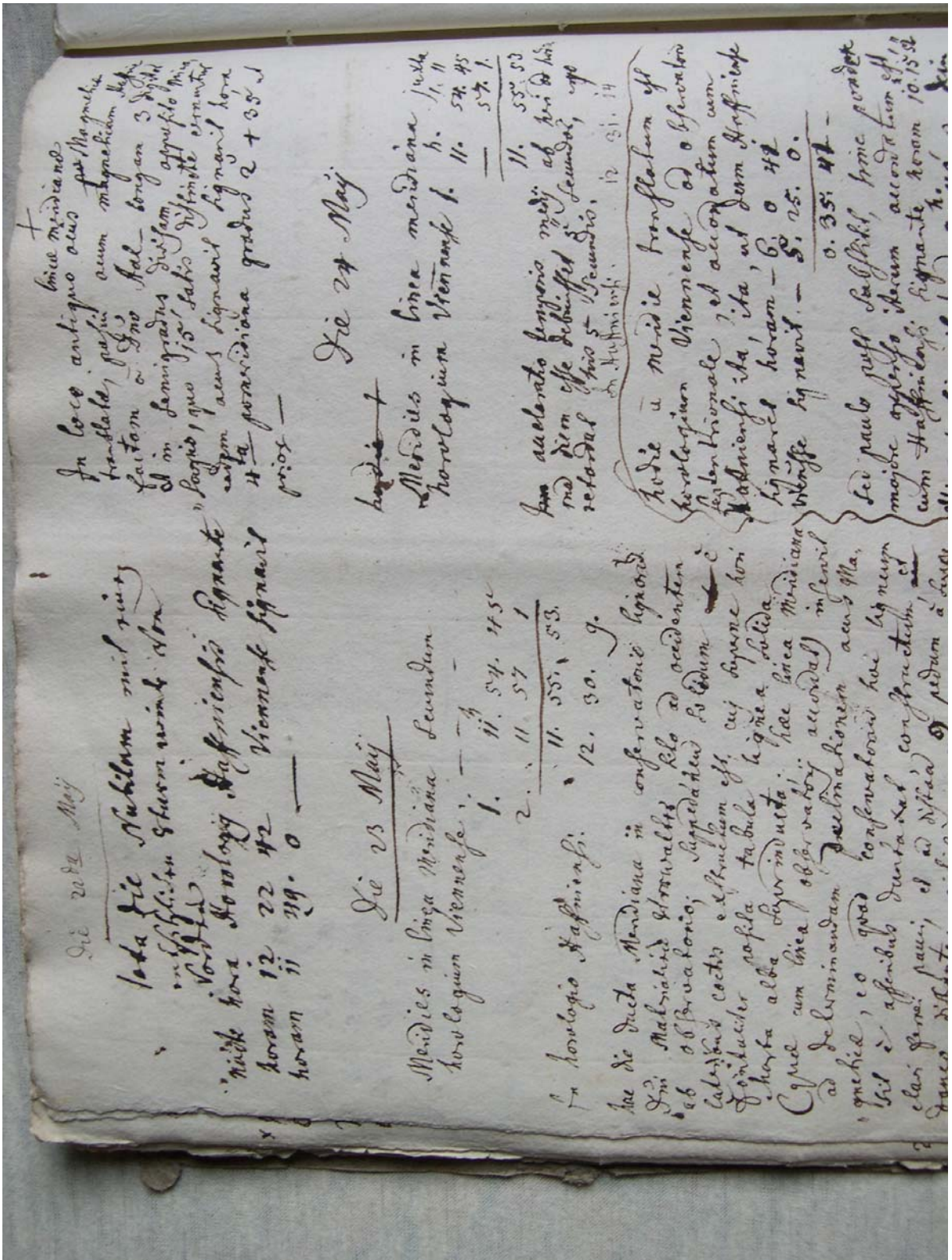


**Manuscript *Hell c* – an extract from Hell’s “astronomical notebook”**

The following two pictures show a page in Hell’s “astronomical notebook”. Like before, this page has been split into two halves in photographing. As a consequence, the left column of MS *Hell c* 23<sup>rd</sup> May 1769 pt 2 accidentally begins a note that is completed in the right column of part 1.

References to pages in our report giving translations and explanations will be found below each picture.

