



Notes upon Some Medieval Latin Astronomical, Astrological and Mathematical Manuscripts at the Vatican: Part II

Author(s): Lynn Thorndike

Source: *Isis*, Vol. 49, No. 1, (Mar., 1958), pp. 34-49

Published by: The University of Chicago Press on behalf of The History of Science Society

Stable URL: <http://www.jstor.org/stable/226602>

Accessed: 18/05/2008 01:35

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=ucpress>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

---

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We enable the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

# Notes upon Some Medieval Latin Astronomical, Astrological and Mathematical Manuscripts at the Vatican

## PART II

By Lynn Thorndike\*

[This is the second and concluding portion of this study  
of which Part I appeared in *Isis*, 1956, 47: 391-404.]

### BARBERINI 92

(16) BARBERINI 92, a manuscript of the twelfth century, has been noted in G. Friedlein's 1867 edition of the mathematical works of Boethius and in Bubnov's 1899 edition of the *Opera mathematica* of Gerbert.<sup>68</sup> What I would add here is a passage on measuring the earth, "Quot miliaria sint in totius mundi ambitu," and its resemblance to a paragraph which occurs near the close of the first chapter of the *Sphere* of Sacrobosco. I give the two texts in parallel columns:

Barberini 92, fol. 37v

Quamvis Ambrosii Theodosii Macro-  
bii auctoritate universi orbis  
ambitus notabilis habeatur, tamen  
quia ab illo auctoritatis ratio quasi  
nota prætermissa est volentibus scire  
preponatur. Quod enim a modernis  
impossibile iudicatur, id a veteribus  
sapientia duce facillimum affirmatur  
et quod corporeis sensibus indagari  
non posse videtur, id rationis acumine  
clarius indagatum habetur.

Sumpto horoscopo sub stellate noctis  
claritudine inspectoque polo cum  
utroque mediclinii foramine nota-  
taque graduum in qua steteret  
mediclinium multitudine profectus  
est cosmimetra per rectam lineam  
contra septentrionem a meridie tam  
diu donec in alterius noctis claritate

*The Sphere of Sacrobosco*, ed. Lynn  
Thorndike, 1949, p. 85

Totius autem orbis terre ambitus auctori-  
tate Ambrosii, Theodosii et Eratosthenis  
(Macrobius is added in some MSS) phi-  
losophorum 252,000 stadiorum spatium  
continere diffinitur, unicuique quidem 360  
partium zodiaci (*sic*) 700 deputando  
stadia.

Sumpto enim astrolabio sub stellate noctis  
claritate per utrumque mediclinii foramen  
polo perspecto notetur graduum in qua  
steterit mediclinium multitudo, Deinde  
procedat cosmimetra directe contra sep-  
tentrionem a meridie donec in alterius  
noctis claritate viso ut prius polo steterit  
altius uno gradu mediclinium.

\* New York City.

<sup>68</sup> Vatic. Barb. 92. It is not listed in Charles W. Jones' *Beda's Pseudepigraphia*, 1939, although it has a "Tabula Bede" at fol. 2r, and tracts *De ponderibus* which later hands ascribe to Bede: fol. 46v, margin in later hand, "De ponderibus," opening, "Ponderum pars minima calculus est qui constat ex granis cicericis duo-

bus . . ." (incipit not in *A Catalogue of Incipits of Medieval Scientific Writings in Latin*, 1937), and closing, ". . . mensurarum in liquidis coclear est pars minima" (fol. 47r. At 47v in a later hand, "Bede liber."); 48v, *De ponderibus* ("Haec Beda," in a later hand), opening, "Ponderum signa plerisque ignota sunt. . ." (also not in *A Catalogue of Incipits*).

viso polo ut prius cum utraque mediclinii foramine stetit ipsum mediclinium altius unius gradus numerositate. Post hec ratione dicante mensus est huius itineris spatium et notatis huius spatii miliaris que sunt lx<sup>ta</sup> vel, ut alii dicunt lxvi et due partes unius miliarii. Nam cum sol ascendit vel descendit unum gradum, tot miliaria per terram eum facere firmant per ccc.lx, tot enim graduum est astrolabium, sunt multiplicata et quot miliaria provenietur ex hac multiplicatione tot dicuntur inveniri in totius mundi circuitione.

Post hoc mensus sit huius itineris spatium et invenietur 700 stadiorum. Deinde datis unicuique 360 graduum tot stadiis terreni orbis ambitus inventus erit.

If Sacrobosco was the author of both passages, this would show that he was already writing in the twelfth century, would favor my contention that he composed the *Sphere* early in the thirteenth century,<sup>69</sup> and would indicate that he had a long career, since internal evidence proves that he was working on his *Computus* in 1235. If the twelfth-century passage is not by him, it would show how he incorporated bits from other writers into his celebrated textbook.



#### OTTOBON. 1826

(17) OTTOBON. 1826 is mainly devoted to astronomical tables and canons as to their use. It is written in part in a hand of the thirteenth or early fourteenth century, with additions of the fourteenth and fifteenth centuries, in part in single- and in part in double-columned pages. Years ago Moritz Steinschneider published the first paragraph and chapter headings of its initial treatise, at fols. 1r-38v, the canons of Arzachel in the twelfth-century translation by Gerard of Cremona.<sup>70</sup> Next come the equally well known canons on the Alfonsine Tables by John de Lineriis in the early fourteenth century, at fols. 41ra-50v, and his *Canons of the Primum Mobile*.<sup>71</sup>

(18) The remaining contents of Ottobon. 1826 are less familiar. At fol. 62r-v, Tables for the mean places of the planets are given for the years from 1432 to 1467; at fol. 63v, instruction on finding the true conjunction of sun and moon. An astrological tract or passage on want and famine, or abundance and fertility, has an unfamiliar incipit, "Ptholomeus. Quando Iupiter fuit in

<sup>69</sup>*The Sphere of Sacrobosco and its Commentators*, 1949, pp. 5-14. Cf. cod. lat. Monacensis 13084, 10th century, *Ars geometrica*, cap. 31, fol. 68v, "Ambrosii Macrolii Theodosii De mensura et magnitudine terrae. . ."

<sup>70</sup>"Etudes sur Zarkali," *Bullettino di Bibliografia e di Storia delle Scienze matematiche e fisiche*, 1887, 20: 32-36. Millás Vallicrosa, *Estudios sobre Azarquiel*, 1943-1950, pp. 37-42, "Índice de capitulos de los canones," from other MSS, says at p. 41 that Steinschneider's list of chapters agrees "con la nuestra, pero que sólo llegaba hasta aquí, y luego, en apéndice, la completó a base del manuscrito Aug., f° 65,

de Wolfenbüttel, f° 171 ss."

<sup>71</sup>Ottobon. 1826, fols. 51ra-61va: rubric, "Incipiunt Canones de primo mobili extracte ex dictis Albategni"; then in large letters, "Cuiuslibet arcus propositi sinum rectum invenire . . ." which is usually accepted as the incipit of the work, followed in smaller writing by "Sinus rectus est medietas corde portionis arcus duplicate . . ." (see *A Catalogue of Incipits*, col. 693). The text closes, ". . . quo invento scias ceteros domos ut in 31a huius dictum est. Expliciant Canones supra Tabulas de primo mobili quas compilavit Magister Iohannes de Lineriis ex dictis Albategni Parisius."

signo aquatico . . .”<sup>72</sup> and there are further notes on wars and on fixed stars which change the weather and cause storms at sea.<sup>73</sup>

(19) The thirteenth or early fourteenth hand in Ottobon. 1826 resumes at fol. 65r with chapters of the seventh book of Ptolemy’s *Almagest*.<sup>74</sup> Tables occupy most of the rest of the manuscript, beginning with one at fol. 80r of the differences between one kingdom and another.

(20) In the bottom margin of fol. 80v is a statement that in A.D. 1333, there had elapsed since Albumasar 484 years or about that.<sup>75</sup> Albumasar is supposed to have died at the age of over one hundred in 886, so that this statement may not be far off for his observations. At the bottom of fol. 85r are two notes in the same hand as that on fol. 80v. Of these the second states that, according to Albertus Magnus in his *Speculum*, at the time of Christ’s birth the motion of the eighth sphere was  $8^{\circ} 37' 2''$ .<sup>76</sup> If the former note may be taken as written in 1333, which seems palaeographically possible, this would be another bit of evidence that the *Speculum astronomiae* was then accepted as the work of Albertus Magnus. At fol. 86rb are tables for the meridians of Florence and of Siena, the latter for the year 1420 and by a Beltramus, whose last name I could not make out. But in the bottom margin of fol. 113r is written in the same hand as the previous marginal notes, “Expliciunt tabule illustris regis Alfonsi regis Castelle.”

(21) “A Tabula stellarum fixarum verificatarum tempore Alfonsi” begins in Ottobon. 1826 at fol. 113v, with some text concerning it in the bottom margins of fols. 113v–114r, while the table goes on through fol. 117v. Other tables continue. At fol. 130r is the heading, “Incipiunt Tabule de primo mobili,”

<sup>72</sup> Fol. 64r, “De caristia et fame vel habundantia et utilitate.”

