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Eclipses in the Fourteenth and Fifteenth Centuries

By Lynn Thorndike *

IN previous articles attention has been called to the prediction of eight solar eclipses between the years 1366 and 1386,¹ in a manuscript at Utrecht, and to "A Record of Eclipses for the Years 1478 to 1506,"² in a manuscript at Florence. In the present paper will be noted further forecasting of eclipses, primarily from five Sloane manuscripts of the fourteenth and fifteenth centuries at the British Museum, and chiefly in connection with calendars issued by Englishmen: namely, that of Walter de Elvedene or Elvedene³ or Elvenden⁴ for the years from 1327 to 1386, and those for the ensuing period, 1387-1462, composed by John Somer or Somur or Somour in 1380, for Joan of Kent, princess of Wales and mother of Richard II, and by Nicholas of Lynn in 1386, at the request of John of Gaunt, duke of Lancaster. But how their data as to eclipses were computed is not revealed in our manuscripts.^{4a} The Calendar of Nicholas was for the latitude and longitude of Oxford, and John Somer is sometimes spoken of as "of Oxford," and his calendar as for its meridian. Both men are mentioned in the preface to Chaucer's Treatise on the astrolabe.^{4b}

Since their two calendars and the tables which accompany them apply to the same years, it has been easy to confuse them, especially when they appear anonymously.⁵ Their prefaces may be distinguished by their incipits, "Quia Christus Jesus mediator dei . . ." in the case of Nicholas, and "Ad honorem dei et virginis gloriose necnon sanctorum confessorum Francisci Antonii episcopi Lodowici in hoc opusculo facio kalendarium ad instantiam nobilissime domine Iohanne principisse Wallie ducisse Cornubie comitisse Castrie . . ." ⁶

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¹ "Prediction of Eclipses in the Fourteenth Century," *Isis* 1951, 42: 301-302.

² *Isis*, 1952, 43: 252-256.

³ MS Digby 176 at the Bodleian Library, Oxford, once contained, according to its old table of contents, written in a hand of the fourteenth century: "Calculatio M. Walteri Elvedene de dominis mensium ab anno 1332 usque ad 1357, annorum ab anno 1332 usque ad 1386."

⁴ W. H. Black's Catalogue of the Ashmolean MSS at the Bodleian, p. 4, in connection with MS Ashmole 5, refers to "the tables formerly composed by master Walter de Elvenden for the three cycles or 57 years which ended in 1386" Walter is not included in the *Dictionary of National Biography* or in Sarton's *Introduction to the History of Science*.

^{4a} Instructions for computing eclipses are of not infrequent occurrence in MSS of the later middle ages. Two examples are: Basel F. II. 15,

15th century, fols. 73r-95v: "Ad inveniendum eclipses sic procedendum est. Primo sumantur radices motuum solis et lune. . . . Et sic finitur practica de utraque eclipsi scilicet tam solis quam lune, facta anno Ihesu Christi 1437 incomplete mense Iulii die 20. Deo gratias. Amen. Amen." Basel F. III. 25, 13-14th century, fol. 9r, "De solis vera conjunctione reperienda . . ."; fol. 13va. "Cum eclipim lune et eius quantitatem prompte et evidentiter invenire voveris . . ."

^{4b} Sarton, *op. cit.*, III (1948), 1501-2. *The Equatorie of the Planetis*, edited by Derek J. Price, Cambridge University Press, 1955, pp. 79, 86, 157.

⁵ Black, in the description of Ashmole 5. mentioned in a preceding note, listed some other MSS at the Bodleian as the Calendar of Nicholas which are rather that of John.

⁶ British Museum, Cottonian MS Vespasian E. VII, fol. 4(7)r. Such a form as "Ad honorem dei et virginis gloriose necnon et omnium (sanc-

in the case of John Somer, who was a Franciscan. But whether the right calendar always accompanies its preface is another problem. In Sloane 282 of the British Museum what seems the calendar of John Somer opens at fol. 5r, but the aforesaid preface comes only at fol. 17r-v.⁷ Sometimes there is no preface,⁸ and it is not easy to determine an incipit for the Calendar itself.⁹