For notes on abbreviations and other palaeographical remarks, see above on MS *Hell a* and *Hell b*.



Translations on pp. 19, 20. Comments on p. 21

que hic, eo quod conservatoris hoc lignum  
 vel e' aspidibus duntaxat constructum  
 clar. fere. pau; et ad dista' pedum a' logis  
 dante distantes nihil omnino acum habere  
 possunt, pretere' contra ventum in bene labia  
 hujus Conservatorij tela crassa tenentij mia  
 undique vestita sunt. Ob servatorum  
 hac appellatione observatorum Accus  
 Magnificae novum.

18. Ex die 18<sup>ta</sup> et 23<sup>ta</sup> Maji Meridies  
 providit retardatio diurna horologii Venerabilis  
 pro tempore medio = 5"  
 Et horology Hassinense accelerato = diurna  
 pro tempore medio = 58", est enim in  
 Meridie diei 18. ubi 12. 25. 4" a die  
 autem 18 ad 23 erat acceleratio brevioris medij  
 = 14" ergo die 23 esse debet 12. 25. 21"  
 erat autem 12. 30. 9", hinc diebus quinque  
 acceleravit 4'. 48", seu pro revolutione  
 diurna 58". quod supra inventum quoque est.

A meridie hora 3 1/2 translata est acus magne  
 tica ad novum observatorij magnetium Vlaho  
 a' prioris ad occidentem passus 50. acus magne  
 tica hora 1/2 in loco prioris, observatorij Abo  
 meridi signavit gradus 2 + 05' ad occidentem  
 et translata ad novum, atque in quiete posita  
 signavit gradum eodem pro tempore 2. 55".  
 hinc venditio habetur 20 m. quam mihi  
 inservisse videtur Cornax forea Laboratorij  
 licet acum pedes distans in tra' septentrionis et  
 orientem sub angulo inveni 45 gradum, que per  
 acum hujus 20 hore hinc est orientis versus orientem  
 distans 4. 15. 20.

Sei pau' post signavit, hinc  
 majore appello, hinc accenditum est  
 cum Hassinense signante horam 10. 15. 32  
 Hassinense signavit horam 9. 40. 0. hinc  
 hinc Hassinense hinc multo infra.

Die 25<sup>ta</sup> Maji  
 Anulum data diei  
 Vespere hore Hassinense signavit  
 horam 9. 40. 55". Hassinense hore  
 ante, concordatum signavit horam  
 9. 5. 0, hinc, hoc tempore praestitit  
 Hassinense 35. 15. 55".  
 Die 28 Maji  
 Anulum ante Meridies  
 et in Meridie.  
 In Meridie quavis Hassinense  
 signavit horam 12. 39. 16  
 Hassinense signavit 12. 2. 0.  
 diei hora 9. 5. 0. val 55"  
 ergo acceleratio hore 15 erat. h.  
 21.  
 12. 34. 11 1/2  
 11. 54. 34  
 11. 55. 56 1/2  
 11. 55. 47 1/2

Translations on pp. 20, 21



**Manuscript *Hell Kratzenstein* – Hell's letter to the instrument maker**

The following pages depict a letter from Father Hell to Mr. Kratzenstein, who had constructed one of his declinometers. Plans for observations of magnetic declination are mentioned towards the end of the second page.

The size of the original is the same as elsewhere, but unlike the other pictures, the sheets have been photographed in full. MS *Hell Kratzenstein* 1-2 represent the front and back of a single sheet.

Peculiarities of Hell's handwriting are explained briefly above for MS *Hell a* and *Hell b*.

