MOST EXCELLENT OF ALL THE ARTS

Adelard of Bath & Arabic Astrology

J. E. TRUITT

HAVERFORD COLLEGE CLASS OF 2017

SENIOR THESIS IN HISTORY
PROFESSOR DARIN HAYTON
21 APRIL 2017
Cover image: A well-dressed young man observes the pole star.

*Western France, mid twelfth century. Avranches, Bibliothèque municipale, MS 235, folio 32v.*

In memory of my parents, Barbara Wellbery and Max Truitt.
ACKNOWLEDGEMENTS

No single person creates knowledge. Its making is a socially embedded phenomenon. The writing of my thesis is no an exception; I owe my gratitude to many people who have helped this document into existence. Chief among them is Darin Hayton, who has mentored me from my first semester at Haverford through this moment. Darin first introduced me to the history of science, and he has been instrumental to my intellectual development and its culmination in this thesis. When I sought funding from the F. Page Newton fund to examine manuscripts in England, he advised me on the application; when I received funding, he helped me plan the trip and wrote me letters of introduction; and as my first reader, he has guided me through the thesis process. Despite his hectic schedule, he has always been available for conversation on a variety of topics. I am still struck by a kindness he showed me early in my time at Haverford. Within several weeks of arriving at the school, overwhelmed by its demands, I submitted my first college essay to him, and it was a mess. I expected a rebuke for the poor quality of my paper. Instead, when I got the essay back, I found note at the bottom: “Let’s see what we can do to help you thrive.” I owe him my heartfelt thanks.

Professor Hayton is far from the only person who has helped me in the thesis process. Paul Smith’s feedback as second reader has also been very helpful, and I thank him for the time he has taken to read my drafts. I would also like to thank Freda Coren at the Writing Center for meeting with me weekly and offering ever-helpful advice, and Brian Cuzzolina of the Office of Academic Resources for helping me manage my time as I worked on the thesis. They have all had a hand in shaping the final product.

My thesis depends upon the historical evidence and modern scholarship that I have consulted, and I am grateful to the people who have helped me access this material. At Haverford, I thank Margaret Schaus for her tireless efforts helping me track down sources, Rob Haley for getting me copies through Inter-Library Loan, and Theresa Donahue, Dawn Heckert, and Liz Romano for their support from behind the Circ Desk. My gratitude is also due to Marianne Hansen at Bryn Mawr, who uncomplainingly taught me the basics needed to work with medieval manuscripts. I would also like to thank the British Academy and editor Richard Ashdowne for making the Dictionary of Medieval Latin from British Sources freely available through the Logeion website. Their generosity has helped me through many a line of Latin.

In England, I thank those who allowed me to view early manuscripts of Adelard’s work: Chris Barker at Jesus College, Cambridge; Nicholas Robinson and the rest of the staff at the Fitzwilliam Museum, who were especially welcoming; Harriet Fisher, Joanna Snelling, and Julian Reid at Corpus Christi College, Oxford; the staff of the British Library, particularly in the Manuscripts Reading Room; and especially Bruce Barker-Benfield of the Bodleian Library, who was extremely accommodating and went above and beyond to aid me in my research. I am also grateful to these institutions for making their collections available to me, and to the donors to the F. Page Newton fund, especially Renee Hanson and Mitch Kossoff, for giving me the opportunity to travel to England to work with these documents.

I can hardly ignore the tremendous debt I owe to Charles Burnett, Adelardian of the first degree, whose decades of painstaking research on the Bathonian and his writings form a base without which I could never have hoped to write this thesis. I am of course, grateful to all Adelard scholars, but my obligations to Professor Burnett extend beyond his corpus of writings on medieval astrology. He was kind enough to meet with me and discuss my project while I was in
London, and he graciously allowed me the use of his edition of Adelard’s translation of the *Liber Prestigiorum*, which is currently in preparation. My sincerest thanks to him.

I also owe so much the friends and family who have helped me through this process. Cindy, Robin, and Alexander Truitt and Sarah and Jake Kantrowitz have been my rocks for the last several years, offering aid and encouragement at every step of the way. They are better family than I could ask for, as is my cousin Elly, whose sharp mind has inspired my interest in the Middle Ages, offered me solace in difficult times, and helped me hone my thinking. I am grateful to those of my friends who have stuck with me even though my head has been stuck in the stars for the last year, and especially to Kavita Shroff for her support. Likewise, my gratitude to the other history majors for their camaraderie, especially Mac Perkins-High, Michaela Novakovic, Amanda Ashley Jones, Abigail Corcoran, Victor Medina Del Toro, and Amanda Robiolo.

I wish the best to everyone named here in addition to the many whom I cannot name.

Any remaining errors are my own.
Abstract

Stellarly, starrily,
Adelard Bath-dweller
translated Arabic
texts on the stars.

Courtier, teacher, his
heavenly forecasting’s
quadriviality
got him quite far.

My thesis uses Adelard of Bath as a case study to understand the factors that led dozens of scholars in the twelfth- and thirteenth-century Latin West to seek out and translate Arabic works on the science of the stars, including texts on celestial divination and astral magic of a type previously unavailable to Latin Christians. I look to Adelard’s institutional and cultural contexts to explain his endeavor. The sophisticated horoscopic techniques offered by Arabic texts aided Adelard in building a reputation for masterful erudition and deploying it to his social advantage. Horoscopic practices allowed Adelard to create certain knowledge about a wide range of topics and in a manner that implied he possessed masterful erudition. Celestial divination and astral magic therefore constituted an important tool for advancing Adelard’s social standing in the competitive contexts of classroom and court Adelard inhabited. As a teacher specializing in the often under-studied quadrivium, the four mathematical liberal arts, Adelard could deploy horoscopic techniques to assert the relevance of his subject and to display his pedagogical prowess in the agonistic environment of twelfth-century education. As a courtier vying for favor, the Bathonian could use celestial divination and astral magic to offer monarchs, nobles, and other political actors a range of useful justifications, prognostications, and interventions that met the criteria for certain knowledge and were grounded in the authority of the learned quadrivium. These applications of the horoscopic techniques Adelard had drawn from Arabic sources aided the Bathonian in securing the patronage that was crucial to his livelihood and social standing. Celestial divination and astral magic thus represented answers to specific questions facing Adelard and his peers, questions that were historically contingent, grounded in the society and culture of the Bathonian’s particular time and place. They show that the translations produced by Adelard and other Latin scholars of the twelfth century resulted not from an indiscriminate desire for knowledge, the mere availability of the texts, or some general epistemological osmosis, but from the specific needs and desires of human beings embedded in specific social structures, and they bespeak the fruitfulness of considering not only the texts but also the contexts of the people who made natural knowledge in the Middle Ages.
CONTENTS

Acknowledgements ..................................................................................................................... i
Abstract ...................................................................................................................................... iii
Contents ..................................................................................................................................... iv
List of Images .......................................................................................................................... v
Abbreviations ........................................................................................................................... vi

INTRODUCING ADELARD ........................................................................................................ 1
Adelard’s Life and Times .......................................................................................................... 6
The Science of the Stars in the Latin West .............................................................................. 7
Defining the Questions ........................................................................................................... 9
Overview of Evidence ............................................................................................................. 11
Plan of the Thesis .................................................................................................................. 14

ADELARD PHILOSOPHER: Celestial Divination as Natural Knowledge ........................................ 18
Creating Natural Knowledge in the Twelfth Century ............................................................... 19
The Prestige of Natures and Causes ...................................................................................... 22
Celestial Divination as Causal Natural Knowledge .................................................................. 23

ADELARD TEACHER: Demonstrating Quadrivial Excellence .................................................. 30
Pedagogy in the Twelfth Century .......................................................................................... 31
Promoting the Quadrivium ..................................................................................................... 34
Constructing Expertise ........................................................................................................... 39
   Proof by Prediction .............................................................................................................. 39
   The Prestige of Arabic Learning ......................................................................................... 41

ADELARD COURTIER: Deploying the Science of the Stars for Political Ends ............................. 45
Adelard at the Anglo-Norman Court ...................................................................................... 48
The Persuasiveness of horoscopy ......................................................................................... 50

BEYOND THE BATHONIAN .................................................................................................... 58

BIBLIOGRAPHY ....................................................................................................................... 61
Unpublished Primary Sources ............................................................................................... 61
Published Primary Sources ................................................................................................. 61
Secondary Sources ............................................................................................................... 62
LIST OF IMAGES

Figure 1—Drawing of an astrolabe rete.
Worcester, 1120–1140. Oxford, Bodleian Library, MS Auctarium F. 1. 9, f. 75v..................1

Figure 2—Diagram of the four elements and four qualities.
Ely, late twelfth century. London, BL, Arundel MS 377, f.111v........................................18

Figure 3—Annus-Mundus-Homo diagram.
England, late twelfth century. London, BL, Sloane MS 2030, f. 94v.......................................28

Figure 4—A student of the quadrivium uses geometry to measure the height of a distant object.
West France, mid-twelfth-century. Avranches, Bibliothèque municipal, MS 235, f. 33v.............30

Figure 5—A well-dressed young man observes the pole star.
West France, mid-twelfth-century. Avranches, Bibliothèque municipal, MS 235, f. 32v.............45

Figure 6—Horoscope treating the death of Count Geoffre of Anjou, circa September 1151.
Horoscope F. England, circa 1151. London, BL, Royal MS Appendix 85, f. 2r.............................52

Figure 7—Transcription of Horoscope F with the twelve places labeled in red..........................53
ABBREVIATIONS


BL.......................... British Library.


DED ...................... Adelard of Bath, De eodem et diverso, ed. and trans. in Conversations.


QN ......................... Adelard of Bath, Questiones naturales, ed. and trans. in Conversations.

INTRODUCING ADELARD

Figure 1—Drawing of an astrolabe rete. The triangular pointers indicate the locations of prominent stars; the smaller circle represents the ecliptic, the apparent path of the sun over the course of a year. *Worcester, 1120–1140. Oxford, Bodleian Library, MS Auctarium F. i. 9, f. 75v.*

In his 1125 *Deeds of the English Kings*, William of Malmesbury digressed from his larger historical narrative to offer a brief but vivid biography of Sylvester II, the pope reputed to have consorted with the devil. William painted a scandalous picture of Sylvester, better known by the name of Gerbert d’Aurillac. In William’s account, Gerbert fled his monastery as a young man and journeyed to al-Andalus, the region of Spain under Muslim rule, in search of the Arabic science of the stars. There, among Saracens who were, according to the *Deeds*, “eager students of divination and incantations, in keeping with the well-known custom of their race,” Gerbert outstripped Ptolemy in knowledge of the astrolabe, Alhandreus in that of the relative positions of the stars, and Julius Firmicus in that of fate. There he learned what the songs and flights of birds portend; there he learned how to summon faint figures from hell; there he learned, in short, each thing human curiosity has discovered, whether harmful or healthful. Indeed, nothing needs to be said about
the licit arts, arithmetic, music, the science of the stars, geometry, which he drank up in such a way as to show them less than his intellect, and he brought back to Gaul arts that had long been entirely forgotten there [such as the abacus, the mechanical clock, and the hydraulic organ].

Gerbert’s learning did not stop there. When the Muslim philosopher teaching him refused to share his most advanced book, the renegade monk seduced the instructor’s daughter; with her help, Gerbert stole the volume and fled. When his teacher pursued, Gerbert used his new knowledge to summon the devil, whom he offered to worship in exchange for protection. Upon his return to France, Gerbert rose quickly through the church hierarchy and soon attained the papacy; according to William, he owed his rapid promotion not only to his own ambition but also to the diabolical assistance he had secured during his Andalusian studies. Gerbert found other ways to deploy his Arabic learning for personal gain. He used his knowledge of necromancy to enrich himself by finding treasure buried by pagans, and with his skills in the science of the stars he crafted a metal head that would answer any yes-or-no question truthfully. But the head deceived its maker. Gerbert asked it whether he would die before saying mass in Jerusalem, and the head told him that he would not. Yet Gerbert forgot that there was a church in Rome nicknamed Jerusalem, and shortly after celebrating the mass there he became gravely ill. Gerbert’s last wish was that his body be dismembered in repentance for his diabolical pact.

While not a historically accurate account of Gerbert d’Aurillac’s life, *The Deeds of the English Kings* gives us what seems like a fairly typical picture of Christian attitudes towards Muslims.
and astrology in the western edge of Eurasia during the High Middle Ages. William’s account of Gerbert emphasizes the demoniacal practices of Muslims, the erasure of the boundary between licit and illicit knowledge in the Islamic world, and the dangers of seeking foreknowledge from the stars. Many other works popular in the twelfth-century Latin West echo the themes found in *The Deeds.* However, one of the Malmesbury monk’s contemporaries contradicts these first impressions of twelfth-century attitudes towards Muslims and astral science.