Furthermore the Tables and figures and other matter accompanying the Calendars vary in different manuscripts. John Somer says in his preface that his Calendar contains Tables of conjunctions from 1387 to 1462.¹⁰ But these are found in only three out of 13 copies of his work at the British Museum.¹¹ If we compare Royal 2. B. VII and Sloane 282, which both contain the Calendar of Somer, we find that the former manuscript has an Algorithm Table (found also in Cotton, Vesp. E. VII) which is not in the latter, apparently also a *Tabula paschalis* and one of Golden numbers. "*Cave*"s for each sign of the zodiac which precede the calendar in Sloane 282,¹² are perhaps roughly paralleled by influences of the signs of the zodiac (with blank space for a sign-man, for which no provision is made in the other manuscript) which are the fourth item following the Calendar in the Royal MS. The Tables of ruling planets and signs and of the positions of the moon in Royal 2. B. VIII, fols. 9v-10v, correspond to Sloane 282, fol. 13r, "Tabula docens quis planeta regnat in qualibet hora incipiendo diem ab ortu solis";¹³ 13v, "Tabula lune ad sciendum eius signum omni die";¹⁴ 14r, "Tabula lune ad sciendum eius gradum omni die."¹⁵ And there are Tables and figures of solar and lunar eclipses in both.¹⁶

It is with these tables of eclipses rather than the Calendars proper that we

torum) . . .", given by Black for Ashmole 391. V, 14th century, fol. 1r, is inaccurate. I did not get to examine the Cotton MS further for Tables of eclipses.

⁷ Black, in cataloguing Ashmole 789. VIII, remarked that the preface differed considerably from the prefaces to the calendar in Ashmole 5 and 391. V, which was not surprising in the case of Ashmole 5, which has the incipit of Nicholas of Lynn, whereas the other two MSS have that of John Somer.

⁸ Ashmole 370, anno 1424, fols. 1-24, "has neither title nor preface, but in other respects agrees with No. 5; each month occupies 4 pages in this and 5 in that MS." Sometimes, as in Ashmole 391. V, we have a preface, but the Calendar has disappeared.

⁹ "Ad notitiam tabularum et kalendarii . . ." seems to be the usual opening of John Somer's Canon for his Calendar: see Sloane 2250, late 14th century, fol. 1r; Sloane 2465, late 14th century, fol. 1r; Royal 12. E. XVI, 15th century, fol. 9v; Oxford, Bodleian, Rawlinson D. 238, end of 14th century, fol. 15.

But in Sloane 282, 15th century, fol. 5r-v, the preliminary description opens, "In hoc calendario ad meridiem universitatis Oxonie composito anno domini 1380 primo ponuntur menses . . ." And in Ashmole 391. V, 14th century, fol. 1r, "In hoc kalendario primo

ponitur numerus dierum in prima linea . . ."

¹⁰ The description in the Catalogue of Royal 2. B. VIII does not state whether they are planetary conjunctions (as of Saturn and Jupiter) or conjunctions (and oppositions) of sun and moon.

¹¹ "Of thirteen copies of Somer's work in the Museum only three (Cotton MS Faust. A. II, Add. MS 10628, Harley MS 321) contain the computations for the years above mentioned"; from the Catalogue's account of Royal 2. B. VIII.

¹² In Sloane 2465, 14th century membrane, they follow the Kalendarium (at fols. 2-7) at fol. 10r as "Signa zodiaci."

¹³ In Sloane 2465 at fol. 9r. Similarly the Calendar of Nicholas of Lynn in Ashmole 5 is accompanied at fol. 35r by "Tabula ad sciendum quis planeta dominatur pro omni hora diei et noctis incipiendo ab ortu solis."

¹⁴ Ashmole 5, fol. 34r, "Tabula ad sciendum in quo signo fuerit luna quolibet die quantum ad medium motum."

¹⁵ Sloane 2465, fol. 9v.

¹⁶ Also in Ashmole 5, fols. 29r-33r. It also has a figure of the human body related to the signs of the zodiac, a "Nota quem humorem quisque planeta eicit," a "Tabula ad invenientum dignitates planetarum in signis," and "Equationes domorum ad latitudinem 41° 40'."

are here concerned. In the case of those by John Somer, as time went on, the period which they covered altered. Thus in Sloane 282 they begin not from 1387 but from 1409; in Sloane 2250, from 1400; in Sloane 2465, from 1399 and 1406. In Sloane 2397 only the fourth cycle from 1444 to 1462 is covered. These four manuscripts are all of the Calendar of John Somer. Only with Sloane 1110 do we come to that of Nicholas of Lynn. But first we turn back to that of Walter of Elvedene before 1386 in the fourteenth century.

