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**Calendar for 1490 with computational tables [and] Treatise on arithmetic  
In Latin and Dutch, decorated manuscript on parchment  
[Northern Netherlands, 1490]**

*ii + 13 + ii folios, complete (collation: i<sup>8+</sup> + ii<sup>4</sup>), parchment (215 x 156 mm), modern foliation in pencil in Arabic numerals, first part of manuscript written in dark brown ink in a gothic bookband, single column text, 36 lines per page (justification: 135 x 105 mm), second part of manuscript written in a large gothic textura quadrata script (justification: 140 x 100 mm), single column text, 23 lines per page, all text vertical justification and ruling in plummet, paraph marks in red, headings and rubrics in red, initials painted in red (1- to 4-lines), TWELVE LARGE CALENDAR TABLES in red and brown ink with each month of on a grid formed of 22 vertical and 18 horizontal lines ruled in brown ink over original plummet ruling (135 x 104 mm), calendar pricked for vertical ruling, ONE DIAGRAMMATIC TABLE in red and brown on f. 2v (69 x 82 mm), ONE LARGE MATHEMATICAL COMPUTATION TABLE on f. 10v with horizontal and vertical justification in plummet (120 x 96 mm), ff. 9r-9v blank but ruled and justified, f. 13r justified but ruled, ff. 1r, 10r, 13rv blank, ff. 1 served as original guard page, marginalia and additional text to lower columns in calendar tables, f. 1 attached as singleton, ff. 3-8 loose and separated from quire one, ff. 1 and 9 detached from sewing but affixed to spine, internal spine broken between quires one and two, mildew in gutter on ff. 2v-3r, slight browning to lower margin on ff. 1v-3r, thumbprint to right margin on f. 6r, moderate soiling to f. 1r and 13v, moderate water damage to upper half of f. 13v, slight soiling and water damage to upper margin, two small holes to upper margin on f. 13, modern pencil marginalia on f. 1r ("1490."). Bound in nineteenth-century maroon morocco over cardboard, gilt frame composed of double gold filets with fleurons at four angles on front and rear covers, smooth spine with gilt two line compartment dividers and gilt title ("Kalender // 1490," spine worn with cardboard showing through on head and tail and edges, corners bumped revealing cardboard, slight wear to head and tail cover edges, minimal scuffing to front and rear cover, modern cotton paper used a fly-leaves and pastedowns, book plate affixed to front pastedown (see below under Richard Giveen), missing bookplate on recto side of first front flyleaf leaving brown and red stains (see below under W.A Foyle), catalogue information in modern pencil on recto of first front fly leaf and rear pastedown, ("7141"), small chip to last rear flyleaf. Dimensions 217 x 158 mm.*

This well-preserved manuscript contains three brief treatises on the calculation of the rising of the sun and the rules for multiplication and division, accompanied by a complex series of calendar tables. Possibly made for student use and written partly in the vernacular, the manuscript provides an important example of the importance of calculating time through astronomical analysis and basic mathematics in order to chart the course of the calendar year and the hours of the day.

## PROVENANCE

1. Language of the second part of manuscript confirms the Dutch origin for this codex, although precise region of origin cannot be determined.
2. Richard L. Given. Armorial bookplate affixed on front pastedown. Bookplate contains a coat of arms with cross of Saint Andrew centered on a white field. Four five-pointed stars are placed within each of the cross sections. A flexed armored arm appears on the top of the shield, holding a five-point star. Below the shield is a banner containing the motto "AUXILIUM AB ALTO".
3. William Alfred Foyle (1885-1963). Noted London bookseller, who gathered one of the largest private collections in England after purchasing Beeleigh Abbey in 1943. The recto side of the first flyleaf contained his now lost bookplate. The original bookplate was made of maroon leather with gilded decoration. "EX LIBRIS W.A. FOYLE BEELEIGH ABBEY." Bookplate has a coat of arms with six fleur-des-lis set over a scroll with the motto "ANIMO ET FIDE." The coat of arms and owner's information is set within a gilded four panel decorative frame surmounted by a half clamshell.

## TEXT

f. 1r-1v, blank.

f. 2r-2v, Rule for finding the rising point of the astronomical signs, rubric, "*Canon sive regula de inveniendo gradu ascendente figuraque celesti*"; incipit, "Gradum ascendentem ac medii celi reliquorumque angulorum atque domorum..." explicit, "...illic apparentem suscipio atque illius temporis celestis figure descriptio fiet hoc modo (ff. 2r-2v)"; schematic diagram for the marking of the rising of the astronomical signs on 2 June 1490 with caption in red, "*Figura celi tempore eclipsis medie lune anno Christi 1490 post meridiem secunde diei Junii hora nona minute 51 diebus equatis* (f. 2v)"; rubric, "*Capitulum de ortu occasuque solis ac longitudine cuiusvis diei ac noctis*"; incipit, "Ad cognoscendum tempus siue horam qua singulis diebus per totum annum sol oriatur..."

ff. 3r-8v, Calendar for the year 1490 (January-December), with the computational table for each month on a full-page grid (see below).

ff. 9r-10r, blank.

f. 10v, Multiplication table for the numbers one through ten, rubric, "Tabula multiplicationis".

f. 11r-11v, Short treatise on the method for multiplying numbers, rubric, "*Multiplicatio*"; incipit: "Die sommige setten inder multiplicatien..."; explicit, "...blust die cysser altyt uerloeren ende bleyst nulladats o uoer die proeue.

f. 12r-12v, Short treatise on the method of dividing numbers, rubric, "*Diuisio*"; incipit, "Soe wanneer dat inder divisioer eenich o state..."; explicit, "...met een screbbeken geleyck uoerfaeuwen steet."

f. 13-13v, blank.