Adelard of Bath’s historical life paralleled that of the fictionalized biography Gerbert. Like William’s Gerbert, Adelard left France and travelled to Arabophone regions, though where Gerbert set out for Toledo, Adelard journeyed to Sicily and the Middle East in search of “Arabic studies”. Like Gerbert, Adelard was very learned in the four arts of the quadrivium and wrote treatises on the Arabic technologies of the abacus and the astrolabe. And, again like Gerbert, Adelard was a master of the Islamic world’s astral science; the Bathonian scholar translated several Arabic treatises on celestial divination and talismanic astral magic. And yet, where William’s Gerbert is a figure of scandal and ambition, one who transgresses the boundaries of the socially and religiously acceptable and pays the price, Adelard expected this knowledge to help establish his reputation as a learned man, an expectation that proved accurate. Why did Adelard undertake long and difficult voyages to acquire Arabic texts on the science of the stars if he risked being accused of consorting with demons? How did he attempt to defuse such concerns when presenting what he had learned from the Islamic world? What did he hope to do with Arabic knowledge, and whom did he hope to impress?

---

Questions about the motives behind translating Arabic texts into the Latin and the means of making them acceptable do not apply to Adelard alone. The Bathonian was not an outlier; he was typical of growing movement among western Christian scholars who sought out Arabic scientific works and translated them into Latin. In the twelfth and thirteenth centuries, dozens of scholars traveled to newly conquered areas of Muslim Spain to produce Latin renderings of texts on mathematics, astral science, optics, zoology, logic, and natural magic. And yet, like Adelard’s career, the translation movement is marked by contradictions. A long and robust tradition of anti-Islamic sentiment was current in the Christian parts of Western Europe; William of Malmesbury was hardly the only author to paint Islamic civilization as one involving demons, divination, magic, and heresy. How could Latin scholars claim that the knowledge they translated from Arabic texts was legitimate, when, in Christian accounts, the licit and illicit were so thoroughly mixed in the Islamic world? The early translators did not make this task any easier for themselves, for at its beginning the translation movement focused on texts of celestial divination, what we today would call astrology. This focus is surprising, because influential Christian writers had long condemned celestial divination on religious grounds. Authors of no less stature than Church Father Saint Augustine and encyclopedist Isidore of Seville, leading lights of the early Church whose opinions were hugely significant in the later Middle Ages, had denounced the practice of attempting to learn the future from the stars. According to these men, astrological determinism denied God’s gift of free will, and any successful predictions were the work of demons that tricked the gullible and thereby gained power over them. Set against Latin distrust of

---


Islam and celestial divination, the vigorous investigation of Arabic sidereal prognostication constitutes a paradox, and the motives of the Latin translators cry out for examination. The early dates of Adelard’s life make him a useful window onto these motives, for he was one of the first people in the Latin West to go seeking Arabic texts.

When we turn to Adelard’s writings, we find that he saw the Arabic and divinatory nature of the material he translated as unproblematic—in fact, he saw it as useful. The Bathonian openly praised celestial divination as the acme of the study of the stars; he touted the Arabic origins of his knowledge as a point in his favor; and the reasons lie in Adelard’s specific cultural and institutional context. The study of the natural world is a human activity, and efforts to understand this activity must begin with and focus on the people engaged in it.

To comprehend the reasons for the Bathonian’s attitude towards Arabic astral science and his decision to translate it, we must consider not only what Adelard wrote but also who Adelard was—a philosopher, teacher, and courtier in early-twelfth-century Anglo-Norman England. The science of the stars that Adelard translated from Arabic texts advanced his goals in each of those areas. To Adelard’s philosophy, Arabic astral science brought a powerful system that explained the causes of a wide variety of phenomena in a manner consistent with the Bathonian’s Neoplatonic worldview. In his teaching it endowed him with rare quadrivial learning that offered an advantage in the competitive world of twelfth-century pedagogy. To the skills he might offer a courtly patron it added a useful tool

---

6 DED, 68–69; QN, 90–91.
7 Andrew Cunningham, “Getting the Game Right: Some Plain Words on the Identity and Invention of Science,” Studies in History and Philosophy of Science 19, no. 3 (1988): 370–373. Cunningham’s words are worth producing here: “Science is not a material object. It is a human activity. It therefore deserves the history appropriate to a human activity. That history will be centrally about people, about people engaged (or not) in that activity, about how and why they started that activity for themselves to engage in, about how they pursued, changed or abandoned that activity over time, about how their pursuit of that activity affected the way they pursued other activities.” See also William Eamon’s concern with the interplay of the locus and content of knowledge production. “Court, Academy and Printing House: Patronage and Scientific Careers in Late Renaissance Italy,” in Patronage and Institutions. Science, Technology and Medicine at the European Court, ed. Bruce T. Moran (Woodbridge, Suffolk: Boydell Press, 1991), 25–50.
likely to win the gratitude and favor of political actors. And, far from hindering him, in all of these areas the Arabic origins of Adelard’s knowledge acted as a boon. Far from being the demonic work of a heretical people, Adelard understood—and expected his peers to understand—Arabic astral science as a way to advance larger projects grounded in the culture of the Medieval Latin West. In short, the sophisticated techniques of celestial divination offered by Arabic texts aided Adelard in building a reputation for masterful erudition and in deploying it to his social advantage.

**ADELARD’S LIFE AND TIMES**

Adelard lived during a political, economic, and cultural flowering of Latin Christendom known as the twelfth-century renaissance. It was during this century that Christian Western Europe, long the object of invasions by Vikings and the Islamic Empire, began to expand its boundaries, taking back parts of Spain and launching the first Crusades to the Holy Land. The Latin West was marked by new economic prosperity. Besides the translation movement, non-monastic schools were rapidly gaining in numbers and prestige, and within several decades of the Bathonian’s death pedagogues had banded together to form the first universities.

Details of Adelard’s biography are hard to come by, but his writings and a few pieces of outside documentation have allowed scholars to sketch a picture of a teacher and courtier who took part in the broader changes sweeping the Latin West. The Bathonian was likely born in Bath circa 1080, only a generation after the Norman Conquest. His writings tell us that, like many Anglo-Norman nobles, he travelled to France and studied at the schools of Tours and Laon, both major centers of learning. Adelard soon left France behind, departing on trips to for-

---


eign lands in search of Arabic knowledge. During this time he visited the Norman principalities of Sicily and Antioch, where he seems to have been during an earthquake in 1114. It is not clear who financed Adelard’s trips, but several scholars have proposed the bishop of Bath, a physician named John of Villula (also known as John of Tours). At some point during or after his travels, Adelard translated a number of Arabic scientific texts into Latin. While Adelard clearly had some command of Arabic, it is unclear whether could read it; Charles Burnett has put forward a strong case that Adelard’s translations took place orally, with someone else reading the Arabic aloud while the Bathonian wrote down a Latin version.\textsuperscript{10} Upon his return to England, Adelard was probably based in Bath.\textsuperscript{11} He likely made his living by instructing the children of the nobility in the liberal arts, the seven disciplines that constituted a genteel education in the Latin West. He was also active in courtly circles, for he reported playing music before a queen of France, received favor from Henry I of England, and dedicated his treatise on the astrolabe to a young Duke Henry of Normandy (later Henry II of England). This last fact also suggests that in the period of unrest and conflict following Henry I’s death in 1135 and his nephew Stephen’s seizure of the throne, Adelard’s sympathies lay with Duke Henry’s mother Empress Matilda, and it is likely that during the 1140s he spent time in Normandy as young Henry’s tutor.\textsuperscript{12}

\textbf{THE SCIENCE OF THE STARS IN THE LATIN WEST}

Although twenty-first century residents of the United States and Western Europe tend to see astronomy and astrology as distinct enterprises, the two activities were much more closely


\textsuperscript{12} Burnett, epilogue to \textit{The First English Scientist}, by Cochrane, 162.
linked in the Middle Ages, and the people engaged in them often thought of celestial mechanics, celestial divination, and astral magic as belonging to the same endeavors. By the end of the twelfth century, most learned people in the Latin West regarded the study of the stars to foretell or alter earthly events as a legitimate science. When discussing the Middle Ages and early modern period, it is more useful to think of a single “science of the stars” or “astral science” (astronomia in Latin) that encompassed both types of activity. To be sure, divisions of this single astral science existed, and medieval writers in the Latin West distinguished between observation and divination. Nevertheless, any distinction tended to be fluid, and the modern categories of astronomy and astrology impose too neat a dichotomy upon this ever-shifting landscape to give insight into the past.¹³

There are many ways to derive meaning from the behavior of the heavens, but mathematical horoscopy, the particular tradition of celestial divination and astral magic with which Adelard engaged, depends upon the positions of the seven planets (the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn). From these one could make predictions about natural matters like the weather, animal behavior, or human health, or even about human institutions. Horoscopy had its roots in Greco-Roman antiquity; a number of late-classical authors wrote on horoscopy, most famous among them Ptolemy. Arabic-speaking scholars enthusiastically took up this tradition in the ninth through eleventh centuries, elaborating on both celestial mechanics and ideas of astral influence. In the Latin West, on the other hand, worries about astrological fatalism, free will, and superstition led early Church Fathers like St. Augustine of Hippo or Isidore of Seville to condemn prognostication from the stars along with most other sorts of magic and divination. Even if someone in the Latin West wanted to learn horoscopy, they would be hard

---

pressed to find the means to practice it in the early Middle Ages. Few classical texts on the subject survived; the only ones to enjoy any circulation were Firmicus Maternus’s *Mathesis* and Marcus Manilius’s *Astronomica*. Moreover, before the tenth century, the science of the stars in the Latin West lacked the necessary mathematical techniques for planetary horoscopy. In this period astral science seldom got more sophisticated than observing the rising and setting times of stars to determine the times of nightly prayers and predicting the vernal new moon to set the date of Easter. Adelard and his peers offer something completely unheard of in the Latin West when they translated Arabic mathematical techniques for predicting eclipses and precisely determining the positions of the planets at any given time.

**Defining the Questions**

Throughout my thesis, but especially in sections two and three, I argue that reputation and competition were key considerations driving Adelard’s decisions to study Arabic astral science. As a non-monastic scholar in the early twelfth century, Adelard would have depended on patronage for a great extent of his livelihood, and patronage, whether it took the form of courtly sponsorship or pedagogical fees, depended on his name being widely known. In my focus on Adelard’s social situation and its influence on his works, I diverge from the majority of previous scholarship on the Bathonian, which has concerned itself with establishing the facts of Adelard’s role in transmitting Arabic learning to the Latin West and with producing critical editions of his writings. Scholarly work of this sort is of great and unquestionable importance, and were it not

---


16 For a recent exception, see Max Lejbowicz, “Adélard de Bath ou les sortilèges de la nouveauté,” in *Die mantischen Künste und die Epistemologie prognostischer Wissenschaften im Mittelalter*, ed. Alexander Fidora and Katrin Bauer, Beihefte
for the efforts of Charles Burnett, the leading authority on Adelard and editor of at least five of his works, it would have been impossible for me to even dream of writing this thesis. Yet the questions that animate me differ from those driving Professor Burnett and most who have treated Adelard.

I have modeled my inquiries on a slightly different vein of scholarship on medieval science, one represented by the works of Roger French and Andrew Cunningham on natural philosophy; Sophie Page on magic; and Michael A. Ryan, Laura Ackerman Smoller, and Roger French on the science of the stars. These scholars pose questions that go beyond the content and provenance of texts to focus on the human beings who composed, copied, and made meaning out of the artifacts that have come down to us. French and Cunningham seek out the historically contingent questions that the thirteenth-century invention of the discipline of natural philosophy answered. Page investigates whether a community of Benedictine monks could turn to magical texts and still be seen as devout Christians, and presses readers to consider what the answer implies about contemporary beliefs about magic and religion. Ryan, Smoller, and French ask what the problems a Spanish monarch, a French cardinal, or an English nobleman hoped to solve by engaging with celestial divination. These questions are precisely the sort I seek to answer in my

zum Archiv für Kulturgeschichte, Heft 74 (Köln: Böhlau Verlag, 2013), 73–100. Like this thesis, Lejbowicz’s article considers Adelard’s reasons for traveling a great distance for Arabic knowledge, particularly astrology. However, Lejbowicz’s work focuses on Adelard’s connections to medical practice and on the relationship of his philosophy to celestial divination, and pays less attention to Adelard’s pedagogical and courtly contexts.