In MS Sloane 286 (membr. in-4) at the British Museum the *Computus* of Sacrobosco in a hand of the thirteenth century at fols. 1-14 is followed at fols. 15-24 by a calendar of Master Walter of Elvedene with tables of solar and lunar eclipses from 1327 to 1386 in writing of the fourteenth century.¹⁷ The table of solar eclipses (at fol. 21v) begins with the first cycle from 1330 to 1348, for which it lists eight; the same number for the second cycle from 1349 to 1367; and seven during the third cycle from 1368 to 1386. Of lunar eclipses Walter gives two for 1327 and 1328, 17 for the first cycle, 14 for the second, and 19 for the third.¹⁸

In Sloane 282 the calendar of John Somer for the meridian of Oxford, composed in 1380, is followed by tables of twenty solar eclipses from 1409 to 1462 and of forty-two lunar eclipses which occurred between 1410 and 1462. Seven eclipses of the sun are announced for the years 1409-1424, eight for 1425-1440, and five for 1448-1462. Of lunar eclipses twelve fall in the years 1410-1424, four in 1424-1429, eleven in 1431-1443, and fifteen between 1444 and 1462.

In Sloane 2465 the Calendar of John Somer appears anonymously without his preface.¹⁹ Four eclipses of the sun are listed for the second cycle as follows:

June 15, 1406 at 16.43.24 P.M.
 Oct. 18, 1408 at 19.59.45 P.M.
 April 15, 1409 at 9.28.02 P.M.
 Aug. 19, 1411 at 4.51.02 P.M.²⁰

Schroeter²¹ and Oppolzer date the first two of these eclipses on June 16 and

¹⁷ At fol. 15r. is Walter's Canon on the calendar, opening and closing: "Quidam homines multum affectant scientiam astronomie scire et comprehendere . . . / . . . situationis vel situm(?) eclipsi solis. Explicit canon super kalendarium compositum a magistro Waltero de Elvedene." The Calendar itself occupies fols. 15v-21r.

¹⁸ Fol. 22r: "Tabula eclipsis lune pro anno Christi 1327 et 1328 et pro primo ciclo cuius principium est annus Christi 1330, finis autem eius 1348." The tables for the second and third cycles are on fol. 22v. Figures for the 23 solar eclipses occupy fol. 23r; at fols. 23v-24v are figures for the 52 lunar eclipses.

¹⁹ It opens at fol. 1r, "Ad notitiam tabularum et kalendarii sequentium primo ponitur tabula docens legere algorismum . . ." This corresponds to the incipit of the Algorism Table which follows his preface in MS Royal 2. B. VIII. There follows at fol. 1v: "Tabula docens pro 140 annis ab A.D. 1367 quis sit annus bisextilis, que littera dominicalis, que indictio, et que primatio inchoandi annum a Circumcisione Domini excepta indictione que incipit 8 Kal. Octobris."

²⁰ Sloane 2465, fol. 8.

²¹ J. F. Schroeter, *Spezieller Kanon der zentralen Sonnen- und Mondfinsternisse*, Oslo, 1923.

October 19, to which the above dates are equivalent, since they reckon the day from noon rather than from midnight. Most of the dates for lunar eclipses between the years 1399 and 1424, presumably reckoned for the meridian of Oxford rather than Greenwich or London, are pretty accurate, often varying by only a few seconds from those given in the Canons of Schroeter and Oppolzer.²²

| Sloane 2465, fol. 10v | P.M. | Schroeter | Oppolzer | Schroeter, Mitte der Finsterniss |
|--------------------------|------------------------|-----------|-----------------|-------------------------------------|
| 1399 April 20 | 8 ²³ .05.59 | 18.5 | 19.45 | 19.48 |
| 1402 Feb. 17-18 | 16.06.37 | | 5.07 | |
| 1403 Aug. 2 | 8.33.46 | 20.47 | 22.33 | 22.37 |
| 1405 Dec. 5-6 | 17.54.32 | | 6.28 | |
| 1406 June 1 | 10.36.22 | | 0.38 (June 2) | |
| 1406 Nov. 25 | 8.00.04 | 19.44 | 21.27 | 21.31 |
| 1407 May 21 | 11.30.27 | | 1.12 (May 22) | |
| 1410 March 21 | 10.15.05 | | 0.13 (March 22) | |
| 1414 Jan. 5-6 | 18.33.27 | 6.27 | 8.11 | 8.13 |
| 1414 July 2-3 | 14.33.10 | 3.02 | 4.51 | 4.64 |
| 1414 Dec. 26 | 3.06.04 | 15.13 | 16.53 | 16.57 |
| 1417 April 30 -May 1 | 13.19.35 | 1.23 | 2.59 | 3.2 |
| 1418 Oct. 14 | 8.15.28 | 20.24 | 22.05 | 22.7 |
| 1421 Feb. 17 | 5.37.10 | 17.56 | 19.43 | 19.45 |
| 1421 Aug. 12-13 | 16.22.02 | 4.30 | 6.16 | 6.20 |
| 1422 Feb. 6 | 6.26.04 | | 19.54 | |
| 1422 Aug. 2 | 9.39.13 | | 23.10 | |
| 1424 Dec. 5-6 | 16.28.18 | 4.37 | 6.20 | 6.24 |