<sup>73</sup> Fol. 64v, upper part: “De guerris” and “De stellis fixis que mutant tempora et commotionem faciunt in mari.”

<sup>74</sup> Rubric, “Claudii Ptholomei mathematicorum sintaxeos elmeruguisti capitule VII libri incipiunt.” Then in black ink: “Quoniam fixe stelle eandem semper positionem conservant ad se invicem. Quoniam et circa eius qui per media polos spere fixarum in consequentia motus perficitur. De modo descriptionis stellarum fixarum. Expositio canonica eius qui secundum borealem hemisperm asterismi.”

This appears to be a table of chapter headings, for next “Quoniam fixe stelle . . .” etc., is repeated in red, and the text then opens: “Pertranseutes in ante hoc q coordinatis, O Syre, et circa rectam et circa inclinam speram. . . .”

At fol. 72v the text ends and at fol. 73r a table begins with the above heading, “Expositio canonica . . .” etc. It ends at fol. 78r, the verso being ruled for tables but left unfilled. At the top of 79r is a little table, but the rest of the page and 79v are blank.

In the printed text of 1515 at Venice by Petrus Liechtenstein Dictio septima is divided into five instead of four chapters, thus:

“Capitulum primum de hoc quod longitudo stellarum fixarum que est inter quasdam et quasdam alias est longitudo una semper, et quod ipse comitantur proprietates locorum suorum

Capitulum secundum de hoc quod sphaera fixarum stellarum habet motum ad partem successionis signorum

Capitulum tertium in hoc quod motus stellarum fixarum ad successionem signorum non est nisi super duos polos orbis medii signorum

Capitulum quartum in modo scribendi differentias tabularum stellarum fixarum

Capitulum quintum in firmatione stellarum fixarum que sunt in medietate septentrionali sphere et positione earum in tabulis.”

Although worded more fulsomely than in the MS, the ground covered seems about the same. The opening words of the Dictio also vary: “Et postquam narravimus in dictionibus que hanc precedunt dictionem ea que accidunt in sphaera recta et in sphaera declivi. . . .”

But in the edition of Venice, 1528 by Luca Gaurico with the Latin translation of George of Trebizond, the chapter headings are more like those of our MS:

Quod stellae non erraticae semper eundem inter se situm servant

Quod non erraticarum etiam sphaera motu quodam ad successionem signorum progreditur

Quod in polis circuli qui per medium signorum est ad successionem non erraticarum stellarum sphaera movetur

De modo descriptionis fixarum

De constellationibus in sphaera solida fabricandis.

And in this edition the Dictio opens: “Quoniam in superioribus tam rectae quam declivae sphaerae accidentibus. . . .”

<sup>75</sup> The writer of the note adds, “Hec dico propter ymagines quas ponit tempore suo, que postea mutatae sunt, ut ipse ponit in suo Introductorio tractatu 6° in principio.”

<sup>76</sup> In Borgnet’s edition, *B. Alberti Magni Opera omnia*, 1891 10: 644b, “Et iam scimus quod sub ascendente eiusdem partis coeli, scilicet Virginis, natus fuit Dominus Jesus Christus, cum hoc quod equatio motus octave sphere in tempore nativitatibus eiusdem fuit octo gradus et triginta septem minuta et duorum secundorum secundum calculationem certissimam” (8 graduum et 37 minutorum et duorum secundorum, in MS Bodleian, Digby 228, fol. 78vb).

and at fol. 131v, "Tabula declinationis solis verificata secundum Almeonem filium Albumagaris que est s. 23 graduum 33 minutorum et 30 secundorum secundum quod verificatum fuit cum aspectibus certis magistri Abuzak anaham azarkel."<sup>77</sup>

(22) On fol. 133r, beneath a table of the elevation of the signs in the direct or right circle is written the following text:

Si vis corrigere vel facere tabulam de ascensionibus signorum in circulo recto, umbram 21 punctorum et 37 mi., multiplica per 4°, et productum divide per 31, et g. m. 2 que proveniunt sunt elevatio totius Arietis, quam divide per 30 et da cuilibet gradui Arietis partem suam. Elevationem Tauri sic invenies. Umbram 23 digitorum et ii mi. multiplica per 4°, et productum divide per 31. Et si elevationem Arietis et Tauri simul iunctas minuas de 90 et remanet quod queris et tunc fac quod prius. Hoc ponit Iohannes de Scicilia in scripto suo super Tabulas Tolletanas.<sup>78</sup>

(23) At fol. 135ra, after the rubric, "De longitudinibus et latitudinibus quarumdam regionum seu civitatum," a brief text opens, "Occidens vero ab habitato distat per 17° 30'. . . ." That is to say, longitude is reckoned from a point 17 degrees and a half west of the inhabited portion of the earth. Such places are mentioned as Arim, the imaginary center of the earth's surface, Cremona, Genoa, Toledo and London, and it is stated that the pillars of Hercules or Cadiz (*Gades Herculis*) is where the habitable quarter of the earth begins. It is noted that the difference in longitude between Novara and Magdeburg is nine minutes of one equal hour. The true latitude of Paris is 48° 50', and its true longitude from the west is 40° 30'. "And I found this in the Canon of master John de Lineriis. Now, moreover, according to the same authority, the difference in longitude between Toledo and Paris is two minutes of a day, which are 12° 8'."

(24) At fol. 141r there is a reference to the meridian of Florence.<sup>79</sup> On fol. 145v mansions of the moon are considered, with citation of Firminus (de Bellavalle) in his *De impressionibus et mutationibus aeris* and of Abraham (ibn Ezra) *De seculo*. At fol. 146r, tables occur for the years 1421-1432, and by fol. 147v have reached the years 1457-1468. At fol. 148ra-rb, a brief text with the rubric, "Canon tabule sequentis que intitulatur tabula motus diversi solis et lune in una hora et semidyametrorum secundum tabulas Alfonsi," has the unfamiliar incipit, "Verum motum lune et solis in una hora . . ." and closes, ". . . M.I.C. composuit istum canonem et etiam tabulam, et hec est tabula quam ipse nominat in principio suorum canonum de eclipsibus." Possibly M.I.C. stands for Magister Iohannes Chillingworth. However, in Latin manuscript 7282 of the Bibliothèque Nationale at Paris a table, "ad sciendum motum solis in una hora et semidyametros luminarium," is followed by a canon on it ascribed to John of Genoa, and with the first word of the incipit given as "Utrum."<sup>80</sup> At fol. 150ra, the rubric, "Canon tabule sequentis que intitulatur Tabula latitudinis lune," introduces a text with the unfamiliar

<sup>77</sup> Almeon or Al-Ma'mun, who was ten years older than Albumasar, is similarly called his son, perhaps in the sense of disciple, in MS Vatic. Palat. lat. 1414, fol. 137v. In other MSS, however, the reading is *Almansoris*, not *Albumasaris*. But Al-Ma'mun (786-833) was the son of Harun-al-Raschid and not of Al-Mansur, who died in 775.

Steinschneider, *op. cit.*, p. 15, in another connection, identified "secundum Jahiben filium Albumasaris" with Jahja ben abi Mansur, "Célèbre astronome du IXe siècle, rédacteur des

'tables vérifiées'; 'abi Mansur' est devenu abu Masar, ou Albumasar."

<sup>78</sup> The allusion is to John of Sicily's commentary on Arzachel: see BN 7281, fols. 46r-138r, "Expositio Io. de Silicia supra canonem Arzachelis facta Parisius anno Christi 1290."

<sup>79</sup> "Si vis coniunctionem et oppositionem reducere ad meridianum Florentinum."

<sup>80</sup> BN 7282, fol. 129v, "Canon tabule precedentis quam composuit magister Iohannes de Ianua," opening, "Utrum motum solis et lune in una hora. . ." "Verum . . ." seems preferable.

incipit, "Per istam tabulam scitur latitudo lune. . ." Where the canon ended was not clear. In any case, at fol. 151ra is the rubric, "De equatione dierum," followed by more citation of John of Sicily on the Tables of Toledo.<sup>81</sup>

(25) More tables follow, and then, at fol. 152va, a "Canon Tabule subsequentis que intitatur Tabula veri loci lune ad dies datos post mediam conjunctionem vel oppositionem solis et lune." It ends at fol. 153ra, "Explicit canon tabule sequentis que est una tabularum quas composuit magister Iohannes Vimondi." This last John is surely the same as a John Vimundus, to whom a treatise on the astrolabe is attributed in a fourteenth century manuscript at Erfurt,<sup>82</sup> and another astronomical work, dated in 1320 at Paris, in a manuscript of the same century at the Bibliothèque Nationale, Paris, in which it is stated that the author is from the diocese of Bayeux and writes for the students of the University of Paris "and all others."<sup>83</sup> Our Ottobonian manuscript proceeds, "Moreover, this canon is the eleventh of the canons which master John de Spira composed on the Tables of the aforesaid master John at Paris."<sup>84</sup> It is a remarkable fact that in both of the other manuscripts the works by Vimundus are immediately followed by the Canons on the Primum mobile of Johannes de Lineriis, which were completed at Paris two years later. The two men thus appear to have been teaching astronomy at Paris contemporaneously, although the name of neither is found in the *Chartularium Universitatis Parisiensis*. A Johannes de Vimi, one of several students who were severely wounded by armed servants of the official and bishop in 1267, aside from the difference in name, would seem too early.