17 I am grateful to Professor Burnett not only for the excellent scholarship he has produced but also for the generosity he has shown me in meeting with me to discuss my project, offering me access to his institution’s library, and allowing me to consult a yet-unfinished edition of Adelard’s Liber Prestigiorum that he is working on.

study of Adelard. My conclusions are, as the Bathonian would put it, sometimes more probable than necessary; I cannot always construct an unbroken chain of deductive statements proving my findings. Yet I have taken care that my arguments are plausible and likely, and these criteria were sufficient for Adelard even in a century when most scholars were drunk on dialectic.19

**Overview of Evidence**

To answer these questions I draw primarily on Adelard’s writings and supplement them with discussions of science of the stars from contemporary English sources. Adelard’s works fall into two main categories, his original compositions and his translations from Arabic. The original works comprise treatises on philosophy, natural philosophy, the abacus, the astrolabe, and the care of hawks. Adelard likely wrote these texts to impress his patrons. Most feature a letter of dedication to a prominent bishop or noble; all employ a polished, literary Latin prose that shows off the Bathonian’s erudition and wit; and none demand excessive mental labor from the reader. Together they constitute something of a basic introduction to the seven liberal arts central to the education of the young noblemen Adelard likely taught.20 These texts give us an opportunity to gain insight into the intellectual and social background that informed the Bathonian’s translation of Arabic works. They also provide a glimpse of Adelard’s self-construction. The Bathonian is a highly present textual presence in most of his original compositions, whether he appears as a character involved in a dialogue or as the referent of a frequent authorial “I,” and in both forms he is prone to autobiographical allusions. In works that Adelard hoped would appeal to benefactors, the Bathonian’s self-portraits highlight what about himself he thought would con-

---

19 QN, 102–103. For the twelfth-century’s obsession with dialectic, see French and Cunningham, *The Friars’ Natural Philosophy*, 56–57.

20 Burnett, “Adelard and the Arabs,” 92–93. Hawking was not among the liberal arts, but was a popular pastime among the nobility whose children Adelard taught.
vince his readers to support him. I take advantage of this revealing self-construction to deduce the system of the values that gave meaning to Adelard’s engagement with Arabic horoscopic practices.

Adelard’s translations from Arabic, which lie at the heart of my thesis, are a stark contrast to his original compositions. Where his compositions shine with literary effort and anticipate a wide readership, his translations are in a rough Latin that follows the Arabic text closely, and they seem intended for a smaller specialist audience.21 We do not find Adelard’s authorial voice in them, nor did the Bathonian accompany them with prologues or letters of dedication. The works offer the basis for advanced study in the quadrivium, the four liberal arts central to mathematical education in the Latin West. The Bathonian is best known for producing the first Latin version of Euclid’s Elements, an important text in geometry, but I focus on Adelard’s other five translations, all of which deal with horoscopic practice. After the Elements, Adelard’s most famous work is his translation of the Planetary Tables (Ezich Elkauresmi) written by ninth-century Muslim scholar Muḥammad ibn Mūsā al-Khwārizmī, who lived in what is today Uzbekistan. This work allows its reader to precisely calculate the position of any of the seven planets at an arbitrary time. Such feats of astral science were previously impossible in the Latin West, and Adelard’s translation of this work points to the powerful new techniques that he gained by translating Arabic texts. Though often characterized as a work of astronomy, the Tables are very much concerned with celestial divination; they contain procedures for finding the boundaries of the astrological places and the angles between the planets, something useful only in the casting of a horo-

---

21 Burnett, “Adelard and the Arabs,” 94. We have the original Arabic text of only one of the works Adelard translated, the TM, where Adelard stuck close to his source text without omitting or adding anything. Since I have no better evidence to go on, I assume that he followed the same procedure in his other translations, excepting the Centiloquium, which he seems to have only gotten halfway through. Adelard of Bath and Pseudo-Ptolemy, Centiloquium i–39, London, BL, Sloane MS 2030, ff. 87r–87v.
scope. It is likely that Adelard acquired this text and the others he translated from Petrus Alfonsi, converted Spanish Jew trained in Arabic science who was active in England during Adelard’s lifetime. Alfonsi had offered to teach the science of the stars to Latin scholars, and he himself attempted a translation of the Planetary Tables.\footnote{Petrus Alfonsi, Epistola ad peripateticos, edited and translated in John Victor Tolan, Petrus Alfonsi and His Medieval Readers (Gainesville: University Press of Florida, 1993), 164, 172; O. Neugebauer, The Astronomical Tables of Al-Khwārizmī. Translation with Commentaries of the Latin Version, supplemented by Corpus Christi College MS 283 (Kobenhavn: Munksgaard, 1962); Burnett, “Adelard and the Arabs,” 105–106.}

Adelard’s remaining four translations deal with interpretation and use of such planetary charts. These texts comprise the Lesser Introduction to the Science of the Stars (Ysagoge minor in astronomiam, henceforth Lesser Introduction) of ninth-century Iraqi scholar Abū Maʿshar, a reference work listing the properties of the planets and signs and defining various astrological terms; the Centiloquium erroneously attributed Ptolemy throughout the Middle Ages, a list of 100 short aphorisms for professional astrologers of which Adelard translated the first thirty-nine; the Book of Talismans according to Ptolemy and Hermes (Liber prestigiorum Thebidis secundum Ptolomeum et Hermetem, henceforth Book of Talismans) of ninth-century Mesopotamian scholar Thābit ibn Qurra, which provides instructions for constructing talismans at astrologically propitious times; and one particular version of the Book of Images of the Seven Planets from the knowledge of Abel the Just, Son of Adam, First Father of the Sciences (Liber de imaginibus planetarum septom ex scientia Abel iusti filii Ade primi patris scientiarum) attributed to the mythical Hermes Trismegistus, which also provides instructions for making talismans and which scholars have argued was translated by Adelard.\footnote{Complete Dictionary of Scientific Biography, Charles Scribner’s Sons, 2008, s.vv. “Al-Khwārizmī, Abū Ja’far Muhammad Ibn Müsā,” “Abū Maʿshar Al-Balkhi, Ja’far Ibn Muhammad,” “Thābit Ibn Qurra, Al-Ṣābiʿ Al-Ḥarrānī”; Vittoria Perrone Compagni, “Studiosus incantationibus: Adelardo di Bath, Ermete e Thabit,” Giornale Critico Della Filosofia Italiana 21, no. 1 (2001): 36–61.} Together these texts constitute a thorough introduction to horoscopic practice. Taken with the Planetary Tables, they indicate that Adelard practiced celestial divination and astral magic.
Adelard’s works were conceived, circulated, and preserved in parchment manuscripts, and this format allows us insight into their use and reception that would otherwise be unavailable. Every surviving copy of the Bathonian’s works represents a historical actor’s judgement that, for some reason, the text was worth the investment of copying; the codices in which Adelard’s writings survive offer evidence of those reasons. The materiality of the manuscripts is informative; some of copies of Adelard’s works are in sizable letters on the pages of heavy books larger than a person’s head, while others were written in codices small enough to fit in the palm of a hand. Such physical differences can give us an idea of how the text’s owner might have used the book; for example, larger codices might have been studied by a group of people, while smaller ones lent themselves to private reading. Co-occurrence is another major piece of evidence. A medieval text seldom had a whole book to itself; it was customary for a single codex to contain multiple texts. Sometimes these texts were all copied by the same person at about the same time with the intention of being placed together; sometimes they were gathered from a variety of sources and bound into the same book; and sometimes the financial situation of the owner or the physical dimensions of the book did more to determine collocation than anything about the texts themselves. Nevertheless, more so than a printed book or pamphlet, medieval texts come to us embedded in an intellectual context, and I have attempted to take advantage of this context when considering my source material.

**Plan of the Thesis**

Section one establishes that the horoscopic techniques Adelard of Bath encountered in Arabic texts were compatible with the intellectual traditions of the Latin West and that celestial divination constituted a form of natural knowledge; sections two and three explore the social context in which the Bathonian deployed that knowledge. Section one lays out the intellectual back-
ground for Adelard’s translation of Arabic astral science and establishes that celestial divination and astral magic from the Islamic World offered prestigious causal knowledge about the created world. In the twelfth-century Latin West, such causal knowledge, cast within a cosmological system of four elements and reached through the deployment of deductive logic, carried great prestige. The celestial divination and astral magic that Adelard learned from Arabic texts constituted natural knowledge in that it depended on knowledge of natures cast within the same system of four elements, entailed the same kind of logic, and was inherently interested in the causes of terrestrial phenomena. Adelard’s engagement with Arabic astral science formed part of his larger philosophical investigations and demonstrated his masterful knowledge of the created world.

Sections two and three examine the advantages that horoscopy offered Adelard in his institutional contexts of classroom and court. Fierce competition marked both milieus, and both required Adelard to convince patrons—whether students or monarchs—that he could offer them better things than his rivals could. The celestial divination and astral magic that Adelard learned from Arabic texts constituted a powerful tool of persuasion that aided him in this goal; by translating works of horoscopy Adelard was able to advance his social standing. In the classroom, prognostication attested to Adelard’s mastery of the liberal arts of arithmetic, geometry, and astral science, important qualifications for a teacher. In the court, it allowed him to offer his patrons predictions backed by significant learning and expertise, an ability whose political utility likely helped Adelard earn his benefactor’s favor. Horoscopic celestial divination and astral magic, available only from Arabic texts, lent the Bathonian knowledge he could deploy to his social advantage.

Section two considers Adelard through the lens of twelfth-century pedagogy. Arabic astral science played an important role in the Bathonian’s self-construction as a gifted teacher by marking him as a man who had skill in the liberal arts that few others could boast. Moreover,
though the Bathonian was learned in many fields, he specialized in mathematical disciplines of the quadrivium. These quantitative subjects were understudied in the Latin West, and Adelard would have had less success attracting students through the mathematical teachings in which he excelled than through the linguistic arts of the trivium, where his skills, while impressive, were less exceptional. Because horoscopic celestial divination and astral magic depended upon mastery of mathematics and allowed their practitioner unusual knowledge of a variety of earthly phenomena, they demonstrated that the quantitative subjects in which Adelard specialized were worth studying. By allowing the Bathonian to show that he had a thorough understanding of the liberal arts unavailable elsewhere, Arabic astral science helped him earn the students and reputation key to success as a pedagogue.

Finally, section three investigates the ways that celestial divination and astral magic allowed Adelard to gain courtly favor. The Bathonian enjoyed royal patronage, and horoscopy likely numbered among the tools he deployed to earn it. Learned interpretation of the heavens could provide monarchs and barons with well-justified accounts of the future that met their political needs. The mathematical and deductive procedures on which the construction and interpretation of a horoscope depended lent such prognostications the authority of the learned quadrivium and allowed them to satisfy the twelfth century’s standards for certain knowledge. Adelard’s ability to offer predictions backed by such persuasive expertise likely gave the Bathonian an edge over competing forecasters and played a role in earning him the favor that the historical record shows he enjoyed. Sophisticated horoscopic techniques of the sort Adelard found in Arabic texts were virtually unknown in the Latin West; the astral science of the Islamic World furnished the Bathonian with the means to advance his standing in the court.

Taken together, these three facets of Adelard’s identity allow us to understand what his engagement with Arabic texts meant to him as a socially embedded human being and suggest the
importance of a history of science driven by a focus on historical actors rather than abstract ideas.
Adelard’s engagement with Arabic astral science allowed him to cast horoscopes, and he had good reason to do so, for a claim to foreknowledge from the stars would have demonstrated that he possessed intimate and prestigious knowledge of the physical world. Adelard’s works indicate that in twelfth-century England there was cachet attached to causal knowledge of the created world. Such knowledge consisted of understanding the causes and natures of physical phenomena through deductive logic and the system of four elements. The ability to prognosticate from the stars constituted just such natural knowledge. The possibility of planetary divination depended on the interconnection between the upper and lower worlds, but to work out the terrestrial effects of celestial movements required deep familiarity with both the heavens and the
Horoscopic practices thus gave Adelard a learned system for understanding the role of astral influence in the causation of natural phenomena.

**Creating Natural Knowledge in the Twelfth Century**

“Let me come up with something that you cannot explain.” This is the challenge the character of Adelard’s nephew issues to the persona of Adelard at the beginning of the *Questions on Natures*. The *Questions*, a fictitious dialogue on the workings of the physical world, exemplify many features of natural knowledge in the twelfth century and demonstrate the prestige that it carried. In particular, the *Questions* show us that natural knowledge comprised an understanding of causes and natures framed within a system of the four elements and reached by means of logical deduction. Natural knowledge that met these characteristics earned its possessors a good reputation and distinguished them from the *vulgus*, the common rabble.

