchronik* (1493), Creation. From left to right: 3. First day [fol. 28.] 4. Sixth day [fol. 32.] 5. Seventh day [fol. 34].

As said, Münster too begins the first book of *Cosmographia* talking about the creation. Münster, however, compressed the whole story into a single image. In the 1544 *Cosmographia* Münster has placed a woodcut entitled as the “Beschöpfung der welt” right after the foreword (image 22).<sup>588</sup> The same image was used also in Gregor Reisch’s *Margarita Philosophica*.<sup>589</sup> In Reisch’s book it was used as a thematic opening picture in the beginning of each section on natural philosophy. The greatest difference between these images is that Schedel’s image (20) pictures the moment of Adam’s creation, whereas in the image of Münster and Reisch (22) one can see the Creator giving birth to Eve from Adam’s rib.<sup>590</sup> In the However, whereas the background of Schedel’s image depicts just a conventional landscape void of figures, Münster’s image portrays also a number of animals, fish, birds, plants and other natural elements. In the 1550 *Cosmographia* Münster had replaced this image

<sup>588</sup> Münster, *Cosmographia* (1544), fol. 15.

<sup>589</sup> Andrew Cunningham, and Sachiko Kusakawa, (eds.), *Natural Philosophy Epitomised: A Translation of books 8-11 of Gregor Reisch’s Philosophical Pearl* (1503) (Farnham: Ashgate 2010).

<sup>590</sup> Kathleen Crowther has analyzed ways in which the symbolic potential of Adam’s creation was used in medieval and early modern pictures. Adam shown half emerged from a lump of earth, like in Schedel’s picture, could remind viewers of God’s curse after the fall: “You are dust, and to dust you shall return” (Genesis 3:19). Adam’s upper body shown fully formed and his face turned up toward God, but the lower parts of the body being still unformed mud, could also capture the dual nature of humankind, both earthly and spiritual. Kathleen Crowther, *Adam and Eve in the Protestant Reformation* (Cambridge: Cambridge University Press, 2010), 65 – 66.

with a new one which seems to clarify his message (image 23). In this picture the creation is illustrated without the figures of Adam and Eve. The creator is still there, seated inside a foggy framing, which seems to replace him from this-world. On the left and right side of the creator-figure, one can also see the sun, the moon and stars. This layer of heavenly figures is framed separate from the other pictorial elements by “the element of fire”, which is symbolized by a long band of ornamental flames. The focal point of the image, however, situates in the centre where this-worldly creation is depicted. One can see the sky, the earth and water and the multiple animals, beasts, birds, fishes and plants within. Although Adam and Eve have been excluded, men are not completely missing. One can imagine them into the boat, sailing the waters in the foreground of the image.

The way how Münster employs here the myth of creation differs greatly from that of Schedel. Whereas Schedel represented the whole biblical story from the beginning till the end, Münster discusses only its “geographically relevant part”, the division of earth and waters.<sup>591</sup> Despite the fact that Münster’s discussion of the Creation was not based on observational material but on the Bible, Münster still, as Manfred Büttner has pointed out, unlike his medieval predecessors, does not comment what God did during the first and the second day of the Creation. Münster, instead, starts with the geographically significant third day, when God divided earth and water. Büttner associates this thematic limitation with a growing interest in God’s providence within the Reformed theology.<sup>592</sup> That God created the world is an unquestionable fact for Münster. Nevertheless he seemingly wants to distinguish between geographical and theological discussions. A look on Schedel’s and Münster’s different illustrations of the creation supports this view. In order to illustrate the creation Schedel had prepared an extensive cycle of images. In fact, Schedel’s illustrations, even more than his texts, seem arguing for a philosophical unity between ancient learning and Christian theology. Therefore a presentation of Ptolemaic cosmos and heavenly realities in a single portrait is not just unproblematic for Schedel, but actually even the argument he wants to make. With these respects Münster is way more hesitant. His picture of the creation is the only place in the whole *Cosmographia* where one can see the God portrayed, and even here the image seems to underline distance between the transcendental and immanent realities. These images which Münster has chosen to illustrate the creation, unlike those of Schedel, do not aim at representing spiritual realities. Instead of picturing the biblical story of the creation itself, Münster’s image, its textual description, and actually the whole *Cosmographia*, seek to describe its visible consequences. Münster does not picture God’s transcendental actions, but

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<sup>591</sup> Ibid., fol. 112-113.

<sup>592</sup> Büttner 1979 A, 117.

his immanent works: continents, oceans, lakes, plants, animals and fish. The picture that Münster chose to the 1550-edition of the *Cosmographia* takes more distance to the Old Testament narrative: The mythical forbears, Adam and Eve, are left out and men are represented in a sailing ship. Münster brings the miracle of the creation to the present day. Münster's picture seems to argue, that what men can perceive about the miracle of creation is the immanent nature as it unfolds before their eyes.

Beschöpfung der welt ein an-  
fang aller historien vnd vrsprung der  
ganzen Cosmographiei.



Psal. 104.

Die glozy des herzen bleibe in ewigkeit/ vnd er ersöwe  
sich in seinen wercken.

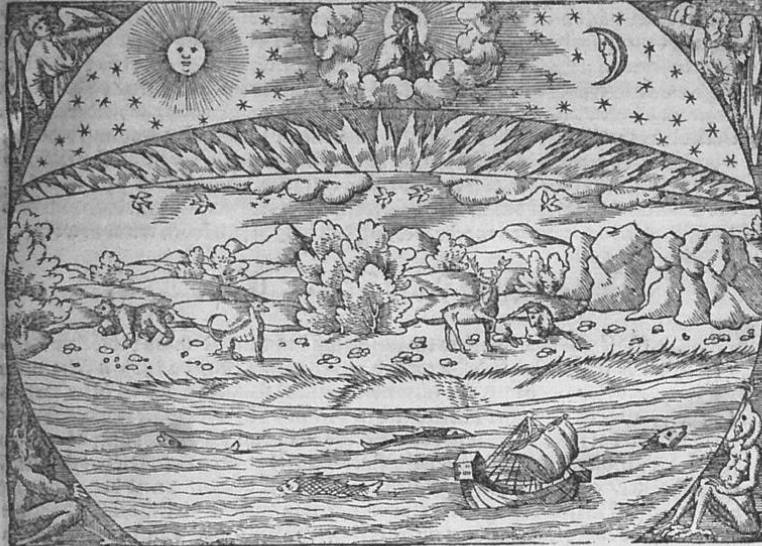
Image 22. "Beschoepffung der welt". *Cosmographia* (1544) [fol. 15].



**Das erst büch der Cosmography**

oder welle beschreibung: durch Sebastian Münster auß  
Ptolemeo/Strabone/Solino/Pomponio/vnnd anderen erfarnen  
Cosmographen/welde vnd historien beschreibern/altten  
vnnd neuwen gezogen vnd verreürschet.

Wie das erdrich vnd das möre erstlich von Gode  
beschaffen seind vnnd in einander gefüge. Cap. 1.



**I**r hand auß götlicher  
offenbarung in d'heilige geschriffte/  
wie das erdrich im anfang seiner  
beschöpfung ganz vnd gar/ oben  
vnd vnden mit dem möre vmbfan-  
gen ist gewesen/ vnd das also lang  
biß gote dem wasser geboch / hin-  
dannen sich zu thun von dem obern  
theil des erdrichs/ do mit alles das  
so auff erdrich sein leben vnd wesen  
haben solt/ ein bequeme wonung  
haben/vnnd sich von des erdrichs  
21 manchfel

Image 23. “Das erst Buech der Cosmography”. *Cosmographia* (1553), [fol 26]. Printed with the plate of the *Cosmographie* (1550). Differences: pagenumber “i” added and ‘Welt’ instead of ‘Weldt’.

Schedel’s and Münster’s images propose ultimately quite different epistemological claims. Schedel’s cycle of images argues that it is possible, even suitable, to represent the God and his invisible work of creation in a visual and symbolic form. The way how naturally

Schedel's illustrations assemble Ptolemy's model of cosmos with a Biblical story, demonstrates that Schedel held theological and natural philosophical issues as unseparated. Schedel's illustrations demonstrate the attempt to unite philosophy and theology of the late medieval scholasticism. Münster's reserved attitude on Biblical material in geographical context comes almost like an antithesis to Schedel. By avoiding illustrating the truths of the Bible, Münster defines the object of geography to immanent reality. Münster's illustrations echo the basic argument of the evangelical natural philosophy: God cannot be pictured, but his works are in nature for all to see.

These differences in epistemology had visible consequences in Münster's and Schedel's biblical images but they affected also their natural images. Rich illustrations of Schedel's chronicle have been studied profoundly, and particularly his city views have attracted scholarly attention. Also the Münster-scholar Burmeister praised Schedel's images taking them as the model of Münster's city views. How close Münster's and Schedel's natural images thus come to each other?

Detlef Haberland, discussing typologies and media strategies of Münster and Schedel, has come to disagree with Burmeister's views. According to Haberland, Münster and Schedel, despite the superficial similarity of their views, use them differently. Although Schedel's views seem realistic, their topographical authenticity is questionable.<sup>593</sup> The 1809 woodcuts of Schedel's chronicle were realized with only 645 blocks. Schedel's presentations of the portrait of Council of Kalzedon (451), and the Council of Basel (1431-1443), for instance, are identical. This is the case also with most of Schedel's portraits and representations of stars, animals and other real natural phenomena. Haberland sees Schedel's illustrations as stereotypical. The primary function of Schedel's natural images, Haberland argues, is not to describe reality, but to guide the reader. The illustrations of the Nuremberg Chronicle were not representations of external reality, Haberland argues, but rhetorical and didactical tools for directing the reception of the book.<sup>594</sup>

Haberland argues that unlike Schedel, Münster aimed at authentic representations with his illustrations.<sup>595</sup> Haberland takes up a short note which Münster's gives about his City

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<sup>593</sup> Detlef Haberland "Die Kosmographie – Typologie und Medienstrategie", 125-159 in Karl A.E. Enenkel & Wolfgang Neuber (eds.), *Cognition and the Book. Typologies of Formal Organisation of Knowledge in the Printed Book of the Early Modern Period* (Leiden; Boston: Brill, 2004), 130. Also McLean has observed that regardless of their exceptional quality, the level of details and verisimilitude varied in Schedel's cityscapes. McLean 2007, 116.

<sup>594</sup> *Ibid.*, 131.

<sup>595</sup> *Ibid.*, 138.

views at the end of his foreword to the 1550 edition. In this note Münster lays here open his structural principles and ideals of illustration:

So vil der stetten contrafhetzung antriff/ soll menglich wissen/ das ich in disser meiner dritten Arbeit vnderstäden / einer jeden statt / deren beschreibung in dissem bûch verfaßt ist / gelegenheit vnd contrafhetische pictur / so vil moglich / yn zûleiben / hab auch des halben mich mit schreiben vnd durch mittel persone[n] weit vnd breit beworben nit allein in Teütschem land sonder auch in Italia/ Franckreich/ Engelland/ Poland vn[d] Den[n]marck/ was ich aber erlāgt hab bey ettlichen fürsten/ bischoffen/ stetten vnd ettlichen besonderen personen/ wirt in dissem bûch mit ewigem lob deren so ir hillf her zû gethan an jedem ort gemeldet. Von manchem ort ist mir vff mein anlangen kein antwort wordenn. Es hat sich auch manch ort beklagt/ das es mir nit hat mu[e]gen zû willen werden eins geschickten malers halb. Wie ich dan auch bey ettlich grossen stetten erfahren hab/ dz nit ein jeder maler ein stat in grund legen kann. Die maler in Italia seind deshalben nit ongeschickt/ wie das schein ist in Rom/ Neapels/ Venedig/ Florentz/ Constantinopel/ Alcair etc. welche alle in Italia cōtrafhetet vnd recht in grund gelegt/ in grosser form getruckt/ vnd mir zû handen kommen seind/ wie ich sie dan auch dis wreck (aber gar klein) geordnet hab.<sup>596</sup>

Münster praises good images and explains why some pictures are not optimal. Münster also demonstrates that he has only pictures which he has studied or checked himself. As city views were not just illustrations but ways to witness God's creation in the world, Münster, Unlike Schedel, was not satisfied to use the same plate twice to portray two different cities. On this basis one can also understand Münster sincere attempt to convince his reader that his work and his images are not products of imagination but as far as possible based on information that has been gathered at place.<sup>597</sup>

However it is important to remember that how Münster's illustrations changed between the first edition of the *Cosmographia* and the 1550-edition. The first edition of the *Cosmographia* did not yet have the splendid topographical cityscapes which later made the book so well known, and was illustrated with images which actually remind quite a bit those used by Schedel. Eventually some scholars, reading the first edition, have criticized Münster for the same "errors" which Schedel has been accused of.<sup>598</sup> However, there's little doubt

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<sup>596</sup> Münster, *Cosmographie* (1550). First cited in Haberland 2004, 138.

<sup>597</sup> Haberland 2004, 138.

<sup>598</sup> For instance R. Oehme in his introduction to fac-simile of 1550 edition. See. Münster, *Cosmographie* (1550).

Münster, in the 1550 edition, tried his best to get as many topographically authentic city views as possible. Also Münster's correspondence bears witness of this.<sup>599</sup>

The epistemological attitude driving Münster's illustrations differs remarkably from that of Schedel. Whereas Schedel seeks to illustrate biblical truths and build bridges between the visible world order and the transcendental, invisible reality, Münster tries to find spiritual the meaning of the immanent visible world. But as Münster's faith in the Christian dogma seems unswerving, scholars have had hard time explaining this peculiar form of "religious materialism" which seems in the first sight as an unresolvable paradox. Melancthon's Gospel and Law -dichotomy, however, may offer a contextually sensitive way for explaining the problem.

By disengaging from the Biblical scheme of the seven world ages and replacing it with the Ptolemaic mathematical structure; and by limiting his discussion of the Creation on geographically relevant aspects, Münster, as an author, was no more secular than Schedel. What he probably did then, was that he followed Luther's theological views, according to which the only acceptable source of theology is Christ and his Gospel – upon that basis there was nothing human reason could add. This meant that theological speculations in philosophical or geographical books were futile. Acknowledging this, Münster left theological speculations for others. Moreover, Münster seemingly followed Melancthon's understanding of the role of philosophy as study of God's law. This meant that a geographical study was an attempt to seek God's will and his order in nature. The *Cosmographia* was serving this purpose.

In the *Cosmographia*, there's a place where Münster comments on speculations about a location of the Earthly Paradise, a traditional topic of medieval natural philosophy (see chapter III on Reisch's *Margarita Philosophica*). Here Münster's theological understanding can be seen to take an explicit form.

Münster begins by apologizing, that despite his sincere attempts to describe the whole Earth and all of its countries, he hasn't defined the place of the Paradise, where God created the first men Adam and Eve.<sup>600</sup> Münster complains how scholars disagree about the

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<sup>599</sup> BSM, epp. 44; epp. 47; epp 48; epp 49.

<sup>600</sup> Münster, *Cosmographie* (1550), First book, third chapter, Von dem irdischen Paradys, xliii.

“Die weil ich mir fürgenommen hab in disem büch zů beschreiben das gantz ertrich nach seiner gelegenheit vnd bewonten landschafften / vnd das paradys auch ein bestimptē platz des ertrichs begreiff / ist es nit ausz dem weg / das ich hie im amfang meines schreibēs anzeig / wo doch diser lustgarten auff erden seinen låger hab gehabt zů den zeiten do unsere ersten ältern Adā vñ Eua von Got erschaffen sind / vnnd item ob solicher garten noch vor handen sey oder nitt.”

matter. Some say the paradise in the east, on the other side of the circles of Cancer and Capricorn. Others, Münster explains, situate the paradise under the equinoctial, in a well-tempered land. Münster criticizes how the third ones have “fabricated the paradise to situate on a high mountaintop beyond all human dwellings” and how these storytellers dare to claim that Henock and Elias had gone there living, “with their flesh and soul.” The fourth ones, Münster writes, hold that before the deluge, paradise was situated in countries of the Orient like Syria, Damascus, Arabia, Egypt and so forth, and that the Paradise was not a small, but a vast area, that existed there guarded by Angels until the Deluge, “like the scriptures say”. Münster shares also Jewish myths of the paradise, but is even more critical about these “fantasies”, finding “many lies” in Jewish texts. The story of a rabbi Jehosua being carried by an angel at the gates of Eden is, in Münster’s eyes, “height of imprudence.” Münster condemns all these myths as “foolishness”, expressing his horror over simpleminded attempts which seek to absorb a lot from “where not a single letter is from the Scripture.”<sup>601</sup> Then he arrives at the resolution:

A man wished to challenge me by [citing] the word of Christ who spoke: today you will be with me in the Paradise, proposing that this means in the Paradise on earth. My answer was: On request of his interlocutors, the Christ clarified this word himself by saying: through me you shall enter his Kingdom. Christ’s answer thus was, today you will be with me in the Paradise, that is, in my Kingdom. The kingdom of Christ is not in this world, as he spoke to Pilatus.”<sup>602</sup>

Münster’s message is clear: the paradise has to be understood as a spiritual entity, as the kingdom of Christ. And as Christ’s kingdom is not in this world, the speculations about the situation of the paradise are nothing but vanity. The Earthly Paradise does not exist in the visible world. Here Münster also demonstrates how uneducated parallelisms between the Scripture and geography lead into problems. Imaginative stories about an earthly paradise are not only false, but have no spiritual merit, because they have no basis in the Bible. Münster is also reluctant to grant them any geographical merit because they are based only on human opinion, having no reference to the physical world, God’s visible creation.

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<sup>601</sup> Münster, *Cosmographie* (1550), first book, xliiii, ”Solich narheit schreiben die arbetsäligen Juden /vnnnd die einfältigen halten vil darauff / ob schon nit ein büchstab ausz der geschriffdt dar bey ist.”

<sup>602</sup> Münster, *Cosmographie* (1550), first book, xliiii, “Hie mag aber einer mir fürwerffen das wort Christi / so er sprach / heüt wirst du bey mir sein im paradys / vnd darausz probieren / das noch auff erden das paradys ist. Antwort. Es erklärt sich selbst diser spruch ausz d[ie] bitt des sprächers / do er sprach / herz gedēck mein so du komst in dein Reich. Antwort im Christus / heüt wirst du sein bey mir im paradys / das ist / in meinem Reich. Das reich Christi ist aber nit in diser weldt / wie er vor Pilato sprach.”

## Conclusion

In the preface of the *Cosmographia* Münster wrote that geography, or “histories describing various places” as he puts it, are second only to Scripture, because they are “nothing but examples which show how often human understanding fails and how everything depends of God’s hand that works everything in everything”.<sup>603</sup> Basing on ideas of ancient stoic geography Münster’s *Cosmographia* offered a moral description of the world governed by God’s order and his all-seeing beneficial guidance, the providence. The focus on the providence encouraged Münster to go beyond the purely mathematical Ptolemaic tradition and to work with history, botany, zoology, and ethnology.

It seems that Münster’s novel geographical guidelines go hand in hand with the emerging evangelical natural philosophy of Philip Melanchthon and Simon Grynaeus. It seems likely that theological ideas of these humanists encouraged Münster to enlarge the limited scope of the traditional descriptive geography to an all encompassing world description. These theological ideas may also have urged Münster to abandon medieval structures which sought to unite philosophical and theological learning.

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<sup>603</sup> Sebastian Münster, *Cosmographia* (1544), dedication. “Es were nach den büchern Göttlicher geschriff / kein lesen auff ertrich lustiger unnd nützlicher dem menschen / daß das lesen der hystorien / wo sie (als sie solten) on angesehen diser oder jhener partheyen geschriben weren. Dann was seind alle hystorien daß fürgebildte exempel / an denen man sieht / wie dise oder jhene sach ausz geschlagē / wie menschlich witz vnd vorsehung züm offtern mal so ongewissz/ ja blind ist / vnd alle ding so gar an der hand Gottes hangen / der alle ding würket in allen dingen.”

## Chapter IX

### Painting the Spectacle of Nature

This chapter will make further observations about the philosophical presumptions that affected the role ascribed to images in the thought of Philip Melanchthon and Simon Grynaeus. Both Grynaeus and Melanchthon promoted the contemplative looking at nature. What is to be discussed is what one should perceive, when looking at nature and what the relationship of this looking was with mathematics, the central part in our philosophers' understanding of nature. In order to understand the specific type of looking endorsed by Grynaeus and Melanchthon, one has to comprehend broader intellectual transformations taking place in the period. Accordingly this chapter will combine two levels of observation: it will consider some broader conceptual changes from a long-durée perspective as well as make some more detailed remarks about Melanchthon's and Grynaeus' texts. Because of the particular attention to technical terms, this chapter is largely dependent on secondary sources. Acknowledging the complexity of the subject, the following remarks are to be taken as a conjectural attempt to chart the main factors affecting the understanding of images in the thinking of Melanchthon and Grynaeus.

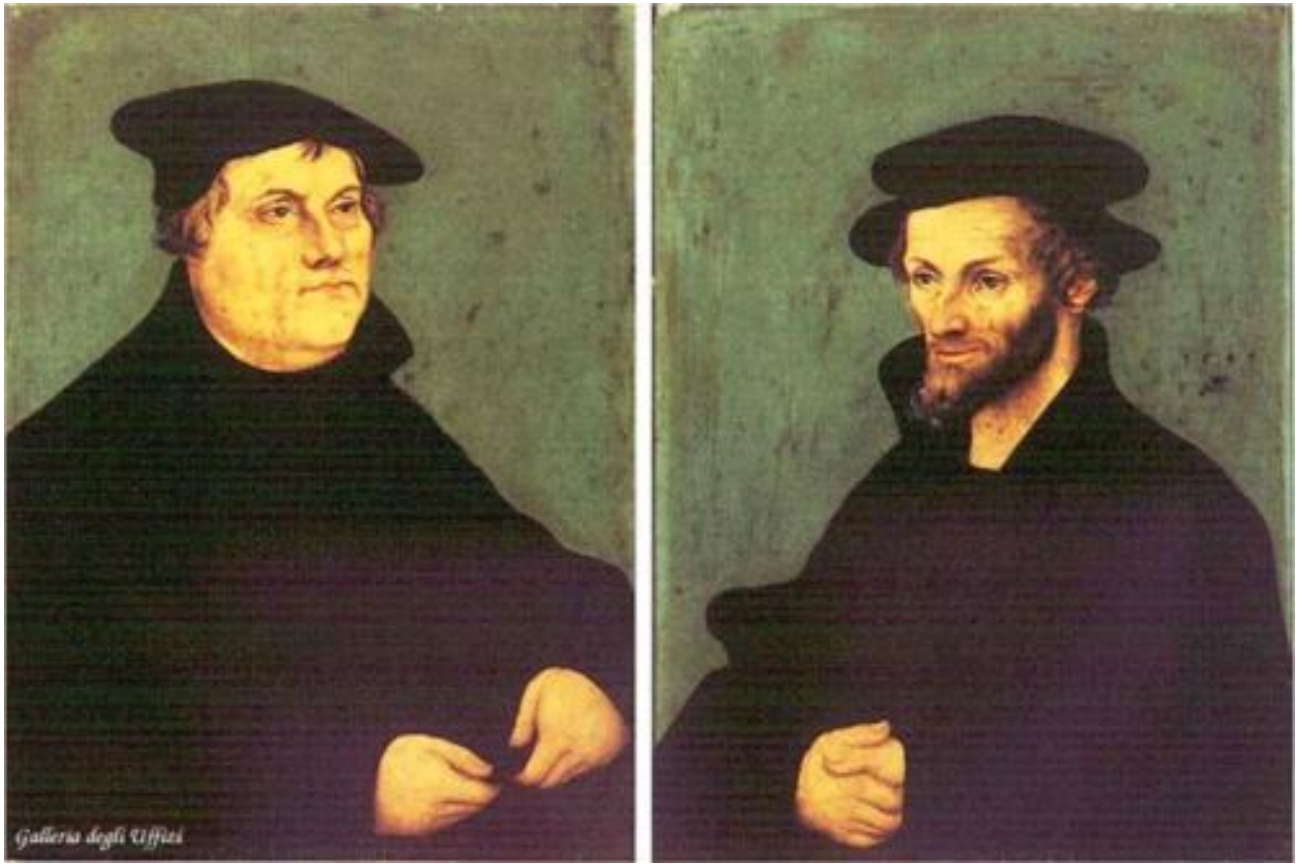


Image 24. Lucas Cranach the Elder: Luther and Melanchthon (1543). Oil on wood. 21 x 32 cm. Galleria degli Uffizi, Florence, Italy. Source Wikiart. Public domain. (I apologize for the poor quality of the photo).

### *The Reformation of the Image*

The growing interest in materiality created a growing tension in religious thought. Within the visual arts the most visible expression of this tension was the iconoclasm of the Protestant Reformation. A double portrait of Martin Luther and Philip Melanchthon (image 24) by Lucas Granach, one of the most important painters in the northern Renaissance and the developer of early Lutheran iconography, seems to characterize these conflicting tendencies in several respects. It is. The two religious leaders of a new Christian doctrine are portrayed as two normal mortal men without a halo or any other saintly symbols. The painting seeks to capture merely Luther's and Melanchthon's physical appearance. Visible references to spirituality are limited to a single material item, the Bible in Luther's chubby hands. This detachment from divinity is not a feature that was only limited to this particular painting. How to depict the



invisible divinity, as J. L. Koerner, has asserted, became one of the primary concerns of early Lutheran religious painting.<sup>604</sup>

The reverse side of the invisible God was a remarkable emphasis on physicality. Observing early Lutheran iconography, Lyndal Roper argues that in the 1530s an image of a stout fleshy Luther emerged and replaced earlier Lutheran iconography that had followed medieval models picturing Luther as a thin, divinely inspired saint. In the 1530s Lutheranism developed a standardized iconography of Luther, which was exemplified by Lucas Cranach's realist portraits that pictured the spiritual leader as a stout, earthly, fleshy man. According to Roper the physicality of Luther's portraits is not an accidental feature but was actually intimately connected with the reformer's deepest theological insights.<sup>605</sup>

Hence Luther's theology challenged the role traditionally given to images as objects of religious devotion. The role of images in medieval theology had been based on an idea of the visible world as a sign of the invisible. Gradually, taking up ideas of St Augustine, Pseudo-Dionysius and John Scotus, the entire universe became seen as an interdependent system of signs.<sup>606</sup> In this system the signifying quality of the natural world was considered as a way to 'know' the supernatural. Within the framework of pictorial devotion this idea meant that the worshipper was to "look through" the merely physical image, and see the mystery behind it.<sup>607</sup>

Images were never Luther's main concern, but some of his key theological principles were in irreconcilable conflict with the traditional epistemological basis of religious images. In Luther's theology the infinite gap between God and man could be bridged only by faith granted by God's infinite grace. This emphasis on grace led Luther to abolish salvation through Good Works, which had been the driving force of medieval Christianity and the basis of pictorial devotion.<sup>608</sup> But according to Luther, God was invisible. The only thing mortal

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<sup>604</sup> Joseph Leo Koerner, *The Reformation of the Image* (Chicago : University of Chicago Press, 2004), 10

<sup>605</sup> Lyndal Roper, "Martin Luther's Body: The "Stout Doctor" and His Biographers", *The American Historical Review* (2010) 115 (2): 351-384.

<sup>606</sup> Henning Brinkmann, *Mittelalterliche Hermeneutik* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1980), 74, 84-86.

<sup>607</sup> Bob Scribner, "Popular Piety and Modes of Visual Perception in Late-Medieval and Reformation Germany", *Journal of Religious History* (1989) 15 (4): 448-469, 458.