Viro celeberrimo Kratzensteinio  
Hafniam

an 25  
1722 22 23 1789  
125458 13910  
1234567890

Tua erga me singularis amicitia, & animorum ~~me~~ nostrorum  
intima conjunctio jubet, eor<sup>um</sup> que a me postulasti rationem  
reddere candidissimam. Jubebas primum in certam, ut inquirerem  
Latitudinem geographicam Urbis Frontheimicæ; Et hanc  
ita habere, quemadmodum Quadrante tel. Dom. Nieburg per altitudines  
solis meridiana de 1 et 2 Augusti, in arca subidi<sup>li</sup> Turis Templi  
quod præterit<sup>er</sup> dicitur appellatur, obtinui, die 1<sup>a</sup> Augusti, distantia oppo-  
siti<sup>o</sup> Superioris à vertice observata est = 45° 14' 0". Ex hac  
factis calculis reperio Latitudinem Turis hujus templi = 63° 26' 30".  
Die 2<sup>a</sup> Augusti eandem distanciam observavi = 45° 52' 30" ex  
qua prodit Latitudo = 63° 26' 28" 7, sine media = 63° 26' 29". Hoffmannus in hinc  
ad usum velis, determinationem hanc hinc hinc, & nullum in qua, <sup>magis, cum pond</sup>  
drante <sup>errorem</sup> quædam errorem quadrantis in quibus nocte inter <sup>gradibus errorem</sup>  
iam et 2<sup>a</sup> Augusti inbrecedente, et quidem ope fixarum γ et α Cygni  
in meridiano austrum, atque β Cephei ad septentrionem telorum, et  
quidem γ Cygni obtinui. Et reliquæ α Cygni, ob illum tibi ad ipsam partem  
in partem admodum oculto in omnibus β artem Cephei, ob nubeculas et  
eorum nimis jam audum omni me obtinui, ~~ad~~ in sequente  
noctibus diebus <sup>et</sup> partim ab nubes continuas, partim ab ventum validior  
perpendiculari Quadrantis nimis hinc inde moventem, nullum extem  
peccare hinc observationem. Ex usu Quadrantis ad ipso tel. Nieburg  
intellexi, se ~~in~~ tribus minutis tanquam majorem reperisse errorem Quadrantis  
hujus. Quapropter est Latitudo supra dicta 63° 26' 29". ~~in~~ minutis  
aliquot propter incognita adhuc errorem Quadrantis incerta sit, hæc tamen  
questionis. Sicut, num Frontheimij inbrans Venris contactus in egressu  
vno celo spectabitur an seu<sup>er</sup> factis fuerit, ut opinor. Contactum  
interiorem in egressu, hinc effectum parallaxeos ad meridiannam Viennæ  
= a me supputatum (vide Appendix ad Eph. Anni 1722) p. 174. 56. 9.  
Hafnia bene, acidentibus est. 14. 29. aut ex determinatione recessioni 17. 27. in longiore. v  
Frontheimij e magis <sup>Frontheimij</sup> circuli <sup>Horiz</sup> declinationem versus per <sup>per</sup> telum est. 1. 180  
seu in longiore 0. 40. et hinc <sup>Frontheimij</sup> Viennæ 21. 7. igitur contactus  
interius in egressu geocentricus 14. 12. 2. ut si admodum effectum parallaxeos vel id  
nubeculas contactus interius geocentricus h. 14. 22. oritur vero sol die  
die 3 Junij Frontheimij hora. 14. m. 23. <sup>unde colligitur</sup> ~~unde colligitur~~ <sup>unde colligitur</sup>  
contactus interius in egressu Frontheimij observari poterit, maxime si

14. 26.

animadvertas usque Frontheimicam montibus sed albis circumposita  
 in ortum solis integro horae quadrante retardare possunt. Supra  
 igitur et provide scribis, si librum observationis tibi eligas 30  
 aut 40 millionibus Frontheimio Lybationem versus sitam.  
 circa gradum latitudinis 68<sup>o</sup> in magna Wengen thecaena plura reperiantur  
 loca, in quibus habentur Ecclesie Predicatorum, in quibus unum sine  
 Stationi commodissimum facile reperias.  
 Hae quidem ita se habent, ut quae rationem itineris attinent, difficilia,  
 res non nullas reperio; ~~primum~~ itinere terrestri Frontheimium petere  
 non poteris mensibus Aprilis aut Maio, quibus mensibus his in agris  
 nives salu calore solis soluta, ~~non ita~~ cum ~~ad~~ ~~flamma~~ ~~non~~  
~~hinc~~ ~~quis~~ ~~tam~~ ~~atque~~ ~~via~~ ~~improvisum~~ ~~faciunt~~. Modus igitur  
 alius hinc non videtur quam, vel ut mense Aprilis in ore maritimo  
 de Frontheimura petas, ~~vel~~ mense februario, bellae adhuc gelu  
 confriata, itinere trahis per nives Frontheimium petas, Frontheimio  
 vero circa medium aut finem Aprilis itinere maritimo facile  
 Stationem tuam attinges. ~~revertis~~