After five more pages of tables, we reach, on the last leaf of the manuscript, another canon, which is based upon revolving tables that Jean de Murs composed at Paris. In opening it mentions 1320,<sup>85</sup> which was presumably the year of the composition of the Tables. A note at the close of the text by the copyist says that he does not trust in the aforesaid canon as to opposition,<sup>86</sup> since he has found it false.<sup>87</sup>

#### PALATINE 1171

(26) PALATINE 1171, of the fourteenth century, contains, besides the *Conciliator* of Peter of Abano, two astronomical works by him, *On the Motion of the Eighth Sphere*<sup>87a</sup> and his *Lucidator*.<sup>87b</sup> The former gives the full text

<sup>81</sup> Ottobon. 1826, fols. 151ra and 151rb.

<sup>82</sup> Amplon. F.377, fols. 21-22: "Planicelium vero componitur ex eis que sunt —. Limbus est circumferentia materialis planicelii . . . / . . . in parte sub horizonte illa erit meridionalis. Explicit tractatus Ioh. Vimundi de floribus illorum que per instrumenta spere signorum possunt inveniri ad faciendia iudicia astronomica secundum intentionem summi Ptholomei Feludiensis."

<sup>83</sup> BN 7286, fols. 11-8v: "Dispositio corporum celestium continetur hic cum suis argumentis. Et primum sequitur de radice coniunctionum mediarum solis et lune . . . / . . . Et in hoc terminatur opus Iohannis Vimundi Baiocen. dyoc. de dispositionibus planetarum et stellarum fixarum. Et cum istis seq. de his que per ipsum ordinantur ad conversionem temporum verorum et equalium sociatorum. Et de dispositionibus eclipsalibus solis et lune sibi pertinentibus. Et de aliis dispositionibus ipsorum et aliorum corporum celestium ad utilitatem scolarium universitatis Parisiensis et omnium aliorum."

<sup>84</sup> Fol. 153ra, "Iste autem Canon est undecimus canonum quos composuit magister

Iohannes de Spira supra Tabulas predicti magistri Iohannis Parisius."

<sup>85</sup> Ottobon. 1826, fol. 156ra: titulus, "Incipit canon super tabulas revolventes quas composuit Magister Iohannes de Muris Parisius. Canon tabule sequentis intitatur tabula vere coniunctionis et oppositionis solis et lune"; incipit, "Canon huius operis talis est. Ab annis domini perfectis deme 1320 et annorum remanentium scias numerum lunationum . . ."

<sup>86</sup> On fol. 156rb, in the middle of the column, is the rubric, "De oppositione solis et lune invenienda."

<sup>87</sup> Fol. 156va, "Non confido in predicto canoni de oppositione quia invenio falsum."

<sup>87a</sup> At fols. 317va-320ra, "Incipit tractatus quem Petrus Padubanensis construxit in motu octave spere cuius sunt quatuor distinctiones . . . Prohemiale in operis causa et ipsius inventione (intentione?) . . ."

<sup>87b</sup> At fols. 320ra-337r, opening as usual "Quoniam astrologice considerationis ambiguitates et discolie propter ipsius grandem difficultatem extant . . ."

in four Distinctions ending with different past estimates of the age of the world.<sup>87c</sup> I have a microfilm of fols. 317r-337r.

## PALATINE 1414

(27) PALATINE 1414 is a collection of astronomical treatises made in the thirteenth century. It is a small quarto written in double columns for the most part in a firm and neat hand, and apparently should prove useful for any future critical editions of the works contained in it. Millás Vallicrosa used it, as we shall see, for one work which he edited in his *Estudios sobre Azarquiel*, but not for another. There are treatises by standard Arabic and Latin authors, such as Alcabitius,<sup>88</sup> Thebit ben Corat,<sup>89</sup> Arzachel,<sup>90</sup> and Messahalla,<sup>91</sup> or Gerard of Cremona,<sup>92</sup> Sacrobosco,<sup>93</sup> Robert Grosseteste,<sup>94</sup> and Campanus of Novara,<sup>95</sup> while others are to be found, so far as I know, only in this manuscript. It contains at least two references to the city of Paris. The date A.D. 1188 is given for the conjunction of the equinoctial circle and

<sup>87c</sup> Desinit: ". . . Hec est itaque dissonantia que circa producendum ac principium extat universi presentem in nullo impediens considerationem quolibet enim ponatur motus eius et diversitas tamen tanta nutu dei existit prefati."

<sup>88</sup> His *Liber introductorius*, in the Latin translation by John of Seville, opening, "Postulata a domino prolixitate vite . . ." occupies fols. 11a-20b, and is followed by miscellaneous notes at fol. 20b-vb.

<sup>89</sup> His work on the motion of the eighth sphere opens at fol. 21ra, "Imaginabor speram equatoris diei . . ." which form of incipit, rather than "Imaginabor speram equationis . . ." (*A Catalogue of Incipits*, col. 313) is given in Thabit B. Qurra, *Four Astronomical Tracts in Latin*, edited by Francis J. Carmody, Berkeley, California, 1941, p. 5, and by Millás Vallicrosa in editing Thebit's tract at pp. 496-509, of *Estudios sobre Azarquiel*, Madrid-Granada, 1943-1950. But he does not list our MS among those which he used for the text.

At fols. 84ra-85rb occurs his tract on imagination of the sphere: rubric, "Incipit liber Thebit de ymaginatione qui est introductorius in astrologiam"; incipit, "Nos iuxta rectam ymaginationem astrologiam inchoantes . . ."; desinit, "Explicit Tebith de ymaginatione." It is incorrectly described by a much later hand in the margin as Thebit on the motion of the eighth sphere.

<sup>90</sup> The Canons of Arzachel on his Tables (commonly known as the Tables of Toledo) occupy fols. 67r-84ra; the Tables themselves come a little later at fols. 86-139. In the top margin of fol. 67r is written, "Iste sunt canones Arzachelis cuius etiam sunt tabule." After a rubric three lines long follows the customary incipit, "Quoniam cuiusque actionis quantitatem temporis metitur . . ." At fol. 84ra, "Finiuntur canones supra tabulas astronomie." This MS was noted by Steinschneider, "Etudes sur Zarkali," *Bullettino*, 1887, 20: 13.

<sup>91</sup> The *Practica* or second part of his work on the astrolabe opens at fol. 179va, "Nomina instrumentorum sunt hec. Primum est armilla suspensoria ad aliquam altitudinem capiendum et dicitur arabice Alhauaga. Secundum Alhalka, id est, ansa que iungitur. Postea mater rotulas omnes in se continens cum aranea cui iungitur margolabri in 360 gradus divisum . . ." It is found in many MSS and has been printed from

English MSS, by R. T. Gunther, *Early Science at Oxford*, 1929, 5: 168-192, 217-231, both in Latin and in English translation. His slightly different rendition of its opening may be noted: "Nomina instrumentorum sunt hec. Primum est armilla suspensoria ad capiendam altitudinem, et dicitur arabice alhahucia" (*alhantia* in BN 7336, fol. 320rb). "Secundum est alhabor, id est, ansa que iungitur ei. Postea mater, rotula scilicet, in se continens omnes tabulas cum aranea, cui coniungitur margolabrum scilicet in 360 gradus divisum."

At fols. 183va-189vb follows Messahalla on the composition of the astrolabe, usually represented as the first part of his work, with the usual incipit, "Scito quod astrolabium est nomen grecum . . ." but ending, like MS Ashmole 1796 at the Bodleian, Oxford, with what are the closing words of Chapter 16 in Gunther (*op. cit.*, pp. 193-216, from Cambridge University Library MS li.3.3, a.d. 1276). ". . . Hoc modo facies ceteras longitudines eiusdem regionis eiusdem tabule, si deus voluerit" (Gunther omits the first *eiusdem*).

<sup>92</sup> *Theorica planetarum* at fols. 160ra-166ra.

<sup>93</sup> His *Algorismus* at fols. 29vb-34vb.

<sup>94</sup> His *Sphere*, at fols. 34vb-41ra, is separated by the *Centiloquium* of Hermes, at fols. 41va-43vb, from his *Computus*, at fols. 43vb-61rb, with tables that seem to belong with it at fols. 61v-62r. Only "Incipit computus episcopi Lincioniensis" appears on fol. 43vb; on fol. 44r, a table of contents of the twelve chapters is followed by the usual incipit, "Computus est scientia numerationis et divisionis temporum . . ." S. Harrison Thomson, *The Writings of Robert Grosseteste*, 1940, p. 96, lists our MS among those of *Computus correctorius* as distinguished from *Computus I* (in 14 chapters) and *Computus minor*, but gives the fols. as 44-61.