<sup>608</sup> Sergiusz Michalski, *The Reformation and the visual arts : the Protestant image question in Western and Eastern Europe* (London ; New York : Routledge, 1993), 5-41. Michalski points out that Luther's views on images were developing and changing considerably during early days of the Reformation: In Lectures on Epistle to Hebrews in 1516-1518 Luther wrote that God had created Christ as a sign which believers should transform into a mental image in order to turn away from images of the world.

men, bound to the visible world of flesh, could see of him, was the cross where God hid himself in suffering. Accordingly, the visible material world could no longer be taken as a sign of the divine invisible world. It is important to note that Luther never banned images as such; it was only the worshipping of images that was prohibited.<sup>609</sup> In Luther's understanding, images per se were 'adiaphorous', indifferent therefore neither good nor bad. Religious images could be used for didactical purposes as long as it was clear that they did not become objects of idolatry.

Other Reformers adopted a more critical stance to images. Andreas Karlstad, Luther's co-reformer at Wittenberg and later Sebastian Münster's colleague at the University of Basel, was one of the first active promoters of the complete prohibition of religious images. But it was Huldreich Zwingli, a reformer who since the early 1520s occupied a central place in the Swiss and South German Reformation, who played an even more important role in the question of images. Zwingli's theology presented a dramatic division between the spiritual and material realms. According to Zwingli, believers had to place their faith in either God or creatures (this dualism is evident in Zwingli's view of the Eucharist, which he insisted to be only a memorial act). Zwingli accepted images of historical nature, but insisted that in church all images became idols.<sup>610</sup>

In summary, Reformation theology started to transform the symbolical and allegorical links between the visible and the invisible, so essential to medieval art. In the Lutheran tradition religious images were accepted, not as a medium to reach the invisible but merely as educational tools. Eventually the Reformed tradition adopted Zwingli's view and prohibited all religious images in churches as idols.

At first glance the tendency of Renaissance art to embrace materiality and materialize divinity seems antagonistic to the Protestant view of God as invisible and completely non-representable. This, however, is only half of the picture. Firstly it is important to note that in Luther's time art was almost exclusively religious. The division between religious and secular art had not yet crystallized in Northern Europe and the word "secular" was mostly used in a pejorative sense.<sup>611</sup> If one expands the category of religious art to embrace also images of nature, Reformation art actually seems to radicalize the idea of materiality of divine. This is eventually the case with early Lutheranism, especially with

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After the iconoclastic riots which broke out in Wittenberg in 1521, Luther abandoned this view which could be used to support iconoclasm of the radical reformers like Andreas Karlstadt.

<sup>609</sup> Koerner 2004, 18.

<sup>610</sup> Michalski 1993, 56.

<sup>611</sup> *Ibid.*, 2.

Philip Melancthon's thought. Would it be possible to take the emergence of images of nature as a response to the problem of how to visualize the invisible divinity? In order to have a better understanding of this relationship between theological ideas and images of nature it is useful to have a closer look at transformation of the fundamental philosophical concepts in Reformation theology and natural philosophy.

### *Accidents and the De-Ontologization of Aristotelian Model of Causality*

Sixteenth century natural philosophers operated with Aristotelian concepts and terms. Therefore – before moving on to see how transformations of these concepts may have implied visual choices and the understanding of the visible world – some general remarks about this rich tradition must be taken. Research in the last three decades has deconstructed the monolithic view of early modern Aristotelianism. Most importantly early modern Aristotelianism is no longer considered as simple engagement with some specific Aristotelian philosophical positions. Since Charles B. Schmitt's work, scholars have been more aware of the diversity of approaches between Aristotle's philosophy, their uniqueness, but also eclectic-character – often integrating elements of neo-platonic thought, stoicism, and mathematics. Despite the lack of a single dominating view on Aristotelian natural philosophy, as Edward Grant and Hans Thijssen have argued, communication between early modern Aristotelians was enabled by a shared conceptual frame. This intellectual framework consisted of assumptions about the significance of reality and used Aristotle's terms of material, formal, efficient, and final cause, hylomorphism (division between form and matter) and division between act and potentiality (in causal explanation).<sup>612</sup> The key to understanding the ascending materialism in Protestant thought and consequentially also in Protestant images of nature, lies in the transformations that took place in the causal roles of two Aristotelian concepts: the substantial form and the accident.

Following Thomas Aquinas the causal understanding of the high medieval Aristotelian philosophy (or better theology), started with the conjecture that in the beginning God had created prime matter and substantial forms. Matter and form were considered as the constituents of natural species which guided the natural activity of individual beings. In this framework each being had its own power which, together with the prime causality, acted as

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<sup>612</sup> Michael Edwards, "Historiographical Reviews: Aristotelianism, Descartes, and Hobbes", *The Historical Journal* (2007) 50 (2): 449-464, 452.

the immediate cause of physical effects. On the material level beings were thus constituted of matter and form, and on the metaphysical level, each being represented the species which with it shared its substantial form. In its life's course each being was thus thought to actualize the essence of its species. An individual being's actualization in the world and also its individuality was thought to be based on matter. Representatives of the same species were considered as identical in relation to their shared substantial form. Within this framework the individual accidental features of beings were taken as (causally) insignificant. The effects that an individual thing could cause were based on its substantial form. The capacity of an individual flame to cause heat, say, was based on the substantial form of fire. Although God was understood as the formal and the final cause of every movement, he did not need to intervene with his creation where causation was issued by the substantial forms and secondary causes.<sup>613</sup>

Aquinas had rejected the so-called occasionalism of the Arab philosopher Abû Hâmid al-Ghazâli (1058-1111), a view which saw God as the only active agent in reality. The occasionalists believed in the continuous creation of the world, which meant that God at every moment created a new accident to replace a destroyed one. According to occasionalism there were no proper substances, only aggregates of accidental properties.

Occasionalism was revived by late medieval nominalism, represented by John Duns Scotus and William Ockham. Emphasizing God's absolute power, the nominalists proposed that the laws of perceived reality did not bind God who was absolutely free to create whatever pleased him and He had innumerable possibilities. This notion challenged the traditional conception of causality. Nominalists proposed that 'universals' were only individuals or linguistic concepts. Although nominalists believed that substantial secondary causes were the only genuinely explanatory causes in the epistemological sense, in reality one could not have any ontological guarantee of causal connection between two phenomena. On a perceptual level fire seemed to be the cause of heat, but at any given moment God could change that – therefore, in a fundamental sense, an individual incident of fire causing heat was something that took place primarily because of the will of God. Accordingly, Ockham argued that God is the immediate cause of everything. Ultimately, because God was the cause of all

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<sup>613</sup> Reijo Työrinoja, "God, Causality, and Nature: Some Problems of Causality in Medieval Theology" in Eeva Martikainen (ed.) *Infinity, Causality and Determinism: Cosmological Enterprises and their Preconditions*. (Frankfurt am Main: Peter Lang, 2002): 45-60, 47.

natural actions, there was no real difference between the two divine actions, creation and conservation.<sup>614</sup>

Church historians, who have emphasized the medieval roots of the Reformation and stressed the continuity between the medieval- and early modern periods, have often taken nominalism as one of the key factors underlying Protestant thought. The historian Heiko Oberman, the most prominent speaker of these scholars, went as far as to call Luther a “nominalist”, and nominalism “the gateway to modernism”.<sup>615</sup> Although Luther’s relationship with the medieval tradition is a complex matter, his indebtedness to nominalism (particularly to Ockham and Gabriel Biel) in causal matters has been plausibly demonstrated. Essential in both nominalism and Lutheranism is an emphasis on God’s absolute power over his creation. In *the Disputatio on Indulgences* in 1518, as Työrinoja points out, Luther reasoned God’s conservation to be the same thing as his continuous creation. According to Luther, creation meant making continuously new (*creare est semper novum facere*).<sup>616</sup> In causal terms this meant that all beings were at every given moment dependent on God. A creature in itself, Luther reasoned, was nihil, nothing: all being comes continuously out of non-being, nothingness, due to God’s creative conservation.<sup>617</sup> As Työrinoja has argued, Luther’s radical emphasis on God’s omnipotence led him to completely abandon traditional Aristotelian-Thomistic essentialism, and the idea of natural finalities implied by it.<sup>618</sup> In Luther’s view, nature was but a passive receiver of the divine without any independent faculties or powers (traditionally associated with substantial forms). God’s constant creation and conservation of all life implied that everything in the world was subject to God’s divine providence.

Despite his fundamentally providential view of nature, Luther showed little interest in natural philosophy, as is often recognized. Luther’s priority was salvation theology, not creation theology. Melanchthon on the contrary did not hesitate to connect the idea of providence with his natural philosophy, though it should be noted that Melanchthon’s views of causation followed Luther closely in eliminating the causal role given to substantial forms.

The *Scholia on Paul’s Letter to the Colossians*, one of the first sparks of Melanchthon’s developing natural philosophy, gives a good example of how Melanchthon

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<sup>614</sup> Työrinoja 2002, 49.

<sup>615</sup> Heiko Oberman, *Luther : man between God and the Devil* (New Haven : Yale University Press, 1989).

<sup>616</sup> Martin Luther, *Resolutiones disputationum de indulgentiarum virtute* (1518). WA 1, 563: 6-13. See Työrinoja.

<sup>617</sup> Työrinoja 2002, 56.

<sup>618</sup> *Ibid.*, 57.

applied Luther's causal views. Under the topic "who is the image of the invisible God", Melanchthon explains how "all things have been created through the Son and continue to exist through him." Basing his idea on the phrase of Hebrew's [1.3.], 'upholding all things by the word of his power', Melanchthon sought to explain the meaning of creation; he argued, like Luther, that "realities are not so made, that they can continue in existence without God's help; rather God governs them, and constantly keeps them in being".<sup>619</sup> Here Melanchthon apparently agreed with Luther's view of God's omnipotence over nature and with the idea of God's constant creation and conservation.

Melanchthon's views also suggest that it seems viable to expand J.L. Koerner's thesis of the invisibility of God in Lutheran art. Melanchthon addresses the matter explicitly. The image of the invisible God, according to him, is all things, the created nature, being constantly created through the Son, Christ and logos. These views may also help to clarify Melanchthon's profound interest in nature. This theological tenet alone, however, no matter how vital for the emerging evangelical natural philosophy, cannot explain the growing interest in the material over the substantial. It is vital to look closer at the ontological consequences of this idea of God as the source of all creation.

Whilst Melanchthon's thought on nature evolved between the 1520s and 1540s, its essential core remained more or less the same since the early 1530s. Melanchthon's text book *initia doctrinae physicae* (1549) provides us with the most lucid presentation of the topic. As Gunter Frank has pointed out, this text offers interesting reflections on the Aristotelian concept of movement, revealing Melanchthon's own original and distinct ontological emphasis.<sup>620</sup>

Melanchthon's understanding of movement in the *initia* was built on Aristotelian terms. Quoting Aristotle's definition of movement with reference to diverse traditional Aristotle commentators, Melanchthon defines movement within the traditional act/potentiality –framework: "Movement is an act of a being that has the potentiality, inasmuch as it still has that power"<sup>621</sup>. "Ens in potentia", he argues following Aristotle, is "an object that has an intrinsic ability which enables it to have a specific form. According to Melanchthon

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<sup>619</sup> Philip Melanchthon, *Scholia on Paul's Letter to the Colossians*, 1. 15. Translated by D. C. Parker (Sheffield: Almond Press, 1989), 38.

<sup>620</sup> Gunter Frank, *Die Theologische Philosophie Philipp Melanchthons (1497-1560)* (Leipzig: Benno, 1995), 245-249.

<sup>621</sup> CR XIII, 92, Frank 1995, 248. *Motus est actus eius quod est in potentia, in quantum huiusmodi.*

movement, ‘actus’, signifies an agitation in the object itself that can be both substantial and accidental.<sup>622</sup>

In the traditional concept of movement, accidental movement was defined as an agitation that did not move by itself but was moved by something else. Substantial movement instead was considered to be the cause of its own movement. What is essential here is that Melanchthon is interested only in the accidental activeness of beings, identifying it with Aristotle’s term “Endelechie”.<sup>623</sup> He translates the term after Boethius and Cicero as ‘actus’. Accordingly, Melanchthon defines accidental movement as activeness (agitatio), i.e. acquisition of a shape or a goal, or losing a form that is in a subject that has the power to take a form and aims at it.<sup>624</sup>

As Gunter Frank has noted, although Melanchthon’s presentation follows Aristotle’s definition of a universal concept of movement terminologically, his interpretation of it differs considerably from the traditional medieval and ancient readings. Although the idea of movement as an accident appears already in speculative philosophical discussions of the high and late scholasticism, it was rejected until the sixteenth century. Melanchthon’s abolition of substantial forms as causal explanation of movement implies that once a particular movement has been put in motion by a cause, it shall continue its movement until it is destroyed by other forces. This view is in apparent contradiction with the classical Aristotelian interpretation arguing that movement continues only until it finds its natural place (determined by the substantial form) where it enters rest. Melanchthon’s interpretation implies that once a movement has been put in motion it is no longer subject to Aristotle’s principle of movement, but rather happens as a consequence of its own inherent property.<sup>625</sup> Unlike Stagirite’s traditional model that sought to explain movement from a metaphysical perspective within the act/potentiality -framework, Melanchthon’s reflection emphasizes a physical viewpoint. So whilst Melanchthon’s conceptual vocabulary comes out of the Aristotelian tradition, his de-ontologization of causal explanation diminishes the role traditionally given to the substantial forms of beings and opens opportunities for the study of accidents.

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<sup>622</sup> Frank 1995, 249. *Ens in potential significat Aristoteli subiectum, quod recipere aliquam formam potest, et ad eam tendit. Actus vero significat in subiecto agitationem aliquam, vel substantialem, vel accidentalem.*

<sup>623</sup> *Ibid.* ”Motus vero accidens est, quod accedit, quod hic vocat Endelechiam, id est, agitationem.”

<sup>624</sup> *Ibid.* ”Motus est ectus, id est agitatio, id est acquisitio formae vel termini, vel abiecto formae in subiecto, quod est in potentia, id est, quod formam recipere potest, et ad eam tendit. Est autem tunc agitatio, quotenus subiectum ad eam formam tendit.”

<sup>625</sup> *Ibid.*

Charlotte Methuen has criticized Sachiko Kusukawa's views on the specifically Lutheran character of Melanchthon's natural philosophy. According to Methuen the use of the concept of providence was not just Lutheran but also a common feature in early modern natural philosophy. According to Methuen, Galileo and some reformed astronomers are also known for having used the concept of providence. Furthermore, Methuen suggests that Kusukawa's view of Melanchthon and Luther's similar notions of providence is flawed. Relying on views of Reinhold Bernhardt, Methuen claims that Luther's idea of providence differs from that of Melanchthon. Luther was unsystematic in his use of the concept of providence, but talking about it he focused primarily on God constantly renewing the world according to his will, whereas Melanchthon focused on order, and God orderly governing the creation.

The closer one looks at the causal views of Luther and Melanchthon the clearer it is that these differences between Luther and Melanchthon are superficial. Although the two reformers used the concept of Providence for different rhetorical purposes, they shared its fundamental causal meaning. It was truly the idea of God's omnipotence contradicted with the Aristotelian doctrine of formal causes – therefore the latter had to be refuted. Although Melanchthon wavered between more traditional Aristotelianism and his own 'Lutheran' Aristotelianism which he had made uniform with the Lutheran dogma, his causal views paved way for material and particular properties of individual beings to become theologically legitimate objects of investigation.<sup>626</sup>

### *Melanchthon on Method*

Melanchthon's reading of Aristotle made accidental features become causally significant. This in turn meant that the surface of life and the individual properties of creatures, which had long

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<sup>626</sup>Although the de-ontologization of Aristotelian causal nexus fit well into the Protestant theology of God's omnipotence and justification by faith only, there is nothing in this reduction per se that would make it the sole right of the Protestant. The mechanical philosophy of early 17th century for instance applied somewhat similar thoughts based on the Aristotelian heritage. It is also essential to note that the word 'providence' became popular also in everyday parlance, and the popular Protestant print of the seventeenth century used the word as a mere synonym of extra-ordinary and supernatural events, turning providence into a form of protestant miracle. These accounts of providence had little in common with Melanchthon's idea of God orderly governing the world. Accordingly, what is essential here, is not so much the word 'providence' itself, but its deeper implications to Aristotelian concepts – whether the natural world was to be taken as a symbol of the invisible (scholastic view) or significant in its own accidental materiality (Melanchthon's view).



been taken as mere effects of species, were meaningful. Inevitably, the idea of accidents being causally more certain than substances implied radical consequences for the possibility of knowing in arts and sciences. As Kusukawa has noted, Melanchthon argued that due to his post-lapsarian condition man could know substances only through accidents.<sup>627</sup> Although this does not suffice as proof of a firm methodological guideline for the investigation of nature, it still radically overturns the traditional understanding of knowing.

Renaissance scholars inherited a medieval concept of method which was based on Aristotelian logics. In *Posterior Analytics* (II, 13) Aristotle argued that proof is scientific (certain) if and only if it derives from premises that are universal.<sup>628</sup> Within this framework, the visual perception, interpreted as an account of particular properties, was obviously rather weak. Nominalists, claiming that all knowledge had a sensorial basis, had sought to overcome the gap between particulars and universals by developing a method of scientific demonstration called *regressus* which inferred universals from particulars such as accidental sensorial perceptions. This method had four steps: Firstly, *observatio*, offering “accidental” knowledge of a particular effect; secondly, *inductio*, i.e. demonstration from the effect to the cause; thirdly, *consideratio*, where the mind should reach the closest necessary cause of the effect; and fourthly, *demonstratio*, from cause to effect offering dependable knowledge. In this process, however, accidents were only a starting point. The essential goals and outcomes of this logical process were universal propositions.<sup>629</sup>

During the early sixteenth century traditional Aristotelianism and the *regressus* method came under growing criticism. Some philosophers sought alternative approaches to resolve the problem. They abolished the method as a tool of scientific demonstration (*modus doctrinae*) and took it as a tool of educational organization (*ordo docendi*). Dialectics as a means to study and refine arguments that were not necessary but possible was also an attractive option. Conclusions in dialectics derived from premises that were uncertain and were thus only probable, not absolute. Such premises could be, for instance, reputable opinions that were accepted by all, by the majority or by the wise. Another way of applying dialectics as a method was topical syllogism which took its middle term from “general topics” or “loci”, and used categories like genus, species, cause, effect, antecedent, consequent, greater, less, argument from authority and so forth. Rhetorical persuasion was also a

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<sup>627</sup> Sachiko Kusukawa, “Leonhart Fuchs on the importance of pictures” in *Journal of the history of ideas*, Vol. 58, no. 3 (Jul. 1997) p. 403-427.

<sup>628</sup> R.W. Serjeantson, “Proof and Persuasion”, in Lorraine Daston and Katharine Park (eds.) *The Cambridge history of science. Early modern science. vol. 3* (Cambridge, New York : Cambridge University Press, 2006), 141.

<sup>629</sup> *Ibid*, 141.

methodological option. In natural philosophy, however, rhetoric was usually rejected as a method. According to the prevailing traditional view the universal manifestation of nature was the proper object of natural philosophy. As its subject was universal its proofs also had to be necessary and logical. On these grounds Renaissance philosophers usually made a clear distinction between (universal) natural philosophy and moral and political philosophy – the latter having human actions as its object and therefore receiving its proofs from history and rhetoric.<sup>630</sup>

In this context the way Melanchthon's thought united moral philosophy and natural philosophy is unique. Relying on a providential view of the world, Melanchthon made a connection between natural law and ethical and moral law, arguing that the latter should be based on observations of the former. Melanchthon's moral philosophy was thus firmly grounded in natural philosophy.<sup>631</sup> This union between disciplines that traditionally relied on mutually exclusive methods, logic and dialectic on the one hand, and rhetoric on the other, demonstrates that Melanchthon's understanding of method was somewhat unorthodox.

Melanchthon's educational program was based on the seven liberal arts and history. However, as noted by Charlotte Methuen, Melanchthon's curriculum also put particular weight on mathematical sciences. Mathematics, according to Melanchthon, was practical in everyday life, but most importantly math, particularly arithmetic and geometry, trained the mind in logical and philosophical thinking.<sup>632</sup> The highest application of mathematics was in natural philosophy where it served as a source of knowledge of God. In Melanchthon's opinion, natural and moral philosophy operated in the immanent sphere.<sup>633</sup> This is to be understood particularly in the context of Luther's theology and his emphasis on the infinite gap between God and man. Man was bound to his condition and could not exceed the visible realm. But nature itself, as Melanchthon wrote in the Scholia of 1527, was the image of invisible God. The highest purpose of philosophy according to Melanchthon was thus the restoration of knowledge of God's law. Since God's law unfolded in his creation, mortals could reach truth by observing nature. Melanchthon claimed that the order and harmony of heavenly spheres, the orderly movements of heavenly bodies, and their beauty and regularity were a reflection of the skillful mind, men's architectrix. He argued that human society should follow a similar order. The visible order of heavenly bodies demonstrated that God wished his

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<sup>630</sup> Ibid, 145.

<sup>631</sup> Methuen 1998, 71.

<sup>632</sup> Ibid, 72.

<sup>633</sup> Ibid, 72.

world to function regularly – the order of nature offered thus a model for ethical and moral action in society and the church.<sup>634</sup>

Through his encounters with Neo-Platonic and Pythagorean thought Melanchthon was convinced that the structure of the world was mathematical. Accordingly, mathematics, arithmetic and geometry in particular, were not just vital practical arts but constituent elements of natural philosophy. As Gunter Frank has argued, Melanchthon showed significant interest in geometry as the basis for knowledge about nature.<sup>635</sup> Melanchthon's only survived praise of geometry is his preface to Johannes Vogelin's *Book on the Elements of Geometry* (1536).<sup>636</sup> Here Melanchthon argues that geometry belongs to the scientific disciplines (*ordo disciplinarum*) and prepares one for philosophical studies.<sup>637</sup> The meaning of geometry, therefore, was not limited to mechanical arts but could be applied to all education.<sup>638</sup> Also, philosophy benefited greatly from geometry, Melanchthon claimed, as geometry offered the beginning of the *physica* and all parts *physica* derive benefit from it.<sup>639</sup> Because of the power of its demonstration, the geometrical method appealed to Melanchthon as an ideal discipline: "Geometrical demonstrations are most distinct", he argues, "and without knowledge of this art no one will be master of method".<sup>640</sup>

As Frank has pointed out, Melanchthon saw the geometrical method as a necessary basis of knowledge and sciences. This view was grounded in Melanchthon's mathematically inspired epistemology, which emphasized the knowledge of numbers and figures as the key to knowing God's creation. Study of the mathematical structure of the world was not an end in itself, but a means to unfold the divine order of the world. Melanchthon's understanding of the usefulness of geometry in natural philosophy was theologically grounded. Following Plato, Melanchthon understood God as a geometer; therefore also philosophers had to seek

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<sup>634</sup> Ibid, 73 – 76.

<sup>635</sup> Frank 1995, 177.

<sup>636</sup> CR III, 107-114. English translation in Philip Melanchthon, [ed. Sachiko Kusukawa], *Orations on Philosophy and Education* (Cambridge: Cambridge University Press, 1999), 98-104.

<sup>637</sup> CR III, 108. First cited in Frank 1995. *tamen dubitari non potest, quin in hoc symbolo simul aliquid de ordine disciplinarum monuerit et in Geometria praeparandos esse senserit eos, qui ad Philosophiam accessuri essent.*

<sup>638</sup> CR III, 108. *Non enim tantum releganda est haec ars ad mechanicos, qui aedifica, vasa, aut alia exigua corpora metiuntur, etsi ea etiam exercitatio liberalem doctrinam continet, et magnas ad vitam utilitates affert.*

<sup>639</sup> CR III, 108. *Sed Philosopho propter alias multas causas opus Geometriae scientiae: inde enim oriuntur initia Physices. Et passim in omnibus partibus Physices plurinae demonstrationes ex hac arte sumuntur...*

<sup>640</sup> CR III, 109 *Deinde cum demonstrationes Geometricae maxime sint illustres, nemo sine aliqua cognitione huius artis satis perspicit, quae sit vis demonstrationum nemo sine ea erit artifex methodi.*

mathematical and geometrical sources of this architect God.<sup>641</sup> Frank rightly takes Melanchthon's geometric and axiomatic understanding of method as an important step towards the mathematization of arts and sciences (Wissenschaft).<sup>642</sup>

### *Grynaeus on Method*

Melanchthon situated the art of geometry at the heart of his program of natural studies, but as Charlotte Methuen has rightly noticed, he never offered a practical discussion of how this method was to be applied.<sup>643</sup> Relying solely on Melanchthon the question of how one was to proceed from perceptions of nature (the image of the invisible God so to speak) to rational knowledge remains undetermined. Melanchthon's colleague Simon Grynaeus, on the contrary, wrote a number of more detailed accounts on geometrical method. These texts accompanied Grynaeus' editions of Euclid's *Elements* and Proclus' commentary on the *Elements* (1533), Aristotle's *De Mundo* (1533) and Ptolemy's *Almagest* (1538). Grynaeus addressed the question of method most directly in his introduction to Euclid's *Elements*. This text, albeit short, must be taken as an important methodological argument in the series of publications and orations advancing the evangelical natural philosophy in the crucial period between the 1520s and 1540s. Grynaeus' philosophical introduction to *Elementa* was added to his edition of Euclid's book which for the first time offered the original Greek text of this popular textbook on geometry. Although the Greek edition speaks for Melanchthon's obvious philological ambitions, the book also stressed the mathematical content of the ancient work: Proclus' commentary and carefully realized illustrations of geometric figures demonstrate the weight given to the mathematical contents of the work.

Grynaeus' views on the role and function of mathematics correspond to those of Melanchthon. Like Melanchthon Grynaeus understands mathematics as a useful tool for interpreting observations and argues that with mathematics human mind can understand the whole universe and the beautiful works of God. Grynaeus also praises the precision of mathematical proofs and arguments, but specifies that mathematics should not be misunderstood as a sterile teaching of lines and points.<sup>644</sup> Mathematics could be applied in dialectic. As Methuen has rightly observed, Grynaeus argues that mathematics is useful in

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<sup>641</sup> Frank 1995, 178.

<sup>642</sup> Ibid.

<sup>643</sup> Methuen 1998 166.

<sup>644</sup> Ibid., 167.

dialectic because it can overcome the ambiguity of words. Since mathematics can offer a way to surpass the confusion in texts and methods,<sup>645</sup> Grynaeus recommends geometry as a tool for reasoning in all disciplines.

Grynaeus' remarks on the relationship between philosophy and sense perceptions are particularly interesting. He argues that since interpretation is not inherent in perception, it is necessary to have clear principles which guide the interpretation of perception. Failures in the interpretative processes lead into such fallacies as the discussion of natural philosophers on the immortality of God, a topic to which natural philosophy (*physica*) has nothing to say.<sup>646</sup> Since mathematical principles begin with small number of principles and proceed by demonstrations, as the discipline of geometry clearly demonstrates, Grynaeus argues that they are the best means to interpret observations. Methuen has argued that Grynaeus' interest in the role of mathematics in the interpretation of sense-experiences presents a particular epistemological consideration which cannot be found in Melanchthon's thought. Although Grynaeus does not directly comment on the relationship between observations and cosmology or ancient authorities, "his concern with problems of interpretation and the search for methodology which will give rise to an authoritative and certain philosophy could easily raise the question of the relative authority of contemporary observations and received understanding", Methuen concludes.

Grynaeus' remarks on the methodological uses of geometry in philosophy, dialectics and interpretation of sensory data are fascinating and ask for a more detailed investigation. Considering the practical extensions of the geometrical method, one should not let Grynaeus' complicated phrases obscure his point. Mathematics in Grynaeus' understanding, as he clearly emphasized, were not to be taken as a sterile discipline but as something to be applied. The practical dimension of mathematics is vibrant in Grynaeus' view of geometry. He calls geometry the discipline which lets "man to study the theatre of the world", "to explore the figure of the earth and the whole work of nature as subject before eyes".<sup>647</sup> Grynaeus praises geometry as "the instrument that conducts the mankind through hostile seas, the most extreme lands, and the ends of the world, and opens inaccessible nature

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<sup>645</sup> Ibid., 169.