Nos Frontheimium die 30 Julii ~~revertis~~ ~~empero~~ Christianae et vicarij  
 doctissimi et lex ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 pervecinus, hic a Praefectis, et ceteris officialibus omni ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 Frontheimiensi Praefectus, qui omnia itineris necessaria, ad quam  
 cae quae ad commodam Wapdo hinc ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 Illustrissimi Domini Hagruys Immarchis Praefecto, conducta navis  
 vulgo suis fasti die 17 Augusti ingredi meditamus. Ceterum  
 in itinere hoc per dove ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 tum geographicas ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 id omni hinc ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 fecimus, ne perire adeo accuratam ut nihil correctionis in ea  
 reperire. ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 nullam mihi facere licuit observationem, de quota quidem  
 solis meridiana altitudinem obtinisse, ad hanc ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 quadrante in arca subdiali Illustrissimi Generalis de Veltheim  
 populo, advenientibus ad ipsum observationis tempus ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 de ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 et alij hospitalibus, timore turbato, accurata observatio  
 fieri non potuit.  
 Determinationem aere magneticae tum Christianiae, tum hic Frontheimio  
 ad ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 observare mihi non licuit. Ad has et ceteras observationes, in redire  
 dum mihi in his Stationibus diversis comitari licuit ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 non prohibuit. Et Frontheimio Licentiae ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~  
 noster, in ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~ ~~revertis~~ ~~empero~~ ~~Christianae~~ ~~et~~ ~~vicarij~~

Discussion on p. 27





## Manuscript *Sajnovics* – the diary of Hell's assistant

This is the diary written by Hell's assistant Joannes Sajnovics, in which a few entries have been found to contain descriptions of geomagnetic activities and related subjects. Those we consider most important are presented here, half a page at a time. The original format is the same as for all the other manuscripts reproduced in this report.

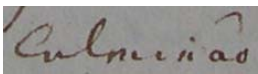
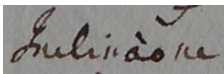
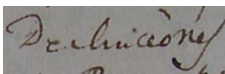
Below each picture we have indicated where in our report the reader will find translations or discussions.

Again, this is not the place for a thorough description of the peculiarities of Sajnovics' Latin. Some aid to the mere decoding of his handwriting may, however, be of help to those already familiar with reading printed texts in this language.

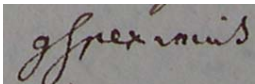
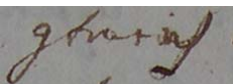
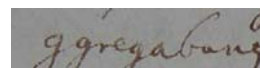
- Sajnovics uses several of the same abbreviations described above for MS *Hell a* and *Hell b*, but they may look slightly different:

 = *ibique*     = *et cetera*     = *protendebantur*

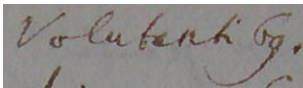
- Note also the abbreviation sign for the suffix *-atio*:

 = *Culminatio*     = *Inclinatio*     = *Declinationes*

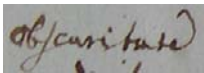
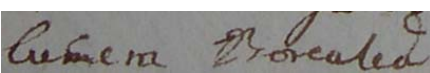
- The prefix *con-* is frequently written like the letter *g*:

 = *conspeximus*     = *contrarius*     = *congregabantur*

- The suffix *-bus* may be found written thus:

 = *Volutantibus*

- Endings in *-am*, *-em*, and *-um* are more often than not marked by a single upward stroke, sometimes with the result of ambiguity:

 = *obscuritatem*     = *lucem Borealem*[?]

 = *ortam*, compare:     = *sed*     = *ad*

- Finally, the similarity between the letters *r* and *v* should be noted:

 = *Visitati*     = *Radij*

11. Louis Insuper in Thiops Tempus.  
 12. Venny Advenit Navig Norvegica, Jess. unicans. Observato Angli  
in Cop Nord ante 10 circiter die advenisse, Altem Angli in  
Scium in Hamer, est confidisse. Callate Comes ex Vagie.  
receptis 10 April postquam ad Albionem via transit. abit.  
advenit. De Co.  
 13. Dominica Bentley. In Vandensis Angulis Commodat  
spiritu lefta Precaute. Audimus Observato Rufus in Albion  
Ter. 2. Angul quadragesimo post 2 septim erat mod 2 latis fructu.  
quod accepti in Uria Statione. una 9 ad Ninged April  
et nix et cygrie us 9 ad hord 8. fructu Denov.  
Quid Videre impedimus. Ob Nubib hord Coel.  
 16. Ter 9. Ventus est hord hord Denov manere Regit.  
 17. In 4. Edem ut hori.  
 18. Ter 9. Quid Tantum in Mensula ibiqs luna Meditana duca pro  
exploranda Exhibenda Magnati. Ad hunc Locus brevis evecti.  
die 9 in Arcti videtur plaga. Tong fuit supra hord hord, 6  
et epi post infra latere debet. 6 nuba hord refructi.  
quarta vero huc fit 3 quarta diuina hord hord  
abtem averit 3 huc. alibi refructu.  
 19. Ter 9. Arca 5. Nante noti. Ad Navigio Fortitudo ad Melior  
vere pro ligas. Ad hord Nubi ly hord. 2 medie ex 30  
per et Navig Valutissimus Tentatio et Ferri Coegnomat.

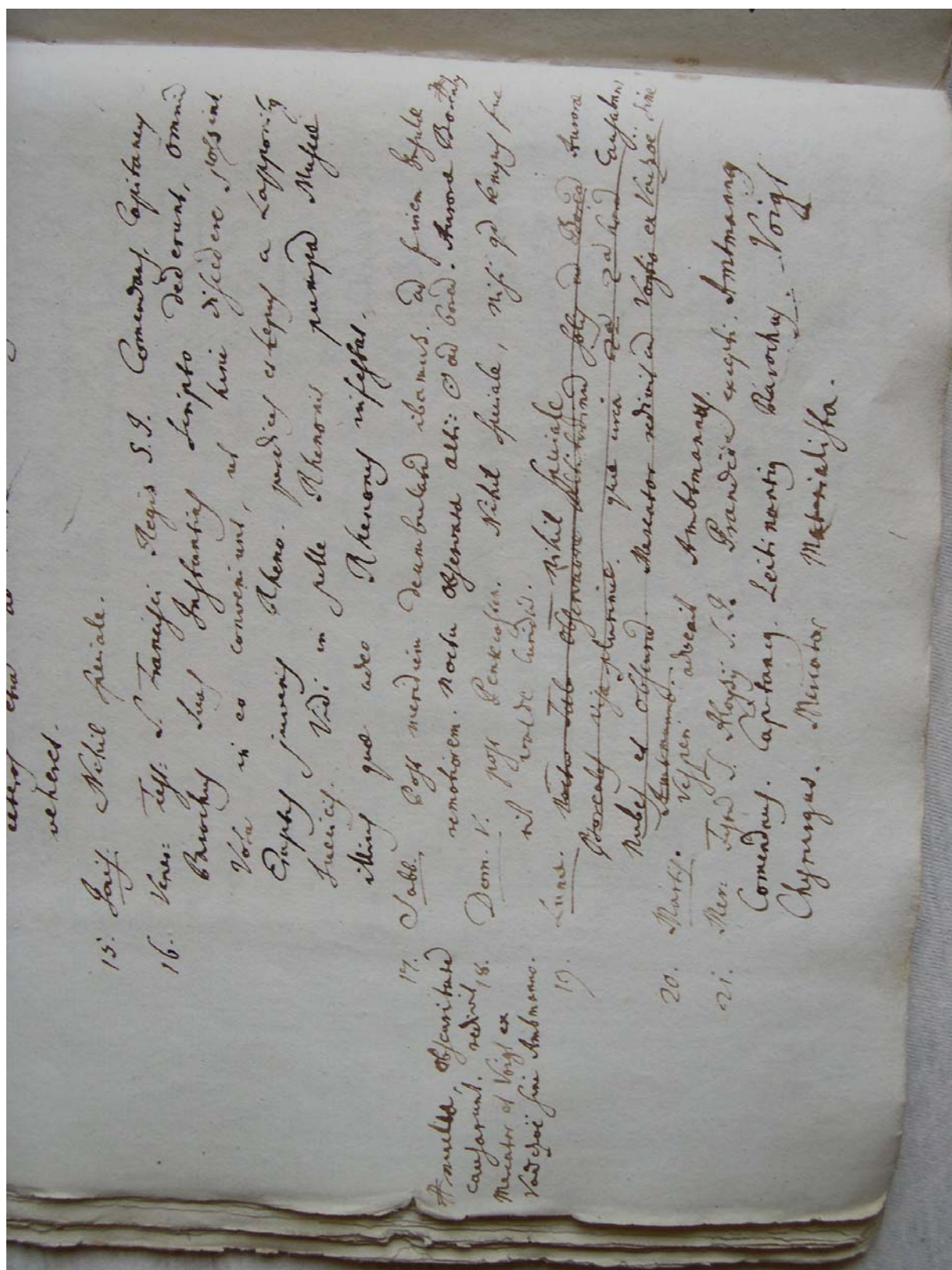
Magis.