In Sloane 2397 of the fifteenth century, Tables of solar and lunar eclipses for the fourth cycle accompany the Calendar of John Somer. Five solar eclipses of 1448, 1450, 1453, 1460 and 1462 are the same as in Sloane 282.²⁴ The table for lunar eclipses is as follows, beginning, like the solar, with the Golden Number and Dominical Letter:

²² Th. Ritter v. Oppolzer, *Canon der Finsternisse*, Vienna, 1887, in *Denkschriften der kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe*, Bd. 52. Oppolzer gives only "die Weltzeit der grössten Phase der Finsterniss in Stunden und Minuten." Our MS like Schroeter gives the time of

the beginning of partial eclipse. But Schroeter includes only total lunar eclipses. Our MS gives the time in hours, minutes and thirds.

²³ Apparently the figure for six has been miscopied as an eight.

²⁴ See the Appendix for these.

| Sloane 2397, fol. 14r | | Initium | Schroeter | Puncta | Tempus casus | Duratio | Oppol- zer |
|--------------------------|----------------------|----------|-----------|----------|-----------------|---------|---------------|
| 1 d 1444 | May 31 d | 5.56.16 | | 4.41.29 | 1.10.35 | 2.21.18 | 2.24 |
| 3 b 1446 | Oct. 4-5 d | 11.32.28 | 23.22 | 11.52.34 | 1.41.34 | 3.23.08 | 3.18 |
| 4 a 1447 | Mch. 31- Apl. 1 f | 17.02.01 | 5.2 | 12.48.53 | 1.14.01 | 3.25.46 | 3.28 |
| 5 f 1448 | Sept. 12 c | 9.50.12 | | 1.09.24 | 0.34.07 | 1.08.14 | 1.12 |
| 7 d 1450 | Jan. 27-28 f | 10.38.55 | 22.55 | 14.46.08 | 1.12.21 | 3.35.06 | 3.30 |
| 7 d 1450 | July 24 b | 4.35.30 | 17.7 | 18.21.09 | 1.04.46 | 3.47.07 | 3.40 |
| 8 c 1451 | " 13-14 e | 9.57.05 | | 7.48.07 | 1.28.50 | 2.57.40 | 2.52 |
| 12 c 1455 | May 1 b | 10.48.53 | | 2.45.52 | 0.55.23 | 1.50.47 | 1.54 |
| 13 c 1456 | Mch. 21-22 c | 16.28.42 | | 0.23.46 | 0.21.41 | 0.43.23 | 0.36 |
| 14 b 1457 | Sept. 3 a | 8.22.59 | 20.24 | 14.28.41 | 1.13.11 | 3.33.33 | 3.32 |
| 17 e 1460 | July 3 b | 6.21.47 | | 3.14.42 | 1.00.25 | 2.00.50 | 1.02 |
| 17 e 1460 | Dec. 27-28 d | 10.26.37 | 22.25 | 15.33.30 | 1.10.08 | 3.38.32 | 3.34 |
| 18 d 1461 | June 22 e | 6.46.08 | 18.50 | 20.16.42 | 3.03.47 | 3.48.12 | 3.42 |
| 18 d 1461 | Dec. 17 a | 1.38.10 | 13.11 | 12.55.29 | 1.21.36 | 1.26.20 | 1.30 |
| 19 c 1462 | June 1-2 a | 12.35.21 | | 6.47.52 | 1.23.32 | 2.46.24 | 2.40 |