<sup>646</sup> Ibid., 169.

<sup>647</sup> Grynaeus, *Elementa* (1533), fol a2v. "Inconversum est enim in clarissimum mundi theatrum hac disciplina genus hominum admissum, machinae totius [sic] mundanae inuento medio, cardinibus inventis, orbis figura totius explorata, tum unius cuiusque praecipuorum corporum, & terrae in medio mundi, situ vastitateque deprehensis, idque ex ista rerum immensitate, disciplinae unius ui. Igitur totum hoc naturae opus mentis oculis subiectum tenemus.

up to be seen”.<sup>648</sup> Even more incredible in Grynaeus’ eyes, however, was the way how “the art [of geometry] constituted stars inside the mind and enabled man to explore them and their movements and intervals”.<sup>649</sup> Grynaeus’ allusions here to cosmographical arts, geography and astronomy are unmistakable. “The elements [of Euclid’s geometry]”, he argues, “offer an abundant source for the measurement of latitudes, longitudes and depths, fields, mountains, and islands, for the observations of stars with instruments, making of sundials, studying machines, and understanding spiritual issues, to investigate all apparitions in mirrors, pictures and phantasms.”<sup>650</sup> Sebastian Münster’s cosmographical and astronomical works, maps, diagrams and calendars illustrate Grynaeus’ ideas well and the following chapter shall take a closer look to this material.

Pursuing to understand the methodological use of geometry in the natural philosophies of Melanchthon and Grynaeus, one should remember humanists’ general disappointment with the traditional regressus method. The ideals of universality and causal necessity had taken the method of scientific knowledge up to a point where not only Melanchthon and Grynaeus but also a number of other practically minded Renaissance philosophers were looking for alternative standards for producing and sharing knowledge. The Italian philosopher Agostino Nifo (ca. 1469–1538) for instance, had criticized Aristotle and the regressus method by arguing that there were many aspects in natural philosophy which could not attain demonstrative certainty since their causes would stay forever hidden.<sup>651</sup> This search for new methods is characteristic of the sixteenth century. One option was offered by a move from logical certainty to probabilities of dialectics. Another alternative was to define method as a way of educational organization (*ordo docendi*).<sup>652</sup> Elements of both of these developments can be discerned in Melanchthon’s and Grynaeus’ thought. What is essential, however, is to understand this crisis of method as the very context within which the interest in the geometrical method emerged. What Grynaeus and others were looking for was

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<sup>648</sup> Grynaeus, *Elementa* (1533). a2v. Atqui hoc illud instrumentum est haec illa machina hominum sapientum industria excogitata, qua per infesta maria, ad extremos terrarum & mundi fines, hominum genus excurrit, & naturam qua inaccessa videbatur, eruit.

<sup>649</sup> Ibid.. a2v. Magis est miranda ac longe incredibilior res, arte nescio qua, mentem intra sydera constitui, omnem istic motuum, intervallorum, diversitatem deprehendi, & exploratam rem coetibus hominum inferri.

<sup>650</sup> Ibid.. a2v. fol a2v. Ex his elementis velut fonte uberrimo quidem, sed recondito, & non cuiuis scaturiente, omnis latitudinum, longitudinum, profunditatum, omnis agrorum, montium, insularum mensio, omnis de coelo per instrumenta syderum observatio, & gnomonice tota, omnis machinarum uis & ponderum ratio, omnis in cogendo spiritu, omnis apparitionum qualis in speculis, in pictura, in phantasmatis est, diversitas manat.

<sup>651</sup> Serjeantson 2006, 142.

<sup>652</sup> Ibid.

not another trap of theoretical speculation but concrete means to make the visible world intelligible.

### *Painting the Spectacle of Nature*

While Grynaeus promoted elements of Euclidian geometry as a method for interpreting sensory experience, Euclid's geometry had already made its way to numerous practical arts of the Renaissance, most visibly, painting. Euclidian geometry was inevitably one of the most important tools of the ascent naturalistic painting, providing the mathematical basis of the linear perspective.<sup>653</sup> The role of Euclid's theory of optics for Piero della Francesca, one of the pioneers of the linear perspective, has been discussed in literature. Yet a better example of the use of Euclid's geometry is offered by Leon Battista Alberti. The vital importance of Euclidian geometry for Alberti's theory of linear perspective becomes apparent already in his treatise "Elements of Painting", where several sections resemble Euclid's definitions, as art historians have demonstrated.<sup>654</sup> Although the relationship between mathematics and painting is very complex, it is clear that while Grynaeus was writing about the geometrical method in the context of natural philosophy, Euclid's elements were already applied as a method for representing and systematizing human perception in the field of painting.

One of the most important disseminators of the theory of linear perspective north of the Alps was Albrecht Dürer. In this respect Dürer's books on methodology of painting (integrating mathematics, observation and representation of three dimensional objects) were probably as instrumental as his paintings and engravings. Dürer's famous manual of painting *the Four Books on Measurement*, published for the first time in 1525 only eight years before Grynaeus' treatise, was a work that was explicitly based on Euclidian

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<sup>653</sup> Historian James Elkins has warned against confusing the renaissance concept(s) of perspective with our modern understanding of it. Whereas our modern understanding of perspective is "an elaborate concept, a metaphor as much as a method, and [...] supported by an extensive critical dialogue as well as by a sometimes arcane mathematics"(41), the renaissance understanding of perspective was, according to Elkins, a "pluralist approach", "a collection of methods" and "largely unenriched by critical dialogue." Elkins argues that the "Renaissance artist did not often think in terms of unified, isotropic space", but understood space concretely as tables, beds, arcades, wells, façades, piazzas. (45). According to Elkins, there was no single theoretical understanding of perspective in quattrocento but a number of nonverbal practices instead. In cinquecento the concept of perspective turned into a metaphor, a concept for ordering our perception and way to accounting our subjectivity. It seems logical to place Grynaeus' engagement with geometry and method in the latter context. James Elkins, *The Poetics of Perspective* (Ithaca & London: Cornell University Press, 1994).

<sup>654</sup> Kim Williams, Lionel March, Stephen R. Wassell (eds.), *The Mathematical Works of Leon Battista Alberti*, (Basel: Springer, 2010), particularly Stephen R Wassell's "Commentary on Elements of Painting", pp. 153-170.

geometry.<sup>655</sup> In this treatise Dürer demonstrated how fruitful geometry could be when applied to the design of three dimensional architectonic forms, like columns and statues. He also provided his reader with tools for the geometric study of human body and visual perception by means of the linear perspective. Dürer's persuasive illustrations in the treatise have become classic images of the art historical narratives on the emerging linear perspective. Dürer's images inspired his contemporaries. In 1526 Dürer was asked to make portraits of Erasmus and Melanchthon. Even Luther referred to Dürer in his *Table talk* as he argued for simpler rhetoric in sermons.<sup>656</sup> Joachim Camerarius, Melanchthon's colleague and Grynaeus' interlocutor and co-reformer in the University of Tübingen, was Dürer's biographer. Melanchthon is assumed to have known Dürer since 1518, when he met the painter during his visit to Pirchheimer. During their lives, the connection between them was strongest in 1525-26, but it was not until the 1540s that Melanchthon often made appreciative remarks and comments about Dürer in his writing.<sup>657</sup> Whereas Erasmus appreciated Dürer's clarity and the power of his articulation as highly effective instruments for describing nature, Melanchthon saw in them a potent vehicle for depicting the divine. According to Kuspit "[I]n Melanchthon the difficulties implicit in the conception of Dürer as a man of learning come to a head. What was initially a naive view of Dürer as a master technician or applied mathematician developed in to the conception of Dürer as a genius of world-historical significance."<sup>658</sup> In the 1540s Troubled by the discord racking the evangelical movement, Melanchthon saw in Dürer a perfect union of Humanism and Protestantism. The simplicity of Dürer's art had both the power to transmit religious revelation, and confront the iconoclastic crisis facing graphical art. According to Donald Kuspit, Melanchthon appreciated Dürer's stylistic force precisely because of this ability to simply follow natural forms:

I recall the painter Dürer saying that when he was young he loved to paint monstrous and unusual figures, but now that he was old, he studied nature and tried to imitate it as

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<sup>655</sup> Albrecht Dürer, *Vnderweysung der Messung mit dem Zirckel vnd Richtscheyt* (Nuremberg: Hieronymus Formschneyder, 1538) In the very beginning of the book one Durer makes clear his indebtedness to Euclid and the use of studying geometry: "Der aller scharff sinnigst Euclides/ hat den grundt der Geometria zusammen gesetz wer den selben wol versteht / der darff diser hernach geschriben Ding gar nit / dann sie sind alleyn den jungen vnd denen so sonst niemandt haben der ste trewlich vnderweyst geschrieben."

<sup>656</sup> Michalski 1993, 39.

<sup>657</sup> Donald B. Kuspit, "Melanchthon and Dürer: the search for the simple style", pp. 177–202, *Journal of Medieval and Renaissance Studies*, vol. 3 (1973).

<sup>658</sup> Idem, 180.



closely as possible; but from experience he was learning how hard it is not to depart from nature. And the same thing happens in speaking.<sup>659</sup>

According to Melanchthon, Dürer's simplicity of style was, at its deepest, sacramental.<sup>660</sup>

That Grynaeus never mentions Dürer is not so important. It is more essential to understand that during the 1530s, as tropes of seeing and measuring of the world increasingly find their way to Grynaeus' and Melanchthon's rhetoric of natural world (within which Euclidian geometry was praised as the proper method), Renaissance painters were already demonstrating how geometry worked as a "method" for understanding visible nature. On this background I would like to interpret Grynaeus' appraisal of "Euclidian method" as a concrete invitation to depict the natural world mathematically. When talking about the measuring of the spectacle of world and the theatre of nature, Grynaeus might have envisioned something rather concrete such as Dürer's figures of renaissance people whose gaze marks viewpoints in studies of the linear perspective (image 26).

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<sup>659</sup> Melanchthon to Albert Hardenberg, 25 Sept. 1556. Dürer, *Schriftlicher Nachlass* (Berlin, 1956), I, 289. Cited first and translated in Kuspit 1973, 189. Memini Durerus pictorem, qui dicebat se adolescentem in pingendo amasse monstrosas et inusitatas figuras: Nunc senem intueri naturam, et conari quantum omnino posset eam proxime imitari, sed experiendo se cognoscere, quam difficile sit non aberrare a natura! Fit hoc etiam in dicendo.

<sup>660</sup> Kuspit 1973, 193



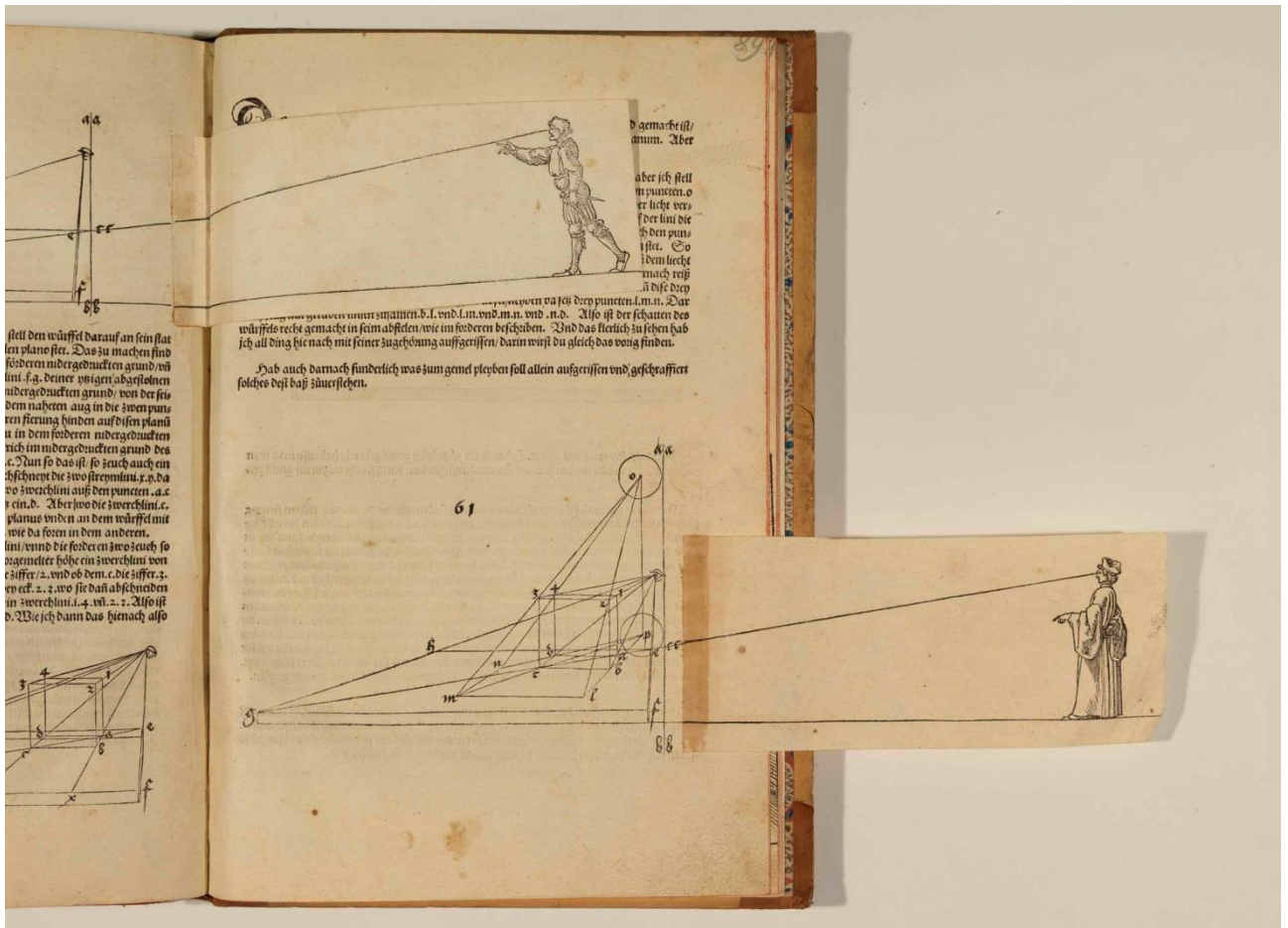


Image 26. Euclidian geometry applied in practice of linear perspective, as illustrated by Dürer. The image on the lower half of the left page illustrates trigonometric relations of a hexagon in a study of perspective. The small image of an eye in the illustration and the human figure on a separate patch mark viewpoints. Dürer's image demonstrates how Euclidian geometry was applied to the study of perspective. Albrecht Dürer, *Vnderweysung der Messung mit dem Zirckel vnd Richtscheyt* (Nuremberg: Hieronymus Formschneyder, 1538 [first printed in 1525]).

Grynaeus' texts pose fascinating questions about the likely methodological unity of geometry, drawing and the study of nature. The idea that the development of representational techniques in Renaissance art had worked as an inspiration or even as a precondition of the observational sciences, however, is an old and much debated one. Erwin Panofsky's in his classic work *Artist, Scientist, Genius*, already paid attention to parallelisms within the transformations which took place in the naturally oriented disciplines and the visual arts of the fifteenth and sixteenth centuries. During the Renaissance both of these fields witnessed an increasing interest in description and depiction. Development of representational techniques in painting, Panofsky believed, could inspire particular fields of observational sciences like zoology,

botany, paleontology and first and foremost anatomy that, as Panofsky put it was “directly predicated upon the rise of the representational techniques”<sup>661</sup>. The continuing discussion on the role of advancing pictorial naturalism and scientific empirism in the Renaissance has been considerably nuanced and broadened by scholars like James Ackerman, Martin Kemp and William Ivins.<sup>662</sup> However, as demonstrated by this discussion, the naturalism of illustrations alone does not ensure an empirical approach to nature.

Sachiko Kusukawa has demonstrated typical misconceptions in the use of naturalistic images as evidence of observation in the Renaissance. Her classic example is Leonardo da Vinci’s naturalistically rendered drawing of a dissection of female viscera. Despite numerous visual clues suggesting the viewer to take the image as evidence of real observations, anatomists demonstrate that Da Vinci’s image is fully imaginative. Many other anatomical images and descriptions of dissections in the period demonstrate similar aspects. The skills of a painter are not a reliable register of observation, Kusukawa argues. Nor can naturalistically rendered illustrations in chirurgial or botanical (or cosmographical) books alone be taken as proof of the development of anatomical or botanical knowledge. However, the Renaissance painters reproducing inherited medieval models of human anatomy in their “representations” of real dissections, are not examples of forgery but demonstrate the complexity of human perception. As Alexander Koyré noted, theory and observations are often times inseparable. Koyré argued that for Ptolemy the actual cosmos, not only a theory of it, was definite and closed by the firmament of fixed stars. When Galileo claimed that some stars could be perceived not in fixed but in variable distances from the earth he virtually “broke” lacunae on the firmament. Therefore “looking” as E.H Gombrich puts it, is a complex act that involves an active process of selection and pattern-matching with reference to what is known or expected.”

Adapting Gombrich’s idea Kusukawa takes images as a way to make the process of looking concrete.<sup>663</sup> Images in books about nature are not evidence of observation or observed objects of the past but an integral part of argumentation of these books.<sup>664</sup> Images

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<sup>661</sup>Erwin Panofsky, “Artist, Scientist, Genius: Notes on the Renaissance-Dämmerung,” in *The Renaissance: Six Essays*. (New York: Harper, 1953/1962), 140.

<sup>662</sup> See for instance: James Ackerman, *Distance Points: Essays in Theory and Renaissance Art and Architecture* (Cambridge: MIT Press, 1991); Martin Kemp, *The science of art: optical themes in western art from Brunelleschi to Seurat* (New Haven: Yale University Press, 1990); William M. Ivins, *Prints and visual communication* (New York: Da Capo Press 1969).

<sup>663</sup> Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago: Chicago University Press, 2012), 20.

<sup>664</sup> Kusukawa 2012, 24.

are used to interpret one's own observations, to show one's discoveries, or to elevate the status of research. Essential in the use of images (in books on nature) is how they develop a visual argument. A visual argument is a skillful combination of text and image. Images are not mere illustrations but an integral part of argumentation. Applying Kusukawa's argument on the classical debate on naturalism and empiricism, we see that the question is not so much about naturalistic images of nature alone, but about the epistemological status of images of nature as an integral part of scientific argumentation. We have made some remarks on the transformations which took place in Melanchthon's understanding of Aristotelian metaphysics and causal conceptions. Would it be possible to extend these implications to the use of images as a valid form of argumentation?

In the period of Simon Grynaeus and Sebastian Münster, image as part of argumentation was by no means self-evident. Contemporary critique on Leonhart Fuchs' use of botanical illustrations, analysed by Kusukawa, provides an interesting example on attitudes on images in the period. Leonhart Fuchs is one of the most important early modern botanists and a developer of morphology. He is known particularly for his beautifully illustrated botanical books. Following the reformation of the University of Tübingen in 1534, Fuchs was appointed to chair medicine. As noted in chapter IV, the reformation was directed by Ambrosius Blarer and Simon Grynaeus. Particularly interesting is that Grynaeus had a seemingly instrumental role in hiring of Fuchs. In a letter to Blarer on 10 June 1535, Grynaeus urges Blarer to pay Grynaeus' costs, some 160 Guldens, and approves that Fuchs' erudition "becomes evident from his publications".<sup>665</sup>

All scholars weren't as eager as Grynaeus to acknowledge the merits of Fuchs' books. Fuchs' use of morphology instead of philology in his definition of ancient plants was challenged by a French physician Monteux, causing a heated debate between Fuchs and Monteux by the end of 1530s.<sup>666</sup> According to Monteux, Fuchs' mistake was to deduce names of plants from "accidents" and not from "essential differences". Accidents come and go independently of the state of the subject. Although one would assume all crows to be black, blackness is not an essential definition of a crow, since also whites turn up. An essential feature had to be valid to all individuals of the same species.<sup>667</sup> Fuchs replied that forms and colors of roots, stems, leaves and flowers were inseparable accidents that were always

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<sup>665</sup> Herbert Rädle (ed.), "Simon Grynaeus (1493-1541): Briefe", in *Basler Zeitschrift für Geschichte und Altertumskunde*, 90 (1990). Epp.22. 10. June 1535. Grynaeus (in Tübingen) to Blarer (in Stuttgart).

<sup>666</sup> Sachiko Kusukawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany* (Chicago: The University of Chicago Press, 2012), 103.

<sup>667</sup> Kusukawa 2012, 103.

inherent in the plant's substance. Therefore they had to be taken as native accidents which could serve the definition of unknown substances like one would distinguish a swan from a crow.<sup>668</sup>

As Kusukawa has shown, Fuchs and Monteux debated by adapting Aristotelian concepts and terminology. As discussed above, Aristotle's views in the *Posterior Analytics* emphasized the necessary and universal character of infallible knowledge (*scientia*). Necessary premises are derived from predicates (genus, difference, property), not from accidents. In the traditional Aristotelian framework accidents were the weakest link, as they were neither causal nor demonstrative. In the arts course from Porphyry's *Isagoge* accident was defined as something that can come and go without the basis (the substantial form) being destroyed. Porphyry made a difference between separable and inseparable accidents, like black color in the case of crow or an Ethiopian. But even inseparable accidents did not predicate substances reciprocally, because they are shared by other substances. These views denied a fixed relationship between external appearances and the essence. The rhetorical theory, however, recognized a definition with a basis in accidents. This was based on listing the attributes of a subject and accidents. Although individual properties could be shared with other subjects, all attributes and accidents together were co-extensive with the subject. In rhetorical terms this listing was called a description.<sup>669</sup>

The debate between Fuchs and Monteux shows how the question of the demonstrative power of images and their use as integral part of argumentation related closely to the basic conceptions of Aristotelian ontology and the role of accidents. Kusukawa has recognized how, particularly in Fuchs' case, Philip Melanchthon had discovered the usefulness of accidents. Fuchs corresponded with Melanchthon who supported him in the dispute against Monteux. In Melanchthon's dialectics, as Kusukawa has pointed out, description of plants was used as an example of "definitio ex accidentibus". Accidents could also be used for telling the difference between a swan and a crow or to describe men, as Homer did presenting Thersites (*Iliad* 2) as "Squint-eyed, hump-backed and scurrilous". Melanchthon saw accidents useful because definitions based on differences were difficult to find. Eventually, Melanchthon argued that because of the original sin, men could understand substances only through accidents.<sup>670</sup>

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<sup>668</sup> Ibid, 104.

<sup>669</sup> Ibid.

<sup>670</sup> Kusukawa 1997, 403-427.

Kusukawa's study of Fuchs' use of images and their legitimation as a valid form of inquiry is a very important lead for this study. As discussed above, Martin Luther's theology denied the traditional theoretical basis of images taking the visible world as a sign of the invisible. Because of the Fall and Original Sin, there was an insuperable gap between man and God. In this framework medieval esthetics of "looking through" could not be accepted – man could not look through but was bound by flesh to the visible realm of things. What is interesting with Melanchthon and Grynaeus, however, and what becomes very apparent with the case of Fuchs, is that Protestant theology could also have something positive to say about images. This positivity is closely tied with the idea of God's omnipotence and the consequential de-ontologization of Aristotelian causality. This understanding of God as the immediate and effective cause of everything in the cosmos caused substantial forms to lose their mandate. Accidents, material, individual and particular characters of beings could therefore be as causally valid as the substantial forms. Grynaeus' preface to Euclid and the case of Fuchs are concrete examples of intellectual effort targeted to finding new methods of understanding the visible and material world, which could no longer be understood using traditional metaphysical tools. In this context mathematics, geometry and descriptive rendering of physical forms in particular, seemed fruitful means of making the visible world intelligible.

It is probably fair to say that the debate on the role of images and use of visual techniques in early modern science culminates in the so called Edgerton-Mahoney debate. Samuel Y. Edgerton argued in the 1980s, following Panofsky, that descriptive visual language was just one of the major implications which Renaissance naturalism had on the emerging natural sciences. Edgerton claimed that the visual techniques of Renaissance art such as the linear perspective should actually be taken as preconditions of the success of the scientific revolution of the seventeenth century. These new techniques, Edgerton argued, offered the prerequisites for the new sciences which pictured the world-machine.<sup>671</sup> According to Edgerton the critical moment in western art was the acceptance of the Euclidian space as the absolute frame upon which three dimensional objects were to be set. In this process scientists and artists began to conceptualize reality as a window within which objects and persons alike manifested themselves, primarily as entities in three-dimensional space.

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<sup>671</sup> Bert S. Hall, "The Didactic and the Elegant: Some Thoughts on Scientific and Technological Illustrations in the Middle Ages and Renaissance", pp. 3 – 39 in Brian S. Baigrie, (ed.), *Picturing Knowledge: Historical and Philosophical Problems Concerning the Use of Art in Science* (Toronto: University of Toronto Press, 1996), 21

Edgerton's views were opposed by a number of professional historians of sciences, most importantly by Michael Mahoney. Although Mahoney did not disagree with Edgerton's views on the development in arts, he pointed out that in the field of the emerging sciences description of physical systems actually moved further away from the physical space which artists depicted.<sup>672</sup> The prerequisites of the scientific revolution, as Mahoney saw it, were not to be found in visual arts but in the development of mathematics. According to Mahoney, formation of modern science was to be associated with the rise of mathematical mechanics, not with linear perspective or printed images.

The discussion on the epistemological and ontological views of Melanchthon and Grynaeus reveals that the juxtaposition of the Edgerton-Mahoney-theses is somewhat artificial. As recent research on neo-Aristotelianism and mechanical philosophy has demonstrated, Aristotelian concepts and the new philosophy of the seventeenth century were not fully antagonistic. To some extent the new "scientific" thought also operated with Aristotelian concepts and terms.<sup>673</sup> It is therefore essential to understand the philosophical preconditions which allowed natural world to be understood as trustworthy and regular; and even more importantly, the presumptions which presented the material visible realm as something significant and worth studying.

Medieval metaphysics took the visible, accidental world as unreal. If the visible world had any value at all, it was through its signifying quality, as a sign of the invisible. The two primary characteristics of the emerging scientific thought in the sixteenth and seventeenth centuries were the idea that visible particular properties of beings were trustworthy and could be reliably described; and the idea of the world as a mechanism that could be measured and calculated. In the thought of Melanchthon and Grynaeus (and probably also more broadly in the sixteenth century) these two convictions were not antagonistic but united, having their roots in the transformation of the Aristotelian metaphysics. The de-ontologization and lessening role of substantial forms let accidental properties become significant. Melanchthon's view of movement as an accident, something that continues until other forces destroy it, and his acceptance of the use of images as definition 'ex accidentibus', are both consequences of the profound transformation in Aristotelian metaphysics. This metaphysical transformation can be seen as one of the most essential prerequisites of the geometrisation of nature promoting a mechanical and plan centred understanding of nature.

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<sup>672</sup> Hall 1996, 21.

<sup>673</sup> Ibid. 22.



# Chapter X

## Images of Providence

The previous made observations on the theoretical and philosophical preconditions of using images in the study of nature presented by Philip Melanchthon and Simon Grynaeus. This chapter will present a more concrete discussion on whether these grand epistemological and ontological transformations had some concrete impact on the illustrations in Münster's *Cosmographia*. Münster was close to Grynaeus and most likely was also aware of Melanchthon's theological philosophy. Although Münster was not a philosopher or a theoretician, he nevertheless shared the providential world view of his more philosophically oriented colleagues. Moreover, when it comes to images, the de-ontologization of the Aristotelian causal nexus discussed above, had some clear and concrete suggestions about the use of images which could be understood and applied without great theoretical understanding: firstly that the visible world could not be taken as a sign of the invisible; secondly that the visible world in its actual material realization could, nevertheless, express the will of God. What one is thus supposed to find in Münster's illustrations is diminishing direct symbolism and increasing number of descriptive and mathematical images.