Written between 1107 and 1133, the *Questions on Natures* are aimed at a wide audience and commanded a wide readership in the twelfth century. The goal of the interlocutors in the *Questions* is to understand the workings of the physical world through philosophy, i.e., learned study. Such understanding consisted of knowledge of the natures (*natura*) and causes (*causa*) of things in the physical world. The prefatory list of questions that serves as a table of contents reveals the central place of causes to inquiry into the natural world; most of the questions start with some version of the word “why” (*quaer, qua ratione, ut quid, cur*). Moreover, the heading “this is how the causes of things work” (*sic faciunt cause rerum*), which follows the list of questions but precedes the actual dialog, indicates that causes are at the heart of the text’s subject matter. The title of the work attests to the importance of natures in natural knowledge. To understand the natural world...

---

24 Max Lejbowicz reached a similar conclusion independently. “Sortilèges de la nouveauté,” 88–90.
25 *QN*, 84–89.
was to comprehend the nature of a thing, its essential character, and to grasp the cause behind it, the reason it behaved as it did. These goals usually coincided to some degree; when the nephew presses Adelard for the reason some animals chew their cud and others do not, Adelard identifies the different natures of different species as the cause of the variety in their behavior. Thus, we see that natural knowledge in twelfth-century England consisted of understanding causes and natures.

Adelard created natural knowledge by means of learned intellectual tools; the Bathonian deployed logic and the system of four elements. Adelard’s use of logic to create natural knowledge is evident in one of several arguments that his persona puts forward to prove that the planets have souls (*anime*). The character of Adelard begins by citing Aristotle’s statement that movement can only come from nature, force, or will (*natura, vis, voluntas*). The Bathonian goes on to disprove the first two options, leaving only the option that the planets move by will, and if they have a will they must have souls.

Whatever moves by nature either moves upwards, like fire, or downwards, like earth. The stars do not move in this way; so they do not move by nature. They do not move by force. For what greater force can there be? So they do not move by force. They must move spontaneously, then, and voluntarily. But if they move spontaneously, then it follows that they also move by the soul’s movement. . . . If sometimes they move but at other times stand still, and when the move, they sometimes move forwards and at other times turn back, then they are moved by no nature. For what is done nature does not stop or turn back. It remains, then, that they move either by force or by will. In the nature of things no force is more irresistible than the revolution of the body of the *aplanos* [the daily east-to-west rotation of the heavens that causes the sun to set and rise]. But they are not moved by that; for they are roused into a motion contrary to that [i.e., each night they are farther west]. So they are moved by will.

---

27 QN, 104–105.

Adelard conclusion that the planets are ensouled constitutes a piece of natural knowledge, and its creation through logic strongly calls to mind a syllogism, in that it deduces its conclusion from given premises. The Bathonian’s deployment of logic reflects the high prestige placed on that art during the twelfth century, especially among cathedral schools like the one Adelard likely taught at.\textsuperscript{29} Thus, the increasingly esteemed tool of logic was important in the creation of natural knowledge.

The \textit{Questions on Natures} also employ the theory of the four elements, another prominent intellectual tool. Like most learned people in his day, Adelard understood the world through a system of four elements and four qualities inherited from classical antiquity and passed along by Christian authors such as Isidore of Seville.\textsuperscript{30} All physical things were composed of a mixture of fire, air, water, and earth. These elements were in turn composed of mixtures of the four qualities; fire was hot and dry, air hot and wet, water cold and wet, earth cold and dry. The elements and the mixture of qualities that made them up were also involved in the turning of the seasons and the workings of the human body. The system of four humors that dominated medical thinking drew on a similar system as well; blood was hot and wet (air), yellow bile hot and dry (fire), black bile cold and dry (earth), and phlegm cold and wet (water). The elements and qualities provided a powerful framework that allowed philosophers to explain a range of disparate phenomena. Winter produced an excess of phlegm because both were cold and wet; earth fell and fire rose because they sought to occupy their natural place in the universe. Adelard drew extensively

\begin{flushleft}
\textit{ut aut vi aut voluntate moveantur. Vis autem in rerum natura nulla molestior est quam applanetici corporis conversio. Atqui ab illo non moventur; contra illud enim citantur. Voluntate itaque moveantur. Quid inde sequitur, vides." Translation by Charles Burnett. QN, 220–221.}
\end{flushleft}

\textsuperscript{29} French and Cunningham, \textit{The Friars’ Natural Philosophy}, 56–57.

\textsuperscript{30} Edward Grant, \textit{A History of Natural Philosophy: From the Ancient World to the Nineteenth Century} (New York: Cambridge University Press, 2007), 101. For an excellent explanation of how thoroughly ideas about the qualities permeated medieval thought, see Nancy G. Siraisi, \textit{Medieval & Early Renaissance Medicine: An Introduction to Knowledge and Practice} (Chicago: University of Chicago Press, 1990), 101–104.
on elemental theory in the *Questions on Natures*. Smell, taste, and touch operated by the sensing the mixture of elements. The wetter and colder natures of women explained their menstruation, their ability to pass on sexually transmitted diseases without being affected by them, and their supposedly lustful characters. Thus, understanding of natures took place within the learned framework of the four elements, which, cutting-edge logical techniques was used to create knowledge of the physical world.

**THE PRESTIGE OF NATURES AND CAUSES**

The *Questions on Natures* construct natural knowledge as a prestigious form of knowledge. Adelard and his nephew frequently draw contrasts between the opinions they put forward, which are informed by logic and the system of four elements and those of the *vulgus*, the common crowd. This Latin word could carry either a status meaning (commoners as opposed to nobility) or a more general sense of “the undistinguished majority” of any group. Both interlocutors in the *Questions* cast aspersions on the opinions of the *vulgus*. At one point the persona of Adelard tells his nephew, “If you follow the crowd, you stumble upon a precipice. For while they understand the natures of things wrongly, they dream; while they discuss the same natures crookedly, they snore.” This attitude conveys that the opinions of the common people are worthless. They “stumble,” “understand badly,” “talk crookedly”; they sleep, unconscious of the truth around them. The assertion of the ignorance of the common people serves two purposes, establishing hierarchy both between and within classes. On the one hand, it reinforces the superiority of the learned nobility, who have true understanding, over the ignorant commoners. On the

---

32 DMLBS, s.v. vulgus.
other hand, it endows with cultural capital those within the nobility who have knowledge of causes and natures. Adelard’s assertions attest to the prestige that came of being able to explain causes and natures by means of logic and the four elements.

**Celestial Divination as Causal Natural Knowledge**

The *Questions on Natures* have shown us that natural knowledge rooted in logic and the four elements carried great prestige in twelfth-century England. Adelard’s own writings and several works he translated indicate that celestial divination constituted exactly this sort of natural knowledge. To understand the effects of the planets upon the earth, one had to understand the natures both of the planets and of lower things, a form of natural knowledge. Moreover, Adelard had to understand each well enough to grasp the ways in which they would interact. Thus, if Adelard used the texts he translated to successfully prognosticate, he would have established himself as intimately familiar with the workings of the physical world, and this natural knowledge would have strengthened the reputation that Adelard’s livelihood depended on.

The horoscopic celestial divination exemplified by the works Adelard translated was centrally concerned with movements of the seven planets (the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn) across the sky and with tying their positions to specific times and places. These were the *stellae planetae*, the wandering stars. Their positions change with respect to the fixed stars (*stellae fixae*) from night to night, whose positions relative to each other do not change. The planets do not end up just anywhere in the sky, however; they stick closely to a line across the heavens called the *ecliptic* or *zodiac*. The science of the stars divided the 360 degrees of the ecliptic circle into twelve *signs*, thirty-degree sections of the zodiac defined by the position of the sun on the ecliptic at the equinoxes and solstices. The picture of the cosmos described so far was
The prognosticatory tools found in authors like Ptolemy, Abū Ma’shar, and Firmicus Maternus went beyond celestial mechanics to assign various properties to the signs and planets. The signs each received an associated element, a gender, a part of the body and region of the earth they are associated with, and several other attributes, such as a level of fecundity. The planets also received elemental qualities and genders. The power of planets’ effects was thought to vary with their location on the ecliptic, and their positions relative to each other could further strengthen or weaken them. Finally, the celestial data were localized to a particular time and place by dividing the ecliptic into twelve places or houses according to its relationship to the observer’s horizon and meridian at the relevant moment. The ninth place, for example, ends at the most southerly point on the ecliptic and relates to journeys; the planets in that position will therefore be more significant in questions about travel.

Adelard’s celestial divination constituted natural knowledge, for prognostication rested upon a thorough understanding of the upper and lower worlds. This is evident in Adelard’s earliest work, On the Same and the Different. In this text, Adelard described astronomia as explaining the movements of the heavens to intelligentes; thus, it is an art only for those with understanding. Moreover, Adelard described the connection between the upper and lower worlds that made prognostication possible in terms of natures and causes. Someone who has become intimately acquainted (privatam facere) with astronomia would be able to predict the state of the lower world, because the planets, “those higher and divine animalia are the principle and causes of lower na-

---

34 For a brief but practical overview of the cosmological picture, see Hilary M. Carey, Courting Disaster: Astrology at the English Court and University in the Later Middle Ages (New York: St. Martin’s Press, 1992), 7–8.
The planets were the causes of lower natures. Studying the connection between low and high, then, involved peering into the workings of the physical world, investigating causes and natures using reason and the four elements. Prediction, in short, required natural knowledge. Moreover, that knowledge had to pertain to both upper and lower worlds, as we see in Adelard’s translations of the *Lesser Introduction* and the *Centiloquium*. The *Lesser Introduction* makes clear the necessity of knowledge of celestial natures, the *Centiloquium* emphasizes the importance of terrestrial natures, and the codex they are bound in shows that both earthly and heavenly natures were understood within the framework of the four elements.

The *Lesser Introduction* claims that natures are crucial to celestial divination and astral magic. The work begins with the assertion that anyone . . . who closely examines the wondrous effects of the heavenly bodies on the perceptible universe (since, after all, similarities to higher forms appear upon this lower world in some natural way and indicate foreknowledge of things to come) can hardly reach success without knowledge . . . of their natures, nor less those of the signs.

Knowledge of higher natures was necessary to prognostication; without it, one would be unable to understand the connection between upper and lower worlds. Because knowledge of natures constituted natural knowledge, the ability to predict would have entailed the possession of natural knowledge, which in turn lent its knower prestige.

Celestial divination also demanded knowledge of lower natures, as we can see from Adelard’s translation of the pseudo-Ptolemaic *Centiloquium*. Composed by a Muslim astrologer but attributed to Ptolemy throughout the medieval world, the *Centiloquium* is a short text of a hundred

---


36 “Quicumque . . . ammirabiles celestium in universitate sensili perscrutatur effectus (similitudinibus quippe super[i]orum formarum supra mundum hanc inferioris naturali quodam modo apparentibus rerumque futurum prernocionem portententibus) haut quamquam id absque noticia . . . consequetur . . . corundem [i.e., planetarum] natura nec minus et signorum.” Translation my own. *IM*, 1.2–1.3.
aphorisms that provide guidelines for astrologers. Adelard’s translation survives in no more than three copies, and consists of only the first thirty-nine of the eponymous hundred sayings. One of these immediately follows the *Lesser Introduction* in Sloane MS 2030 and is my primary source for the text. The *Centiloquium* stresses that prognostication depended on knowledge of lower natures, the kind of natural knowledge one found in the *Questions on Natures*. Its reader is instructed to “weigh the natures of the root [of a matter] . . . before undertaking to judge the outcome” and told that “a powerful astrologer [will be able to] remove many effects of the stars when he or she is learned in the efficacious nature of that thing.”

The *Lesser Introduction* operates within the same intellectual framework of four elements that the *Questions on Nature* do, describing the natures of celestial objects with the four element system. The text assigns each sign of the zodiac an element and the associated bodily humor; each planet is described in terms of the four qualities of hot, dry, cold, and wet.

Thus, Cancer’s nature is cold, wet, watery, and phlegmatic, and Taurus’s is cold, dry, earthy, and of black bile. Jupiter is of a hot and moist nature and airy; Mars is hot, dry, fiery, and choleric. The natural knowledge needed for prognostication, then, was the same four-element-based knowledge that Adelard praised in the *Questions on Natures*.