The Calendar of Nicholas of Lynn, as found in Sloane 1110, opens at fol. 2r, "Quia Christus Jesus mediator dei . . ." After the Calendar proper at fols. 3r-29r, comes at 29v a Table of solar eclipses for the four nineteen-year cycles 1387-1405, 1406-1424, 1425-1443, and 1444-1462, or, more specifically, from the eclipse of 1387 to that of 1396, from that of 1406 to that of 1424, from that of 1425 to that of 1440, and from that of 1448 to 1462. Illuminated figures of these eclipses fill vol. 30r. Tables of lunar eclipses for the same four cycles occupy fols. 30v-31r, and figures of them, fols. 31v-32r. Of other Tables at fols. 32v-37r, we may note one to find the dignities of the planets in the signs and the continuations of the motion of the sun from A.D. 1385 to A.D. 1469.²⁵ In the Appendix is reproduced the portion of the Table of Solar Eclipses from that of 1448 to 1462. The varying dates for these eclipses of John Somer are given in parentheses from Sloane 2465.

Attention may further be called to an isolated prediction of a single eclipse which occurs in another manuscript at the British Museum, number 3731 of the Harleian collection. In the course of an annual prediction for the year beginning on March 11, 1430 (the vernal equinox), a partial solar eclipse is forecast for February 12, 1431, at 2.19 P.M., "diebus equatis," with the second degree of Cancer rising "above our horizon." "Our horizon" is that of Milan, to whose duke the prediction is addressed by a Vernadigius or Bernadigius of that city. The duration of the eclipse will be about two hours.²⁶

²⁵ Fol. 37v opens, "Pro declaratione punctorum in principio huius Kalendarii positorum . . ." On 40r, near the bottom of the page, is the rubric, "Canon pro minutionibus faciendis et purgationibus recipiendis," incipit, "Quia secundum sententiam Tholomei in suo Centilugio . . ." At 40v it breaks off and the present MS ends, but a modern note says, "The portion here wanting may be found in MS Arundel 347." Another MS where it is ascribed to Nicholas of

Lynn is at the Bodleian, Oxford, Ashmole 391, V, 14th century, fols. 4-5. It occurs anonymously in MSS at Cambridge and Munich: Cambridge University Library 1569 (Gg. V. 37), 15th century, fols. 160v-161r; CLM 10661, anno 1470, fols. 71ra-72ra.

²⁶ Harley 3731, fol. 195va: "Durabit autem illa eclipsis a principio observationis usque ad totalem restaurationem luminis solis 2 horis equalibus fere."

Oppolzer and Schroeter indicate a solar eclipse for the same day (total for a central portion of Italy south of Milan) but at an earlier hour (about 1.20 P.M. for "der wahren ekliptischen Conjunction"). The Harley manuscript gives the hour and minutes for the vernal equinox on March 11 as 7.10 P.M., "diebus equatis," with the ascendent "for our horizon" 13° Libra "in hora lune." It further states that the opposition of sun and moon immediately preceding the vernal equinox will be on March 9 at 20.24 P.M. "diebus equatis" (i.e. 8.24 A.M. on March 10).²⁷

APPENDIX

TABLE OF SOLAR ECLIPSES: SLOANE 286, FOL. 23R.

| Cycle | Year | Month | Day | Latitude of Moon | Puncta Minuta Secunda | Tempus casus | Semi- diameter solis | lune | Duratio, in hours, minutes, seconds |
|-------|------|-------|-----|------------------------|-----------------------------|-----------------|----------------------------|-------|--|
| 1 | 1330 | July | 17 | 4'51 N | 10.15.18 | 1.02.00 | 15.49 | 16.04 | 2.04.00 |
| 4 | 1333 | May | 15 | 6'43 S | 9.28.03 | 1.06.43 | 15.48 | 15.43 | 2.07.26 |
| 9 | 1338 | Feb. | 20 | 26.41 N | 1.1.03 | 0.34.40 | 16.28 | 14.51 | 1.09.20 |
| 10 | 1339 | July | 7 | 0.04 S | 11.59.51 | 1.07.08 | 15.47 | 15.48 | 2.14.16 |
| 12 | 1341 | Dec. | 9 | 16.16 N | 6.17.28 | 0.54.34 | 16.49 | 17.05 | 1.29.08 |
| 13 | 1342 | May | 5 | 30.46 N | 0.25.00 | 0.16.01 | 15.51 | 16.01 | 0.32.02 |
| 15 | 1344 | Oct. | 7 | 2.35 S | 10.42.46 | 1.05.00 | 15.52 | 15.02 | 2.10.00 |
| 16 | 1345 | Sept. | 27 | 20.54 N | 4.10.58 | 0.59.23 | 16.24 | 15.56 | 1.39.46 |

To save space I have omitted the following columns which, combined under the general caption, "Coniunctiones vise solis et lune," occur in the chart between the day of the month and the latitude of the moon: Anni Arabum, numerus mensis, Name of the Arabic month, dies, hora, minuta, secunda. . Also the column giving the number of the Christian month (7 for July, 12 for December, etc.) which occurs between the columns for the Christian year and month.