Although Münster's *Cosmographia* is known for its beautiful maps and high quality illustrations, this view of it is primary based on the 1550-edition. The first version of the book was edited in a frantic haste caused by rumors of a competing work being in preparation in the neighboring Zurich. The textual content of the *Cosmographia* and the appended maps (which had already been prepared for Münster's edition of Ptolemy's *Geographia* in 1540) were more or less finished and complete. However, the rest of *Cosmographia*'s illustrations did not yet exist. Münster's solution was to use whatever he could find in his printer's stock. As a result the quality of illustrations in the first edition was inconsistent.

However, as the first edition of the *Cosmographia* and its subsequent lightly edited reprints sold well, Münster kept refining his book and its visual content. The fruit of this work was the 1550 edition of the *Cosmographia*. The pronounced difference between the first 1544 edition and the completed 1550 edition offer us an interesting opportunity to see what visual changes Münster made and how these changes reflected his visual ideals. In the following pages I shall make some remarks on these visual choices arguing that on a very

fundamental level the transformations which took place in *Cosmographia*'s illustrations offer reflections on the changing epistemological status of images and the visible world in evangelical natural philosophy.

### *Meanings in Flesh*

In the early 1530s Münster had the rare fortune to work with one of the greatest painters of his time, Hans Holbein the Younger (1498 – 1543).<sup>674</sup> Holbein had moved to Basel in 1515 and despite periods in Lucerne (1517-1519), France (1523-1524) and England (1526-28) mostly worked there until 1532, when he moved permanently to England. Holbein's last period in Basel was overshadowed by the fear of iconoclasm, but because of this, it was also a period when Holbein designed most of his prints and illustrations for scientific works. Their shared

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<sup>674</sup> Considering Holbein's cosmographical tutoring anglophone literature usually gives the credit to Henry VIII's cosmographer Nicholas Kratzer. [See for instance, Susan Foister, Ashok Roy and Martin Wyld, *Making and Meaning: Holbein's Ambassadors* (London: National Gallery Company, 1998), and Susan Foister, Holbein's Paintings on Canvas: The Greenwich Festivities of 1527, 109-124 in *Hans Holbein: Paintings, Prints, and Reception*, Mark Roskill and John Oliver Hand (eds.) (Washington: National Gallery of Art, 2001).] In these discussions Münster's role has rarely been acknowledged, or touched only by passing. John North's account is a rather typical one: "While it does not concern Kratzer directly, Holbein's earlier involvement in illustrating yet another astronomical work is of some interest, if only to show that the painter himself was not entirely foreign to this kind of subject-matter. Anonymous woodcuts designed by Holbein were used to illustrate a work by Sebastian Münster, a Franciscan astrologer and geographer who had turned to Protestantism when he went to Basel in 1529. The book deals with an instrument known as a *luminarium*, one by which the principal types of astronomical calculation concerning Sun and Moon could be fairly easily carried out. The work was widely circulated in Latin in a Basel edition of 1534 but an earlier version printed in German with Holbein's illustration pre-dated *The Ambassadors*. See. John North, *The Ambassadors' Secret: Holbein and the World of the Renaissance* (New York: Hambledon and London, 2002), 65.

More recent German studies follow largely the anglophone line of interpretation. Older research, however, did acknowledge Münster's importance to Holbein. Paul Ganz, for instance, wrote about Münster in 1912: "Die Tätigkeit für den basler Buchdruck nahm Holbein wieder auf und kam durch Heinrich Petri mit Sebastian Münster in Verbindung, für dessen Kosmographie und astronomische Werke er eine große Zahl von Illustrationen vorzeichnen hatte. Die Vermutung liegt nahe, daß der Astronom Heinrichs VIII., Nikolaus Kratzer, ein geborener Münchner, den Holbein kurz zuvor in London porträtiert hatte, seinen Kollegen Münster auf Holbeins Verständnis für physikalische und astronomische Dingen augmerksam gemacht habe, und daß Münster, der im Herbst 1529 nach Basel kam, ihm selbst die nötigen Vorkenntnisse beibrachte, mit deren Hilfe er die ihm gestellte Ausgabe bewältigte." [Paul Ganz, *Hans Holbein d.J. Des Meister Gemälde* (Stuttgart: Deutsche Verlags-Anstalt, 1912), xxxiv.] Heinrich Alfred Schmid's authoritative Holbein study also acknowledged both Grynaeus and Münster as important sources of Holbein's cosmographical inspiration. See. Heinrich Alfred Schmid, *Hans Holbein der Jüngere: Sein Aufstieg zur Meisterschaft und sein Englischer Stil, Zweite Halbband* (Basel: Holbein Verlag, 1947), 327.

interest in the study of nature brought Münster and Holbein together during the early years of the 1530s. In this period Holbein illustrated Münster's treatise on sundials, *Compositio Horologium* (1531).<sup>675</sup> Holbein and Münster designed a double page world map for Simon Grynaeus' travelogue anthology *Novus Orbis* and Holbein's astrological designs ended up decorating Münster's several calendrical publications.<sup>676</sup> Holbein's decision to seek financial security in the court of Henry VIII in England ended their collaboration in 1532. Although this period was short, it was lively and brought out exciting aspects of art and scientific illustration which must be discussed in order to reach a better understanding of how the broader philosophical transformations discussed above influenced Münster's images.

In her very recent study on Holbein, art historian Jeanne Nuechterlein argued that the elevated descriptivism of Hans Holbein's portraits developed as a deliberate response to debates on nature and rhetoric in the Renaissance and the Reformation.<sup>677</sup> Holbein was an artist who produced very little for free markets and sought rather the security of private commissions. For this reason he was also relatively dependent on his patrons, leading politicians, learned circles and publishers whose tastes and desires shaped his output. Because of this dependence on patrons, the Protestant Reformation and the subsequent heated debate on religious images posed a particular challenge for Holbein. In the 1520s as the Reformation spread in Basel, Holbein's patrons became increasingly divided with their responses to the new faith and the image debate. Some of Holbein's patrons had a very close relationship with the movement such as the printer-publishers Adam Petri, Thomas Wolff and Christoph Froschauer who specialized in Reformation publications and who apparently supported its cause. Other customers, such as Erasmus and the lawyer Bonifacius Amerbach, were ambivalent or reacted negatively to the Reformation. According to Nuechterlein, Holbein

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<sup>675</sup> Sebastian Münster, *Compositio horologium, in plano, Muro, Truncis, Anulo, Concavo...* (Heinrich Petri: Basel March 1531) see. Hollstein XIVA, 174,176-177,188-189. Münster and his printer Petri seemingly enjoyed Holbein's images as they kept in rotation also in the following sundial books *Horologiographia post priorem additionem* (Petri 1533) and its German translation *Fürmalung und künstlich beschreibung der Horologien* (Petri 1537). The *Horologiographia* was also supplied by a large sundial and 12 new woodcuts depicting the signs of the Zodiac by Holbein. The visual material of these sundial books was reused to illustrate Münster's mathematical textbook *Rudimenta Mathematica* (Petri 1551), twenty years their appearance. Such a long lasting satisfaction with particular illustrations was not always quaranted as we are going to see with the case of Schnitt's illustrations to Münster's *Cosmographia*

<sup>676</sup> Sebastian Münster, *Horologiographia, post priorem additionem recognita, adiecta multis novis descriptionibus & figuris, in plano, concavo, convexo...*, (H. Petri: Basel 1533). Sebastian Münster, *Canones super novum instrumentum luminarum, docentes quo pacto per illud inveniantur Solis & Lunae medij & veri motus...*, (A. Cratander: Basel 1534). Sebastian Münster, *La declaration de l'instrument des grands luminaires...*, (J. Estauge: Basel 1554). See. Hollstein XIV A, 187-191.

<sup>677</sup> Nuechterlein 2011.

remained neutral, supplying his evangelical customers with pro-reformation imagery and his traditional customers with more conventional religious images.<sup>678</sup>

Whatever Holbein's own religious preferences were he nevertheless ended up in a situation where the deepening religious crisis, culminating in the question of religious images, forced him to find concrete solutions in order to manage the rising tensions in the image debate. During the 1520s Holbein experimented with religious painting, developing a visual style which Nuechterlein has depicted as an objective mode of representation. Holbein's most important religious paintings in this period, the 'Dead Christ' (1521-22) and the 'Solothurn Madonna' (1522), avoided all dramatization as Holbein sought to present himself not as an active innovator or imaginative creator, but as a faithful observer transmitting only what he saw.<sup>679</sup>

The image debate made Holbein more aware of the ways in which visual construction shaped reception of images. In the mid-1520s Holbein's experiments matured into two conscious styles. Within this process, as Nuechterlein points out, Holbein's choice of style became an integral part of the meaning of his works. Holbein made a clear distinction between an inventive style, which he applied to historical, mythological and religious subjects – and a descriptive style which he applied to his portraits. Descriptive religious painting such as the Solothurn Madonna and the dead Christ characterized only a short phase. Holbein's descriptive style was now established as a means to represent things that existed in the physical world. With careful rendering of materials, Holbein sought to create an impression of faithful recording of real appearances.<sup>680</sup>

Holbein's portraits perfected his naturalistic technique. He painted his sitters, clothes and surrounding objects descriptively giving an impression that every detail in the painting was not an outcome of his imagination but of careful observation. Seeking to create an effect of a real-world encounter for the viewer, Holbein's portraits, as Nuechterlein interprets, let one understand that their utmost meaning resides in the corporeal existence of their models.<sup>681</sup>

Discussing Holbein's stylistic development and his increasing interest in the material, Nuechterlein gives some credit to contemporary natural philosophy. At the same time as Holbein's interest in material aspects increased, mathematics and the study of nature

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<sup>678</sup> Ibid, 22.

<sup>679</sup> Ibid, 46.

<sup>680</sup> Ibid, 48.

<sup>681</sup> Ibid, 155.

became more frequent motifs in his paintings. Particularly by the end of 1520s and in the early 1530s Holbein paintings were often staged with mathematical objects, sundials and polyhedra, maps, musical instruments and globes. A painting that best characterizes these tendencies is probably Holbein's portrait of the French Ambassadors which he painted in 1533 (image 27). Carefully represented astronomical instruments and globes of the earth and the firmament speak of Holbein's awareness of astronomy and cosmography. Holbein's careful visual record of material appearances of his sitters and their tools of mathematical measurement invited the viewer to draw parallels between Holbein's own study of nature and that of natural philosophy and cosmography. The anamorphic skull, a Lutheran Hymnal and a Crucifix which Holbein has added to his painting, however, still remind us of the invisible spiritual truth and the limits of material investigation of the world.<sup>682</sup>

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<sup>682</sup> See. Susan Foister, Ashok Roy and Martin Wyld, *Making and Meaning: Holbein's Ambassadors* (National Gallery Company, London 1998); John North, *The Ambassadors' Secret: Holbein and the World of the Renaissance* (Hambledon and London: London 2002).

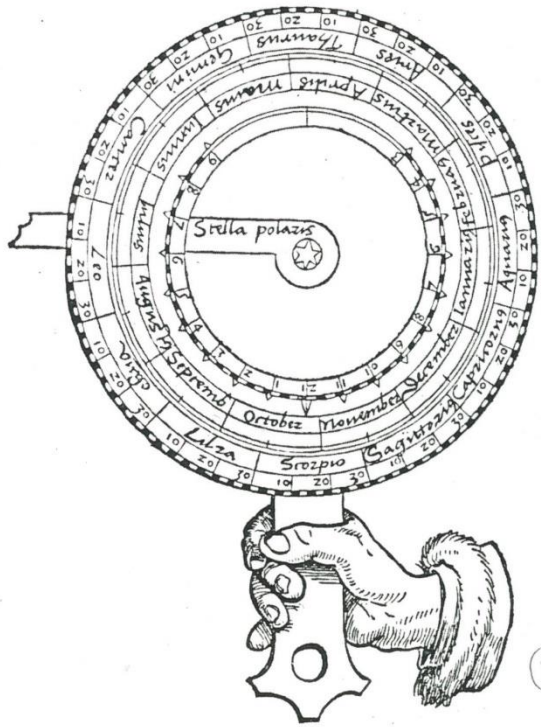


Image 27. Hans Holbein the Younger, "The Ambassadors". Oil on oak. 207 x 209,5 cm. National Gallery, London.

Holbein's paintings are rich, subtle and complex (much like studies about them) and cannot be addressed here in more detail. Within the context of Münster's cosmography however, Nuechterlein's remarks concerning Holbein's awareness of the meaning of stylistic choices are interesting. It seems that this awareness can be perceived not only in Holbein's portraits but also in the woodcut illustrations which he designed for Sebastian Münster in the early 1530s.



As a technique of naturalistic rendering, woodcut comes second to oil painting which enables much richer detail. Despite the limitations of the woodcut form, however, Holbein seems to follow the distinction between objective and descriptive modes of expression in his scientific illustrations. For instance, in Holbein's drawing of a nocturnal that illustrated Münster's treatise of astronomical instruments, *Compositio Horologiorum* (1531),



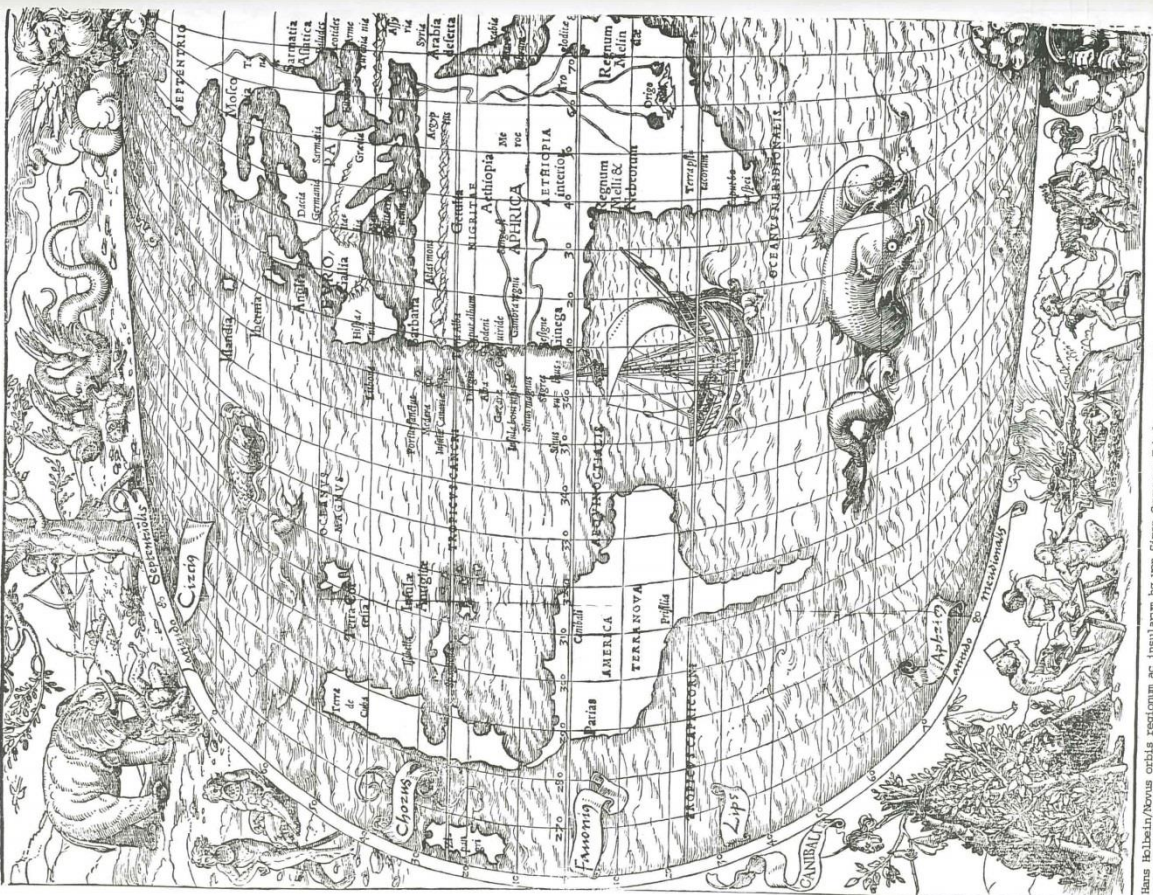
we see how carefully the hand holding the mathematical instrument is drawn (image 28). Holbein has rendered it as naturalistically as possible describing the streaks and weal of human skin. The hand stretches out from a sleeve end that is decorated with fur. Also the fur as material is described as minutely as a simple diagrammatic picture enables. Although the woodcut medium and the scientific illustration require simplification, Holbein's interest in the material fleshy aspects of human body and natural materials is still apparent.

Image 28. Hans Holbein the Younger, 'a nocturnal', an illustration in Sebastian Münster's *Compositio horologiorum, in plano, Muro, Truncis, Anulo, Concavo...*, (Heinrich Petri: Basel 1531), 17.2 x 12.8 cm. ca. 1530-31. [Source Hollstein XIV A, 175]

IMAGE 29. (next page) Hans Holbein the younger and Sebastian Münster, *TYPUS COSMOGRAPHICVS VNIVERSALIS*, an illustration in Simon Grynaeus' (ed.) *NOVUS ORBIS regionum ac insularum veteribus incognitarum...*, (J. Herwagen: Basel 1532), 36.0 x 55.7 cm. [Source: Frank Hieronymus, *Oberrheinische Buchillustration 2*, (Universitätsbibliothek Basel: Basel 1985), 688-689.

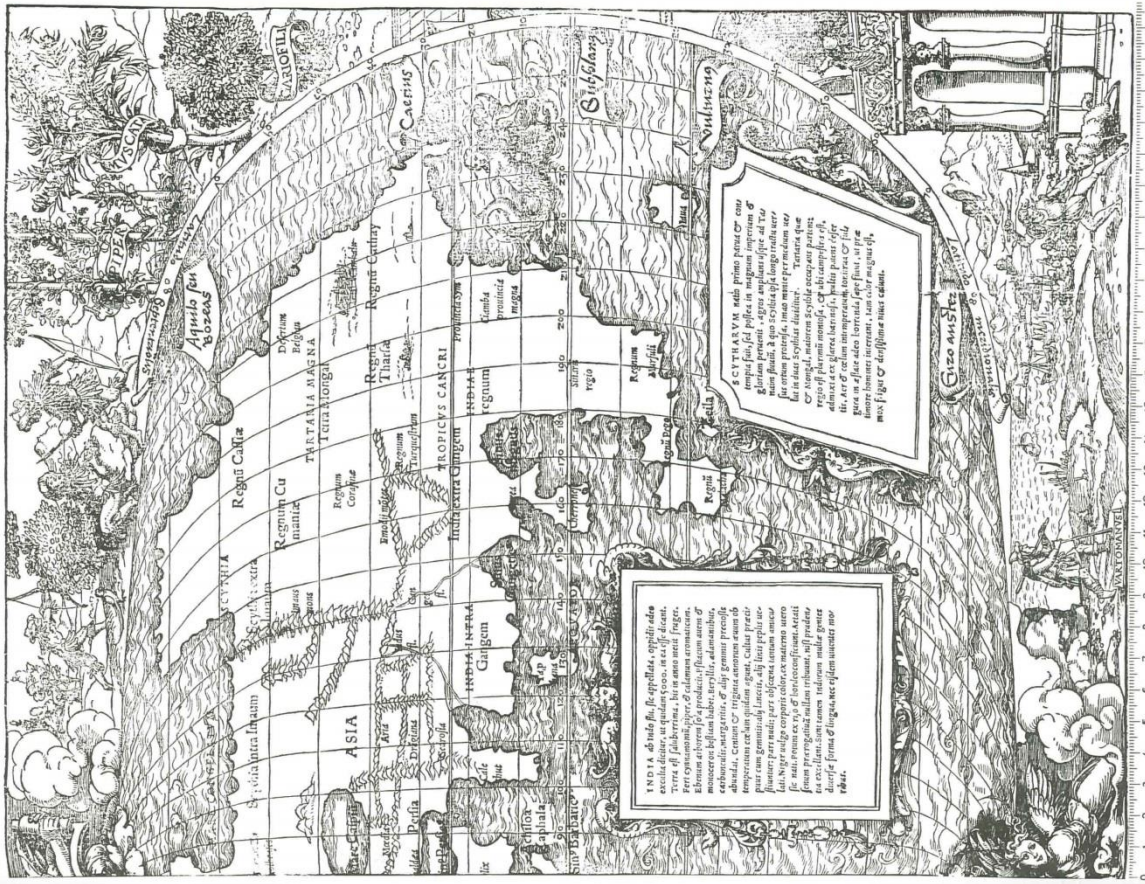


# TYPVS COSMOGRAPHI



Hans Heibner/Novus orbis regionum ac Insularum, by von Simon Grynaeus; Tabula cosmographica von Sebastian Münster; 1532, 1536/37, 1555/150

# CVS VNIVERSALIS



0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



The world map, *Novus Orbis*, which Holbein and Münster created in 1532 for Simon Grynaeus' travelogue anthology, *Novus Orbis*, offers a more concrete example of links between Holbein's pictorial choices and the new natural philosophy (image 29). The world map was printed on two folio pages and was supplied with an illustrated frame. It was the only world map in the whole book, and as such, was an important reference for the book's many travel accounts. As a central element of the book the map reflects on Simon Grynaeus' preface. As discussed above (in chapter VI) in this preface Grynaeus extolled nature as a book which conducts human minds to its maker, the invisible God. For Grynaeus, the book of nature was open and visible. It was a spectacle that could, and should, be perceived and beheld.<sup>683</sup> Because so many people remained ignorant of nature's great majesty and diversity, Grynaeus argued, God's providence provided men with the arts of astronomy, geography and cosmography.<sup>684</sup> These arts highlighted the magnificence of nature and enabled men to study nature, go around the world and contemplate on heavenly spaces.

As a geographical representation of the visual world, Münster's and Holbein's map is very concretely what Grynaeus was asking for. The lines of longitude and latitude on the side of the map proclaim that the image is not a product of human imagination but is made after a real model, the visible physical world. In the map's pictorial frame, one finds exotic animals and peoples and their unique customs portrayed, and also, illustrations of natural riches of faraway countries such as pepper and Muscat representing the beauty and variety of God's creation.

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<sup>683</sup> Grynaeus, *Novus Orbis* (1532), prefatio Simonis Grynaei ad Collimitium. "QVANQVAM hoc totum nature spectaculum, ex quo uelut uiuo libro cōdisci opifex rerum debebat, luculenter co(n)siderationi hominum offert sese: & quo minus uel fastidium & satietatem perere co(n)templantibus se posset ullam, plenu(m) dignitateq(ue), quocunq(ue) oculus & animum coniecisti, occurrit, & nouis addiedue coeli uicibus, iucundissime nos inuitat, dum ali aliaq(ue) quotidie sydera & occidu(n)t et ori(u)ntur, noctis dieiq(ue) alia quotidie magnitudo, caloris & frigoris alia quotidie uis, alia quotidie aut senescentis aut reiuuenescentis anni forma"

<sup>684</sup>Ibid. "Tamen ignaua esse uitio & socordia hominum uidetur, nec quicquam admirationis habere facies illa nature, estq(ue) incredibile memoratu, quàm pauci mortales uel maiestate eiussumma, uel uarietate mirabili excitentur. [...]Adversus hunc morbum hominum, omnis generis scriptores & inventores rerum, divina prouidentia ueluti medicos commenta obiecit, qui imperitis & inertibus istis uim naturae eruerent, & tanquam in lucem proferrent, & per eam opificis admonerrent. [...]Ac ut artes caeteras, quae uariae & multiplices sunt, aliam aliamq(ue) unaquaeq(ue) naturae partem tractantes praeteream nunc, nullae plus uel sibiipsis autoritatis, uel naturae rerum admirationis parant, quàm quae coelis & terrae situm, quam illa & seorsim & quem inter sese habent, descripserunt (ασρονομικοι, γεωγραφικοι, κοσμικοι Graeci uocant) non absque certa & euidenti multarum & difcilium artiu(m) notitia constitutas. Quae postquam iuuentae non absq(ue) singulari beneficentia dei, & prodiatae literis fuerunt: rem prius impossibile(m) generi humano: ire non solum mente & cogitatione per coeli spatia, sed terram oculis circuire, & mundum perambulare licebat.

Münster's and Holbein's map is pronouncedly this-worldly which was not self-evident at the time. Medieval perceptual principles have been discussed in greater detail above (in chapter VII), but in summary it can be said that the traditional approach on images took the visible world primarily as a sign of the invisible, as something that was to be looked through. Extremely broadly speaking the two epistemological principles of Reformation theology, the infinite gap between God and man (in the spiritual sense) and God's omnipotence interpreted as his omnipresence in creation (in physical sense), put an end to the "looking through" aesthetics. Although all Protestants did not know about these principles or accept them, it seems clear that Simon Grynaeus, if anyone, as an evangelical natural philosopher and as Philip Melanchthon's close correspondent was aware of these ideas. Grynaeus' preface to the *Novus Orbis* offers a clear demonstration of these ideas and enables an interpretation of Holbein's and Münster's world map as a practical, visual, application of these epistemological ideas.

The scenes which Holbein designed in the pictorial frame of Münster's world map are striking with their immanence. Figures in the frame, as peculiar as they are, give an impression of observations of physical realities of the world. The group of cannibals in the lower left corner of the frame is of great ethnological interest. Even the odd winged worm-like monsters, devouring a ram in the upper left margin, are described as they were real.

For a modern reader, Holbein's illusion of observation seems strange. The feet of an elephant, in the upper left corner, are strangely flat. What is essential, however, is not whether the images are based on actual observations, but the idea that visible and corporeal existence is meaningful in itself. The rendering of these figures pay considerable attention to accidental features such as the costumes of northern hunters and naked bodies of the southern savages. Like Holbein's portraits, the world map seems to proclaim that matter is significant in itself.

In the scientific illustrations that Holbein made for Münster, Holbein's objective mode of presentation seems to almost always be the rule when a particular illustration presents a subject that clearly belongs to the perceptual sphere, but there are also some exceptions. Holbein's astrological pictures are somewhat anomalous within this framework, as Holbein's pictures for Sebastian Münster's calendar of 1533 demonstrate (image 30). The illustrations of this calendar are cut by Conrad Schnitt after Holbein's designs. The circular mark with letters S.M. refers to Sebastian Münster.<sup>685</sup> Thin Italianate columns divide the

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<sup>685</sup> Sebastian Münster, *Im Jar Christi M.D. XXXXIII. ist die gulden zal xiiij*, [Basel UB], See. Hollstein XIV, 146.

picture in seven fields, each representing zodiac signs, works of each month, and the respective constellations of the sun and the moon in the period. But here Holbein seems to mix his symbolic and objective modes of representation. The plenitude of different pictorial elements and their different epistemological statuses is confusing. There are peasants observed in their daily work, fishing and farming, who are set in the same landscape as symbolized zodiac signs. This creates Hieronymus Bosch-like hallucinatory scenes, which mix natural with supernatural and physical with symbolical. Furthermore the landscapes in the background are mixtures of imaginary and descriptive elements. In the first field from the left, a realistically portrayed ship sails behind a peasant. Holbein has drawn the ship in perspective, creating an illusion of an observed scene. This illusion, however, is broken by giant raindrops which transform the descriptive landscape into a symbolical depiction of humid weather. In the same way the adjacent scene unites a naturalistic portrait of a castle with two gigantic faces blowing lines of figurative wind out of their chubby mouths.