The early reception of the *Lesser Introduction* confirms the importance of the four elements to readers of the text. The only complete twelfth-century manuscript of the *Lesser Introduction* in Adelard’s translation survives in a rather battered booklet sewn into a larger, later, and more ornate codex. The texts in this smaller booklet, all in the same hand, are devoted to celestial divi-

---


38 For the signs, see *IM* 1.11, 1.17, 1.23, 1.28, 1.35, 1.41, 1.47, 1.53, 1.59, 1.65, 1.72, 1.78, 1.86–89; for the planets, see 5.4, 5.8, 5.11, 5.15, 5.20, 5.24, 5.28.

39 For Cancer, see *IM* 1.27; for Taurus, 1.17; for Jupiter, 5.8; for Mars, 5.11.
A diagram that would have been on the back cover of the booklet before it was sewn into the codex (figure 3) attests to the importance of the intellectual system of the four elements to those involved in celestial divination. The chart is an example of the homo-annus-mundus cosmological diagrams common throughout the Middle Ages. These illustrations provide a visual summary of the interlinking relationships between the four elements, humors, qualities, and directions. The diagram in the Sloane manuscript comprises a central circle surrounded by five concentric rings crisscrossed by a dozen arcs in red ink that pass through or near the diagram’s center. The center circle contains a cross surrounded by the word homo, human. Around this are rings containing the names of the four humors, directions, elements, states of things (status rerum, i.e., hot, dry, cold, and wet), and causes of things (cause rerum, i.e., hotness, dryness, coldness, and wetness). The names of the elements, states, and causes sit on arcs in red ink that pass through the center of the diagram and divide it into sections, thereby articulating the relationships between them. The small booklet sewn into Sloane MS 2030 is entirely concerned with divinatory astral science; the diagram on the its back reminds us that the object’s contents, including the works translated by Adelard, predicated their prognostication upon an accepted, learned cosmology.

---

40 London, BL, Sloane MS 2030. The smaller booklet contains Messahalla’s Liber de receptionibus; an Introducto-rium ad astrologiam necnon de interrogationibus, de electionibus horarum, et de significatone temporis libri attributed to a Zehel; Astronomiae Marciani et liber judiciorum in astra; Adelard’s translations of the YM and Centiloquium; and a version of the Liber Alchandrei. All of these texts pertain to celestial divination.
The works of celestial divination that Adelard translated from Arabic and the claims of foreknowledge they allowed him to make would have implied that he had a thorough knowledge of the workings of the physical world. Medieval people in both the Islamic world and the Latin
West predicated the possibility of forecasting from the stars on a belief in the interconnection between the lower and upper worlds. The planets, as Adelard said at one point, were the causes of terrestrial affairs. By predicting the future from the planets, by linking the heavenly cause and the earthly effect, Adelard would have demonstrated intimate knowledge of the workings of the natural world and established himself as a man of the highest learning. Because they allowed him to make claims to foreknowledge grounded in a learned worldview, works of Arabic astral science would have bolstered the reputation that Adelard depended on for his livelihood as a teacher and courtier.
Adelard inhabited the competitive world of twelfth-century pedagogy, where one’s abilities in the seven liberal arts did much to determine one’s success as a teacher. Arabic horoscopic texts gave Adelard an edge over rival pedagogues by allowing him to demonstrate both the relevance of the four mathematical arts of the quadrivium and his mastery of them. The mathematical arts of the quadrivium drew fewer students than the language-based trivium. Adelard worked to assert the importance of the quadrivium and especially of the science of the stars. Celestial divination and astral magic constituted a powerful tool in this endeavor, for it not only offered to create certain knowledge about a variety of topics but also offered itself to highly visible validation. Advancing the status of the quadrivium would have proven a great boon to Adelard, for he had an unusual amount of expertise in the mathematical arts. Horoscopic techniques helped
Adelard demonstrate that expertise through their mathematical sophistication, and their Arabic origins added to the impression that few others in the Latin West could offer the knowledge the Bathonian could. Thus, Arabic celestial divination and astral science played a key role in Adelard’s self-construction as a skilled teacher of rare and important parts of the liberal arts, and this self-presentation in turn was crucial to the Bathonian’s attempts to draw students and the prestige that came with them.

**Pedagogy in the Twelfth Century**

While we have few details about Adelard’s life, it is clear that he was a teacher. Adelard’s own writings suggest that he had a following of students, for in the *Questions on Natures* he mentions parting ways with his nephew and other students (*auditores*) near Laon.41 Other sources are yet more fruitful. A treatise written by one Ocreatus and dedicated to Adelard refers to the Bathonian as “a friend but also a master and teacher.”42 Also persuasive is classroom banter fossilized in Adelard’s translation of Euclid’s *Elements*, including such comments as “Goodbye, Reginerus; whoever does not know how to reply to you should give you a white cow.”43 These comments likely started as marginal glosses and were inserted into the main text as it was copied; in Charles Burnett’s words, they are redolent of “the chalk-dust . . . of the school-room.”44 Together, these fragments of evidence of Adelard’s life paint a convincing picture of him as a teacher.

---

41 “Meministi, nepos, septennio iam transacto, cum te in Gallicis studiis pene puerum iuxta Laudisdununm una cum ceteris auditoribus meis dimiserim . . . ,” *QN* 90. While it is possible that *auditoribus* here simply means “audience,” it can also carry a meaning closer to “disciple,” which seems more likely here. *DMLBS*, s.v. “auditor.”


43 Burnett, “Adelard and the Arabs,” 94.

Adelard’s pedagogy doubtless focused on the curriculum of the seven liberal arts. This tradition, inherited from Classical Antiquity, formed the foundation for education in the Latin West for much of the Middle Ages. The seven arts were split into two subcategories. The trivium comprised the three language-focused disciplines of grammar, rhetoric, and logic (also known as dialectic or disputation). These disciplines were seen as the easier of the seven arts, and students were expected to master them before moving on to the four mathematical arts of the quadrivium. The quadrivium comprised arithmetic, music, geometry, and *astronomia*, the science of the stars. It received comparatively less study than the trivium, for it was regarded as more difficult and less rewarding.

Adelard needed to know the liberal arts especially well, because fierce competition marked pedagogy in Western Europe prior to emergence of universities in the last quarter of the twelfth century. Early medieval education had taken place mostly in a monastic context, but in the mid eleventh century urban cathedral schools began to earn prominence and prestige, and Adelard likely taught in such an institution. These schools sought to educate administrators for service in the bureaucracies of bishops and monarchs. The education they offered was based in the seven liberal arts. Attending a cathedral school could greatly benefit a young man’s career, and enrollment boomed. By 1115, however, attendance had surpassed the number of choice jobs available. The institutions were marked by fierce competition not only among students, who strove to catch their master’s attention, but also among teachers, who sought to attract more students and the money and prestige that came with them. A master did so by demonstrating his learning in the liberal arts and making a name for himself; a teacher’s reputation did much to determine a school’s success or failure. The agonistic nature of the schools is evidenced by the popularity of an adversarial form of knowledge-making, logical disputation (*dialecticus*). Disputation was framed as a competition; one side won the debate, and the other lost it. The ability to
out-reason an opponent was the mark of a good teacher, and skill in disputation could launch teaching careers. Moreover, disputation demonstrates the competition between disciplines sparked by cathedral schools. Masters like Peter Abelard began using logical disputation to take up points of Church doctrine that had previously been reserved for meditative contemplation by theologians. The dialecticians’ application of their new techniques to doctrinal problems drew them many followers but also earned them the ire of establishment theologians.\footnote{For the developments detailed in this paragraph, see Stephen C. Ferruolo, \textit{The Origins of the University: The Schools of Paris and Their Critics, 1100–1215} (Stanford: Stanford University Press, 1985), 93–96; French and Cunningham, \textit{The Friars’ Natural Philosophy}, 54–59; and French, “Foretelling the Future,” 453, 461.}

Much of the scholarship on education in the first half of the twelfth century has focused on France, and particularly on Paris and the teachers associated with its schools. Little attention has been paid to cathedral schools in England, likely because they did not produce scholars of the same fame during this period. Nonetheless, we can tell that Adelard was part of this larger educational movement based on one of his original works, the \textit{Questions on Natures}, which serves to advertise Adelard’s skill as a teacher. The \textit{Questions} demonstrate the adversarial nature of knowledge-making, for Adelard and his nephew engage in disputation, a contest of wits, each trying to demonstrate intellectual ability by proving the other wrong. The Bathonian painted himself as skilled dialectician here, for the character of Adelard always comes out ahead in these exchanges. Because dialectic was one of the most esteemed liberal arts in the twelfth century, the historical Adelard was therefore presenting himself as a teacher par excellence, one who might be able to teach the reader to emulate him. Moreover, the text presents the debate as unfolding in real time; the reader gets the impression that Adelard produces his clear and logical explanations extemporaneously in response his nephew’s objections. The Bathonian’s responses are couched in elegant, polished Latin prose full of puns and classical allusions, demonstrating Adelard’s eru-
dition as well as his mastery of the other two arts of the trivium, grammar and rhetoric. The ability to speak spontaneously in high Latin was another desirable skill in which pupils might hope to imitate him; it indicated that he knew his grammar very well. This self-presentation was calculated to earn him a reputation as a skilled teacher and attract him students.

**PROMOTING THE QUADRIVIUM**

The *Questions on Natures* may have shown Adelard’s skill in the trivium, but his true prowess lay in the quadrivium, the four mathematical arts. These were not studied as much, for they demanded greater effort and offered fewer rewards. Most students of the liberal arts confined themselves to the language-based arts of the quadrivium, which were the most valuable in a later career. The science of the stars, which required skill in the other quadrivial disciplines, was likely the most neglected. In the early twelfth century, however, Adelard and other scholars in England’s West Country began working to assert the relevance of the quadrivium and especially of the science of the stars. These men sought visible proofs of the quadrivium’s importance to other areas. Horoscopic practices, which Adelard and his peers argued were part of the liberal art of *astronomia*, provided exactly the conspicuous demonstration of quadrivial relevance that they needed, and their success is evident from contemporary writers like William of Malmesbury who accepted celestial divination as the result of quadrivial learning. Besides the Bathonian, the

---

46 Ferruolo, 93–94. Adelard himself wrote that most who sat at the table of philosophy dined on the trivial dishes but ignored the quadrivial ones. “Cum inter nonnulla fercula philosophicae mensae apposita nobis dextrorum solitaris discumbentibus proximi convivae de parte secunda tripliciter sumerent, et me de quadrifida lance pauci or tuo instillante omnia fastidires, quippe quae ab alius seposita et hactenus intemptata tibi videres, Pitagoricum antidotum ante praelibasti.” Adelard of Bath, *Regulae abaci*, quoted in Burnett, “Adelard and the Arabs,” 93.

47 The early-twelfth-century interest in astral science in the West Country is an interesting historical phenomenon that deserves fuller examination and explanation. Roger French has suggested that the region’s proximity to Wales and thus to the Celtic Church, which calculated the date of Easter by different means, may have added a pressure to demonstrate the superiority of the Latin Church’s computistics. He has also suggested that a large Jewish community in the area may have made advanced Arabic astral science more easily available, though there is only evidence for this community from the late twelfth century onward. Nevertheless, further investigation is needed. Roger French, “Foretelling the Future,” 463–65.
notable members of this group were Petrus Alfonsi and Walcher of Malvern; Robert the Lotharingian, a late-eleventh-century bishop of Hereford, is also sometimes counted among their number. The work of all four appears together in a manuscript written at Worcester between 1120 and 1140. These scholars, especially Alfonsi and Adelard, the most prolific, argued for the importance of the science of the stars among the liberal arts. Celestial divination had always had some place in the science of the stars, but the surviving evidence suggests that it occupied a relatively marginal area and lacked mathematical sophistication. Adelard and his peers worked to give celestial divination a more prominent role within quadrivial *astronomia*. Petrus Alfonsi was especially key in this effort. A Jewish convert to Christianity and physician to Henry I of England, Alfonsi grew up in the northern-Spanish town of Huesca, part of Muslim al-Andalus until 1096, and there he received an education in the Arabic sciences. After migrating farther east to France, that Alfonsi joined the competitive world of pedagogy, where he touted his Arabic learning in the hopes of attracting students. In a letter addressed to the Peripatetics of France, Alfonsi extolled the benefits of the science of the stars, but claimed that in the Latin West the study of it languished because of an overzealous focus on disputation. He then attempted to show that astral science deserved a more prominent place, largely by extolling the usefulness and nobility of the science of the stars and implying that those who avoided it were intellectual lazy.