Oppolzer lists eclipses for July 16, 1330, May 14, 1333, and Sept. 26, 1345. For the others his days of the month are the same.

TABLE OF SOLAR ECLIPSES FROM SLOANE 1110 (AND 2465)

| Cycle | Year | Month | Day | Initium | (Sloane 2465) | Puncta | Tempus casus | Duratio |
|-------|------|-------|-----|----------|---------------------|---------|--------------|---------|
| 7 | 1448 | Aug. | 29 | 21.22.13 | (Aug. 28, 20.16.02) | 9.15.04 | 1.05.14 | 2.10.28 |
| 7 | 1450 | Feb. | 13 | 2.17.07 | (Feb. 12, 1.52.39) | 0.18.02 | 0.24.27 | 0.48.54 |
| 10 | 1453 | Dec. | 1 | 2.28.37 | (Nov. 30, 1.25.46) | 9.59.39 | 1.02.52 | 2.05.44 |
| 17 | 1460 | July | 18 | 15.42.00 | | 0.02.47 | 0.56.47 | 1.53.34 |
| 19 | 1462 | Nov. | 21 | 23.27.15 | (Nov. 20, 23.00.25) | 1.09.01 | 0.20.50 | 0.50.40 |

²⁷ Harley 3731, fols. 196rb, 195vb.

TABLE OF SOLAR ECLIPSES FROM SLOANE 282 AND 2397
(First comes the Golden number, then the Dominical letter)

| | | | | | | |
|------|------|--------------------------|----------|---------|-----------------------|---------|
| 5 f | 1448 | Aug. 18 b c | 20.16.59 | 9.15.04 | 1.05.14 | 2.10.28 |
| 7 d | 1450 | Feb. 12 a a | 1.52.39 | 0.58.22 | 0.24.27 | 0.48.55 |
| 10 g | 1453 | Nov. 30 c ¹ e | 1.25.46 | 9.59.39 | 1.02.52 | 2.05.45 |
| 17 e | 1460 | July 17 b c | 15.42.00 | 7.02.47 | 0.46.47 | 1.53.34 |
| 19 c | 1462 | Nov. 20 b c | 23.00.25 | 1.09.01 | 0.52 ² .50 | 0.53.41 |

¹ c in Sloane 282, fol. 14v.

² 26 in Sloane 282.

Oppolzer lists solar eclipses for Aug. 29, 1448 and Aug. 18, 1449, Feb. 2, 1450, Nov. 30, 1453, July 18, 1460, and Nov. 21, 1462.

The above table of solar eclipses from 1330 to 1345 omits that of March 2, 1337, noted by Geoffrey of Meaux in connection with the comet of the same year,²⁸ and concerning which John of Genoa composed a separate treatise.²⁹ In a manuscript at Munich, an instruction for depicting a solar or lunar eclipse takes as examples the lunar eclipse of February 16, 1356, which is correct, and a solar eclipse of 1360.³⁰

²⁸ *A History of Magic and Experimental Science*, III, 286.

²⁹ Noted by Duhem, *Le système du monde*, IV, 74, from MS 7281, ff. 208v-210v, of the Bibliothèque Nationale, Paris. Another MS of it is at Cambridge, University Library, Ee.III.61, ff. 75r-81r. On the fly-leaf of the latter MS is noted a solar eclipse of the afternoon of May 17, 1482; at ff. 12v-15r, the calculation of another

eclipse for the afternoon of May 28, 1481.

³⁰ CLM 10661, 15-16th century, fol. 170 (94)r-v: rubric, "Canon et modus pingendi eclipsim solis et lune"; incipit, "Eclipsim solis vel eam lune volens figurare pono exemplum. Primo de luna anno 1356 completo die 16 Februarii . . ."; desinit, ". . . et evenit (?) figura eclipsis solis ut hic pro anno 1360."