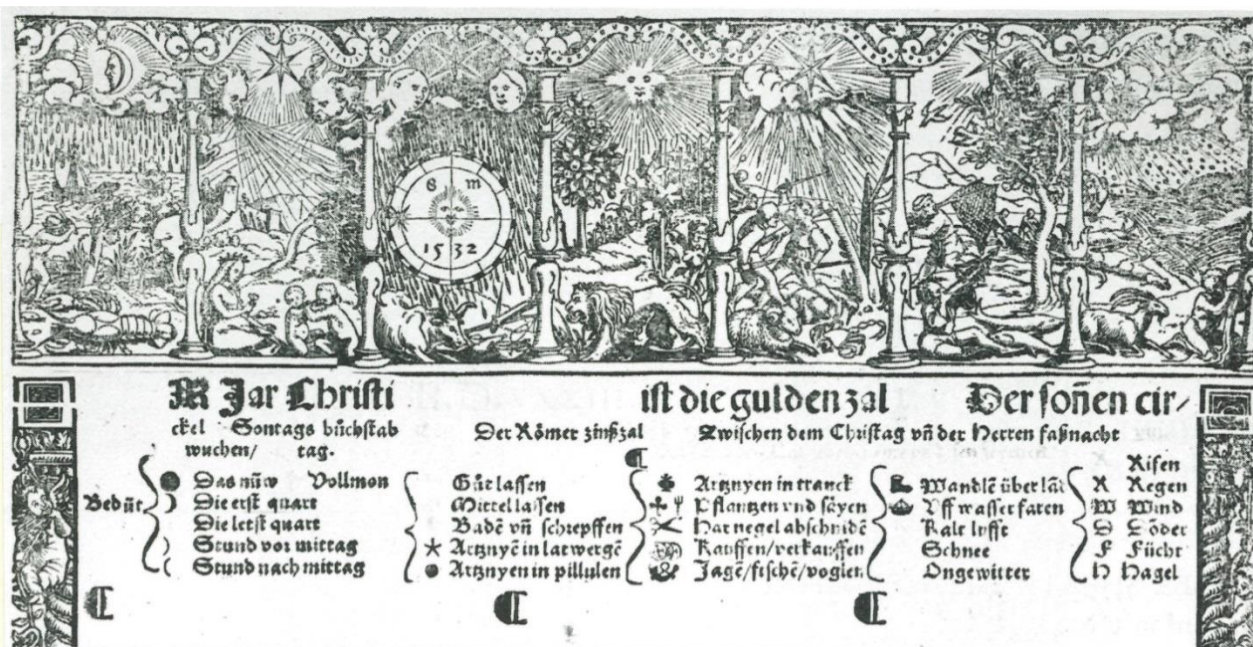
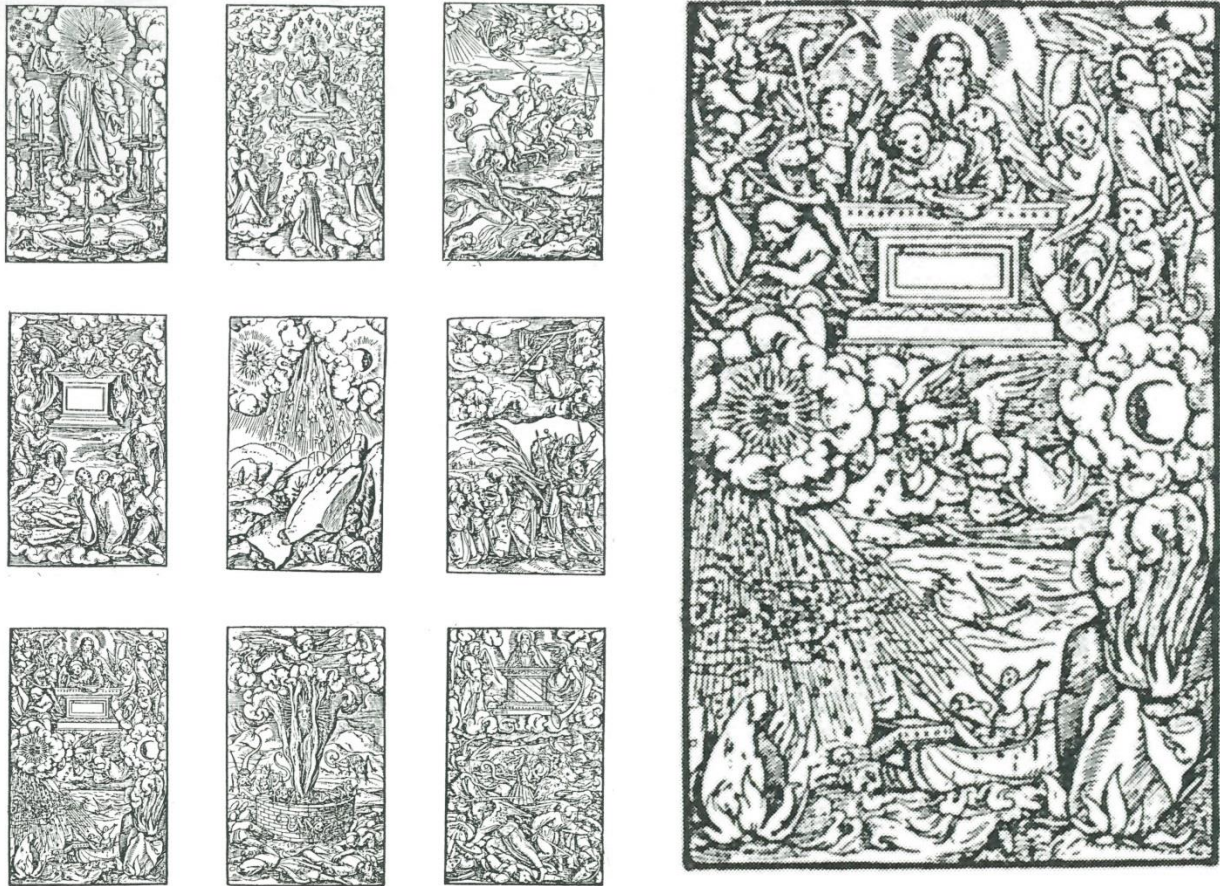


IMAGE 30. (above) Hans Holbein the younger, The signs of the zodiac, woodcut illustration to Sebastian Münster's large folio Calendar for the year 1533, (Heinrich Petri: Basel). 7.9 x 27.9 cm. [Source Hollstein XIV, 146.] IMAGES 31 and 32. (next page) Hans Holbein the younger, Illustrations from the Apocalypse, in DAS GANTZ NEÜW TESTAMENT yetz klårlich ausz dem rechten grundt teutsch..., (Th. Wolff: Basel 1523). Each ca. 12.4 x 7.5 cm. [Source Hollstein XIV A, 73]





Although Holbein's astrological illustrations are different from his portraits and descriptions of the objective mode, they are somewhat reminiscent of his Biblical illustrations in Luther's *New Testament* drawn ten years earlier.<sup>686</sup> Holbein's scene of the apocalypse (images 31 and 32), much like his astrological vision, unites mundane and descriptive figures with symbols of invisible reality. The most significant difference, however, between the astrological illustrations and this biblical picture is that in the astrological vignette, God's invisible government, the God father and his angels are completely absent. Despite the confusion between objective and symbolical modes, Holbein's astrological image nevertheless distinguishes the visible physical realm from the invisible divine realm.

The difficulties of distinguishing the symbolical and objective modes in astrological images seemingly puzzled Holbein. In later astrological illustrations designed for Münster's textbooks on astrological instruments, *Horologiographia* and *Canones super novum instrumentum*, Holbein has more clearly separated the different stylistic elements.<sup>687</sup>

<sup>686</sup> 21 woodcut illustrations by Holbein in a Basel edition of Luther's *New Testament*, *DAS GANTZ NEÜW TESTAMENT yetz klaerlich ausz dem rechten grundt teuscht...*, (Th. Wollf, Basel 1523),

<sup>687</sup> *Horologiographia, post priorem additionem recognita, adiecta multis novis descriptionibus & figuris, in plano, concavo, convexo...*, (H. Petri: Basel 1533). see. Hollstein XIV A, 187-189. Sebastian

Although the zodiac signs are made of figurative pictorial elements, their epistemological status is made clear. Simplified asterisks mark perceivable stars in the observable physical world and the symbolical figures, like the Taurus or the crab, are set upon the asterisks as *invisible* symbols.

In Münster's *Canones super novum instrumentum luminarum* (1534) Holbein's visual epistemology and separation of different pictorial modes has reached stability. This is particularly evident in a large astronomical chart (60.9 x 42.9 cm) that has survived only in a later French impression (Sebastian Münster: *La declaration de l'instrument*, 1554).<sup>688</sup> The chart, which is a masterly demonstration of Münster's mathematical skills and Holbein's artistic powers, is clearly the peak of the cooperation of these two men (image 33). Images in the calendar were cut by the master draughtsman Veit Specklin, who later cut Herbal illustrations for Leonhard Fuchs. Specklin's fine hand gives the calendar a great finishing and clearly helps distinguish different graphical elements. Münster presents his long-term computations of the phases of the Sun and the Moon for the years 1530-1579 in seven circular diagrams. The eclipses of the Sun and the Moon are prognosticated in the left margin. Holbein's designs make use of the full range of his expressive repertoire including ornamental, indicative, numeral, symbolic and descriptive elements, but more importantly, each of these modes of expression is framed to its own separate field. There are four descriptive scenes depicting a woman giving birth, farmers at work, an old man letting blood and a deathbed. In the birth scene a man points to planetary constellations seen through the window. The other scenes also have combinations of the stars, the Moon and the Sun.<sup>689</sup> These images are like a visual equivalent of Melanchthon's preface to Sacrobosco. Following a long tradition, Melanchthon, and seemingly also Holbein and Münster, understood the constellations of heavenly bodies to be vital for agriculture, medicine and history: Stars were determining seasons and proper times for work, affecting humors of the human body and guiding the laws of fate. As Melanchthon put it in an oration on astronomy and geography at Wittenberg in 1536:

Since [...] the science for the heavenly movements is full of knowledge, it is useful in life for

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Münster, *Canones super novum instrumentum luminarum, docentes quo pacto per illud inveniantur Solis & Lunae medij & veri motus...*, (Basel: A. Cratander, 1534). See. Hollstein XIV A, 190-191.

<sup>688</sup> Sebastian Münster, *La declaration de l'instrument des grands luminaires mis en figure par Sebastien Munstere...*, (J. Estauge: Basel 1554), See. Hollstein XIV A, 191.

<sup>689</sup> The Chart is known from, Sebastian Münster, *La declaration de l'instrument des grands luminaires mis en figure par Sebastien Munstere...*, (J. Estauge: 1554). Originally belonging to Sebastian Münster, *Canones super novum instrumentum luminarum, docentes quo pacto per illud inveniantur Solis & Lunae medij & veri motus...*, (A. Cratander: Basel 1534). See. Hollstein XIV A, 191-193.

the distinction of seasons and regions, it is most agreeable, it strengthens in the minds the worthy notion of God and, since there is an opportunity to learn it, I encourage good minds to devote themselves to these studies, both for their own sake and for that of the state, for which we must preserve the noble arts that are useful for life.<sup>690</sup>

The period when Holbein and Münster worked together was short, but it left Münster with understanding of the meaning of style. It is also important that this period was situated in an important era in Holbein's career when he became aware of the importance of distinguishing between symbolical and objective modes of presentation. Both Münster and Holbein shared an interest in the physical, material and corporeal levels of reality. And as Münster later developed his providential cosmography, he continued to study these ideas, namely how describing and capturing purely physical existence could transmit spiritual meaning. This chapter has only scratched the surface of these highly fascinating subjects – hopefully future research brings more light to these apparent parallels between Holbein's art and Evangelical natural philosophy.

Image 33. (Next page), Hans Holbein the Younger, An large astronomical chart and calender. Belonging to Sebastian Münster, *Canones super novum instrumentrum* (A. Cratander: Basel 1534), but known from Sebastian Münster, *La declaration de l'instrument des grands luminaires...*, (J. Estauge: Basel 1554). 60.9 x 42.9 cm.

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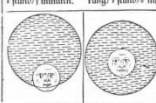
<sup>690</sup> Philip Melanchthon, "Oration on astronomy and geography held at Wittenberg (1536)", [CR XI, 292-8.] translated in Philip Melanchthon,[Sachiko Kusukawa (ed.)], *Orations on Philosophy and Education*, (Cambridge: Cambridge University Press, 1999), 118-119.



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den menschen aber der menschen vnter  
bestellung vnd so vil schreyen haben als sonst  
ein tag ist.



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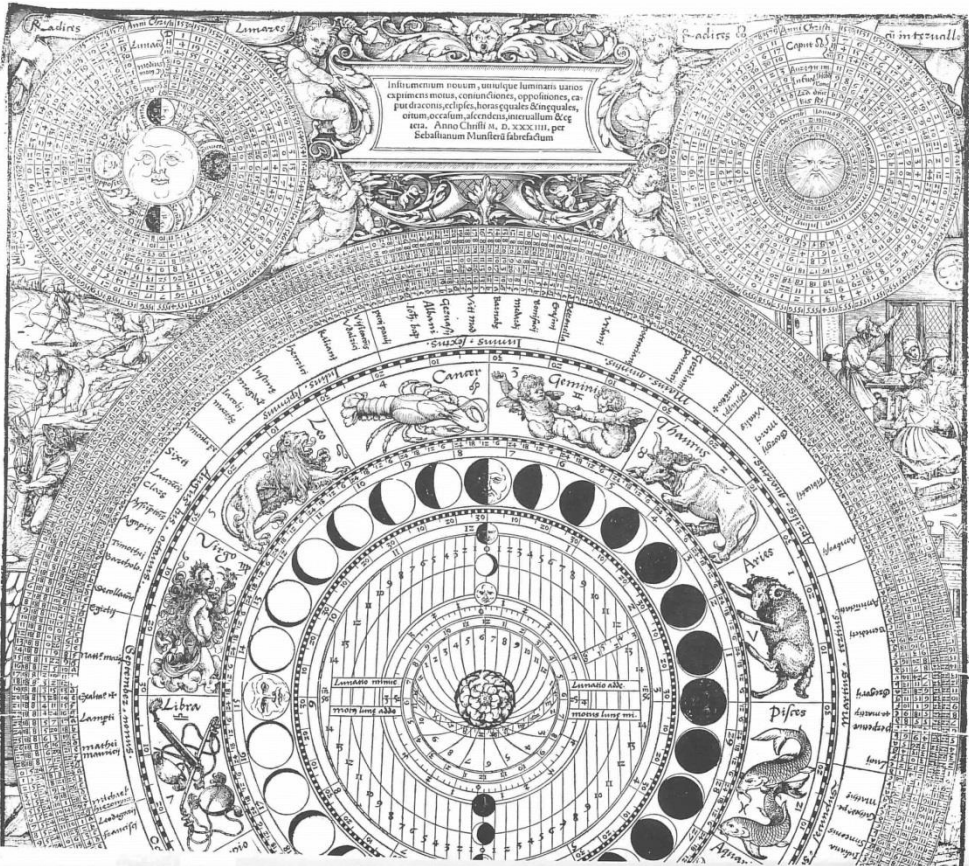
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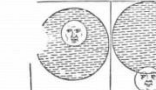
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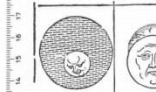
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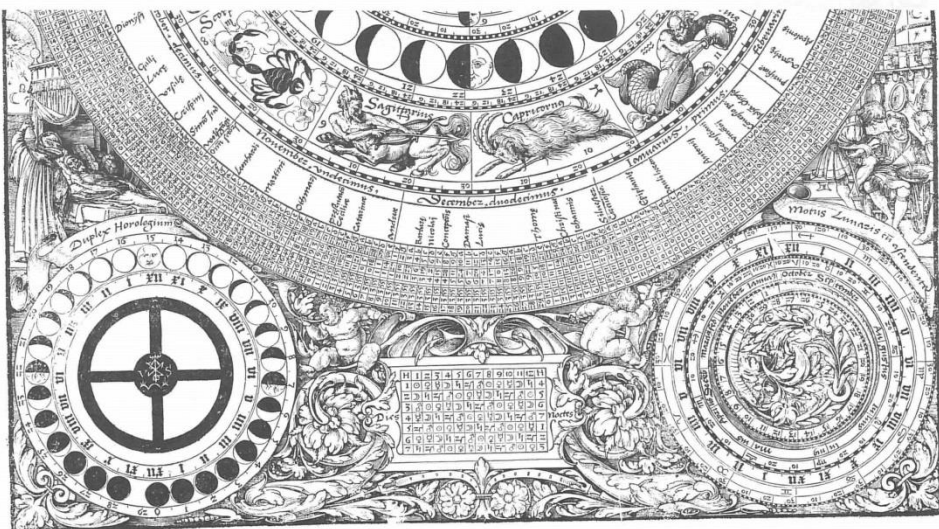
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After Holbein's departure for England, his place as Münster's principal illustrator was taken by the painter and draughtsman Conrad Schnitt. Between 1533 and 1541 Conrad Schnitt produced approximately 200 images for Münster's editorial works. Many of these images ended up in the 1544 edition of *Cosmographia*. Conrad Schnitt belongs to the same generation of artists as Hans Holbein. His artistic activity started around 1517, and in 1519 he is known to have moved from Stein am Rhein to Basel where he worked until his premature death in 1541. Schnitt mastered the ascending classifying Italianate style relatively early and his works and motifs have been compared to those of the 10-15 years older, Urs Graf.<sup>691</sup> In the early 1530s Schnitt assisted Holbein. During this period they designed woodcuts for Basel's printers and worked for the same employers such as the Petri House, Münster's publisher.

One of the earliest clues suggesting that Schnitt worked as Holbein's craftsman is the title page of Martin Bucer's book in 1521 depicting a preacher, a sheriff and a child. The cutting of the image, which was Holbein's design, is attributed to Schnitt.<sup>692</sup> Significant similarities in Holbein's and Schnitt's hand work have sometimes caused difficulties for art historians in attributing their unsigned works. A title-page border picturing the suicide of Lucretia in Jacobus Ceperinus' Greek Grammar in 1522, for instance, was formerly attributed to Holbein but has later been ascribed to Schnitt.<sup>693</sup> Similarly an image of the Roman ruins at Augusta Raurica near Basel in Münster's 1544 *Cosmographia*, taken for long as Holbein's work, has later been attributed to Schnitt. In these woodcuts it is almost impossible to distinguish the work of Schnitt from that of Holbein. Also, contemporaries seem to have acknowledged Schnitt's ability to imitate Holbein. The only time when the printer's mark of Adam Petri was not commissioned to Holbein it was trusted to Schnitt.<sup>694</sup> Although later times have not recognized much originality in Schnitt, he must be seen as an apt craftsman and painter. Following in the footsteps of Urs Graf and Holbein, he became an able illustrator who knew how to satisfy the demand for fashionable Italianate designs.

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<sup>691</sup> Hollstein XLV, 117 and Frank Hieronymus, *Basler Buchillustration 2, 1500 bis 1545* (Basel: Universitätsbibliothek Basel, 1984), 482.

<sup>692</sup> Martin Bucer, *Dialogus das ist ein gesprech oder rede zwischen zweien...*(Valentin Curio, ca.1521-1522), see Hollstein XLV, 173.

<sup>693</sup> Jacobus Ceperinus, *Compendium Graecae grammaticae iam recens editum...*( Valentin Curio, 1522), see Hollstein XLV, 174.

<sup>694</sup> Hollstein XLV, 197.



In Münster's publications, the shift from Holbein's illustrations to those of Schnitt seems relatively smooth. Schnitt delivered his first piece for Sebastian Münster already in 1527, although we cannot give much weight to this small calendar illustration among 60 other woodcuts.<sup>695</sup> In the early 1530s, however, we find Schnitt increasingly cutting Holbein's designs for Münster.<sup>696</sup> Holbein's new designs kept appearing in Münster's books even after his departure to England, giving a reason to assume that he had left a bundle of drafts behind, which were then finished by lesser penmen like Schnitt.

The collaboration between Schnitt and Münster began in the shadow of Hans Holbein. In the mid-1530s, however, Schnitt designed his first original works for Münster's books. In 1534 Schnitt drafted three title-page borders for Münster's *Hebrew Bible*. In 1536 he illustrated Münster's *Organum Uranicum* with 34 woodcuts. Two years later Schnitt drew his first map, based on Münster's survey of Basel and its surroundings. In 1538 Münster's edition of *Solinus/Mela* contains 20 woodcuts, 14 of which are attributed to Schnitt.<sup>697</sup> Most of these designs were used again in the 1544 edition of *Cosmographia*. A view of Rome, maps of Italy, Greece and the South Western parts of Germany, Switzerland, Great Britain, and Africa, The Holy Land, Turkey and Syria, Asia Minor, Europe, The Black Sea region, Greece and the Ionian Sea and Sicily all ended up in *Cosmographia*.<sup>698</sup> By the end of the decade the number of Schnitt's designs in Münster's publications had increased. Münster's edition of Ptolemy's *Geographia* (1540) has 51 woodcuts by Schnitt, the 1544 edition of *Cosmographia* has 105 woodcuts by Schnitt.

### *The Compromised First Edition of the Cosmographia*

Working with the first version of *Cosmographia*, Münster was badly burdened by the significant economic risk associated with the work, overload of work, and ultimately, by the fear of death.<sup>699</sup> Although the cost of printing and cutting the book were primarily paid by Münster's son-in-law, Heinrich Petri, the whole editorial work rested on Münster's shoulders. In May 1544 Münster wrote to his friend and former teacher, Conrad Pellican, complaining

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<sup>695</sup> Hollstein XLV, 198.

<sup>696</sup> Hollstein XLV, 161.

<sup>697</sup> C.IULIUS SOLINUS Polyhistor, *Rerum toto orbe memorabilium...* (Michael Isengrin & Heinrich Petri 1538), see Hollstein XLV, 192.

<sup>698</sup> Hieronymus 1984, 584.

<sup>699</sup> Burmeister 1969, 119.

how busy he was with his “German work”. Münster could not eat in peace, continuously writing new manuscripts, cutting images, reading proofs and casting numbers and notes to his maps.<sup>700</sup> Unfortunately *Cosmographia* wasn’t the only project Münster was involved in. Besides his duties as chair of Hebrew at the University, Münster was also writing a biblical commentary on Jeremy.

“I must hurry with these works”, Münster wrote, “not to let death surprise me. No one else could exit out of this labyrinth.”<sup>701</sup> But even more horrifying than death was news about the same kind of work being in preparation in neighboring Zurich. Another Swiss humanist, Johannes Stumpf, was writing a book on Swiss history and topography.<sup>702</sup> To Münster’s ever greater dissatisfaction, Stumpf had engaged a whole group of Münster’s friends in his project. Even Münster’s tutor, Pellican, and Joachim Vadian were orbiting around Stumpf’s project.<sup>703</sup> Although Münster did not know how much of Stumpf’s work would be similar to his, he knew that the market for geographical books was small, too small for two very similar books.<sup>704</sup> Münster and his printer Petri decided to strike first. Münster’s half-finished *Cosmographia* hit the Frankfurt book fair in the autumn of 1544.

The 1544 edition of the *Cosmographia* was born prematurely. The part that had suffered the most was its illustrations. The main body of texts was more or less finished already in 1542.<sup>705</sup> But with the images, Münster had met several setbacks. “Already almost ten years I have concentrated on the German cosmography and many gentlemen are waiting for its publication.” Münster wrote in 1542. “I haven’t decided though, when it shall be

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<sup>700</sup> Münster to Conrad Pellican on 11 May 1544, BSM, epp.19.

<sup>701</sup> Münster to Conrad Pellican on 11 May 1544, BSM, epp.19. “Festinandum est mihi in memorato opere, ne morte praeoccupet, alioquin nemo posset sese extricare ex hoc labyrintho.”

<sup>702</sup> Johannes Stumpf, *Gemeiner loblicher Eydnoschafft, Stetten, Landen und Völckeren Chronik wirdiger thaaten Beschreibung* (Zürich 1548).

<sup>703</sup> Burmeister 1969, 119. McLean, 168-174

<sup>704</sup> Matthew McLean has described the rivalry between Stumpf, Münster and Petri in detail in, Matthew McLean, “Between Basel and Zurich: Humanist Rivalries and the Works of Sebastian Münster”, pp.270-291 in Malcolm Walsby & Graeme Kemp, *The Book Triumphant. Print in Transition in the Sixteenth and Seventeenth Centuries*, (Leiden: Brill, 2011).

<sup>705</sup> After 1540 it seems rather clear that Münster had a manuscript that he was elaborating and which was to become the first version of the book. The appendage of Geographia and a selection of maps he had provided him with the basic material, but he also conducted new research trips and kept receiving new descriptions from his colleagues and friends. The work intensified in 1543 when Münster received important regional descriptions from the kingdoms of Denmark, Sweden and Wallis. The first version of the manuscript was completed in the early year 1543 starting the long printing process. See Burmeister 1969, 112.

printed: many illustrations still remain to be finished and we have lost our painter Conrad [Schnitt], neither has [Hans] Holbein returned from England.”<sup>706</sup>

Conrad Schnitt had died in 1541 three years before the first edition was published, but he was still the single most important illustrator in the book. From Schnitt came *Cosmographia*'s most important visual elements: the map cycle, the coats of arms and series of portraits.<sup>707</sup> The significant volume of Schnitt's work suggests that Münster had originally planned to use (and create) the extensive and expensive pictorial work in different publications. Illustrations of *Solinus/Mela*, and Ptolemy's *Geographia* must be taken as a preparatory work for the grand opus. A good number of *Cosmographia*'s illustrations were actually printed with plates that were first used in these works. But Münster also ran out of time, which in the end forced him to use whatever pictorial material he could grasp.

Although the 1544 edition was a compromise, Münster and Petri had not saved in the number of pictures. The book had 770 pages and was illustrated with 24 double page maps and 520 other woodcuts.<sup>708</sup> Certain unevenness, however, characterizes these images. The maps of the book are very carefully made whereas other pictorial material was produced more carelessly.

The map cycle, as the most carefully produced part, is also the most interesting part of the first edition. In the first hundred pages of his book Münster offers a cartographic panorama of the whole world. The map cycle begins with two Ptolemaic world maps, followed by maps of Europe and individual European countries. England, the Iberian Peninsula and France are represented in large double page maps, as are also German and Swiss lands, but in even greater detail. The book has also maps of Scandinavia, Italy, Eastern Europe, Greece, Near East and the Holy Land. Maps of Sumatra and India precede maps of continents of Asia, Africa and America or “the new islands found in our times in the great ocean by the King of Spain”.<sup>709</sup> Except for a few exceptions, all these maps had already been published in Münster's edition of Ptolemy's *Geographia* in 1540.<sup>710</sup>

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<sup>706</sup>Münster to Conrad Pellican on 29 July 1542, BSM, epp.12.

<sup>707</sup>Hollstein vol. XLV, 208.

<sup>708</sup>McLean 2007, 173. McLean reports of 640 pages basing his estimate most likely on Münster's own page numbers – the number presented here is based on the total number of folio-pages [VD 16 M 6689] – the difference is caused by the first hundred unnumbered pages.

<sup>709</sup>Sebastian Münster, *Cosmographia* (1544), fol. 109, no page numbers, “Die neue Inselen so zu[e] unsern zeiten durch die kunig von Hispania im grossen Ocean gefunden sindt.”

<sup>710</sup>Sebastian Münster, *Geographia* (1540), Tabula Nova-section. 20 maps of areas not described by Ptolemy attributed to Conrad Schnitt in Hollstein XLV, pp 270-273.

These maps have often been attributed to Conrad Schnitt, but Schnitt was not their originator. In the preface of *Geographia* Münster had revealed the origins of his cartographical sources and his indebtedness to other cartographers. Münster gives credits to Oronce Finé for the map of Gallia, Jacob Ziegler for Scandinavia and the Holy Land, Aegidius Tschudi for the Swiss lands, and Beatus Rhenanus, Johannes Dryander and a group of other men for several other maps.<sup>711</sup> The maps of regions around the Rhine were based on Münster's own observations – elsewhere he relied on others' experiences. Because of the variety of sources, Münster's and Schnitt's original cartographical material varied greatly. Sixteenth century cartography is well-known for its rich visual language, symbolism, allegories, varying projections and formats. Against this background it is surprising how uniform the final outcome was.