<sup>95</sup> At fols. 208ra-211ra, "Scire debes quod circulus solis duas habet medietates . . . / . . . de practica quadrantis sufficient. Explicit quadrantis Campani." MSS are numerous and sometimes have a variant opening, "Debes scire . . ." or "Sciendum quod . . ." What is listed separately in *A Catalogue of Incipits*, col. 650, under "Scire debes quod circulus solis duas . . ." as "II. Canones de locis solis et lune," is undoubtedly Campanus on the quadrant, having the same desinit, ". . . profunditates quaslibet et planities," etc.

the ecliptic in the twenty-third degree of Pisces and of Virgo,<sup>96</sup> while the last treatise in the manuscript in closing gives the present date as 12 November 1266,<sup>97</sup> after which it is added that the cost of writing the manuscript was 62 Florentine florins.<sup>98</sup>

(28) At fol. 23rb, a treatise on the astrolabe which seems unfamiliar opens, "De inventione azimuth. Possunt (*sic*) autem azimuth hoc modo fieri. . . ." Or, "De inventione azimuth" may be taken as a rubric or chapter heading, and the rest as the incipit. On fol. 25r, written in single column, we are told that the fixed stars included "in this table" were verified by armillaries in the city of Paris. On fol. 25v is a figure of the back of the astrolabe and on fol. 26r, a figure of its inner part. Then comes a work ascribed to Ptolemy which also seems peculiar to this manuscript: at fols. 27ra-29vb, opening, "Cum omnibus directe intuentibus constet esse necessarium aliquid in astronomica arte prevalere. . . ," and closing, ". . . secundum hoc quod Anaxagoras ibi disposuit. Finitus est liber figure Ptholomei."

(29) A Theory of the Planets, which opens "Investigantibus astronomie rationes. . . ," occurs anonymously in our manuscript at fols. 62va-66vb. It also is found in other manuscripts, usually anonymously. Baur denied that it was by Grosseteste<sup>99</sup> and Thomson, *The Writings of Robert Grosseteste*, listed it among *Dubia*, with the title, *De astronomia*.<sup>100</sup>

(30) At fol. 139v, between a Table of the longitude and latitude of the fixed stars, and another of the Visibility and Occultation of the three superior planets, is a note in the same hand as had appeared previously in the manuscript. It states that the distance of the city of Paris from the city of Toledo according to some is 11° 30', that is, 46 minutes of an hour; according to others 12° 17', or 49 minutes and 8 seconds of an hour; according to yet others, only 11°, or 44 minutes of an hour.<sup>101</sup>

(31) At fol. 140ra-b, is a brief note opening, "Quandocumque minutia multiplicat minutiam. . . ," and then, at fols. 140va-141rb, a tract on finding the time of eclipses: rubric, "Incipit quedam doctrina de invenienda eclipsi solis et lune breviter"; incipit, "Inventa coniunctione luminarium intrandum est ad horas diversitatis aspectus sive ante meridiem sive post meridiem. . . .";<sup>102</sup> at fol. 141rb, "Explicit," after which the column is filled out by six lines of a "Nota quod ad inveniendum ascendens. . . ." Tables occupy fols. 141v-152va, after which follow *Canons* on tables of eclipses of sun and moon.<sup>103</sup>

(32) What is given in *A Catalogue of Incipits* as a single treatise, occupying fols. 166r-167v and opening, "Cum horam coniunctionis duorum planetarum placuerit invenire. . . ." should probably rather be regarded as a succession of three paragraphs which have no necessary connection and of which the

<sup>96</sup> At fol. 157vb, "Cum sint due signorum distinctiones, una secundum coiunctionem circulorum equinoctialium et ecliptice, que est ad horarum distinctionem aptissima, quam secutus est Ptholomeus in Almagesto et secundum quam factum est astralabium, et est hec circulorum coiunctio a.d. 1188 in 23 gradu tam Piscium quam Virginis."

<sup>97</sup> At fol. 224rb, "Explicit liber presens anno salutis Incarnationis domini Ihesu Christi M° CC° 66, 12 die Novembris."

<sup>98</sup> At fol. 224rb, "Constat pro scriptura 62 fl. Florentinos." A few miscellaneous notes follow at fols. 224v-225v.

<sup>99</sup> In *Beiträge zur Geschichte der Philosophie des Mittelalters*, 1912, 9: 61\*.

<sup>100</sup> *Op. cit.*, p. 235. In *A Catalogue of In-*

*cipits*, the title is given as *Theorica sphaerae*.

<sup>101</sup> Compare the estimate given above from Ottobon. 1826, fol. 135ra.

<sup>102</sup> Our MS is the sole instance of this incipit given by Thorndike and Kibre, but Delisle, *Le cabinet des manuscrits*, III, 89b, gives it for a MS once in the Sorbonne.

<sup>103</sup> Palat. 1414, fol. 152vb, rubric, "Incipiunt quidam canones supra tabulas eclipsis solis et lune"; incipit, "Ut annos Arabum et menses et per consequens etatem lune. . ." (see *A Catalogue of Incipits* for a similar incipit from another MS); 157va, "Explicit quod sufficit de utraque eclipsi tam solis quam lune." The note at fol. 157vb has been noted already; see note 96. It ends at 159rb, if not before. There are figures on 159v.



second opens at fol. 166rb, "Sciendum est quod planetarum quidam sunt benivoli, quidam malivoli . . .," while the incipit of the third paragraph at fol. 167va is, "Notandum est quod octava spera et spere planetarum moventur duobus motibus principalibus. . . ."

(33) Correction and amplification are also required of the brief account given of the next treatise in Palatine 1414 in my article, "Who Wrote *Quadrans Vetus*?"<sup>104</sup> at the time of writing which I had not inspected this manuscript. The treatise on the quadrant (at fols. 168ra-173ra) is written in a larger hand than the previous contents of the manuscript. The Robert named as its author is *not* called Anglicus, but only "of Montpellier" (Montepessalano (*sic*), *not* Montepessino). The work opens, "Geometrie due sunt species (*not* partes) teorica et practica. . . ." It closes, ". . . area multiplicetur per eius altitudinem et produc (*fol. 173ra*) tum dabit capacitatem," followed by the rubric, "Explicit quadrans magistri Roberti de Monte Pessalano."<sup>105</sup>

(34) A series of paragraphs on Saturn in each of the twelve signs (fols. 173ra-174ra), of which the first opens, "Quando Saturnus intrat Arietem et perficit medietatem more sue . . .," is given the title (top margin of fol. 173rb), "Flores Albumasar." The usual incipit for that work, however, is, "Dixit Albumasar. Oportet te primum scire. . . ." Nor does "Quando Saturnus intrat . . .," etc., correspond to the opening words of any section of the *Flores* in the printed edition of 18 November 1488, by Erhard Ratdolt at Augsburg. But our text resembles in subject matter a "Capitulum in narratione Saturni an quid acciderit in mundo de mutacione sua de signo in signum," in a manuscript at Basel,<sup>106</sup> where it is followed by Albumasar on elections and has an introduction opening, "Hunc librum intellexerunt Romani . . .," which appears in other manuscripts as the incipit of Albumasar, *Flores super Saturno*.<sup>107</sup> In Vatican Palatine 1401, the Elections of Albumasar, in a beautiful Gothic hand (13th century?), at fols. 53r-58r are immediately followed by these paragraphs on Saturn in the twelve signs, at fols. 58r-59r, opening, "Quando Saturnus intrat signum Arietis et perficit medietatem more sue . . .," and written in a later and inferior hand.

(35) The next tract in Palatine 1414, at fols. 174ra-177ra, on the significations of the planets in the astrological houses, is usually ascribed to Gergis<sup>108</sup> or Iergis (Jergis), but sometimes to Messahalla,<sup>109</sup> whose treatise on the astrolabe presently occurs in this MS. The planets are considered in the somewhat peculiar order: sun, Venus, Mercury, moon, Saturn, Jupiter, Mars, and then also the Head and Tail of the Dragon. It was usual to begin treatments of the planets with Saturn, and one late MS does so, Cambridge, Emmanuel College 70, 15th century, fols. 69r-70v, opening "Dixit Iergis, Saturnus cum fuerit. . . ." But *Speculum astronomiae*, attributed to Albertus Magnus, and early MSS such as BN 16208, late 12th century, where the "Dixit Iergis, Saturnus cum fuerit . . ." occurs at fol. 51rb, after sun, Venus, Mercury, and moon have been treated, and BN 16204, 13th century, pp. 428b-432b, agree with Palatine 1414 in opening, "Sol cum fuerit in ascendente significat. . . ." In it the tract ends, ". . . Hee sunt significaciones planetarum,

<sup>104</sup> *Isis*, 1947, 37: 150-53, at p. 152a.

<sup>105</sup> Two headings within the work may be remarked: at 172ra, "Secunda pars huius tractatus que de planimetria"; at 172rb, "Sequitur de mensuratione per steriometriam."

<sup>106</sup> Basel D.I.10, 14th century membrane folio, fols. 31ra-va.

<sup>107</sup> See *A Catalogue of Incipits*, col. 305 (ex-

cept that the text does not occur in the Augsburg edition of 1488, and that it further is found in Cambridge, Pembroke College MS 227, 14-15th century, fols. 178-180).