This little pristine manuscript was composed as a primer for the reckoning of time, the rising and setting of the sun, and the position of the sun during the year. The manuscript is divided into three different parts.

The first part contains a short treatise in Latin divided into two chapters. The first chapter describes the rule for finding the rising point of the astronomical signs. The rising of the astronomical signs determined the passing of the days and the calculation of the equinoctial hours of the night, which were marked by the rising of a new constellation on the sunrise of every ten days. The second chapter of the treatises briefly details how one can find the longitude of the sun at sunrise on each day throughout the year.

The second part of the manuscript is composed of several calendar tables. These tables are not primarily concerned with Easter, as most medieval calendars were. Although it does include the means to calculate Easter and the location of saints' days throughout the year, this manuscript was composed as a means to reckon time. Despite being divided into 22 columns, this text is divided into eleven different sections. Section one, equal to column one, contains the days of the year in Arabic numbers, Section two comprising of column two has the days of the month using the modern system of numbered days rather than the Julian system using the calends, nones, and ides. Section three, or column three, contains the Sunday letter, while section four (column four) contains the principal feasts days of the year with an error placing Saint Valerian on 18 April and not on 14 April. Section five, also column five, has the minutes added to the hour of noon to mark midday. Section six, comprising columns six through eight (with eight blank), contains the equinoctial hours of the day divided between hours and minutes with the standard four minute interval of a twelve hour day (as divided between ten normal hours and two hours of twilight). Section seven contains seven columns (nine through fifteen with twelve blank), calculating the equinoctial hours of the night identified by the successive rising of the constellations, which marked the passing of the days with the rising of a new constellation on the sunrise of every ten days. These constellations are marked within the columns in rubric or brown ink depending on the ink used in each column. Section eight contains two columns, sixteen through seventeen, that provided numerical information that needs to be added or subtracted in the calculations used in the tables. Section nine, comprising columns eighteen and nineteen, provides the hour for the rising of the sun in hours and minutes. Section Ten, equal to column twenty, provides the altitude of the sun at noon, while section ten (columns twenty-one and twenty-two) provide the calculations for the setting of the sun in hours and minutes. Additional information is placed on the left side of column one indicating the adjustments for leap year, and below the table to clarify the contents of each column.

The third part of the codex consists of two brief treatises in Dutch on how to perform multiplication and division. The treatises include a grid for reckoning the product of any two numbers up to ten times time. The scribe also included two pages of examples, one page for multiplication and the other for division. The short treatises provide an easy introduction to the basic problems of mathematics useful for the computation of the rising and setting of the sun as described in the first part of the manuscript.

The simplicity of the manuscripts treatises imparts the sense that it was produced for a young or novice student. The author's use of the second person shows that it was directed towards an individual reader, as opposed to an audience in general. However, the excellent condition of the manuscript suggests that it was little used, perhaps in that it only calculated the year 1490.

## LITERATURE

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Brévar, Francis. "The German Volkskalender of the Fifteenth Century," *Speculum* 63/2 (1988), pp. 312-342.

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Thorndike, Lynn. "Computus," *Speculum* 29/2 (1954), pp. 223-238.

Tuckermann, Bryant. *Planetary, Lunar, and Solar positions, 601 BC to AD 1649, at Five-day and Ten-day Intervals*, 2 vols., Philadelphia: American Philosophical Society, 1962-64.

## ONLINE RESOURCES

Medieval calendar tools by O. Lieberknecht  
<http://www.lieberknecht.de/~prg/calendar.htm>

Medieval calendar calculator  
[http://www.wallandbinkley.com/mcc/mcc\\_main.html](http://www.wallandbinkley.com/mcc/mcc_main.html)

Online calendar of saint's days  
<http://www.the-orb.net/encyclop/religion/hagiography/calendar/home.htm>

On reading the medieval calendar  
<http://medievalwriting.50megs.com/whyread/calendar.htm>

Internet resources for the calculation of Easter

[http://www.phys.uu.nl/~vgent/easter/easter\\_text6b.htm](http://www.phys.uu.nl/~vgent/easter/easter_text6b.htm)

Rodolphe Audette on the history of the Gregorian calendar and Easter reckoning

<http://hermes.ulaval.ca/~sitrau/calgreg/>

Medieval Easter calendar by Karl Hagen

<http://www.polysyllabic.com/?q=calhistory/easter/medieval>

IHRT medieval calendar website

[http://aedilis.ihrt.cnrs.fr/liturgie/01\\_2.htm](http://aedilis.ihrt.cnrs.fr/liturgie/01_2.htm)