Shaping this miscellaneous cartographical material into a coherent form, Münster followed certain principles. Firstly, all Münster's maps followed the Ptolemaic paradigm. Münster's decision to pick only Ptolemaic maps seems self-evident. He had worked with Ptolemy's texts and developed his map cycle as part of Ptolemy's *geographia*. He approved the mathematical tradition of geography. But thinking of Münster's spiritual background, his emphasis on mathematical images needs some explanation. In 1544 there were also many other ways to express religious sentiments even in a cartographical form. Above we have discussed the cosmological allegories of Hartmann Schedel (chapter VIII) which demonstrated a medieval synthesis of a symbolical and material approach to nature. Half a century after Schedel such a mixture of symbolism and descriptivism was still a valid approach to making maps. An example of the approach is offered by Pierre Eskrich's famous map "Mappe-monde nouvelle papistique" that was printed in Geneva in 1566 (image 34). Eskrich was a Calvinist convert who fiercely attacked Catholicism and the Papacy in his map. Eskrich's map makes its author's eschatological and propagandistic interests clear. Published as an illustration in a satire of Papacy, Eskrich's map presents a spiritual allegory: inside a devilish mouth is the city of Rome with the walls of the city easily recognizable. The city has come under an attack by reformers who are armed with flaming Bibles and cannons of the

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<sup>711</sup>Sebastian Münster (ed.), *Geographia* (Basel: Heinrich Petri, 1540), no page numbers, fol. 3, "Proinde uiri quoru[m] opera ego in nouis meis tabulis usus sum, hi sunt. In descriptione Galliae consului Orontij excellentis mathematici topographiam. In tabula Noruegiae, Sueciae, Gothiae & c. usus sum opera pr[a]esta[n]tis uiri Iacobi Ziegleri, quae & magna parte imitatus sum in descriptione terrae sanctae. Heluetiam & Rhetiam iampridem ministravit eximius uir Aegidius Tschudus" [etc...]

Word of God.<sup>712</sup> All mathematical principles of Ptolemaic map-making have been abandoned. By embracing imaginative and allegorical presentation, Eskrich's map is antithetical to the maps Münster chose to use in *Cosmographia*.

One reason why Münster avoided this kind of symbolical language may have been his acceptance of Grynaeus' and Melanchthon's views of nature as God's theater, and the perception of God as a geometer and a great architect. Melanchthon and Münster's friend and colleague Grynaeus saw mathematics as the normative basis for all disciplines, and particularly for geography. Mathematics, particularly for Grynaeus, was a way of knowing God's will in nature. Mathematics was thus not seen as an abstract art, a "sterile discipline", but as the method to carry out man's divine quest to study nature. Grynaeus praised how mathematics, geometry in particular, offered a method for measuring longitudes and latitudes, extensions of hills, fields and islands and ultimately the whole machine and theatre of the world.<sup>713</sup> Following primarily a mathematical representation of the world, Münster's selection of maps relates to Grynaeus' and Melanchthon's ideas.

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<sup>712</sup>Pierre Eskrich, Jean Baptiste Trento (Frank Lestringant, Alesandra Preda eds.), *Mappe-Monde nouvelle papistique : histoire de la Mappe-Monde papistique, en laquelle est déclaré tout ce qui est contenu et pourtraict en la grande table, ou carte de la Mappe-Monde* (Genève, Droz 2009 [1566]).

<sup>713</sup> Grynaeus, *Elementa* (1533), fol a2r, first quoted in Methuen 1998. "Quemadmodum enim qui legere uult, elementa discit prius, & ijs assidue recurrentibus utitur in uocibus omnibus experimendis, sic uqi metiri quidquam instituit, figuram omnium in quas primas formae resoluuntur naturam teneat prius necesse est. Ex his elementis velut fonte uberrimo quidem, red recondito, & non cuiuis scaturiente, omnis latitudinum, longitudinum, profunditatum, omnis agrorum, montium, insularum mensio, omnis de coelo per instrumenta syderum observatio, & gnomonice tota, omnis machinarum uis et ponderum ratio, omnis in cogendo spiritu, omnis apparitionum qualis in speculis, in pictura, in phantasmatis est, diuersitas manat."

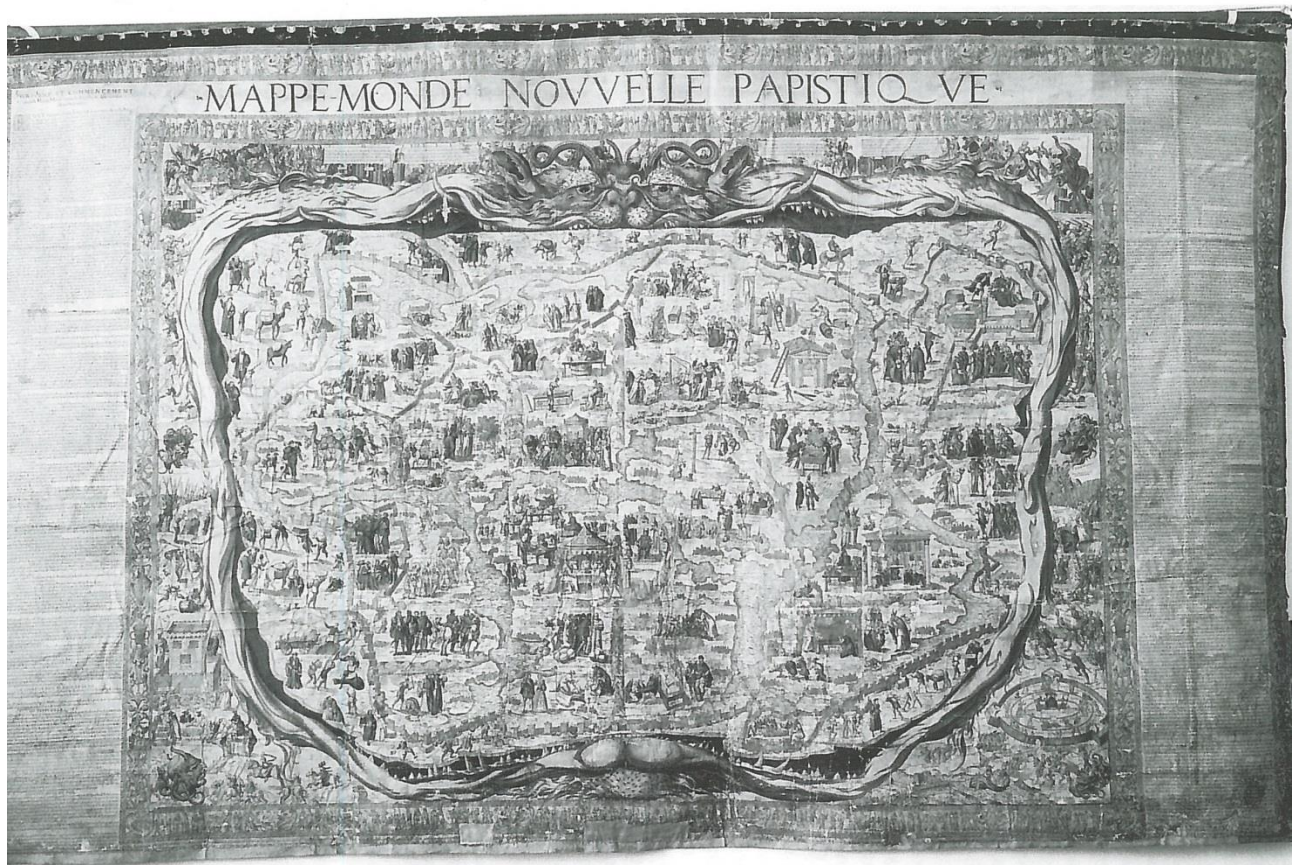


FIG. 11.5. PIERRE ESKRICH'S *MAPPE-MONDE NOUVELLE PAPISTIQUE*. Size of the original: 135.5 × 241.2 cm. Photograph courtesy of the Biblioteka Uniwersytecka, Wrocław.

Image 34. Pierre Eskrich, *MAPPE-MONDE NOUVELLE PAPISTIQUE*. 135.5 x 241.2 cm. 1566. [Source: David Woodward (ed.), *The History of Cartography vol.3, Cartography in the European Renaissance, part 1*(Chicago: The University of Chicago Press, 2007), 391.]

Münster also standardized his maps by using uniform signs to mark out different geographical and topographical features. Cities and towns were reduced to schematic angular and castle-like figures and mountains to triangular forms.<sup>714</sup> The composition of maps reserved space for names of places. Here again uniformity was the rule and the same type sets are used in every map. Schnitt's role here was to unify diverse cartographical material into a single format. The style of Schnitt's cartographical signs descends directly from Ptolemaic maps of the late fifteenth century, based on the works of Francesco Roselli and Martin Waldseemüller (similar signs for mountains were already used in a world map in Hartmann Schedel's *Chronicle*).<sup>715</sup> Schnitt's artistic work did not seek originality but homogeneity and clarity, underlining the authenticity of cartographical representation. The maps in

<sup>714</sup>For a detailed analysis of topographical signs see, Catherine Delano-Smith, "Signs on Printed Topographical Maps, ca. 1470-ca. 1640", pp. 528-590 in David Woodward (ed.), *Cartography in the European Renaissance, vol 3, part 1*, (The University of Chicago Press : Chicago 2007).

<sup>715</sup>An exemplar of Hartmann Schedel's world map in Woodward (ed.) *The History of Cartography, vol 3, part 1*, p. 383.]

*Cosmographia*'s map cycle are clear, distinct, and graphically moderate. The stark contrast of tones, mostly just black and white, and the lack of ornaments and particular distinguishability of different graphic elements, assist legibility of the maps. Most of *Cosmographia*'s maps were also supplied with a scale indicating degrees of longitude and latitude in miles. The scales and indication of longitude and latitude emphasize Münster's mathematical approach but also assist the reader in moving from one map to another creating unity between different maps.

The map of Scandinavia demonstrates Münster's visual guidelines effectively (image 36). Like most of Münster's maps, this one also was based on material that Münster had received through his wide network of correspondents. Traditionally, following Ptolemy's belief, Scandinavia was considered too far north to be a habitable region. There were thus only a few maps of Scandinavia in Münster's days. In the 1540 edition of Ptolemy's *Geography* Münster used a copy of Jacob Ziegler's map of Scandinavia. Ziegler's map became one of the few maps that were replaced in the 1544 edition of *Cosmographia*. Münster decided to replace Ziegler's map with a new map based on Olaus Magnus' "Carta Marina" (image 35).<sup>716</sup> The new map was designed by Schnitt, which means that Münster had received Magnus' map in less than two years after its publication.

Differences between Magnus' original and Schnitt's version are interesting. When it comes to outlines of coasts, lakes and islands, Schnitt's work is almost identical to the original. With place names Münster and Schnitt had economized. Only the most important names are marked on the map. The reason for this was apparently the remarkable reduction in the scale of the map. The original Carta Marina was made of nine sheets and was huge (125 x 170 cm). Münster's and Schnitt's version was reduced to 25 x 34 cm. Some selection thus had to be made. The major difference between these maps, however, is in their use of images. The rich and informative imagery of the original Carta Marina was completely excluded from Münster's version. None of the small figures representing political, military, religious or cultural realities of the northern countries survived to the *Cosmographia*. Also Magnus' sea monsters, devouring northern ships, were gone. If someone were to ask when sea monsters disappeared from maps we could thus say, with some degree of evidence, and a hint of humour, that this happened in 1544 with Münster's *Cosmographia*.

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<sup>716</sup>Münster, *Cosmographia* (1544), no pagenumbers, fol. 69-70 "Gemeine beschreibung aller mittnächte lend[er] Sweden/ Gothen / Nordwegien/ Deñmarck etc."



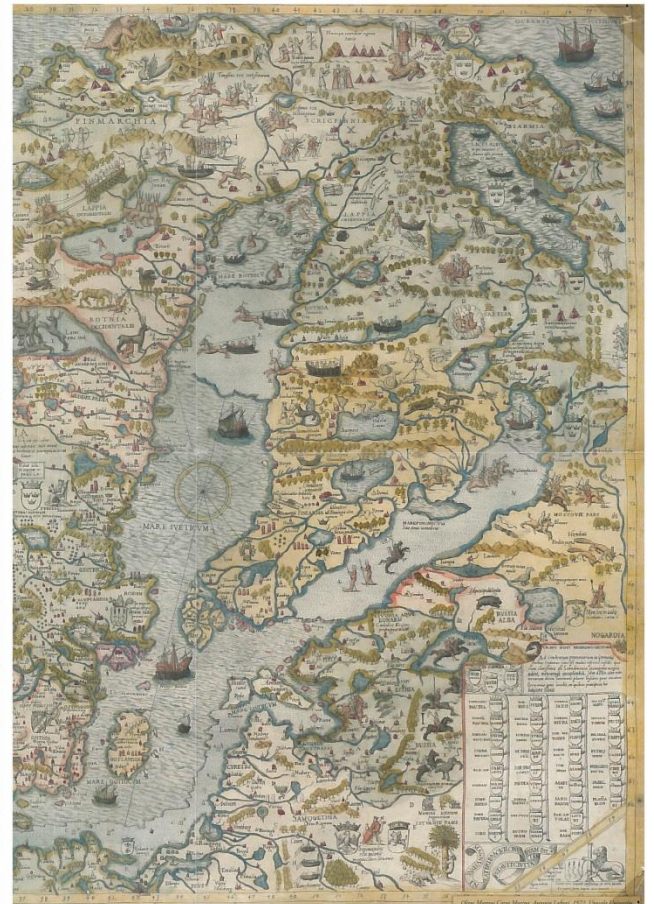


Image 35. [above] Olaus Magnus, (Artist unknown), Carta Marina. 125 x 170 cm. Reprint by Antonio Lafreri 1572, original printed in Venice in 1539. [Source: Ulla Ehrensvärd, *The History of the Nordic Map: From Myths to Reality*, (Helsinki: John Nurminen Foundation, 2006), appendix.]

Image 36. [below] Unknown artist after Olaus Magnus, Map of Scandinavia ca. 1544. 25.0 x 34.0 cm. [Source: the *Cosmographia* (1544), fol 69-70].



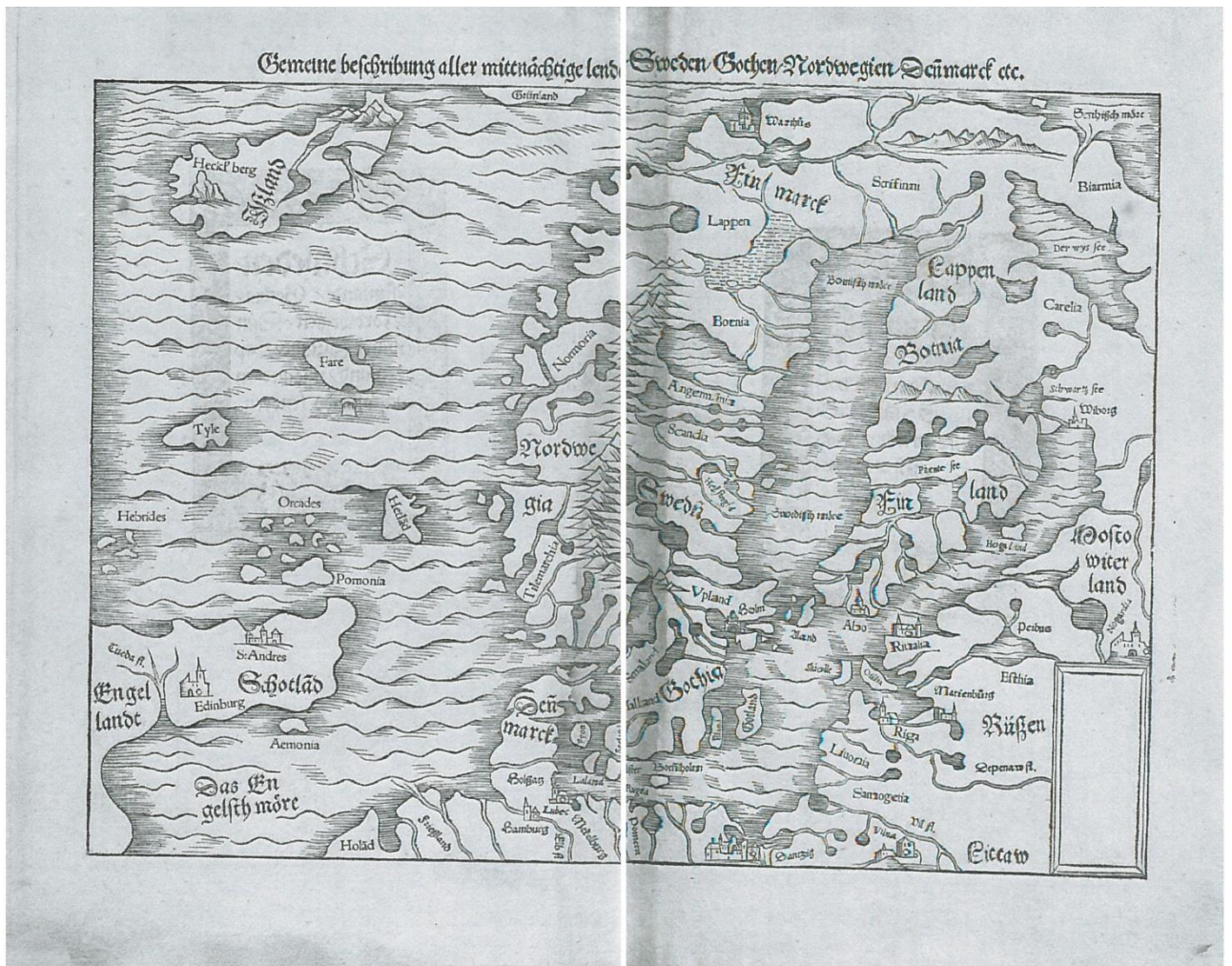


Image 37. Hans Rudolf Manuel Deutsch, Sea and land monsters. From Sebastian Münster's *Cosmographia* 1550. 25.9 x 34.5 cm. Source: TIB 19 (Part 2), 34.

When Münster and Schnitt shrank Magnus' map they had to choose what they wanted to keep. They chose to reproduce physical entities, waterways, rivers, lakes and seas, leaving the small symbolical figures out. Actually Magnus' monsters reappeared in the 1550 edition of *Cosmographia*, drawn by Hans Rudolf Manuel Deutsch. But even then these monsters were secluded from maps. They made their appearance in a separate table describing land and sea monsters (image 37). Looking back at Münster's collaboration with Hans Holbein, the disappearance of monsters can be explained by an increasing awareness of different modes of representation. Münster was aware that symbolical and descriptive modes had to be separated. Importantly these monsters made their reappearance as natural beings which could be described and studied. The monsters disappeared because the stylistic ideals that sought to create an effect of pure description and mathematical mode of representation took over. And when they returned they made their come-back within this framework, not as symbols, but as a description of natural creatures.

Another example of Münster's visual guidelines is the map of Taprobana or "Sumatra" (image 38).<sup>717</sup> Münster's map is based on an older map of Ceylon belonging to a map collection of islands known as *Isolari* which circulated in various forms since the mid fifteenth century.<sup>718</sup> We have no certainty of Münster's source but it may have been Henricus Martellus Germanus' map of Taprobana (1480-90), or some of its subsequent versions (image 22). The maps of Münster and Martellus have similar coastlines and inscriptions. Martellus Germanus' map has no scale of longitude or latitude – but his inscription "Taprobana Insvla indiana", *Taprobana an Indian island* suggests that he situated the island of "Taprobana" correctly in the Indian peninsula.

Considering Hans Holbein's elephant motif, which already appeared in his world map of *Novus Orbis*, Münster has produced his version of the map himself. The framing of the 1544 edition of the map and the scales of longitude and latitude were thus probably placed by Münster and Schnitt. The degrees that Münster includes in the scales misplace his Taprobana roughly between the modern Sumatra and Borneo.<sup>719</sup> Münster's cartographical error which dislocated Ceylon to Sumatra stands in an interesting contradiction with Schnitt's objective mode of visual expression. The precision of line, descriptive style and the scales of longitude and latitude persuade the reader to accept an illusion as real. Münster's

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<sup>717</sup> [IMAGE 22.(PICTURE OF SUMATRA COSM 1544, fol 97/98).]

<sup>718</sup> George Toliás, "Isolari, Fifteenth to Seventeenth Century", pp. 263-284 in David Woodward (ed.), *History of Cartography vol 3*, part 1. (Chicago: Chicago University Press, 2007).

<sup>719</sup> Following the Ptolemaic tradition Münster begins to measure the latitude from the Canary Islands, causing a difference of approximately 20 degrees to modern latitudes of Greenwich.

map looks more authentic than the original map, the cartographical value of which has been damaged. Had Münster used additional ornamentation, symbolical figures or other “imaginary” visual material, the functional value of his map would have remained untouched. At times, Münster’s rigid descriptivism, symbols of mathematical methods and objective mode of representation were little more than just aesthetic ideals.

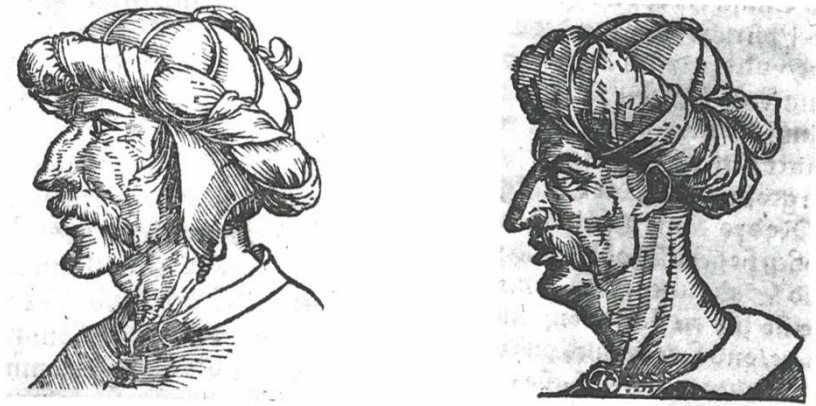




Image 38. [above left] Conrad Schnitt, *Sumatra ein grosse insel so von den alte Cosmographen Taprobana ist genent worden*. [Source: Sebastian Münster's *Cosmographia* 1544, fol.97-98].

Image 39. [above right] Henricus Martellus Germanus, *Taprobana Insvla Indiana*. From *Insularum illustratum* ca. 1480-90. Scanned from David Woodward (ed.), *The History of Cartography vol 3. part 1*, plate 9.

Image 40. [below] Conrad Schnitt. *Turkish Emperors*. From the *Cosmographia* 1544. Each c. 6.0 x 5.6 cm. [Source: Hollstein XLV, 209].



Before his untimely death, Schnitt had finished the map cycle of the *Cosmographia*, and a few other visual elements. One of these was a set of 12 portraits of

Turkish emperors, a relatively good piece of work that was used also in later editions (image 40). Schnitt had also designed a good number of coats of arms which, like his maps, were simple in design and minimal in additional ornamentation. In addition, Schnitt left a set of miscellaneous scenes of men, animals, buildings and landscapes, but their quality was poor and they were left out of subsequent editions. Apart from the maps the visual material of the first edition was miscellaneous and mostly weak. The carefully prepared map cycle instead,

was Schnitt at his best. It also demonstrates Münster's esthetics the best: Münster sought clarity and simplicity in style, limiting ornamentation and symbolism and preferring simple descriptivism.



Images 41, 42, 43. Conrad Schnitt (After Hans Holbein the Younger and Sebastian Münster, *Typvs cosmographicvs vniuersalis*, 1532), A muscat shrub and a clove tree; The cannibals; A hut of cannibals. From the *Cosmographia* 1544, fol. 755, 760 and 761.

In quite sad the way the shadow of Hans Holbein follows all through the first edition of *Cosmographia*. Among the miscellaneous recycled pictorial material Münster used were for instance, the title page borders that Holbein had designed for Adam Petri's edition of Luther's *New Testament* in 1523.<sup>720</sup> The fact these title page borders kept their place also in the following editions of 1546, 1550, 1553, 1569 and 1574 shows how much Holbein's artwork was appreciated.<sup>721</sup> Also the figures that Holbein designed for the pictorial frame of Münster's world map in Grynaeus' *Novus Orbis* (1532) found their way into the first edition (image 22). Cut and redrawn by Schnitt, Holbein's frame had been split into small vignette-like images portraying the Muscat shrub and the clove tree, cannibals and their hut (images 41, 42 43) and even the peculiar flatfeet elephant.<sup>722</sup> These pictures were reminiscent of Holbein's work, but were far from the visual splendour of his original illustrations for Münster's works in the early 1530s.

<sup>720</sup> Hollsteins XIV A, 68-69, Hieronymus 1984, 409-411.

<sup>721</sup> Hollsteins XIV A, 68-69, Hieronymus 1984, 409-411.

<sup>722</sup> Hollsteins XLV, 192, 222.

The 1544 *Cosmographia* left Münster unsatisfied. He immediately started to prepare another edition which came out in 1545. But fear over a competing work continued until Stumpf's Swiss Chronicle was published in 1547. Different editions of *Cosmographia* published in 1544, 1545, 1546 and 1548 indicate that Münster had chosen a twofold strategy in the competition. On one hand he sought to keep his book on the market in the form of new reprints (editions between 1545 and 1548 are actually only reprints of a single version which Münster himself called the second edition), on the other hand Münster quietly elaborated a new super edition that would conclusively raise the bar of geographical books.

Stumpf's book came out in 1547. The Swiss Chronicle was extensive and very well-illustrated, but by its scope significantly narrower than Münster's *Cosmographia*. Focusing only on Swiss history Stumpf gave *Cosmographia* an important advantage which was its global approach. When the risk of being pirated by Stumpf was eradicated, Münster had no reason to keep his treasures hidden. In 1550 the curtains finally opened and the ultimate third edition came out. It consisted of 1233 pages. The number of almost completely renewed illustrations mounted to 910, in addition to 54 double page maps, more than double the number in the 1544 edition.<sup>723</sup> In the 1550 edition Münster placed particular weight on the illustrations. This was also a countermove against Stumpf, whose carefully made images had knocked out the compromised illustrations of the earlier editions of *Cosmographia*.<sup>724</sup>

The visual revision of the 1550 edition was not only quantitative but also qualitative. Almost all images of earlier editions were replaced by the works of new artists. At the heart of the new team of illustrators were three painters, Hans Rudolf Manuel Deutsch the Younger (1525 - 1571), David Kandel (1520 - 1592) and Jacob Clauser (c. 1520 - 1579) and two woodcutters, Heinrich Holzmüller and the Master CS (Christoph Schweitzer). Kandel designed 20 illustrations, Clauser a handful, but the principal illustrator of the 1550 edition was unquestionably Deutsch the younger.

Hans Rudolf Manuel Deutsch was a talented artist, although not very original, and definitely a follower of the Italianate tradition of Urs Graf, Holbein and Schnitt. A comparison between designs of a standard bearer-motif by Graf, Schnitt and Deutsch the Younger reveal an apparent continuity in the classifying style of these Basel-based artists as

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<sup>723</sup> McLean 2007, 174.

<sup>724</sup> For the competition between Münster and Stumpf see McLean 2007, 108-111 and McLean 2011.



well as continuity in Münster's preferences (images 28, 29, 30). Above all, Münster sought clarity and descriptive ability. After *Cosmographia* all Münster's new illustrators continued working with scientific illustrations.<sup>725</sup>



Images 44, 45 and 46. [above, from left to right] Standard bearers by (14.) Urs Graf, 1521, 19.1 x 10.9 cm, (Source: Hollstein XI, 58); (15.) Conrad Schnitt, 1521, 22.0 x 14.5 cm, (Hollstein XLV, 132); (16.) Hans Rudolf Manuel Deutsch, 1546, 23.0 x 18.5 cm, (Hollstein VI, 201).