More convincing than Alfonsi’s praise for *astronomia*, however, were visible and concrete proofs of the relevance of the science of the stars. Walcher of Malvern’s research on eclipses constituted such a proof. Walcher wrote two treatises involving eclipses, the *Lunar Tables*, which al-

---

48 McCluskey, *Astronomies and Cultures in Early Medieval Europe*, 145–49. Adelard, Alfonsi, and several other early-twelveth-century texts stress the central place of the science of the stars among the liberal arts and the importance of celestial divination within astral science. My impression from secondary literature like McCluskey is that these prominences were relatively new developments.


allows for the calculation of the moon’s position and lunar eclipses, and *Statements on the Dragon*, which claims to give Petrus Alfonsi’s teachings for predicting eclipses of both sun and moon. Eclipses carried potent symbolic meaning in the Middle Ages. Early Christians had battled widespread pagan beliefs that lunar eclipses represented the theft of the moon by demons and that pagan rituals were required get it back, and there is evidence the interpretation of the event was still contested in the eleventh century. In twelfth-century England, unusual celestial phenomena could constitute a divine portent.\(^{51}\) Walcher’s ability to announce the coming of these portentous events in advance would have constituted a compelling demonstration of astral science’s power. Moreover, his works meant that the new Arabic-influenced science of the stars now had a say in the interpretation of eclipses. When John of Worcester, a monk and chronicler writing in the 1130s, recounted the sudden darkening of the daytime sky that occurred on the day Henry I left England’s shore for the last time, he drew on Walcher’s work to explain its significance. John saw this unusual event as a divine portent, something outside the natural order, but he was aware that some people held the opinion that it was an eclipse of the sun and therefore part of the normal activity of nature. John defended his interpretation of the darkness by quoting *Statements on the Dragon* to prove that, given the positions of the sun and moon, a solar eclipse could not have taken place.\(^{52}\) Those learned in the science of the stars could now apply their expertise to a wider variety of phenomena, giving them more opportunities to impress potential patrons and students.

---

\(^{51}\) Flint, *The Rise of Magic*, 99–101, 150. John of Worcester, a chronicler contemporary to Adelard, was fond of recording unusual events in the sky and interpreting them as portents; Anne E. Lawrence-Mathers, “John of Worcester and the Science of History,” *Journal of Medieval History* 39, no. 3 (September 1, 2013): 255–74. Likewise, an anonymous English cleric wrote in 1133 that a solar eclipse had terrified the peasantry, but that he had understood it through astral science; Ryan, *Kingdom of Stargazers*, 59–60.

While the forecasting of eclipses was a useful tool for asserting the relevance of the quadrivium, the horoscopic practices that Adelard learned from Arabic texts went to the next level. As we have already seen, the celestial divination and astral magic that Adelard translated were grounded in a widely-accepted learned cosmology and met twelfth-century standards for creating certain knowledge through logical deduction. Moreover, while Walcher’s work predicting eclipses was impressive, it could only be demonstrated in the special circumstances of an eclipse, and for all of their symbolism eclipses did not bear on that many things. Horoscopic practices, on the other hand, could be deployed at any time and about practically any matter. At the end of his *Letter to the Peripatetics of France*, Petrus Alfonsi gave a bold assertion of the universality of stellar influence.

Many and innumerable are the other things on earth which are determined by the course of the stars; and the minds of vulgar men do not comprehend them. The subtle acumen of prudent men, and of those experienced in this art, fathoms these things and knows them. If indeed one were to find some event so subtle that no man could yet direct his acumen toward investigating it, this would not mean that the stars had no power over this event, but merely that man’s intellect is unable to perceive that power.53

The *Letter to the Peripatetics* argues that the stars influence every earthly thing. Even if humans could not understand the working of something, and therefore could not appreciate how the stars played a role, they did still have an effect. Celestial divination was relevant in even more places than the prediction of eclipses.

Moreover, by 1125 many Anglo-Normans saw celestial divination as an uncontroversial part of the quadrivial science of the stars in the first half of the twelfth century, as we can see

from William of Malmesbury’s description of Robert the Lotharingian in *The Deeds of the English Bishops*. Composed sometime around 1125, *The Deeds of the English Bishops* is a sequel and ecclesiastical counterpart to the secular history covered by *The Deeds of the English Kings*, the work in which William narrated Gerbert’s adventures in Muslim Spain.\(^5^4\) William wrote both texts for a courtly audience, and they offer us a glimpse of the attitudes of people less invested in the quadrivium than Adelard and Alfonsi. The science of the stars comes up in William’s discussion of the life of Robert the Lotharingian, bishop of Hereford, who died roughly five years after William’s birth.\(^5^5\)

According to William, Robert was an expert in the quadrivium: “Exceedingly experienced in all the liberal arts, he had studied (*rimare*) more than any others the abacus, the reckoning of the calendar by the moon, and the movement of the stars in the sky.”\(^5^6\) Robert’s studies granted him foreknowledge. When a royal edict summoned England’s bishops to attend the episcopal consecration of a man named Remigius, Robert alone refused to come; “from an unerring examination of the stars he had seen that the consecration would not go forward during Remigius’s lifetime, and he had not kept quiet about it.”\(^5^7\) Therefore Robert was the only one absent when, in accordance to his prediction, Remigius died the night before his consecration. William’s account of Robert highlights the fact that celestial divination was a licit pursuit and founded upon quadrivial skill. William thought Robert based his prediction on accurate observation of the stars (*certa inspectione siderum*). The Hereford bishop’s foreknowledge therefore emerged from the prowess in the quadrivium represented by his study of the abacus, calendric reckoning, and stellar move-

---


William wrote for a general audience, not for scholars engrossed in the quadrivium. The text’s account of Robert makes no attempt to head off disbelief, a fact that implies William expected his broad audience to react without skepticism to his claims about *astronomia*’s predictive powers. Moreover, the story highlights the powerful demonstrations of quadrivial relevance that celestial divination provided.

**CONSTRUCTING EXPERTISE**

Once celestial divination and astral magic were accepted as part of quadrivial astral science, they constituted tools to advance not only the status of the mathematical arts but also that of Adelard. Alfonsi, Adelard, and others portrayed astral science as the most excellent of all the liberal arts, and horoscopic practice constituted its highpoint. As the Bathonian wrote in *On the Same and the Different*, “if a person became intimately acquainted with the science of the stars, they would not deny [knowledge of] not only the present state of lower things, but also the past state or future state of them.”

Adelard’s prowess in celestial divination thus represented prowess in the liberal arts. Prowess in the liberal arts, in turn, constituted the weapons of pedagogical competition, so Adelard’s abilities in horoscopy contributed to his reputation as a teacher and thus his ability to attract students.

**Proof by Prediction**

As useful as the new astral science was, it often conflicted with the traditions of the Latin West. Even determining the date could be difficult. Robert the Lotharingian, for example, subscribed to the argument made by Marianus Scotus circa 1082 that Christ’s death had occurred

---

twenty-two years earlier than the dominant historical tradition claimed. In an environment of such uncertainty, Robert’s “unerring examination of the stars” was no simple feat, and the accuracy of his prediction attested the accuracy of his observations. Likewise, the ability to predict future celestial events persuaded listeners that the new astral science had the correct account of things. Walcher of Malvern, a contemporary of Adelard’s also interested in the quadrivium, recounted how his teacher Petrus Alfonsi, a converted Spanish Jew trained in Arabic astral science, surprised English listeners by claiming that the sun had been in the seventh degree of Aries on the first of April, 1120. Latin authorities, on the other hand, held that on this date the sun was in the fifteenth degree of Aries. This discrepancy of eight degrees owed, Walcher explained, to the different definitions of a degree current in the Arabic and Latin tradition. Nevertheless, the movements of the sun and moon in early spring were of great importance to Latin Church, for they formed the basis of determining the date of Easter; a disparity between the Arabic and Latin traditions here was likely troubling for many in Alfonsi’s audience. When asked about the discrepancy by Walcher and others who had been listening, Alfonsi offered his ability to predict eclipses as proof of his correctness. “You will know that what I have said about the day and the sun and the sign is true,” he said, “when you use it to discover that there will be an eclipse.”

Alfonsi (and, in framing the story, Walcher) argued that the predictive power of his system


demonstrated its truth. Accurate forecasts provided strong evidence that the world was as Alfonsi said it was. They also indicated that Alfonsi had not made an error in his mathematics or gotten confused while converting between calendars. By corroborating both Alfonsi’s claims to knowledge of the workings of the cosmos and his mathematical abilities, the foretelling of eclipses showed his skill in the quadrivium.

Adelard of Bath likely deployed Arabic horoscopic techniques to similar ends. By using the stars to predict terrestrial events, he would have shown that he had a strong grasp of celestial mechanics and the associated skills of geometry and arithmetic. Such a demonstration of quadrivial skills would have aided him in persuading potential students of his abilities as a teacher.61

The Prestige of Arabic Learning

In Adelard’s works, Arabic knowledge carries a distinctly positive valence and works towards establishing the Bathonian’s expertise. The best example of Adelard’s use of Arabic knowledge comes from the Questions on Natures. The persona of Adelard in this work claims that he is putting forth the views of the Arabs, saying that he will defend their case, not his own.62 Despite Adelard’s claims, modern scholars have been able to find no Arabic sources for arguments of either character in the Questions, though the text does draw on a number of late-antique and early-medieval Latin authors.63 As we have already seen, the Questions, with their witty, elegant Latin prose, classical allusions, and sharp debate, are designed to portray Adelard as a desir-

---

61 I do not assert here that Adelard could predict the future in any sense that a modern-day resident of the North America or Europe would accept as accurate. But practitioners of celestial divination were clearly convincing in some way, for intelligent people in both the Islamic World and the Latin West believed in the possibility of foreknowledge from the stars for hundreds of years, as is evident from e.g., Carey, “Astrology in the Middle Ages,” or Patrick Curry, ed., Astrology, Science, and Society: Historical Essays (Woodbridge, Suffolk: Boydell Press, 1987).

62 “Causam Arabum, non meam, agam.” Translation mine. QV, 90–91.

63 Burnett, “Adelard and the Arabs,” 80, 97–98; Burnett, introduction to Conversations, xxvi–xxviii. I believe that Lejbowicz has argued that Adelard borrowed most of the Arabic terms found in the DOA from an eleventh-century astrolabe treatise despite claiming to have learned them directly from talking to an Arabic speaker; however, I am not sure I understand Lejbowicz’s French completely. “Sortilèges de la nouveauté,” 92–93.
able teacher. If Arabic knowledge would make Adelard look bad, he would not have drawn attention to it in the text. Yet the absence of Islamic sources implies that here the Bathonian aimed to not to deploy actual Arabic knowledge but to invoke its reputation. Adelard must have thought that claiming Arabic sources would help accomplish the *Questions*’ goal of demonstrating his skill as a teacher.

We can also see an attachment to Arabic in Adelard’s translations and his astrolabe treatise, which are dotted with Arabic terms. In the translations, the retention of terms from the original language might be seen as a translator’s deficiency, and some scholars have taken them as such. However, it seems that the persistence of Arabic terms has something to do as well with their continued importance to Latin scholars; often in the early manuscripts an Arabic word is written in to gloss its Latin translation.64 While the translations seem to be for specialists, we also find a preference for Arabic in Adelard’s treatise on the astrolabe, which he wrote for a wide audience. Here Adelard uses the Arabic names for the parts of the cosmos and the astrolabe, though the Latin gloss he provides when first introducing each term shows that he could have translated them had he wanted to.65 Instead, the use of Arabic terms represents a stylistic choice motivated by the prestige of Arabic learning. Some scribes even highlighted the words in the foreign language by writing them in the red ink typically used to pick out section headings, num-

---

64 See, e.g., the third chapter of the *Lesser Introduction* in Sloane MS 2030, where the Arabic names of the twenty-five states of the planets have been written in as glosses to the Latin ones. Whoever wrote them seems to have been familiar with Abū Ma'shar’s text in its original language, for all twenty-five Arabic terms match those used in the Arabic original. Sloane MS 2030, London, BL, ff. 84r–85r. These are reproduced in notes in *IM*, 110–116.

65 E.g., “On the back the elcidada lies on top, which Philosophy calls the spoke (*radius*) in the work of Boethius (In dorso vero elcidada superficet qui a philosophia apud Boetium radius appellatur),” translation mine, *DOA*, 173; “This table can be called the alcankabut in Arabic, the rotator (*volubilis*) by the Latins. . . . The tooth can be called the almori in Arabic, the calculator (*computator*) by us (Hec itaque tabula arabice alcankabut, a latinis vero volubilis dici potest. . . . Dens vero prominens arabiæ almori, a nobis computator, . . . appellari potest).” Translation mine. *DOA*, 200. The words *elcidada*, *alcankabut*, and *almori* recur to refer to these parts of the astrolabe; the words *spoke* (*radius*), *rotator* (*volubilis*), and *calculator* (*computator*) do not.
bers, and names.\textsuperscript{66} The choice to call attention to the words suggests that people encountering Adelard’s text within or shortly after his lifetime saw the Arabic words as special.