<sup>108</sup> On Gergis see *A History of Magic and Experimental Science*, II, 718-19.

<sup>109</sup> *A Catalogue of Incipits*, col. 694, "Sol cum fuerit. . . ."

et si fuerint in meliori esse, dic melius. Si vero in deteriori, verte sententiam. Explicit." A more usual ending is that of BN 16024, ". . . et proferas aliud et invenies, si deus voluerit. Explicit." Jergis is also one of the nine judges in *Liber novem iudicum*, Venice, 1509, "ex officina Petri Liechtenstein; Basel, 1571."

(36) After fifteen leaves of astronomical tables follow, at fols. 205ra–208ra, Canons on the Tables of Humenix or Humeniz in the Latin translation of 1239 by John of Pavia, opening, "Sciendum quod Humenix philosophus summus Egyptiorum . . .," which Millás Vallicrosa has edited from this very manuscript, collated with Vatican Palatine 1410 of the fourteenth century.<sup>110</sup> He holds that Humenix is to be identified with Aumatius or Aumanus, a source of the Almanach of Azarquiel, and in turn to be identified with Ammonius, the last director of the school of Alexandria, and the master of Damascius, Simplicius, and Philoponus. Also that the Almanach of Azarquiel "fué resumida o recensionada al latin por Juan de Pavia en el año 1239, con el nombre de Tabulae Humeniz philosophi summi Egipciorum."<sup>111</sup> It was also translated into Castilian by order of Alfonso the Wise, and Profatius Judaeus adopted it for his Perpetual Almanach, calculated on the root, March first, 1301.

(37) The astrological tract which opens in Palatine 1414 at fol. 211r, "Notandum quod principatus planetarum in conceptione humana . . .," does not extend to fol. 215v,<sup>112</sup> since fols. 213ra–215vb are occupied by another treatise, which is entitled, *De fructibus planetarum*. In other manuscripts it opens, "Cupientibus habere fructum planetarum . . .,"<sup>113</sup> or "Cupientibus planetarum habere fructum . . ."<sup>114</sup> but here it begins, "Cupientibus fructum planetarum primo scire oportet quis sit eorum ordo, que natura et proprietates . . ." and closes, ". . . et omne opus quod incipitur bonum habebit finem."<sup>115</sup>

Of this last mentioned tract I may give some account based upon two Basel manuscripts<sup>116</sup> and a rotograph of Amplon. F.386,<sup>117</sup> since I did not examine it in detail in Vatican Palatine 1414. The treatise first considers the order and nature of the planets, their properties, macrocosm and microcosm, how the planets operate in the conception of the child and formation of the foetus, their relation to the members of the human body, hours of the day, and signs of the zodiac, and how long each takes to complete its course. It then turns briefly

<sup>110</sup> *Estudios sobre Azarquiel*, pp. 379–92. He gives the name as Humeniz, but both in the MS itself and in his facsimile of fol. 205r, facing p. 384, it seems to me to be spelled with an x both in rubric and incipit.

<sup>111</sup> Communication présentée au VIe Congrès international d'Histoire des Sciences, Amsterdam, 1950, pp. 142–143; also in *Archives internationales d'Histoire des Sciences*, 1951, 17: 875–77. See also Steinschneider, "Die europäischen Uebersetzungen," *Vienna Sitzungsberichte*, Philos.-Hist. Klasse, 1905, 149: 51–52. Zinner, *Verzeichnis*, Nos. 635–640, lists MSS in German libraries; Steinschneider, in *Zeitschrift f. Math. u. Physik*, 1871, 16: 366, mentions Laud. 644 at the Bodleian, Oxford, and Harley 3647, in the British Museum, London.

<sup>112</sup> As stated by Thorndike and Kibre, "More Incipits of Medieval Scientific Writings in Latin," *Speculum*, 1942, 17: 357.

<sup>113</sup> *A Catalogue of Incipits*, col. 166.

<sup>114</sup> Basel F.IV.18, 14th century, fol. 511ra. Zinner (see note 14 above). Nos. 8257–8261, does not include it, although he lists another Basel MS, D.L.10, also 14th century, where the work occurs at fols. 28va–30vb. In Erfurt, Amplon.

F.386, fol. 55vb, we encounter yet another variant of the incipit, "Et cupientibus habere fructum planetarum. . ."

<sup>115</sup> Basel F.IV.18 ends similarly, ". . . incipere scolas et omne opus (fol. 54ra) quod incipietur bonum habebit finem." In other MSS the desinit varies: Basel D.L.10, fol. 30vb, ". . . ubi declaratur artis assignatio. Explicit liber de effectibus planetarum"; Erfurt, Amplon. F.267, fols. 162–165, ". . . hominibus occidentibus pecus carum. Incipit consideracio fortune in omnibus partibus signis(!)." This last sentence comes in Basel D.L.10 at fol. 31va, and "Incipit de mutatione planetarum" follows, but its astrological matter is similar to that which Basel F.IV.18 includes under *De fructibus planetarum*, and at fol. 32ra we read, "Explicit liber de effectibus (fructibus?) planetarum." In Erfurt, Amplon. F.386, c.1359, fols. 55vb–58vb, Schum gives the ending as, ". . . Deus gloriosus dedit septem planetis, quando ipsas creavit. Explicit. Explicient non plus imicui(!) ut ab iniquo dicitur iniqui."

<sup>116</sup> Mentioned in notes 114 and 115.

<sup>117</sup> Unfortunately reduced in size and somewhat illegible.

to the signs, noting what hours each dominates. Passages of astrological medicine in two of the manuscripts<sup>118</sup> occur after the Explicit of Basel D.I.10, under the caption, "Incipit de mutatione planetarum." But it had included earlier<sup>119</sup> a long account of the influences of the planets which had come last in the other two manuscripts.<sup>120</sup> Meanwhile all three manuscripts considered how to find a man's ruling planet from the letters of his name, the influence of the planets on journeys according to the first seven hours of each day of the week, and when the sun enters each sign.<sup>121</sup> This last is the concluding passage in Basel D.I.10, but precedes that on astrological medicine in the other two manuscripts, where the other two passages follow after that on astrological medicine.

(38) How the text varies in different manuscripts may be further illustrated by reproducing in parallel columns the discussion of the influence of the planet Mercury in Basel D.I.10, fol. 30rb-va, and in Erfurt, Amplon. F.386, fol. 58va-b.

*Basel D.I.10*

Nunc videamus de Mercurio.

Hora Mercurii ad omnia facienda sibi similia bona est. Nam bonum est tunc incipere scolas et continuari et congregare exercitium vendere emere contra verbosos contendere. Habet duo habitacula scilicet Virginem et Capricornum. Quando est in Virgine tunc gaudet et tunc habet dominium in omnibus consimilibus. Si quis tunc acciperet salmonem et de corde illius secum haberet, in palatio numquam amittet (30va) Si quis tunc acciperet virgam pastoris, id est, cardum benedictum et secum haberet in palatio, pars illa in qua esset integra ex integro annuleret(?)

Quando intrat Capricornum, amittit vires suas. Cum planetis nullam habet amicitiam. Habet vitam et mortem. Scorpio est vita eius. Cancer est mors. Quando est in Scor-

*Erfurt, Amplon. F.386*

De Mercurio videndum. Natus sub Mercurio pulcher formosus ingeniosus. Erit eloquens parvus mendax. Tota vita sua erit in laboribus. Si quis autem interrogat de se ipso habens certum motum Mercurii, dic, semper pauper et miser erit et invidiosus valde. Et si de ytinerante, dic, opus tibi erit eundo et redeundo. Si de infirmo, dic, hac infirmitate morietur. Si quid patitur, dic, ex vitio pulmonis de quo nisi divino miraculo liberari poterit. Si de latrone, dic quod ab initio etatis sue furari consuevit, rem tuam habebis, si laboraveris.

Hora Mercuii ad omnia sibi consimilia facienda bona est. Nam bonum est incipere scolas, exercitium incipere, emere, vendere, contra verbosos contendere. Item duo habet habitacula scilicet Virginem et Capricornum. In Virgine gaudet et regnat et habet dominium in omnibus consimilibus.

Si quis tunc acciperet salmonem et de corde ipsius secum haberet in placitis, numquam amitteret. Si quis tunc acciperet virgam pastoris et cardum benedictum et secum haberet in placitis, parvula(?) in qua esset ex integro amitteret.

Quando intrat Capricornum, amittit vires suas. Cum planetis nullam habet amicitiam. Item habet vitam et mortem. Scorpio est vita eius et Cancer est mors. Quando est in Scorpione, tunc gaudet,

<sup>118</sup> Paragraphs opening, "Quoniam creator (lector?) cum discretione omnia debet providere, et maxime medicus in dando medicinas . . .," and, "Si quis prima luna aliqua infirmitate gravatus fuerit . . .": Basel F.IV.18, fols. 52vb-53ra; Erfurt, Amplon. F.386, fol. 56va.

<sup>119</sup> At fols. 29rb-30va, opening, "Quia (or, Quoniam) unusquisque planetarum habet amicum et inimicum. . . ."