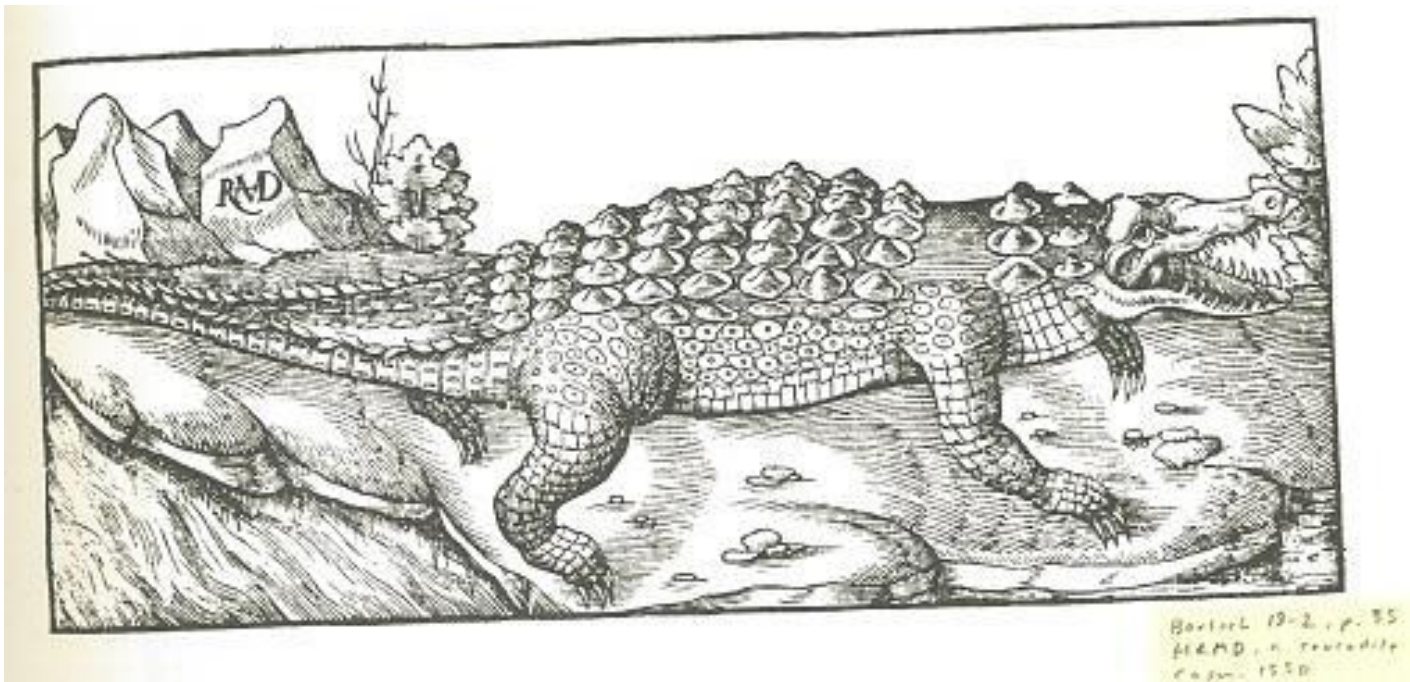
<sup>725</sup> Deutsch the Younger followed with descriptive illustrations in G. Agricola's *De re metallica*. David Kandel made his best known pieces, a set of botanical illustrations, to Hieronymus Bock's *Kreuterbuch*. Also Clausner continued with botanical illustrations collaborating with Conrad Gesner.



Image 47. [left]  
 Conrad Schnitt.  
 A crocodile.  
 4.2 x 12.0 cm.  
 From the  
*Cosmographia*  
 1544. (Source:

Hollstein XLV, 223.)

Image 48. [below] Hans Rudolf Manuel Deutsch. A crocodile. 8.0 x 17.8 cm. From the  
*Cosmographia* 1550. (Source: TIB, 19 part 2, 35).



With his new illustration team, Münster took up the job of revising the visual content of his compendium. The massive sums of money which Münster and his printer-publisher Heinrich Petri were willing to invest into the project reveals how seriously this task was taken. In 1548 Münster reveals that so far the cost of the new illustrations for the new edition was 600 guldens. In 1550 only the carving of the images would have cost 450 Guldens.<sup>726</sup> Münster's annual salary was 60 Guldens.

<sup>726</sup> BSM, epp 33, 1548 & epp.47, may 1550.



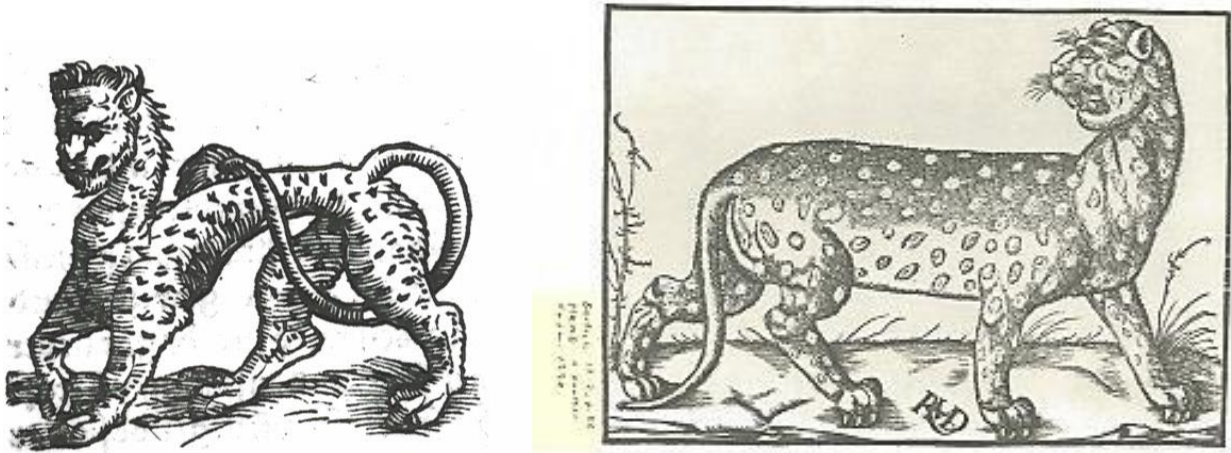


Image 49. [left] Conrad Schnitt, a panther. 4.4 x 5.4 cm. From the *Cosmographia* 1544, (Source: Hollstein XLV, 220).

Image 50. [right] Hans Rudolf Manuel Deutsch. 10.8 x 15.6 cm. From the *Cosmographia* 1550, (Source: TIB, 19, part 2, 36).

In comparison with earlier pictorial material, Münster's new illustrations were clearly stylistically more descriptive. When portraying life and living creatures, the new images avoided symbolism and sought to give an impression of faithful recording of the physical appearance of the subject. In these reformed images Conrad Schnitt's strongly stylized pictures of animals gave a way to more naturalistic portraits. For instance, a rather heraldic picture of a crocodile used in the first edition was replaced with Hans Rudolf Manuel Deutsch's more descriptive picture (images 47 & 48). Where Schnitt's old crocodile hanged up in an empty symbolical space beyond temporal and spatial limitations, Deutsch placed his crocodile in a natural landscape. Carefully rendered details of the animal emphasized the effect of observation: Schnitt's portrait represents an objective description of a real physical animal in its environment. Schnitt's old panther shared the fate of the crocodile. It also was replaced by a fleshy panther within its natural surroundings (images 49 & 50). On the title page of the first edition Münster had exclaimed: "all clarified and placed before the eyes with figures and beautiful land maps"<sup>727</sup> In the 1550 edition he repeated his promise even more emphatically: "all newly embellished with pretty figures and land maps, particularly with forty-six portraits of towns, of which thirty of the German nation made after their appearance [nach jrer gelegenheit dar zû kommē], and joined up with their descriptions."<sup>728</sup> The way in

<sup>727</sup> Münster, *Cosmographia* (1544), title page, fol.6, "Alles mit figuren vnd schönen landt taflen erklet/ vnd für augen gestelt"

<sup>728</sup> Münster, *Cosmographie* (1550), title page, "Itē vff ein neuws mit hübschen figuren vnnnd landtaflen geziert / sunderlichen aber werden dar in contrafhedet sechs vnnnd vierzig stett/ vnder welchē bey

which the visible world was represented in the first edition was not sufficient, the 1550 edition sought to present it according to its appearance.

This more serious approach to images of nature becomes most apparent in Münster's city views. These portraits of cities were, accordingly Münster, one the main reasons for the new editions of his massive compendium. "No one should ask why in this work I have set myself to take the earlier German edition further", Münster writes to the King of Sweden, Gustav Wasa in early 1550, "this is particularly to add pictures and images of towns to their descriptions."<sup>729</sup> Münster also made it clear that these city views were not just decoration or illustration, but that they sought to describe the actual appearance of their subject. Münster supplied the preface of the 1550 edition with a note on the city views emphasizing that he was aware of the origin of his portraits:

Meeting so many portraits of towns, the reader should know, that I have decided here, in my third work, to supply every town described within, with its portrait and picture of its site, adding so many of them as possible. I have tried to obtain them by letters and by third-person contacts, not only all across the Germany, but also from Italy, France, England, Poland and Denmark. What I have then reached by some dukes, bishops, states, and by some special people is, with an eternal praise for their assistance, told in this book at each place. From many places has no answer arrived at my hand. Many places have also complained that because of the painters they haven't been able to send anything. I have heard from some bigger towns that, not every painter is skilled to make a plan of a town. But this hasn't been the reason for Italian painters to refrain from sending. As it seems are Rome, Naples, Venice, Florence, Constantinople, Cairo and so forth, all properly portrayed, set into a plan, and printed in a large form in Italy. They have arrived to my hands and I have edited them to this work even if in a smaller form.<sup>730</sup>

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dressig ausz Teutscher nation nach jrer gelegenheit dar zû kommẽ /vnd von der stetten oberkeiten do hin sampt jrenn beschreibungen verordnet."

<sup>729</sup> Sebastian Münster to Gustav Wasa, January 1550, BSM, epp. 42. Ceterum nemini non patebit, quid molitus fuerim in hoc opere ultra id quod antea in Germanica editione evulgavi, civitum scilicet descriptionibus superaddendo earum picturas et icones. Sic quidem pulchrum iudicavi civitatum et locorum peculiaribus descriptionibus subiungere quoque earundem effigies et figuras, ubi eas assequi licuit.

<sup>730</sup> Münster, *Cosmographie* (1550), no pagenumbers, vorred, "So vil der stetten contrafhetzung antrifft/ soll menglich wissen/ das jch in disser meiner dritten arbeit vnderstädten hab/ einer jeden statt/ deren beschreibung in dissem büch verfasst ist / gelegenheit vnd contrafhetische pictur/ so vil möglichen/ yn zûleiben/ was ich aber erlãgt hab bei ettlichen fürsten/bischoffen/stetten/vnd ettlichen besonderen personen/ wirt in dissem büch mit ewigem lob deren so ir hilff her zû gethan an jedem ort gemeldet.

This promise of genuine city views was not an empty advertisement. Münster's correspondence demonstrates how diligently he searched for authentic portraits. In 1545, Münster wrote to Georg Norman, the secretary of Gustav Wasa asking for a description of the kingdom of Sweden. Münster also requested a portrait of the capital: "I also ask you to see that a painter or someone who understands drawing would draft out your residence and capital Stockholm on paper and that you would send the picture to me, since in the third edition [1550 edition] I intend to draw [depingere] the natural appearances [nativa sua effigie], (If I may say so) of the most significant towns of Germany and to delineate [delineare] them after a living model [ad vivumque] by the perspective."<sup>731</sup> The letter reveals Münster's visual ideals: the portraits were to be in correspondence with the real appearance of their models and most preferably completed following the mathematical method of perspective.

Means of transportation in the sixteenth century guaranteed that there was no way for Münster to supervise the making of these images himself. Therefore his "pastoral letters" were often the only way to guide the process. To the Duke of Mecklenburg Münster wrote:

Therefore, your highness I stress that, if you wish to adorn [illustrare] the region of your flourishing land, let the learned and experienced men to describe it, let your towns to be drawn in genuine pictures as faithfully as possible, let the family tree of the Dukes of the Mecklenburg (where I hear that I have erred after the Crantz) to be corrected, and send all this to me."<sup>732</sup>

Münster wished to have "picturis genuinis", genuine images, and the repeating key word in his instructions was, "ad vivum", after a living model. Sometimes Münster gave more detailed guidelines. Münster requested the towns of Cracow and Gnesen to be drawn in a "size of one

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Von manchem ort ist mir uff mein anlangen kein antwort wordenn. Es hat sich auch manch ort beklagt/ das es mir nit hat mügen zû willen werden eins geschickten malers halb. Wie ich dann auch bey ettlich grossen stetten erfaren hab/ ds nit ein jeder maler ein stat in grund legen kan. Die maler in Italia seind des halben nit ongeschickt/ wie das schein ist in Rom/ Neapels/ Venedig/ Florentz/ Constantinopel/ Alcair etc. welche alle in Italia cōtrafhedet vnd recht in grund gelegt/ in grosser form getrucktt/ vnd mir zû handen kommen seind/ wie ich sie dan auch in dis werck (aber gar klein) geordnet hab.

<sup>731</sup>Sebastian Münster to Georg Normann on 20 August 1545, BSM epp. 29. Rogo quoque, ut regiam et metropolim vestram Stockholmiam per pictorem aut pingendi gnarum in papyro excipi cures lineis mihique transmittas. Nam conor in tertia editione insigniores Germaniae urbes nativa sue effigie (ut ita dicam) depingere ad vivumque per perspectivam delineare"

<sup>732</sup> BSM epp. 49. To illustrious and excellent Prince and Gentleman, Sir Johann Albrecht, Duke of Mecklenburg, his Highness. "id quod indico tuae excellentiae, ut si illa cupiat quoque illustrari dicionem florentissimae regionis suae, faciat illam per doctos et expertos viros conscribi et figuras insignium civitatum genuine, quoad fieri potest delineari, genealogiam ducum Megalopolensium (in qua audio me non nihil post Crantzium errasse) corrigi simulque haec omnia ad me transferri."

sheet” so that the picture would represent “walls, rivers, bridges, castle, university, and most important churches”. Churches and other important building were to be indicated and named or if there was a lack of space, marked with the alphabets, A, B, C, D.<sup>733</sup>

Sometimes Münster’s requests for pictures were not met. This was the case with the king of Sweden, Gustav Wasa who was notoriously stingy. “I have written already a couple of times in order to have a picture of the authentic appearance (*genuina effigie*) of Stockholm, the primary town of the whole kingdom,” Münster wrote to Gustav Wasa, “but as I must regret, I have received nothing.”<sup>734</sup> The enthusiasm with which Münster continued to beg for images, despite setbacks, demonstrates the transformation in the role of images as arguments. Sixty years previously, Hartmann Schedel had little difficulty in using one picture to portray several cities. Münster could not accept this. He wanted a genuine picture of Stockholm. If he could not have it, there would be no picture at all. In a very fundamental way these differences in the applications of images as arguments reflect the broader transformations in metaphysics. Within the framework of traditional Aristotelian philosophy an individual being was primarily a manifestation of its substantial form. For example, each town had its own distinct accidental and material properties but in a metaphysical sense they all shared the same substantial form of being a town. From this standpoint accidental properties were not significant, and a picture of one town could portray many different towns as all these towns shared the same substantial form. Münster’s approach to images shows how accidents and material properties were becoming increasingly important. What is even more interesting in regard to Münster’s illustrations is that the friction between these two major viewpoints, substantial and accidental, is clearly visible in the differences between the editions of 1544 and 1550.

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<sup>733</sup> BSM epp. 33. to Stanislaus Laski, 6 April 1548.

<sup>734</sup> Sebastian Münster to Gustav Wasa, January 1550, BSM epp. 42. *Scripsi semel aut bis in Sueciam pro Stockholmiaie totius regni primariae urbis genuina effigie, sed, quod dolens refero, nihil impetravi.*

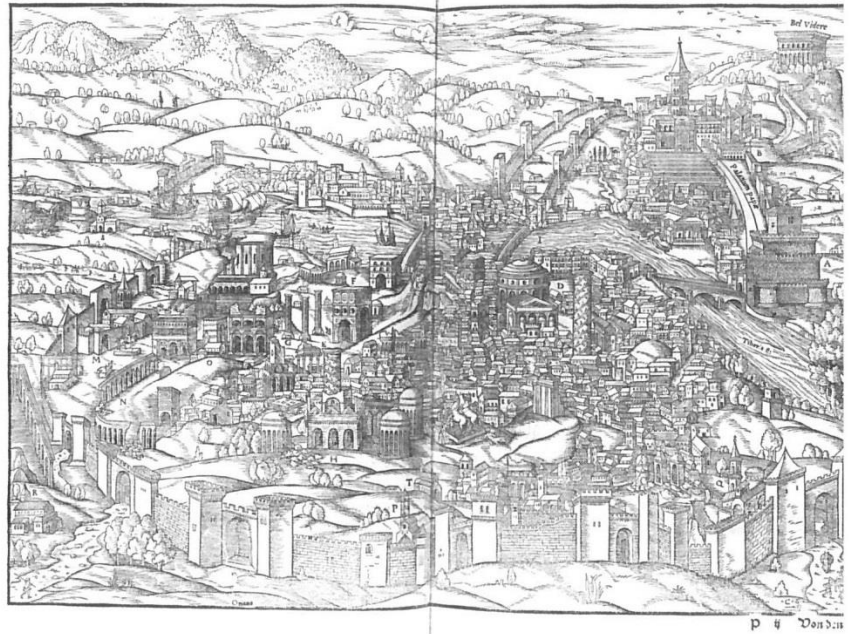
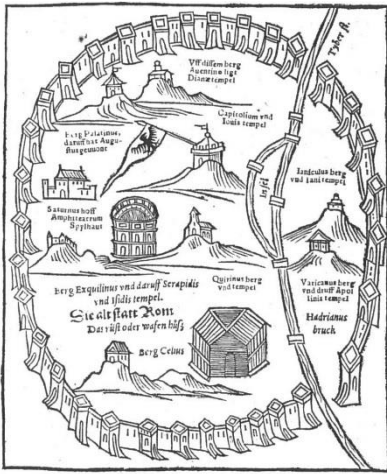


Image 51. [top left] Conrad Schnitt. Map of Rome. 15.2 x 12.8 cm. From the 1544 *Cosmographia*, (used also in the 1545 edition). (Source: Hollstein XLV, 212). ♦ Image 52. [top right] Christoph Schweitzer (cutter) after an unknown artist. A view of Rome, looking west. 23.8 x 35.0 cm. From the 1550 *Cosmographia*. (Source: Hollstein LVI, 11).

Perhaps one of the most striking examples of the changing role of images in Münster's work is the map of Rome. In the 1544 edition Münster used a plan of Rome which originally belonged to a series of 14 woodcuts which Conrad Schnitt designed for the Solinus/Mela-edition in 1538. The picture was newly cut for the *Cosmographia* with minor changes (image 51). This rather rough plan showed only the distinctive city wall and a handful of the most important places in Rome. The figures of buildings in the plan were simplified and idealized with no attempt to create an effect that the painter had really observed the physical appearance of the holy city.



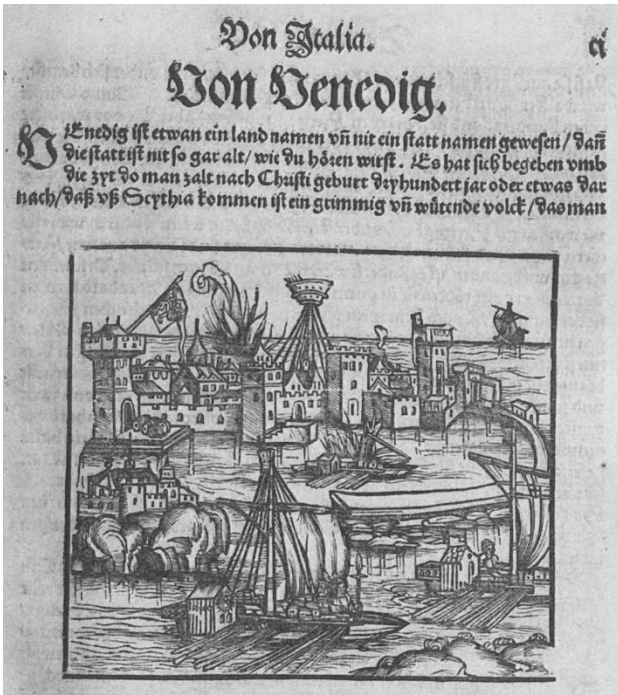


Image 53. [left] Unknown. View of Venice. From the 1544 *Cosmographia*, (fol. 212).

Image 54. [Below] Christoph Schweitzer (cutter) after an unknown artist. A view of Venice. 24.6 x 40.0 cm. From the 1550 *Cosmographia*. (Source: Hollstein LVI, 12).



In the 1550 edition Münster replaced the old plan with a more descriptive one (image 52). The new view of Rome was cut by the master CS (Christoph Schweitzer) responsible for a good number of images in the 1550 edition. The original designer of the image, most likely an Italian, is not known. The differences between the old and the new illustrations are drastic. In the new portrait the eternal city has descended from a timeless and unmeasurable space of the earlier to plan to a natural landscape. For a long time the holy city of Rome, domicile of the Holy See and the capital of Christendom, had been much more than just a physical place. It was the symbol of the Church and an object of religious devotion. Particularly for its many pilgrims Rome was not a physical but a spiritual being. It is not necessary to return to the theological discussions of the previous chapters here. It is clear, however, that Münster's new interpretation transformed the holy city from an invisible space to a visible place.

Throughout the book, illustrations of the 1550 edition witness similar changes. Decorative and symbolical images were replaced by descriptive ones. This is apparent for instance, in the views of Venice (images 53 and 54). Although the original image did not seek to represent invisible reality it served primarily a decorative function, and was not a faithful recording of existing external appearances. The small image of houses and ships of a coastal town was replaced by a cityscape which was clearly based on surveys and offered an accurate plan of the town.

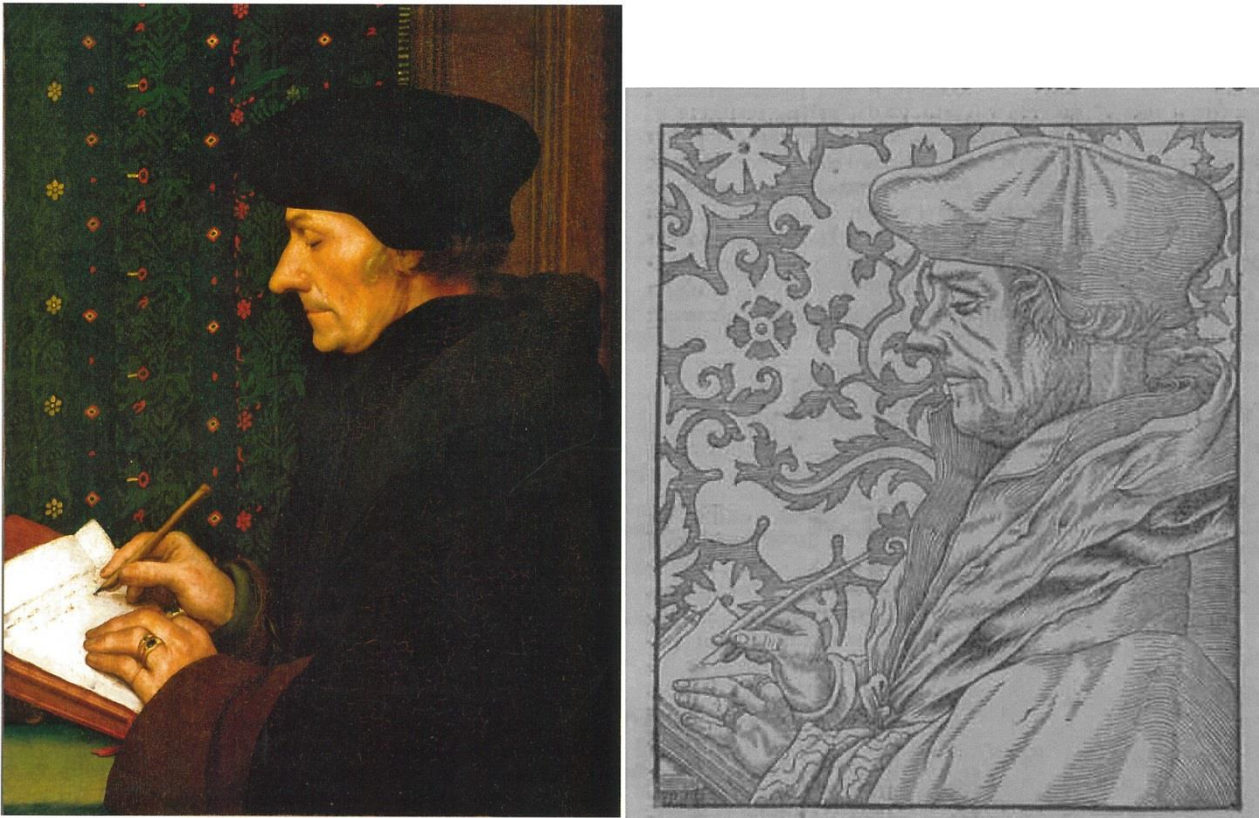


Image 55. [top left], Hans Holbein the Younger, Portrait of Erasmus, ca. 1523. 43 x 33 cm. Musée du Louvre. (Source: Jeanne Nuechterlein, 2011). Image 56. [top right]). (Hans Rudolf Manuel Deutsch?), Portrait of Erasmus. *Cosmographia* (1550), p.447.

It seems likely that the transformations that took place in the illustrations of *Cosmographia* had a connection with Holbein's objective mode of presentation, and to some extent, they took Holbein's descriptive portraits as the stylistic ideal of new descriptive images of animals and towns. Despite the profound pictorial revision which abandoned most of the old illustrations, Holbein's title page borders remained the same. At times Holbein's images were even used as direct models for new illustrations, which is the case for instance with a small portrait of Erasmus drawn by Hans Rudolf Manuel Deutsch after Holbein's original painting in 1523 (images 55 and 56). Despite the limitations of the woodcut medium Deutsch's version has preserved the impression of the original. The wrinkles on the humanist's cheeks and his fine hands are carefully drawn. The draperies of Erasmus' coat and hat seek to create an effect of observed materiality. Even Münster, who rarely mentions his painters by name, educates the reader that the image is made after Hans Holbein's original painting.<sup>735</sup> The portrait of Erasmus in the 1550 edition is as much a tribute to its original painter as to its sitter.

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<sup>735</sup>Münster, *Cosmographia* (1550 Latin edition), *Cosmographia universalis Sebastiani Münsteri* (Basileae: Petri 1550), liber III, p. 407. "SEBASTIANUS MVNsterus ad lectorem [...] Erasmi Roterodami nobis effigie[m] à nobilissimo huius temporibus pictore Johanne Holbeinio coloribus ad vivu[m] be feliciter expressam co[m]municarit, exemplum..."