Tabl. Pluit. ————— 20  
Tabl. Dom: M. Trinitatis. — nihil speciale. Advenit 2i  
 Decem e Norvegia inquit Navarchus.  
Ter. 22. Barometru altitud approp. Visio. Navis 22  
 Visa pasteroch: in Archangel Sed potentissimo M.  
Ter. 3a Erebas surus in Conservatorio Lignis Jui Brate 23.  
 et: Mialid. Duras Lucia Mendico Dehucione Magnis offerat.  
Ter. 4a Nihil speciale. praevident Nave advenit Propofitus. 24  
Ter. 5a Brandis Excepti. Propofitus, Merator Vadensis 25:  
 et fugates Reliqui. Nave hominibus Juba M.  
 Koble. post mundid. sedionis Navis ad lignis e Naktin.  
Ter. 6a: Luca 10. varicere. post mundid. Naktin a D.  
 infortuisse putabamus. post mundid. Naktin a D.  
 Propofitus. qui modis peregrinandi. Junior gratiose  
 Nativitas. ut et de Linnis qui Naktin venerat,  
 cum Rege aliquoties beneh, ut in hlyj suis popel  
 Custos. Lini a Rege id aurey doung. Sed goy  
 Nlyj furety suis illi. e. x. u. & u.  
Sabb. Mene Compendens. Naktin a Propofitus. Dycopus 27.  
 de diomate Laponico. Culminas o accepta, a mundi  
 combinata Mafuray. Sub gra elegantis.  
 na Lucera Proceled a d. ordo gferovis. Sal intra  
 NW. Stabat Denja Nivga super nube lertul, altit hpa  
 horizont. 30 grady ultra denja Nubey Stabas ad NO.  
 itidem alta, grady reliqua. erat sereni, ex Nube

Translation on p. 25

horis fens. 30 gradus altera densa nubes strabat ad NO.  
 itidem alta, spatium reliquum erat sereno, ex nube  
 prore ad altum tenu elegantissimi Nubij cognosc.  
 longi protuberant, et supra fere ad Nord, dilatantur.  
 quibusculi luculentis celum me. h. Volubantur, ex NW.  
 ad NE nubes, cum ubi iter aliquam Gambat.  
 Ventus inferior ghoris erat semper NO. cum  
 nubes congregantur supra Nos, et circa 8. quip. pr  
 medietate densa nubes, ad nubes ita brevi  
 diffracta hnt.  
 Hodie jam Maxime post Infula a Nivibus  
 erat libra, in vallis hnt, et anfractibus  
 hnt inde. Adhuc apparebant. Ad Conchion que  
 ad Sud West adjacet, tota adhuc alba.  
 Dom. II. post Pentecost. Prand. apud Parvum. Deinde valedixit 28  
 Proposuit et circa 10. nubes in Videsi. Incepit.  
 Vind. Vires Gistola a Comandante. Ratione ligno.  
 Ter. 2a. Ambmannus. fustia expectatus. 29.  
 Ter. 3a. Argent. Accepti. Hinc Magnetice Inclina 30.  
 Ter. 4a De Ca Determinari cepit. 31.  
 Ter. 5a De Ca. hodie finita separatis Navi. 1.  
 Ter. 6a. Comes ex Vapores allate. Preparatores facti  
 Observare Grotto. facienda h. Deo V. l. l. l.  
 Quis. ita: Will. Kott! 2.

Translations on pp. 14, 25

MS Sajnovics 17<sup>th</sup> June 1769

Comments on p. 25