Adelard’s deployment of Arabic knowledge in his self-construction is indicative of the Latin West’s wider ambivalence about Islam. Despite the numerous polemics against Muslims, Latin Christians did not see Islamic culture in entirely negative terms. Arabic scholars were recognized as having powerful knowledge unlike anything found in the Latin West, but where some authors saw this as evidence of their philosophical skill, others believed it reflected demonic involvement. Both sides were present, and it could sometimes be hard to tell the one from the other. After all, in William of Malmesbury’s account of Gerbert d’Aurillac’s time in al-Andalus, the renegade monk learned not only every harmful thing discovered by human curiosity but also every healthful one. Muslims were very strongly Other, yet the polarity of their alterity was labile; they could extraordinary for good or for bad reasons. There was therefore a prestige associated with Arabic knowledge, even if that prestige was unstable and slipped easily into infamy.\textsuperscript{67} It is quite interesting that Adelard could confidently, as his nephew put it, “shamelessly extol them [the Saracens] and invidiously accuse our people of ignorance in a disparaging way.”\textsuperscript{68} When we have William of Malmesbury denouncing Muslims in many ways, why was their science acceptable? How could one know that it was truly natural knowledge and did not depend upon demonic

\textsuperscript{66} For an example of the highlighting of Arabic terms, see Oxford, Bodleian Library, MS Auctarium F. 1. 9. For further discussion of Arabic in Adelard’s works, see Charles Burnett, \textit{The Introduction of Arabic Learning into England}, The Panizzi Lectures 1996 (London: British Library, 1997), 40–45.


interference? These questions do not seem to have fazed Adelard at all; after all, he needlessly claimed Arabic sources in a work that aimed to construct him as a skilled teacher for a wide audience, which suggests that he saw them as a positive. It is still unclear why Adelard thought that he could resolve the Islamic World from a multivalent thing to a univalent one in his invocation of it in the Questions and elsewhere, especially given the attitudes expressed by his contemporary William of Malmesbury. But he clearly thought so, and believed that Arabic influences would demonstrate that he had access to rare knowledge that far outstripped the “French learning” which his nephew pursued. Because few others in the Latin West could claim the ability to teach Arabic material, by stressing his possession of powerful knowledge from the Islamic world Adelard would have further demonstrated his desirability as a teacher, and there seem to have been few concerns that it might have contradicted the Christian faith or involved supernatural powers.

***

Arabic horoscopic techniques offered to help Adelard as he and other pedagogues vied for students. Celestial divination and astral magic aided the Bathonian in asserting the relevance of the mathematical quadrivium in which he specialized and in constructing himself as a man more learned in the liberal arts than any of his rivals. By convincing students that the subject he taught was worth learning and that he not only had a masterful command of it but also had gained it from foreign sources unavailable to any other teacher, Arabic horoscopy was a powerful tool for Adelard. Thus, the Bathonian had motives to translate texts on celestial divination and astral magic not only because they fit within his larger intellectual project of creating causal knowledge about the natural world but also because they gave him an advantage in his particular social situation as a teacher in the early-twelfth-century Latin West.
In August 1151, Henry of Anjou, grandson of Henry I and soon to be Henry II of England, made peace with the king of France and was recognized as duke of Normandy. Having resolved the difficulties that had swirled around his holdings on the Continent, Henry and his father Geoffrey were now free to focus on Henry’s claim to the English throne, which the family had been trying to win from King Stephen for over a decade. The development cast the future into question for many in England as they wondered whether Henry would invade with the Norman army and pondered the implications of either outcome.69 Was it necessary to devote resources to mil-

---

tary preparations? Could those unhappy with Stephen’s rule count on support if they opposed him? Some, not content with wondering, turned to the stars for answers.

“As for the Norman army,” reads one horoscope dated to late August 1151, “the judgement is that it will not come.” This horoscope, a diagram of the astrological situation at a given time and place which facilitates learned interpretation of the heavens, is one of ten found in Royal MS Appendix 85, most of which deal with the period between June and October of 1151. The horoscope on the Norman army is not the only one concerned with the conflict between Henry and Stephen. Another deals with the sudden death of Count Geoffrey several weeks later in early September. A third chart, cast on the autumnal equinox no more than fourteen days after Geoffrey’s death, likely refers to King Stephen’s efforts to ensure his son Eustace would succeed him on the throne. According to the inscription accompanying this last horoscope “the king [will] compel his barons to give homage to his son, and he will not be able to carry out such a thing, whatever he plans, without an astrologus,” an expert in the science of the stars.70


Scholars have made several arguments about the maker of A through J. North has proposed Adelard as the most likely candidate, but he himself points out that his argument is not particularly convincing. The Bathonian would have been around seventy years old in 1151, and the lack of evidence about early-twelfth-century astral scientists implies that the charts may be the work of some person otherwise unknown to history. Moreover, Adelard supported a young Henry II, as evidenced by the dedication of the astrolabe treatise, yet the caption of horoscope B can be read as authorial support for the king, who in 1151 would have been Henry’s rival Stephen. This reading has lead Charles Burnett to argue against Adelardian authorship and instead propose that the horoscopes were authored by Robert of Chester, another translator and likely a student of Adelard’s, who was active in Stephen’s
horoscopes attest to the political and military usefulness of celestial divination and to the recognition of that utility in the Anglo-Norman world by the middle of the twelfth century. The science of the stars offered to shed light on an unstable future and allow interested parties to prepare before the fact; the quadrivial expertise of an astrologus had become a vital asset for a monarch.

The identity and allegiance of the author of the Appendix horoscopes remains uncertain. However, given his prowess in astral science, his connections to the courts of Henry I and Henry of Anjou, and the clear interest in celestial divination that his writings show, Adelard likely cast horoscopes like these for a courtly patron. In fact, given the agonistic nature of medieval and early-modern courts, Adelard would have had good reason to do so. Courts, like classrooms, constituted competitive contexts in which a large number of subordinate clients vied for the favor and support of a benefactor, usually a monarch, baron, bishop, or other political actor. The relationship benefitted both parties. The client received wealth, status, security, and perhaps the opportunity for further advancement; the patron received a symbol of power legible to subjects and rivals, in addition to the loyal performance of any useful services the client could offer. However, given his prowess in astral science, his connections to the courts of Henry I and Henry of Anjou, and the clear interest in celestial divination that his writings show, Adelard likely cast horoscopes like these for a courtly patron. In fact, given the agonistic nature of medieval and early-modern courts, Adelard would have had good reason to do so. Courts, like classrooms, constituted competitive contexts in which a large number of subordinate clients vied for the favor and support of a benefactor, usually a monarch, baron, bishop, or other political actor. The relationship benefitted both parties. The client received wealth, status, security, and perhaps the opportunity for further advancement; the patron received a symbol of power legible to subjects and rivals, in addition to the loyal performance of any useful services the client could offer. However, given his prowess in astral science, his connections to the courts of Henry I and Henry of Anjou, and the clear interest in celestial divination that his writings show, Adelard likely cast horoscopes like these for a courtly patron. In fact, given the agonistic nature of medieval and early-modern courts, Adelard would have had good reason to do so. Courts, like classrooms, constituted competitive contexts in which a large number of subordinate clients vied for the favor and support of a benefactor, usually a monarch, baron, bishop, or other political actor. The relationship benefitted both parties. The client received wealth, status, security, and perhaps the opportunity for further advancement; the patron received a symbol of power legible to subjects and rivals, in addition to the loyal performance of any useful services the client could offer.
er, clients had to prove themselves worthy of patronage, showing that they would either be an asset to their benefactor or add to the patron’s glory, and competition for favor was fierce. The court of Henry I was no exception to these trends, for it attracted a number of ambitious people hoping for royal patronage. The horoscopic techniques Adelard learned from Arabic texts allowed him to distinguish himself from the crowd by providing his patrons with politically useful knowledge—claims that took authority from the Bathonian’s quadrivial erudition and that met twelfth-century standards for certain knowledge. The ability of celestial divination and astral magic to parlay Adelard’s skills in the quadrivium into courtly patronage would have given him another powerful motive to translate Arabic texts on the subject.

**Adelard at the Anglo-Norman Court**

While we know little of Adelard’s life, he clearly moved in elite circles. He claimed to have played music before a queen while in France, and wrote a treatise on hawking, a royal pastime. Though he may have had other patrons in his life, the Bathonian definitely enjoyed the favor of the English royal family. His exemption from one of Henry I’s taxes in 1130 was exactly the kind of privilege granted to courtiers and implies that Adelard received support from Hen-


Moreover, Adelard was close to Henry of Anjou, for around 1148 the Bathonian dedicated to him a treatise on the astrolabe that he claimed to have written in responses to young Henry’s frequent requests for such a work. Because such dedications usually served as an acknowledgement of a patron’s support, the astrolabe treatise indicates that Henry’s mother Empress Matilda had continued to show favor to Adelard after the death of her father Henry I in 1135. Clearly Adelard was doing something to earn the support of these powerful people, and that something was likely prognostication from the stars. Courtly patronage of celestial divination was not unheard of in the later twelfth century. Once Henry of Anjou had been crowned Henry II of England, Roger of Hereford cast an official horoscope for his wife Eleanor of Aquitaine, and whoever commissioned the Appendix horoscopes must have seen the applicability of astral science to politics.

Other scientific endeavors also received royal patronage from Norman rulers; Henry I had supported renewed interest in Pliny’s *Natural History*, and Roger II of Sicily promoted scientific learning extensively in the 1140s. Between Adelard’s closeness to England’s royalty and his interest in celestial divination, it is overwhelmingly likely that he cast horoscopes in exchange for patronage.

---


76 *DOA*, 417–418.

77 French, “Foretelling the Future,” 463.

THE PERSUASIVENESS OF HOROSCOPY

It is not clear who commissioned the Appendix horoscopes or for what purpose that person did so, but it is easy to see the uses that this sort of convincing claim to future knowledge held for a monarch or baron. A prognostication could lessen the uncertainty of the future or be deployed as a piece of persuasive rhetoric to justify a decision or convince others. However, to be useful in these ways a prediction had to convince its audience of its validity, and someone like Adelard needed to do so in competition with a host of other divinatory techniques. Monica Azzolini has discussed a “predictive market” in early modern Italy, where astral science vied for attention with other methods of divination such as religious prophecy and the interpretation of omens,\(^79\) and such a situation also applied in Anglo-Norman England. Many other forms of prognostication were current. Holy people or objects could offer knowledge of the future. Henry I and Stephen I are both said to have consulted a pious hermit in Somerset who possessed foreknowledge, and it was common to obtain an omen about a new bishop’s time in office by taking the first line of a page of the Gospels opened to at random during his consecration.\(^80\) There were also other forms of learned divination besides horoscopy. John of Salisbury, a cleric whose moralizing \(1159\) Policraticus sought to encourage courtiers towards virtue, listed over a dozen divinatory techniques that readers should avoid. John culled some of these from ancient sources, but others, such as the celestial divination that John spent several chapters discrediting, likely reflected contemporary practice at courts. John also recounted the attempts at divination made by a priest

---


who had taught him Latin in his youth, circa 1120.81 We also have a substantial corpus of prognostics from manuscripts in England in the eleventh and twelfth centuries, and such texts were even more popular in continental Europe.82 As a courtly prognosticator, Adelard would have been competing with others claiming to offer knowledge of the future.

However, the predictions Adelard could offer from the science of the stars were unlike anything else available to contemporary rulers, for they were grounded in the prestigious learning of the quadrivium, met twelfth-century standards for knowledge whose truth was certain, and depended upon Arabic knowledge rare in England. The Bathonian’s prognostications therefore would have been more persuasive than these other forms of divination. The Appendix horoscopes exemplify the kind of astral science Adelard would have done for a courtly patron, give us a glimpse of the persuasive expertise it depended on, and demonstrate how that expertise appealed to political actors and earned their favor.