These visible changes in Münster's illustrations are parallel with the broader transformation that took place in Münster's surroundings. How Lutheran iconography abandoned otherworldly and saintly features in presenting their religious leader and portrayed Luther as a fleshy man with chubby cheeks and a double chin has been discussed above (chapter VII). These visible changes were supported by Protestant theology. Because of the infinite gap between God and man the visible world could not be taken as a sign of the invisible: flesh was only flesh. However, because of God's omnipotence and his providential care for his creation, flesh as such was a demonstration of God's will and meaningful in itself. On a philosophical level Philip Melanchthon's natural philosophy sought to align with this belief by reducing Aristotelian ontology to accidents. As God was omnipotent the substantial forms of individual beings had no real causal significance. These profound philosophical changes were very gradual and people who acted as agents were often ignorant of what they did, as Nietzsche's cynical blurt on Luther puts it.<sup>736</sup> But as demonstrated, on a concrete level the new convictions could still promote a new kind of interpretation. Our champion Münster, although he never was a philosopher of any kind, could hardly be ignorant of the changes that took place under his very eyes. His illustrator painter Hans Holbein experimented with highly descriptive modes of painting and sought to transmit meanings by portraying only corporeal appearances. His draughtsman Veit Specklin cut Leonhard Fuchs' botanical images, pictures which argued the case by describing accidental properties, wrinkled leaves, pointy petals, and coarse tubers. His friend and colleague, Simon Grynaeus, hired Fuchs to the University of Tübingen and publically praised the visible world as God's theater to be observed and mathematically measured. His schoolmate Philip Melanchthon argued that fundamentally fallen man could have knowledge only by accidents. These ideas were confused and unclear, but for Münster, it had to be clear that the visible material world and its individual particular manifestations mattered.

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<sup>736</sup>Friedrich Nietzsche, *Die Fröhliche Wissenschaft* (Hamburg: Felix Meiner Verlag, 2013. (1887), 252. Was hinterdrein Alles aus seiner Reformation gewachsen ist, Gutes und Schlimmes, und heute ungefähr überrechnet werden kann, - wer wäre wohl naiv genug, Luthern um dieser Folgen willen einfach zu loben oder zu tadeln? Er ist an Allem unschuldig, er wusste nicht was er that.

# Conclusion

## *A New Approach to Geography*

By setting Münster's book in the context of the Protestant Reformation, this study has sought to examine how the major spiritual transformation of the early modern period affected Münster's study of nature and his use of images. Sebastian Münster's *Cosmographia* paved the way for a new approach in the study of geography. Combining descriptive cultural geography and history writing with mathematical Ptolemaic geography, Münster's book sought to offer the reader, for the first time, a comprehensive geographical view of the entire world. Images played a central role, in particular, in the 1550 edition, the last to come out in Münster's lifetime. Numerous maps and carefully prepared illustrations sought to record the physical appearance of the portrayed objects as faithfully as possible. The *Cosmographia* changed the role of images. Throughout the different editions, the images in the book, particularly its cityscapes, evolved from being decorative elements to arguments in their own right to functioning as testimonies of the visible world. Münster's images, maps and descriptions, even more than his texts, created an image of the world – a material world in which visible physical forms converged with their spiritual meaning.

The particular emphasis on the visible and material aspects of the world separates Münster from his late-medieval precursors. The space which Münster's book created was no longer centred on the sacred sites of Rome and Jerusalem or narrated in terms of the seven biblical world ages. Münster did not seek to illustrate invisible transcendental truths of the Bible, but focused instead on visible secular world history. However, despite the novel emphasis on the visible, it would be false to call Münster's book *secular* rather than *religious*. Münster's endeavour to create a comprehensive world description was a task driven by a religious motivation. Münster believed that studies of history and geography were the means to reveal God's providence in nature and his divine care for creation. Due to this spiritual overtone, Münster's *Cosmographia*, notwithstanding its relatively secular content, should not be taken as simply a victory of the secular over the religious in geography. In this respect it is worth noting that in Münster's day the word 'secular' was little used; and when it was, it was mostly in pejorative terms. The growing interest in visible and material aspects of the world was thus justified by using theological concepts and religious vocabulary.

Studying Münster's *Cosmographia* in the broader intellectual context of the Protestant Reformation allows for a greater awareness of Münster's indebtedness to developments in natural philosophy and of his personal contacts with people behind these developments. Münster's burgeoning interest in cosmography and geography in the 1530s was not a discrete episode but one part of a bigger chapter in the history of humanism. Alongside Münster, a number of his colleagues and other humanist scholars were increasingly fascinated by nature, mathematics, and natural philosophy. Simon Grynaeus, a Greek scholar and professor at the University of Basel, was one that stood above the others. Out of all Münster's collaborators and friends, Grynaeus had unquestionably the greatest influence on his geographical work. Grynaeus also connects Münster to the wider theological and philosophical framework of the period.

Although Grynaeus and his regrettably neglected intellectual heritage as yet begs for more research, his central role as an intellectual figure navigating between the different confessional camps of the post-Erasmian city of Basel seems unquestionable. Grynaeus, like Melanchthon, was a Greek scholar whose erudite editions of ancient authors like Plato and Euclid had been well received by fellow humanists and they had even won over the great Erasmus himself. Since the early 1520s, Grynaeus had been on friendly terms with Philip Melanchthon and, in the 1530s, he became Melanchthon's interlocutor in matters concerning education, mathematics, and natural philosophy. Between 1534 and 1535 this intellectual exchange reached a practical level as both Grynaeus and Melanchthon became involved in the reformation of the University of Tübingen. The curricular reforms introduced by these humanists speak for their unanimity in promoting the Gospel, classical languages, mathematics, and the study of nature. Grynaeus and Melanchthon shared an interest in medicine, astronomy, mathematics and natural philosophy. They opposed traditional scholastic philosophy and sought to find new evangelical and yet theologically legitimate ways to study nature. As the friend and long-time collaborator of Münster, Grynaeus thus introduced new ideas to the practical geographical works of Münster from his philosophical discussions with Melanchthon. Grynaeus not only assisted Münster in collecting maps and other source material for his geographical work, but also kept him updated on new philosophical ideas. Münster's intellectual indebtedness to Grynaeus is thus significant,

particularly in matters concerning the theological legitimation of the study of nature. Here Münster held the arguments of his friend in such high esteem, that he sometimes followed them word for word.

Although earlier research has acknowledged Grynaeus' friendship both with Melanchthon and Münster, the actual importance of the relationships in this triad has been neglected. To fully appreciate the importance of Grynaeus as an interlocutor between Münster and Melanchthon and, more broadly, between the intellectual circles of Basel and Wittenberg, sheds new light on issues brought up in the 1970s literature on the subject. Already at this time, the German historians Karl-Heinz Burmeister and Manfred Büttner saw similarities between Münster and Melanchthon's approaches to nature and geography.<sup>737</sup> Their studies rightly recognized that unlike late-medieval geographers and natural philosophers, Münster and Melanchthon were no longer interested in building bridges between transcendental truths and geographical material. The present study has expanded on these views. Both Münster and Melanchthon turned their attention to the visibly immanent in nature by emphasizing that the sanctity of creation could be perceived in the tangible and physically visible forms of nature – not in something invisible. Both Münster and Melanchthon also agreed that because every aspect of the material world was immediately dependent on divine will, material objects could be studied as proof of God's providence; thus describing a purely physical existence accurately enough could transmit spiritual meaning. Moreover, the spiritual approach shared by Münster and Melanchthon encouraged both these evangelical humanists to stress the moral value of history and geography. Because of this moral dimension, geography was not just about mathematics but, in their opinion, had to include descriptive human history as well. It is thus plausible to argue that their emphasis on a moral world history and secular geography was the result of a shared theological and philosophical framework which emphasized God's providential action in nature.

However, despite the apparent similarities between the ideas of Münster and Melanchthon, earlier scholarship has been unwilling to make a connection between Münster and Melanchthon. By being labelled as a "reformed geographer", Münster was assumed to be confessionally quite different from the "Lutheran" Melanchthon; but this assessment needs revision. The present study has reappraised the intellectual exchange between Zwinglian and Lutheran scholars in the 1530s and 1540s; for in matters concerning learning, philosophy, and nature, progressive evangelical thinkers sought allies and interlocutors beyond the

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<sup>737</sup> Büttner & Burmeister 1979; Büttner 1979 B.

confessional borders.<sup>738</sup> In fact, Melanchthon developed a number of his key ideas about natural philosophy in close correspondence with the aforementioned Simon Grynaeus, who was in fact a Basel-based intellectual from the Zwinglian camp. Notwithstanding their confessional differences, Melanchthon found in Grynaeus an equal who shared his interests in Greek texts, astronomy, and learning. Together these men sought to find a new balance between ancient philosophy, nature and evangelical theology. Through Grynaeus, Melanchthonian influences also reached Münster. When received in Basel, however, Melanchthon's ideas became common evangelical property instead of the sole property of the Lutherans. Actually, given the active role of Grynaeus as Melanchthon's interlocutor, the specifically Lutheran character of Melanchthon's own natural philosophy also needs to be reassessed. Since Melanchthon developed his views in close discourse with a reformed scholar it might be more plausible to speak of an evangelical or Protestant natural philosophy instead of a Lutheran one.

### *Theology, Images and Cosmography*

There is always a certain difficulty in explaining and describing the *Cosmographia* with the current vocabulary for religion, art and science. These concepts and practices themselves, as they are understood today, were going through a significant transformation in Münster's period. The *Cosmographia* as a typical product of its period is, to the current reader, as much a work of art as a scientific or religious work. The interpretation of Münster's work, and likewise any aspect of early modern culture, thus requires an interdisciplinary approach. As a consequence, the present account of the specific nature of Münster's "scientific" illustrations begins with a note on religious painting in the Reformation.

Traditional art history has taken the Reformation as mostly a catastrophe, associating it primarily with decreasing artistic quality in Northern painting, if not a complete disappearance of art in the Protestant areas.<sup>739</sup> Research in the past few decades, however, has

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<sup>738</sup> These observations add to early modern historians' awareness of Melanchthon's scholarly influence across the confessional boundaries. Melanchthon's educational legacy crossed religious polemics and was credited also by many of those who rejected his theological direction. See. Robert Kolb, "Philipp's Foes, but followers Nonetheless: Late Humanism among the Gnesio-Lutherans", pp .157–77 in Manfred Fleischer (ed.), *The Harvest of Humanism in Central Europe* (St Louis, Concordia Pub. House, 1992); and Karin Maag (ed.), *Melanchthon in Europe: His Work and Influence Beyond Wittenberg* (Grand Rapids: Baker Book House, 1999).

<sup>739</sup> Hamling & Williams 2007.

begun to dispel this myth; the impact of the Protestant Reformation on art was not destructive but rather something that shaped western visual culture in a significant way. One of the new thinkers advocating this view is the art historian Joseph Leo Koerner, who has persuasively explored the influences of Protestant theology on German art from Luther to German Romanticism. According to Koerner, the key theological tenet that affected German art across the board, from Lutheran church art to romantic expressions of the sublime, was the invisibility of God. In his recent work, *The Reformation of the Image*, Koerner emphasizes the importance of this notion in early Lutheran art. If God is truly invisible, there is no way He can be portrayed. However, as Luther accepted the use of religious images for didactical purposes, Lutheran painters sought painstakingly to represent their works, not as devotional images, but instead as instructional aids. Lutheran religious painting manifested its own impossibility – to imagine a divinity that cannot be portrayed.<sup>740</sup>

Koerner's observations also have an interesting parallel in Lyndal Roper's more recent views on Lutheran iconography. While Koerner has focused on the fleeting divinity in Lutheran art, Roper has seen early portraits of Luther as demonstrations of the pronouncedly 'fleshy' character of Lutheran religious images. According to Roper, Luther's portraits representing a fat mundane doctor rather than an otherworldly thin saint were a deliberate visual strategy endorsed by the reformer himself. The fleshy naturalistic images were visual expressions of Lutheran theology, which called on Christians to turn their gaze away from idealized man-made holiness to focus instead on the truth of their own human condition in the flesh.<sup>741</sup>

Koerner's and Roper's observations on Lutheran religious art are pertinent to the changes in the illustrations in Münster's *Cosmographia*. Münster's image of the world demonstrates the invisibility of God by emphasizing materiality, or this condition of the flesh. Regardless of its religious overtones, images in of the *Cosmographia* depict a world of 'flesh' in so far as they are images of a mundane, material life. Evoking the theological background of these aspects of Münster's work gives a more comprehensive view of them.

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<sup>740</sup> Koerner 2004.

<sup>741</sup> Roper 2010.

As an old Augustinian, Luther adopted Augustine's idea of infinite distance between man and God. With him this concept became one of the basic pillars of Protestant theology, having its most famous expression in Luther's claim that man could do nothing to promote his own salvation and was saved only by the faith granted by the grace of God. Luther's view was in apparent conflict with traditional Roman Catholic theology that stressed a responsibility shared between man and God, which claimed that man could be saved by faith and good works. Gradually, as Luther began to promote his own views, it became evident that the idea of infinite distance between man and God had serious consequences for the theological legitimation of several forms of medieval piety. This gap between man and God resulted in theological difficulties not just for Lutherans, but also for other Protestants who adopted similar theological views, especially when it came to miracles and other emanations between the transcendental and immanent realms. For traditional religious art, the gap was a real problem. For centuries the devotional practices of medieval religious art had been based on the idea that the worshipper of a sacred image had to transcend via the visible material image to the invisible sacred ideas behind it. However, such devotional ideas were worthless to those who adopted Luther's view that man could not reach divinity by his strength alone.

Luther's theological tenets had similar consequences for the legitimation of natural philosophy. Like the medieval theology of images, medieval natural philosophy was based on the concept that spiritual and material realities were interconnected. Influenced by Aristotelianism and Neo-Platonism, late-medieval natural philosophy and natural theology argued that the visible and invisible realms formed a hierarchical whole where the forms of the lower visible world reflected invisible spiritual ideas in the higher worlds. This cosmological model was linked to Aristotle's metaphysics that stressed the importance of the substantial forms of beings, or substances. In this model, the individual properties of beings, or so-called accidents, were dependent on the primary substantial forms, and in causal and explanatory terms secondary to substances. This metaphysical orientation indicates that late-medieval natural philosophy was not greatly interested in nature as a material phenomenon or willing to study the external qualities of individual creatures. Instead, traditional scholastic natural philosophy sought a knowledge of nature by logical operations on *certain* premises which, in practice, derived mostly from commonly accepted sources such as the texts of the fathers of the Church, Aristotle, and the Bible.

Due to the idea of infinite distance between man and God, Luther could not accept

scholastic natural philosophy. In his view, an attempt to reach God's eternal truths with human intellect was not only doomed to fail but even worse, it ruined God's message of the Gospel. In the early years of the Reformation, Luther therefore aggressively attacked the whole tradition of scholastic theology, natural philosophy, and Aristotle. Rising social unrest, the Peasants' War, and the appearance of religious radicals in the early 1520s, however, forced Luther to reassess the role of education and philosophy in Christian society. As a consequence, Luther's young advisor Philip Melanchthon was entrusted with the massive task of building the foundations for an evangelically legitimate philosophy and an education that would promote civil obedience and social peace.

Melanchthon based this new evangelical paradigm on Aristotle's moral and natural philosophies, which he adapted to fit with the spirit of Luther's theology. As a reply to Luther's demand that the Gospel was not to be diluted with human reason, Melanchthon developed a so-called Law and Gospel dichotomy in the 1520s. The Gospel was a question of faith where reason lost its mandate. But when it came to God's law, the use of reason was permitted and even suitable. According to Melanchthon, natural and moral philosophy were ways of investigating God's law. Following Luther, Melanchthon emphasized God's omnipotence. God had created all natural phenomena. Therefore God alone was the ultimate and immediate cause of all natural action. This meant that the study of nature offered an indirect way of gaining knowledge about God's will.

Developing an evangelical interpretation of natural philosophy, Melanchthon came across a conflict between traditional Aristotelian metaphysics and the theology of God's omnipotence. In the 1990s Günter Frank, a German church historian, demonstrated how Melanchthon sought to de-ontologize Aristotelian natural philosophy in order to resolve this conflict – through emphasizing accidental causality.<sup>742</sup> Since God was taken as the immediate cause of every form and action in nature, substantial forms were no longer necessary. This theoretical view revoked the need for the problematic substantial forms which seemed to diminish God's omnipotence. Although Melanchthon's natural philosophy did not completely abandon traditional hylemorphism or substances, his ideas then paved the way for philosophical positions that emphasized accidents.

Melanchthon was not the only one to operate with Aristotelian concepts and terms. Aristotelian terminology such as accidents and substances had a central role in debates on natural and moral philosophy throughout the early modern era in Europe. An example of the use of Aristotelian terminology is the case of Leonhart Fuchs recently studied by Sachiko

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<sup>742</sup> Frank 1995; Frank 1998.



Kusukawa. As a professor of botany, Leonhart Fuchs (who as pointed out in chapter IX was hired to the University of Tübingen by Simon Grynaeus) put full weight on accidents in a debate with his French colleague Sébastien de Monteux.<sup>743</sup> As one of the pioneers of morphology Fuchs sought to define species by describing their external appearances. In his work detailed pictures of the physical characteristics of plants were vital. Monteux criticized Fuchs' use of images by turning to traditional metaphysics. According to Monteux the external physical properties of plants were mere accidents that come and go and thus could not offer a basis for the reliable definition of a species. Pleading to Melanchthon, Fuchs argued that the definition of plants was a field where it was possible to define “ex accidentibus”, on the basis of accidents. For Leonhart Fuchs, accidents thus offered a way to legitimize his use of images of external physical forms as a valid part of his argumentation in botany.

As argued in chapter VII, Melanchthon's natural philosophy made space for the study of accidental external properties and for the argumentative use of images as accidental descriptions. This new framework was based on the theology of God's omnipotence – all natural properties were as they were due to God's will. Relying on accidents emphasizes the importance of materiality and the senses. Melanchthon and Grynaeus' texts on nature in the 1530s are profuse in tropes that wonder at the beauty and majesty of the external material world. Grynaeus and Melanchthon praised the world as God's theatre. For these humanists nature was a divine play that deeply moved its perceiver. Continents, countries, oceans, lakes, rivers, plants, animals and human kingdoms were all part of a visible and magnificent providential spectacle that was set to demonstrate God's law and his majesty. This philosophical emphasis on accidents sheds a new light on the shared intellectual foundations of the emerging descriptive studies of nature, demonstrated by Fuch's botany and Münster's geography.

### *The Art of Describing*

In the 1980s, in her now classic study *the Art of Describing*, Svetlana Alpers highlighted the descriptive style and cartographical elements in Dutch landscape painting and portraiture from the 16<sup>th</sup> and 17<sup>th</sup> centuries.<sup>744</sup> Unlike Italian painting from the same period, Dutch artists did not try to create windows onto other realities, but instead emphasized materiality and the here-

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<sup>743</sup> Kusukawa 1997; Kusukawa 2012.

<sup>744</sup> Alpers 1983.

and-now. Alpers argued that, by staging their paintings with mathematical instruments and maps, Dutch painters sought to establish an analogy between their highly descriptive naturalistic painting and the work of surveyors and map-makers. Just like cartographers, Dutch painters wanted to give the impression that their paintings were mere faithful records of natural realities, with nothing added. Alpers sought the philosophical roots of the “mapping impulse” in the works of Francis Bacon and argued that Dutch Calvinism was only indirectly related to the emerging Dutch descriptivism. But as Bacon’s works were only marginally known in the Netherlands at this time it seems more likely that one should be looking for the philosophical roots of descriptivism in sixteenth century natural philosophy and in figures like Grynaeus and Melanchthon.

In her recent work, *Translating Nature into Art*, a student of Alpers – the art historian Jeanne Nuechterlein – has studied Hans Holbein the Younger, the Swiss master of descriptive painting.<sup>745</sup> According to Nuechterlein, the rise of iconoclasm and the need to please the dividing religious sensitivities of customers caused by the Reformation lead Holbein to develop two very different styles of painting. Since the late 1520s Holbein started to use a strongly stylized symbolical style in his religious paintings. In his portraiture he used instead a highly descriptive and naturalistic style. In his portraits, Holbein, like his later Dutch colleagues, sought to create the impression of a faithful description of his subjects’ physical appearance. Holbein’s later portraits seek to be presented as if the artist had just recorded details of the material world without adding or omitting anything. According to Nuechterlein, Holbein’s paintings left the perceiver with an impression that the meaning of his objects would be fully convergent with their material appearance.

Taking a philosophical journey into the intellectual background of Sebastian Münster, I’m convinced that in order to understand early modern visual trends better, it is necessary to re-examine the intellectual role of Reformation theology and evangelical natural philosophy. Notwithstanding the individual confessional convictions of the painters themselves, artists who worked in the Protestant areas had to be aware of a few key theological tenets. First of all, the old notion of a traditional devotional image reaching towards the invisible divinity through material forms could not be accepted. The iconoclastic movements and the destruction of religious images were concrete expressions of this development. In these circumstances, the idea of nature as God’s providential theatre (and thus as a legitimate object for artistic activity) was very attractive, particularly when

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<sup>745</sup> Nuechterlein 2011.

expressed by a religious authority such as Melanchthon. Within such a providential framework, religious painting could continue to be camouflaged under secular themes. The prerequisite for such an activity was that the artist presented himself as a humble surveyor of God-given natural beauty.

As chapters VII and X have demonstrated, Münster's case highlights parallels between early modern descriptive painting and natural philosophy. Holbein developed his two styles in Basel in a period when Grynaeus was active in the city's intellectual circles and when Melanchthon was one of the bestselling authors in the catalogues of the city's numerous publishers. At the beginning of the 1530s, Holbein worked primarily with scientific illustrations, with Sebastian Münster as his most important collaborator. Münster took part in preparing Simon Grynaeus' travelogue-anthology *Novus Orbis*. Meanwhile, Holbein's collaboration with Münster continued intensively until Holbein's move to England in 1532. The rich astronomical and geographical symbols in Holbein's portrait of "Ambassadors" (1533) (image 27) are famous, and it is tempting to argue he was influenced by the number of astronomical and calendarical works he had recently created for Münster's books.

Holbein's descriptive illustrations remained the stylistic ideal for Münster and persisted as a model for the illustrations of the *Cosmographia*. After Holbein's departure to England Münster continued to work with Holbein's craftsman Conrad Schnitt and after Schnitt's death Münster entrusted his commissions with illustrators who followed Holbein's pure Italianate style as closely as possible. Some of these artists, such as Hans Rudolf Manuel Deutsch, continued with descriptive scientific illustrations also after Münster's death. Nevertheless, Münster missed Holbein who seems to have been his ideal illustrator.

By the end of the 1540s, Münster started to reform the compromised illustrations of the first edition of *the Cosmographia*. Without exception, his new illustrations followed the ideals of a pure descriptive style. The cityscapes of the 1550 edition of *Cosmographia* became emblematic for Münster's descriptivism. Unlike his earlier, rather uneven and mostly symbolic images, Münster wanted to have new images that were "ad vivum depictas". Münster's correspondence witnesses his detailed instructions for the appearance of towns and cities to be recorded as faithfully as possible.

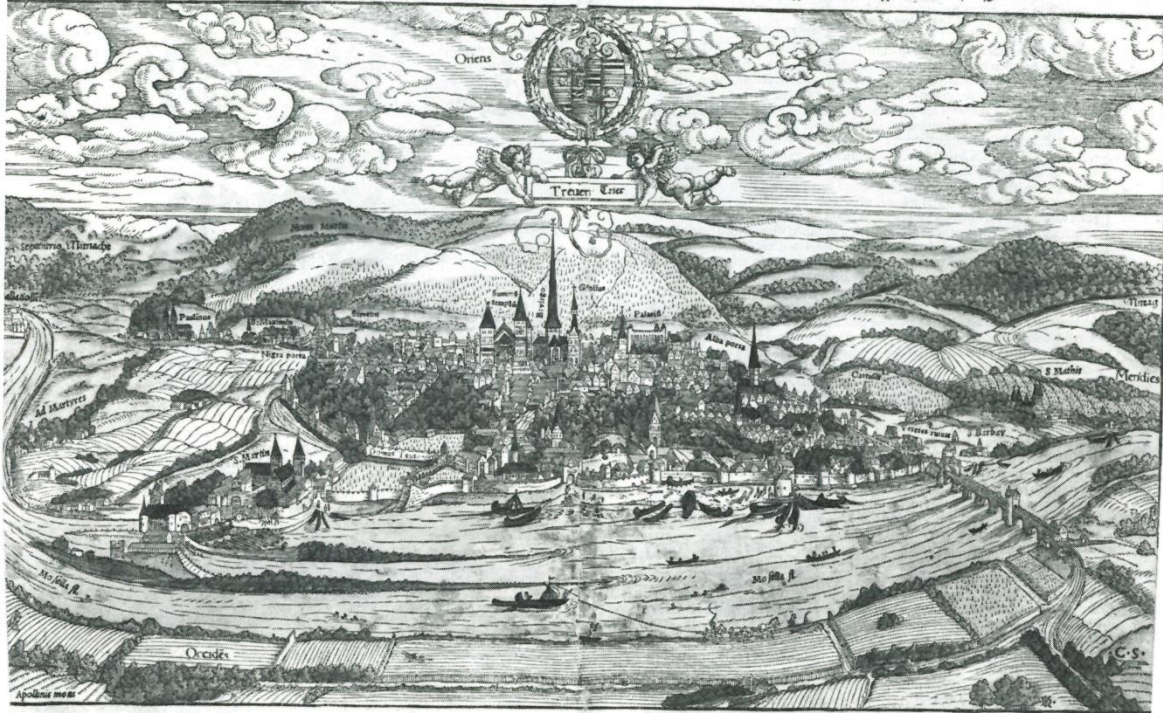
Although Münster never wrote about accidents, his illustrations emphasized the unity of material form and spiritual content in line with the providential ideals of the *Cosmographia*. Unlike some earlier chroniclers, such as Hartmann Schedel, Münster may not have believed that the human mind could reach God's invisible mysteries; but he was

convinced that God's providential theatre was set up right before human eyes. By observing an individual plant, animal, or city, man could see the majesty and wonder of God's miraculous creation.

As argued in chapter VII, Münster's *Cosmographia* should be interpreted as an attempt to record God's providential spectacle as faithfully as possible. The new evangelical approach to natural philosophy that he adopted is apparent in its emphasis on the importance of visible forms in the world and individual accidental properties of the described objects. Within this framework, images could become an important vehicle for argumentation. Münster was aware that symbolic and descriptive modes had to be separated. He preferred images that sought to create the effect of pure description and a mathematical mode of representation. Münster's images, particularly his city views, were not just decoration or illustration; his portraits of natural objects corresponded to the real appearance of their models and most preferably were completed according to the mathematical method of perspective. In Münster's images, the world descended from a timeless and unmeasurable space in the medieval chronicles into a natural landscape.

Ideas can be transmitted in words and images. Those who saw Sebastian Münster's maps and city views did not need to accept Melanchthon's de-ontologization of Aristotelian causality, Protestant theology, or even the idea of an omnipotent God governing nature. Still, in a silent way, Münster's images delivered a new perspective of the world.

Sebastian Münster and Simon Grynaeus should be seen as central figures in European Humanism. During the 1530s they can be seen in dialogue with almost every leading figure of Northern Humanism and the Reformation. The intellectual exchange of Münster, Grynaeus and Melanchthon demonstrates the vitality of the humanist debate between Tübingen, Basel and Wittenberg. It is also important to notice that, while dissent in theological ideas were emerging and leading into deepening splits between the doctrine and birth of new churches, the debate on natural philosophy remained an intellectual field where Erasmians, Lutherans and the Reformed could come together. Despite the doctrinal differences, the study of nature remained a field where dialogue was possible. But as natural philosophy remained dependent on theological concepts and terms, the transformations in theological concepts brought by the Protestant Reformation had significant implications in the way nature was studied.



Erklärung der Latinschen wörter. Mons Martis/ist Marsberg. Mons  
Apollinis/Apollis berg. Nigra porta das Schwarz ebor. Alba porta das  
Weiß ebor. Veteres ruine / die alten versallen beu. Palacium / der Pal

last. Summum exemplum / der Thüm stift. Domus Teutonicoꝝ / das  
Teitsch hauß. Beata uirgo / zu vnser frau. Ad Martyres / zu den Martereu.  
G 4 Von erliden

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