<sup>120</sup> Amplon. F.386, fols. 56vb-58vb; Basel F.IV.18, in part only, at fol. 53va-b.

<sup>121</sup> Basel D.I.10, fol. 30va-b; Basel F.IV.18, fols. 53rb-va, 52vb; Amplon. F.386, fol. 56vb, rb.

pione, tunc gaudet et regnat et dominium habet in consimilibus. Tunc bonum est placitum concinnari et causam in foro ante iudices invenire, tunc informantur signa et arterie et vene in arteriis, tunc bonum est minuere, tunc gaudent mulieres. Si quis tunc aliquid ad luxuriam pertinens postulet, statim impetrat.

Si quis tunc fenugracum super se portaverit, equalibus semper placebit et ab inimicis nullam patietur repulsam. Item si quis tunc acciperet virgam pastoris et in illa radice cum succo yperalico nomen alicuius servi fugati inscriberet et super hostium unde exivit poneret, nullo modo quiesceret nisi ad domum prius rediret.

regnat et dominatur et habet dominium in consimilibus. Tunc bonum est placitare in foro, causas coram iudice ventilare, tunc impluendo(?) renes et arterie et tunc bonum est sanguinem minuere, et tunc gaudent mulieres. Et quod ad luxuriam pertinet statim ab eis impetratur. Etiam mingunt sanguinem. Si quis tunc acciperet sudorem et ipsum desiccaret ad solem et ipsum cum succo plantaginis commisceret et in vase cum eo (58vb) ad ignem bulliret et ipsum ad collum ligaret, si totus incideretur(?), sanguinem emitere non posset. Probatum est in brachio. Si quis hanc accipit ex muliere et quotiens est ligatum in collo mulieris, nullo modo concipiet.

Si ipse fenum grecum portavit supra se, semper placeret et ab inimicis nullam repulsam pateretur. Si quis tunc acciperet virgam pastoris et in unius(?) radice cum succo yperico nomen alicuius servi fugitivi scriberet super hostium unde exivit, nullo modo quiesceret nisi ad domum prius rediret.

(39) Such superstitious recipes using herbs and other simples are a notable feature of the work, and occur in connection with the other planets as well as Mercury. The following love charm is associated with Saturn in Basel D.I.10. If anyone takes the herb *satureia* and heats it in a rude pot and reduces it to a powder and mixes it with the juice of laurel leaves, on which the names of the man and woman have been written, and with the juice of *satureia*, and with that confection touches the woman's pulse, she will be inflamed with love for him in marvelous wise.<sup>122</sup> This charm is not found in Amplon. F.386, but in the corresponding place it states that if anyone takes a live lizard and binds it with elder wood on the nostrils for a day and night, he will not eat.<sup>123</sup> Both manuscripts then unite in asserting that if anyone takes the gall of a calf, which died while Saturn was in conjunction with Jupiter and Mercury, and mixes it with red coral, no animal in whose ear it is placed can suffer from any disease. The close of the text proper in Basel F.IV.18 is followed by magic tricks such as to make a candle flame like silver by amputating the tail of a live lizard and drying it, because the blood in its tail resembles quicksilver.

(40) Coming back to Vatican Palatine 1414, we find fol. 216r filled by a chart showing the significance of the aspects of the planets. Five aspects are arranged horizontally across the page, and six planets, omitting the moon, head vertical columns. A treatise on weather prediction<sup>124</sup> is here ascribed in the margin to Alkindi ("Sequitur Alchindus ut creditur") but is really by Grosseteste.<sup>125</sup> The last work in the manuscript, on rules of judicial astrology, is there anonymous, but its incipit, "Quoniam regulas astronomie iudicandi non nisi per diversa opera diversas invenimus . . .," shows it to be by Roger of Hereford of the twelfth century.<sup>126</sup>

<sup>122</sup> Basel D.I.10, fol. 29va.

<sup>123</sup> Amplon. F.386, fol. 56vb.

<sup>124</sup> At fols. 216va-220ra: "As prenotandum diversam dispositionem aeris futuram . . . / . . . Explicit pronosticatio aeris."

<sup>125</sup> S. H. Thomson, *The Writings of Robert Grosseteste*, 1940, p. 104, lists the work as "un-ascribed" in this MS.

<sup>126</sup> *A History of Magic and Experimental Science*, II, 184-85.

## PALATINE 1354

(41) Finally may be added some further account of another Palatine manuscript, albeit out of its strict numerical order. Various parts of Palatine 1354 have been discussed by me elsewhere: such as its tracts on *Visierkunst* or *Ars visorandi*,<sup>127</sup> a little known tract on phlebotomy,<sup>128</sup> several unfamiliar astronomical treatises which are found scattered through its 250 leaves,<sup>129</sup> and a number of definite astronomical dates.<sup>130</sup> I would now review it as a whole and note some further features of the manuscript, illustrative of the intellectual interests and mental make-up of the time when it was written, in the fifteenth century.

(42) Before "The Way to Make a *Virga Visoria*"<sup>131</sup> begins in German on the second leaf of the manuscript, the first leaf or fly leaf contains astronomical and astrological notes among which we find the following:

In the year 841 B.C. a vestal virgin, as a Vesta dedicated to god, bore twins which a wolf suckled, and prefigured the Holy Virgin who gave birth to Christ at Jerusalem, in which year a conjunction occurred 305 days after the revolution of the year<sup>132</sup> in 1° 7' Sagittarius.

This text is followed by a figure of the nativity or horoscope of Christ "according to some" (*secundum quosdam*).

This interest in chronology and in the birth of Christ crops out again later, when we are told<sup>133</sup> that the poet Vergil died 28 years before the Incarnation of Christ<sup>134</sup> and in the third year of Augustus.

Also the stay in the virginal womb of our divine Jesus Christ was 275 days, including the day of Annunciation and excluding the day of the nativity, that is, for 39 weeks and two days.

Also Christ suffered in the thirty-third year of His life. Also the Passion was on the third day of the month of April. And the ascension of Christ on May 14.

And I put Pentecost on the 24th day of the month of May. Also the glorious Virgin Mary conceived the son of God in her sixteenth year, bore him when seventeen, and dwelt with him 32 years and about 100 days. So when Christ died, she was forty-eight and a little over a half year. After the death of Christ she survived for one year and the period from the Passion until the day on which her glorious Assumption is celebrated, as St. Jerome too says he had read that the Holy Virgin in the fiftieth year of her nativity as by resurrection fell asleep in the Lord. Also the 70 weeks of Daniel make 490 common lunar years. Also an Olympiad is the space of four years. And Ptolemy composed his Tables about A.D. 140. And Alfonso his in 1252.<sup>135</sup>

(43) At fol. 119v in the second column are chronological notes of a more

<sup>127</sup> At fols. 2ra-32ra, 250v; in *Isis*, 1949, 40: 106-7.

<sup>128</sup> At fols. 121ra-126rb, in "Unfamiliar Medical Works by Known and Anonymous Authors in Vatican Palatine Manuscripts," *Annals of Medical History*, New Series, 1936, 8: 301.

<sup>129</sup> In "Some Little Known Astronomical and Mathematical Manuscripts." *Osiris*, 1949, 8, 43-44. The reading there suggested for fol. 160rb, should be revised as follows: "Explicit excerptum de lectura super Alcabitium finitum 1464 quo anno 27 nives notabiles ceciderunt et omnes menses permanserunt usque in Ieiunium." This may be translated: "Here ends the excerpt from the lectures on Alcabitius, completed in 1464, during which year there were 27 notable snowfalls and snow remained on the ground through all the months until Lent."

<sup>130</sup> In "More Dates for Late Medieval Astronomy from some Vatican Manuscripts," in *Homenaje a Millás-Vallicrosa*, II, 1956, 467-470.

<sup>131</sup> "De optica tractatus" on the back of the binding of the MS corresponds to nothing else in it, and would seem due to a misreading or misunderstanding of the meaning of "Virga Visoria" and "Ars visorandi."

<sup>132</sup> I.e., the vernal equinox or entry of the sun into Aries.

<sup>133</sup> At fol. 96v.

<sup>134</sup> Actually Vergil died on 21 September 19 B.C.

<sup>135</sup> This is their year of reference and the first of his reign. But they were actually drawn up later.

local character, also more accurate, and which perhaps serve to indicate the provenance of the manuscript:

Anno domini 972 Sanctus Wolfgangus ordinatur episcopus.<sup>136</sup>

Anno domini 975 Ramuoldus a sancto Wolfgango ordinatur abbas Ratisponensis ad Sanctum Emeranum.<sup>137</sup>

Anno 1052 translatus S. Wolfgangus.<sup>138</sup>

Anno domini 1062 comburitur monasterium S. Emerani idibus Aprilis.

Later on is quoted Albumasar's estimate of the number of years which elapsed between the creation of Adam and the Flood, namely, 2,226 years, one month, 23 days, and 6 hours.<sup>139</sup>

(44) The chronological passage quoted above concerning Vergil, Christ and the Virgin, Ptolemy and Alfonso, at fol. 96v, immediately continued as follows:

Also Albertus in Book 18, Tractate 2, Chapter 3, On Animals, writes thus of twin brothers connected. Says he, "Many trustworthy persons have told<sup>140</sup> that they saw such a man, who was two men joined in the back, and one was impetuous and irascible, the other gentle. And they lived for more than twenty years, after which one died and the other survived, until from the putridity and stench of his dead brother he died too.