Horoscopes constituted an especially convincing form of divination because they were grounded in the methods of the quadrivium, which bore a reputation for erudition and was known for its ability to create certain knowledge. Its unusual persuasiveness would have helped set Adelard apart from others who made claims to foreknowledge. To grasp the effort and expertise represented by the charts in Royal MS Appendix 85, we must have some comprehension of what a horoscope is, how an English person living in the first half of the twelfth century would have gone about making one, and how a client would have understood the finished result. These charts depict the division of the ecliptic into the twelve astrological places or houses and give the

81 For John of Salisbury’s condemnation of divination, see Poliaticus 1.12–13, 2.1, 2.16–28. For the story about his Latin teacher, see Poliaticus 2.28. For a thorough discussion of John’s position on celestial divination, see Carey, Courting Disaster, 28–29.

location of the planets within those places. Constructing and interpreting charts like the ones in Royal MS App. 85 demanded significant expertise in the quadrivium, and that expertise stood behind the prognostications that Adelard and other practitioners of the celestial divination gave their patrons. When, for example, the author of the horoscopes in the manuscript concluded that the Norman army would not come to England, a highly learned interpretation of the accepted influence of the stars legitimized that claim.

For an example, consider the horoscope dealing with the death of Geoffrey of Anjou (figures 6 above), which I have transcribed and annotated with the numbers of the places (figure 7

Figure 6—Horoscope treating the death of Count Geoffrey of Anjou, circa September 1151. Horoscope F. England, circa 1151. London, BL, Royal MS Appendix 85, f. 2r.
The Persuasiveness of horoscopy

below). Likewise, the text in places four and ten indicates that the local meridian (line of terrestri-
al longitude) passed through the ecliptic at the twenty-third minute of the fifth degree of Cancer and the same minute of the same degree of Capricorn. The writing in place seven gives inform-
ation not only on the place’s boundary but also on the position of planets within it. The moon (luna) was at Libra xxvi° lix’ (twenty-six degrees, fifty-nine minutes), Venus at Libra xvii° o’, Jupi-
ter at Libra xiii° xxiii’, and Mercury at Scorpio ii° lvi'; all were relatively low in the western sky. The sun, in the twenty-sixth degree of Virgo in place six, was just below the horizon; the horo-
scope concerns a moment early in an evening shortly before the autumn equinox.

Such a chart constituted one of several steps Adelard would have taken in the laborious

Figure 7—Transcription of Horoscope F with the twelve places labeled in red.
process of interpreting the heavens, and represents a significant amount of effort and expertise in itself. The set of planetary tables Adelard translated would have enabled him to calculate the positions of the planets. However, even using the tables demanded rare knowledge. Their mathematics were framed in the Islamic calendar, a lunar calendar that bears no relationship to the solar year. Because this calendar was not in common use in England, Adelard’s first step would have been to determine the Arabic date; the surest way was to figure out the number of days that had elapsed since a point whose date was known in each calendar. Such work demanded many calculations with large sums; Arabic numerals were not yet in use, and the arithmetic would likely require a practitioner to use an abacus, another instrument of the quadrivium. The production of an accurate prognostication, then, attested to significant quadrivial skill on the part of the person who had made it.

Having computed the date, the Bathonian would then calculate the zodiacal positions of the planets by adding, subtracting, and tabulating various numbers according to various directions accompanying the tables. Interpreting these instructions demanded an understanding of cosmological theory available only to those who had studied quadrivial astral science. Consider the directions for finding the position of the Saturn, Jupiter, or Mars:

The true places of Saturn, Jupiter, and Mars are to be determined as follows. First one must find, for each of them and also for the sun, the mean position. Then one has to subtract the mean position of the planet from the mean position of the sun. Whatever is the remainder, it is to be called elheca. With this argument one has to enter the examination of the definite zenith if the elheca is less than six signs; if it is greater, one must enter both the definite zenith and the examination of the same argument and add this zenith to examination of the argument; this total is to be called the examined zenith. This examined zenith is to be subtracted from the mean position of the planet, and the remainder is called the center. With the center one has now to enter the examination of the center. . . .

83 “Saturni vero, Iovis et Martis loca sic quaerenda sunt. Primo itaque cuiuslibet eorum necnon et solis elwacat invenienda sunt. Deinde vero ipsius planetae elwacat ab elwacat solis auferendum. Quodque residuum fuerit elheca...”
Cosmological knowledge would have simplified these instructions greatly by allowing a practitioner to understand the hypothesized physical reality that these terms referred to. For example the “mean position” of the planet refers to position of the center of its epicycle, a smaller circle the on which the planet turned as it moved around the earth. Likewise, knowing that the elheca referred to the angle of the planet on this epicycle would have clarified a number of possible misunderstandings about how to manipulate it. Once he had determined the locations of the planets, Adelard likely used an astrolabe to find the angles between them and the boundaries of the twelve places, though he could also have calculated these figures from the tables.

Having gone through the efforts of calculating the positions of the planets and the boundaries of the places, Adelard faced the challenge of interpreting the resulting chart. He had to know the properties of the planets, signs, and places as well as what the position of each planet portended. The Bathonian also needed familiarity with the dizzying number of planetary dignities and relationships in order to weight the often-contradictory influences of the different planets. Such information would have come from a book like the Lesser Introduction, and the Centiloquium provided a handful of helpful if eclectic pointers. Only after taking all of these factors into


84 The planet was carried in the epicycle, and the epicycle was carried in a deferent, a larger circle with the earth at or near its center. We can imagine the planet as a point on the rim of the wheel of a unicycle that is going around a hamster wheel, where the hamster wheel represents the deferent and the unicycle wheel represents the epicycle. This demonstration should be used the next time anyone holds an exhibit on the history of astronomy; preferably it will involve a large hamster wheel rather than a small unicycle.

85 For an example of the difficulty of this task, see Tamsyn Barton, “Astrological Practice: Casting a Horoscope,” in Ancient Astrology (New York: Routledge, 1994), 86–113.
account could he offer a prognostication. As laborious as this process was, the author of the charts in Royal App. 85 had things comparatively easy; someone following the instructions of Adelard’s translation of the *Book of Talismans* had to cast at least seventeen horoscopes before being able to make any talismans. Astral magic and celestial divination thus depended on extreme facility in the quadrivium that few people would have possessed. Someone who could use an abacus and astrolabe, understand the cosmology and geometry underlying the tables’ instructions, and interpret the resulting chart was someone who had mastered the liberal arts. Horoscopes thus bore the trappings of the liberal arts, a respected intellectual tradition that would have lent credibility to Adelard’s prognostications.

Moreover, the deductive procedure of constructing and reading the horoscope resembled logic and geometry, learned techniques of knowledge-creation that in the twelfth century were regarded as producing results whose truth was necessary, not likely. In both *On the Same and the Different* and *On the Use of the Astrolabe*, Adelard’s explained how to use geometry to find the height of a distant object without directly measuring it. The geometrical project resembles the casting of a horoscope in that both start with an easily known but uninteresting fact (the observer’s distance from the object, the time and place) and, by the application of mathematical procedures, derive something useful (the object’s height, whether the Norman army will invade) without having to cross the intervening spatial or temporal distance. Moreover, the assessment of the various planetary influences might run like a syllogism: at this moment Saturn is in its domicile; a planet in its domicile has greater influence; therefore Saturn has greater influence on this moment; and so on. The deductive logic used in dialectic and geometry made them more sure ways of creating knowledge in the eyes of many twelfth-century thinkers in the Latin West. The deductive logic

---

86 *DED*, 60–67.
involved in learned celestial divination would have lent its conclusions a similar degree of certainty.

***

It is almost certain that Adelard put the science of the stars to use for political actors. We know that people in the Anglo-Norman world deployed astral science for political ends, and the Bathonian had the opportunity, means, and motive to do so. Like the pedagogical world, the court was highly competitive; Adelard’s ability to provide explanation, foreknowledge and intervention legitimized by learned philosophy positioned him to earn favor and the stability that came with it. The science of the stars formed part of the prestigious expertise that functioned as the Bathonian’s general social currency, and at the same time offered to solve specific problems faced by political actors. Engaging with and translating Arabic astral science furthered Adelard’s ends as a courtier just as it served him as philosopher and teacher.
BEYOND THE BATHONIAN

Adelard of Bath engaged with Arabic texts not because some universal thirst for knowledge animated him but because the astral science of the Islamic World, especially its horoscopic techniques, constituted a powerful tool useful in the Bathonian’s own historically-contingent projects. Planetary celestial divination and astral magic, largely unavailable in the Latin West, demonstrated Adelard’s command of prestigious natural knowledge. In the competitive environment of pedagogy these horoscopic practices gave the Bathonian an advantage over rival teachers by showing that the quadrivium was important and that Adelard was the only one really equipped to teach it. Finally, Arabic astral science let Adelard offer his courtly patrons prognostications grounded in the learning of the liberal arts, which helped him secure their support. In short, the sophisticated techniques of celestial divination and astral magic offered by Arabic texts aided Adelard in building a reputation for masterful erudition and in deploying it to his social advantage.

The scope of an undergraduate thesis is necessarily limited, and I have been unable to touch on several topics I would have liked to. The relationship of celestial divination and medicine may have had some role in Adelard’s engagement with Arabic astral science. Roger French has argued that celestial divination’s usefulness to physicians helped motivate the translations of Roger of Hereford several decades after Adelard’s life, and the two disciplines remained linked throughout the later Middle Ages and the early-modern period. Within the Bathonian’s lifetime, Petrus Alfonsi served as physician to Henry I, and both Alfonsi and Hugh of St. Victor wrote of astral science’s usefulness to medicine. Moreover, a robust tradition of non-horoscopic celestial divination for medical purposes existed in the Latin West from the eleventh century onward. Adelard, in On the Same and the Different and the Questions on Natures, showed that he was familiar with
humoral theory; the Questions attracted some medical readers; and John of Villula, Bishop of Bath and likely Adelard’s first patron, practiced as a physician. Another topic deserving further investigation is the influence of Neoplatonic philosophy on Adelard’s interest in astral science. It is clear from On the Same and the Different and The Questions on Natures that late-classical Neoplatonists like Calcudius and Macrobius influenced Adelard’s thought. The writings of these scholars—especially Calcudius’s translation of Plato’s Timaeus, which Adelard knew well—tend to be much more amenable to ideas of stellar influence than, e.g., St. Augustine. Research in either area promises to be fruitful.

I hope that my thesis, despite its limited scope and other flaws, demonstrates the value of approaches to the history of medieval science that consider not only texts of natural knowledge but also the human beings working in historically-contingent institutional contexts that gave rise to those texts. As Andrew Cunningham has pointed out, the history of science must pay attention to the human actions that constituted the creation of natural knowledge. I hope that historians of medieval science will give more thought to such questions in the future.

Finally, Adelard and his work are especially important today as monuments of Western science’s debt to scholars from the Islamic Empire. So much of the technology and scientific knowledge taken for granted by people on the western edge of Eurasia and in the northern two thirds of North America has its roots in the intellectual labors of Muslims. The people of the Lat-

---

87 For Roger of Hereford, see French, “Foretelling the Future.” For Alfonsi, see Tolan, Petrus Alfonsi and his Medieval Readers, ii, and Petrus Alfonsi, Epistola ad Peripateticos, in ibid., i66, 174. For Hugh of St. Victor, see his Didascalicon 2.10. For medical readers of the QN, see, e.g., London, BL, Cotton MS Galba E IV, which contains a copy of Adelard’s text from the middle of the twelfth century alongside a host of medical works; described in Adelard of Bath, 182. For John of Villula, see Lejbowicz, “Les sortilèges de la nouveauté,” 82–83; Frances Ramsey, “Tours, John of,” DNB http://www.oxforddnb.com/view/article/14846. For prognostics, see Chardonnens, Anglo-Saxon Prognostics, 78–85, 143.

88 For Neoplatonist influence in Adelard’s writings, see Burnett’s endnotes to the QV noting Adelard’s sources, Conversations, 228–235. For the friendliness of Neoplatonism towards celestial divination, see Wedel, The Medieval Attitude toward Astrology, 2, 34–35.
in West learned geometry, algebra, and mathematical astronomy from Muslims; the ten numerals used today in Anglophone world and beyond are of Arabic origin. Adelard reminds us that Muslim scholars played a vital role in the founding of what the modern West calls astronomy, and offers an example of the benefits of cross-cultural collaboration.
BIBLIOGRAPHY

UNPUBLISHED PRIMARY SOURCES


Horoscopes. Royal MS Appendix 85. London, BL.

Liber de imaginibus planetarum septem ex scientia Abel iusti filii Ade primi patris scientiarum. MS 1410. Darmstadt, Technische Universität Darmstadt.

List of Contents. MS 235. Avranches, Bibliothèque municipale.


PUBLISHED PRIMARY SOURCES


———. De eodem et diverso. In Conversations.


———. Questiones naturales. In Conversations.


Green, Judith A., ed. The great roll of the pipe for the thirty first year of the reign of King Henry I, Michaelmas 1130 (Pipe Roll I): a new edition with a translation and images from the original in the Public Rec-


**SECONDARY SOURCES**


Secondary Sources