This unchronological addendum is further unsatisfactory both from a psychiatric and a surgical standpoint, since it is not stated, either in our manuscript or in Albert's original text, whether the irascible or the gentle brother died first, and whether any operation was attempted — as would almost certainly have been the case — to save the survivor. We are disappointed that the curiosity of neither Albertus nor his reader and copier was excited on these points, and the tale remains as uninteresting as it is incredible.

(45) Meanwhile, however, the intervening contents of Palatine 1354 have shown a higher scientific caliber, for the tracts on *Visierkunst* have been followed by an extract from Nicholas of Cusa's *Idiotae libri quatuor* which includes a static experiment,<sup>141</sup> by astronomical figures and Tables, dates for eclipses, and a calendar for 1463-1482-1501-1520.<sup>142</sup> But Palatine 1354 has also lapsed into the astrological and magical with the works ascribed to Hermes on fifteen stars and to Ptolemy on images.<sup>143</sup> These brief tracts, however, are followed by many pages filled with astronomical tables and canons.<sup>144</sup>

(46) Just before the above quoted chronological passage there was citation of "Seldner Almanorum maximus."<sup>145</sup> The reference is to Heinrich Selder of the fourteenth century. Zinner lists six manuscripts of his commentary or

<sup>136</sup> St. Wolfgang became bishop of Ratisbon or Regensburg on Christmas day, 972.

<sup>137</sup> The Benedictine Ramuold became dean of St. Maximin, Treves, in 963; abbot of St. Emeran at Ratisbon in 975, and died in 1001.

<sup>138</sup> Wolfgang died in 994 and was canonized in October, 1052.

<sup>139</sup> At fol. 242vb.

<sup>140</sup> "Narraverunt, inquit, vero multi fide digni quod . . ." in our MS; "et narraverunt nobis multi fide digni quod . . ." in the editions of Albertus Magnus, *De animalibus* by H. Stadler in *Beiträge zur Geschichte der Philosophie des Mittelalters*, 16: 1225, and Borgnet, *Opera Alberti Magni*, 12: 261.

<sup>141</sup> At fol. 32rb-va, opening, "Sciendum quod unitas non attingitur numero quia . . ." and closing, ". . . Unde arbitror hanc staticam experientiam ad omnia geometrica perutilem esse."

On the static experiments of Nicholas of Cusa see *A History of Magic and Experimental Science*, IV, 388 *et seq.*

<sup>142</sup> At fols. 37r-42v. Astronomical Tables and Canons continue at fols. 43r-56v.

<sup>143</sup> At fols. 57r-58v, and 58v-59v. Of these I have already treated in "Traditional Medieval Tracts concerning Engraved Astrological Images," *Mélanges Auguste Pelzer*, Louvain, 1947, pp. 224-227, 256-261.

<sup>144</sup> Such as, at fol. 60r, "Canon super tabulam ostendens distantiam vere coniunctionis vel oppositionis a medio," opening, "Omnis utriusque sexus armoniam celestem . . ."; or, at fol. 92r, "Canon inventionis medie coniunctionis Saturni et Iovis," opening, "Tempus medie coniunctionis et oppositionis . . ." See *A Catalogue of Incipits*, 469, 718, for other MSS.

<sup>145</sup> At fol. 96v.

canons on the Alfonsine Tables<sup>146</sup> and five of his catalogue of stars,<sup>146a</sup> and suggests that other works on the astrolabe and theory of the planets may be by him.

(47) The occurrence in our manuscript of an anonymous pest tract, which seems not to have been hitherto noticed by collectors and cataloguers of this form of medical literature, such as Karl Sudhoff and D. W. Singer, serves to illustrate how omnipresent was this peril in the minds of all after the Great Mortality of 1348.<sup>147</sup>

(48) A treatise which is anonymous in Palatine 1354<sup>148</sup> and entitled, "Of the Great Year of Plato,"<sup>149</sup> is in other manuscripts ascribed to Nicole Oresme and entitled, "On the Movement of the Spheres."<sup>150</sup> It deals, like other writings of his, with questions of contingency and possibility, and the commensurability or incommensurability of the movements of the heavenly bodies. In our manuscript it divides into two tractates containing nine and twenty conclusions respectively. In the Sloane manuscript of the work there are nine marginal numbers for the first part, and twenty-one for the second.<sup>151</sup>

(49) The remaining contents alternate between astrology and astronomy. Messahala on interrogations and pseudo-Hippocrates on medicine from the position of the moon in the signs of the zodiac<sup>152</sup> are followed by lists of fixed stars from the first to the sixth magnitude<sup>153</sup> and by a discussion of the magnitude of the planets.<sup>154</sup> The length of a lunar month according to the mean motion of the moon is given as 29 days, 12 hours, 44 minutes, and 3 seconds.<sup>155</sup> Its occultation by the sun lasts about two days, "but this is not a scientific fact, because it has been experienced many times, that the old and new moon was visible on one and the same day, as happened in the year of Christ 1358."<sup>156</sup> But soon citation of Picatrix,<sup>157</sup> c. 4, *I libri nigromancie*, is succeeded by discussion of the mansions of the moon and astrological images. Then astronomical canons for Magdeburg in 1414,<sup>158</sup> and another tract on the *virga visoria*<sup>159</sup> terminate the manuscript.

<sup>146</sup> E. Zinner, *Verzeichnis der astronomischen Handschriften des deutschen Kulturgebietes*, 1925, nos. 9599-9604. Another is Brussels 930, 15th century, fols. 125ra-151vb. Zinner does not give the incipit, which is, "Licet multi libri sint conscripti. . . ."

<sup>146a</sup> *Ibid.*, nos. 9605-9609. Two are at the Bibliothèque Nationale, Paris (7277 and 7292) rather than "des deutschen Kulturgebietes."

<sup>147</sup> Palatine 1354, fols. 125ra-126rb, with the caption, "De modo preservandi ab epidimia," and the unfamiliar incipit, "Primum et tutissimum est in presentia pestilentie fugare locum. . . ." The thought thus expressed is, however, sufficiently familiar, so that the text may be an extract from some known work. This may also be the case with a passage on the altitude of the planets at fol. 166va-b, which opens, "Auctoritate Alfragani differentia 21. . . ."

<sup>148</sup> At fols. 223vb-237rb, opening, "Ad pauca respicientes de facili enuntiat. . . ."

<sup>149</sup> Fol. 223vb, top margin, "De magno anno Platonis."

<sup>150</sup> In Sloane 2542, of the British Museum, London, at fols. 55v-59r: "Explicit brevis tractatus et bonus de motibus sperarum et proportionate et qualiter possint iudicari eventus rerum aut certum tempus futurorum, editus a magistro Nicholao Oresme." In Erfurt, Amplon. Q. 385, second half of the 14th century, fols. 155r-158v, are catalogued by Schum as "Collectio conclusionum mathematicarum et naturalium (Nicolai Orem nach dem h. i. angebrachten Inhaltsverz.)"

<sup>151</sup> The 21st begins, "Nullus propter ista predicta debet scientiam astrologie dispicere. . . ." and closes, ". . . quia ipse solus novit cuius oculis nuda sunt omnia et aperta." Columbia University has a photostat of the text in the Sloane MS. Schum's description agrees with it.

<sup>152</sup> At fols. 237va-238rb, and 238va-241rb. The incipit of the latter, "Dixit Ypocras medicorum optimus, Cuiusmodi medicus est qui astronomiam ignoret. . . ." shows that it is the third anonymous version rather than the translation by William of Moerbeke or by Peter of Abano: see "Manuscripts of the Writings of Peter of Abano," *Bulletin of the History of Medicine*, 1944, 15: 217-219.

<sup>153</sup> Palat. 1354, fols. 241va-242va, opening, "Notandum astrologi stellas fixas quarum probatio fuit possibilis in 6 ordinant magnitudinibus. . . ."

<sup>154</sup> "Nunc de magnitudinibus planetarum."

<sup>155</sup> Herschel gave 29 days, 12 hours, 44 minutes, and 2.87 seconds for the sidereal period.

<sup>156</sup> Fol. 242vb: "Hoc autem non est scientificum factum, tum quia pluribus vicis expertum est quod luna vetus novaque visa est una et eadem die sicut accidit anno Christi 1358 in die mensis Iunii. . . ."

<sup>157</sup> On Picatrix, see *A History of Magic and Experimental Science*, II, 813-824.

<sup>158</sup> Palat. 1354, fols. 246va-248vb; tables on 249r and 250r.

<sup>159</sup> At fol. 250v.

## Index of Names and Subjects

- Abraham Avenezra, 24  
 Albategni, 17  
 Albertus Magnus, 20, 44  
 Albumasar, 20, 21, 34, 43  
 Alcabitius, 27, 41  
 Alexandria, 36  
 Alfonsine Tables, 17, 20, 42, 46  
 Alfonso the Wise, 36  
*Alhabor*, 27  
*Alhahucia*, 27  
*Alhalka*, 27  
*Alhantia*, 27  
*Alhauaga*, 27  
 Alkindi, 40  
 Al-Ma'mun, 21  
 Almanach, 36  
 Almanson, 21  
 Al-Mansur, 21  
 Almeon, 21  
 Ammonius, 36  
 Arim, 23  
 Armillaries, 27, 28  
*Ars visorandi*, 41, 42, 49  
 Arzachel, 17, 21, 22, 27, 36  
 Aspect, planetary, 37, 40  
 Astrolabe, 25, 27, 28, 46  
 Aumanius, 36  
 Aumatius, 36  
 Azarquiell, see Arzachel  
*Azimuth*, 28
- Bayeux, 25  
 Bede, 16  
 Beltramus, 20  
 Boethius, 16
- Cadiz, 23  
 Calendar, 45  
 Campanus of Novara, 27  
*Canon tabule sequentis*, 25  
 Charm, love, 39  
 Chillingworth, John, 24  
 Christ, birth of, 42  
 Chronology, 42, 43  
 Commensurability, 48  
 Computus, 24  
 Conjunction, 18, 27  
 Contingent, 48  
 Cremona, 23
- Damascus, 36  
*De fructibus planetarum*, 37  
*De ponderibus*, 16  
 Declination, of the sun, 21
- Earth, 16  
 Eclipse, 31, 45
- Firminus de Bellavalle, 24  
 Florence, 20, 24, 27
- Gaurico, Luca, 19  
 Genoa, 23  
 Gerard of Cremona, 17, 27  
 Gerbert, 16  
 Gergis, 35  
 Grosseteste, Robert, 27, 29
- Harun-al-Raschid, 21  
 Hippocrates, pseudo, 49  
 Humenix or Humeniz, 36
- Iergis, 35  
 Image, 45, 49
- Jahja ben abi Mansur, 21  
 Jean de Murs, 25  
 Jerome, St., 42  
 John of Genoa, 24  
 John de Lineriis, 17, 23, 25  
 John of Sicily, 22, 24  
 John de Spira, 25  
 John Vimi, 25  
 John Vimundus, 25
- Liber novem iudicum*, 35  
 Liechtenstein, Petrus, 19, 35  
 Lizard, 39  
 London, 23  
 Longitude and latitude, 23, 30
- Magdeburg, 23, 49  
*Magnus annus*, 48  
 Margolabrum, 27  
 Measurement, 16, 33  
 Medicine, astrological, 37, 49  
 Mercury, influence of, 38  
 Messahala, 27, 49  
 Moon, mansions of, 24, 49; old  
     and new, 49
- Name, letters of, 37  
 Nicholas of Cusa, 45  
 Novara, 23
- Opposition, of sun and moon, 25  
 Oresme, Nicole, 48
- Paris, 22, 23, 25, 27, 28, 30  
 Pest tract, 47  
 Peter of Abano, 26  
 Philoponus, 36  
 Phlebotomy, 41  
 Picatrix, 49  
 Planet, aspect, 37, 40; magni-  
     tude, 49; signification, 35, 37;  
     superior, 30; theory of, 28, 45  
*Planicelium*, 25  
 Plato, 48  
*Primum mobile*, 17, 21  
 Profatius Judaeus, 36  
 Ptolemy, 18, 19, 28, 42, 45
- Quadrans vetus*, 33  
 Quadrant, 27, 33
- Ramuold, 43  
 Ratisbon, 43  
 Recipe, superstitious, 39  
 Robert of Montellier, 33  
 Roger of Hereford, 40
- Sacrobosco, 16, 27  
 Saint Emmeran, 43  
*Satureia*, 39  
 Selder, Henry, 46  
 Siena, 20  
 Simplicius, 36  
 Snow, 41  
*Speculum astronomiae*, 20, 35  
 Sphere, eighth, 20, 26, 27; see  
     Grosseteste and Sacrobosco  
 Star, fixed, 18, 21, 28, 30, 46, 49
- Table, astronomical, 17, 18, 19,  
     20, 21, 22, 24, 25, 30, 31, 36,  
     45  
 Thebit ben Corat, 27  
 Toledo, 23, 30; Tables of, 24, 27  
 Translation, 17, 36  
 Trick, magical, 39  
 Twins, 44
- Vergil, 42  
 Virgin, 42  
*Visierkunst*, 41; and see *Ars  
     visorandi*
- Weather, 18, 40  
 William of Moerbeke, 49  
 Wolfgang, St., 43  
 World, age of, 26

## Index of Manuscripts

- Basel D.I.10, 34, 37, 38, 39  
 Basel F.IV.18, 37  
 Brussels 930, 46  
 Cambridge, Pembroke College 227, 34  
 Cambridge, University II.3.3, 27  
 Erfurt, Amplon. F.267, 37  
 Erfurt, Amplon. F.377, 25
- Erfurt, Amplon. F.386, 37, 38, 39  
 Erfurt, Amplon. Q.385, 48  
 London, British Museum, Harley 3647, 36  
 London, British Museum, Sloane 2542, 48  
 Munich, cod. lat. 13084, 17  
 Oxford, Bodleian, Ashmole 1796, 27  
 Oxford, Bodleian, Digby 228, 20



Oxford, Bodleian, Laud. 644, 36	Vatican, Ottobon. 1826, 17-26, 30
Paris, Bibliothèque Nationale 7277, 46	Vatican, Palatine 1171, 26
Paris, Bibl. Nat. 7281, 22	Vatican, Palatine 1354, 41-49
Paris, Bibl. Nat. 7282, 24	Vatican, Palatine 1401, 34
Paris, Bibl. Nat. 7286, 25	Vatican, Palatine 1410, 36
Paris, Bibl. Nat. 7292, 46	Vatican, Palatine 1414, 27-39
Vatican, Barberini 92, 16	Wolfenbüttel Aug. f <sup>o</sup> . 65, 17

## *Index of Incipits*

Ad pauca respicientes de facili enuntiant .....	48
Ad prenotandum diversam dispositionem aeris futuram .....	38
Autoritate Alfragani differentia 21 .....	47
Canon huius operis talis est .....	25
Computus est scientia numerationis et divisionis .....	27
Cuiuslibet arcus propositi sinum rectum invenire .....	17
Cum horam coniunctionis duorum planetarum .....	32
Cum omnibus directe intuentibus constat esse .....	28
Cum sint due signorum distinctiones .....	27
Cupientibus fructum planetarum primo oportet .....	37
Cupientibus habere fructum planetarum .....	37
Cupientibus planetarum habere fructum .....	37
De inventione azimuth .....	28
Debes scire . . . see Scire debes .....	
Dixit Albumasar, Oportet te primum scire .....	34
Dixit Iergis, Saturnus cum fuerit .....	35
Dixit Ypocras medicorum optimus, Cuiusmodi .....	49
Et cupientibus habere fructum planetarum .....	37
Geometrie due sunt species teorica et practica .....	33
Hunc librum intellexerunt Romani .....	34
Imaginabor speram equatoris diei .....	27
Inventa coniunctione luminarium intrandum est ad horas .....	31
Investigantibus astronomie rationes .....	29
Licet multi libri sint conscripti .....	46
Nomina instrumentorum sunt hec .....	27
Nos iuxta rectam imaginationem astrologiam inchoantes .....	27
Nota quod ad inveniendum ascendens .....	31
Notandum est quod octava spera et spere planetarum .....	32
Notandum quod principatum planetarum in conceptione .....	37
Nullus propter ista predicta debet .....	48
Occidens vero ab habitato distat .....	23
Omnis utriusque sexus armoniam celestem .....	45
Per istam tabulam scitur latitudo lune .....	24
Planicellium vero componitur ex eis que sunt .....	25
Ponderum pars minima calculus est .....	16
Ponderum signa plerisque ignota sunt .....	16
Possunt autem azimuth hoc modo fieri .....	28
Postulata a domino prolixitate vite .....	27
Primum et tutissimum est in presentia pestilentie .....	47
Ptholomeus. Quando Iupiter fuit in signo .....	18
Quando Iupiter fuit in signo aquatico .....	18
Quando Saturnus intrat Arietem et perficit medietatem .....	34
Quandocumque minutia multiplicat minutiam .....	31
Quia (Quoniam?) unusquisque planetarum habet .....	37
Quoniam creator (lector?) cum discretione .....	37
Quoniam cuiusque actionis quantitatem temporis .....	27
Quoniam regulas astronomie iudicandi non nisi .....	40
Sciendum est quod planetarum quidam sunt benivoli .....	32
Sciendum quod Humenix philosophus summus .....	36
Sciendum quod unitas non attingitur .....	45
Scire debes quod circulus solis duas habet .....	27
Si quis prima luna aliqua infirmitate .....	37
Sinus rectus est medietas corde portionis .....	17
Sol cum fuerit in ascendente significat principatum .....	35
Tempus medie coniunctionis et oppositionis .....	40
Ut annos Arabum et menses et per consequens .....	31
Verum motum lune et solis in una hora .....	29