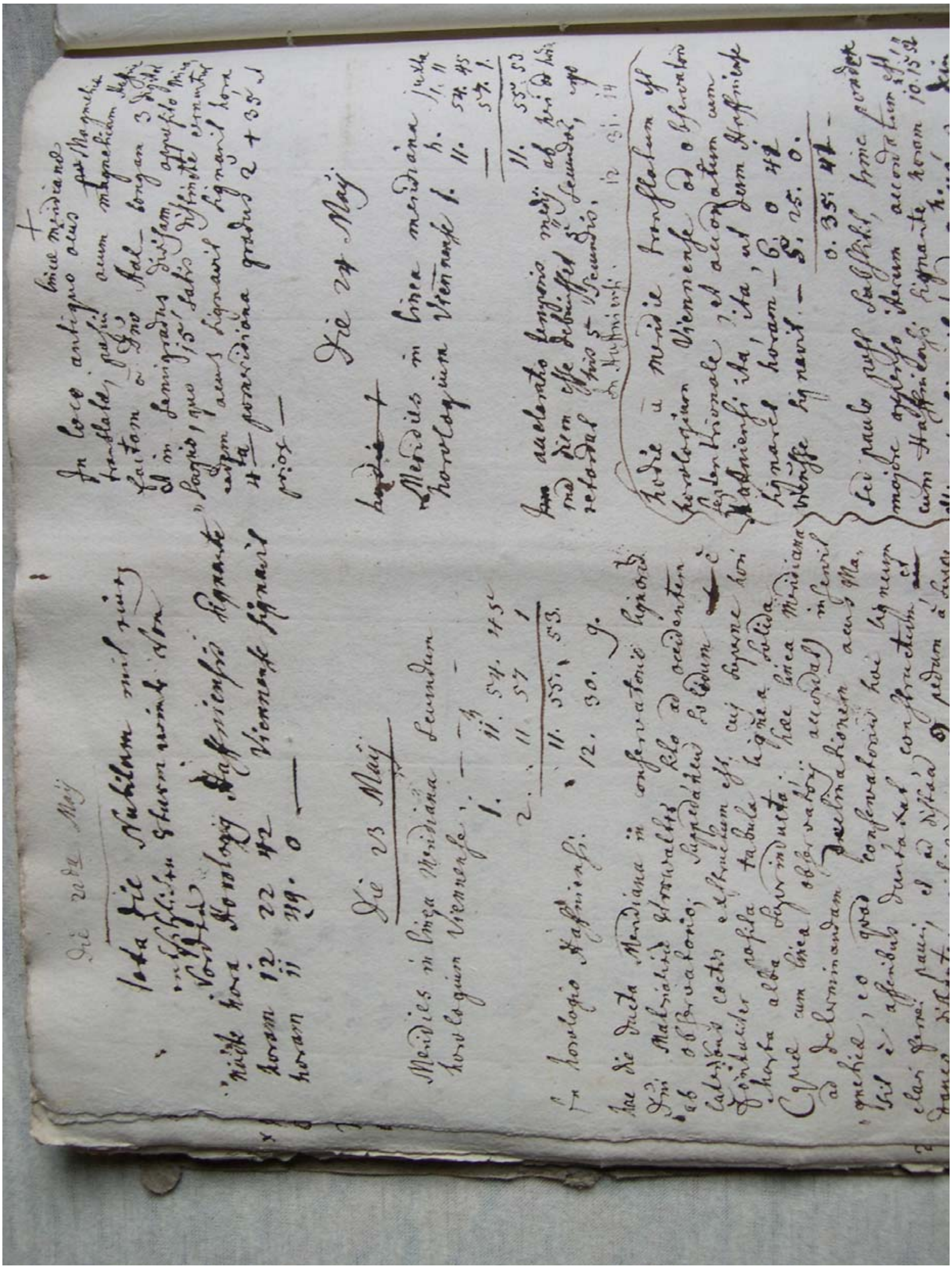
Manuscript *Hell c* – an extract from Hell's "astronomical notebook"

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* 23rd 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.

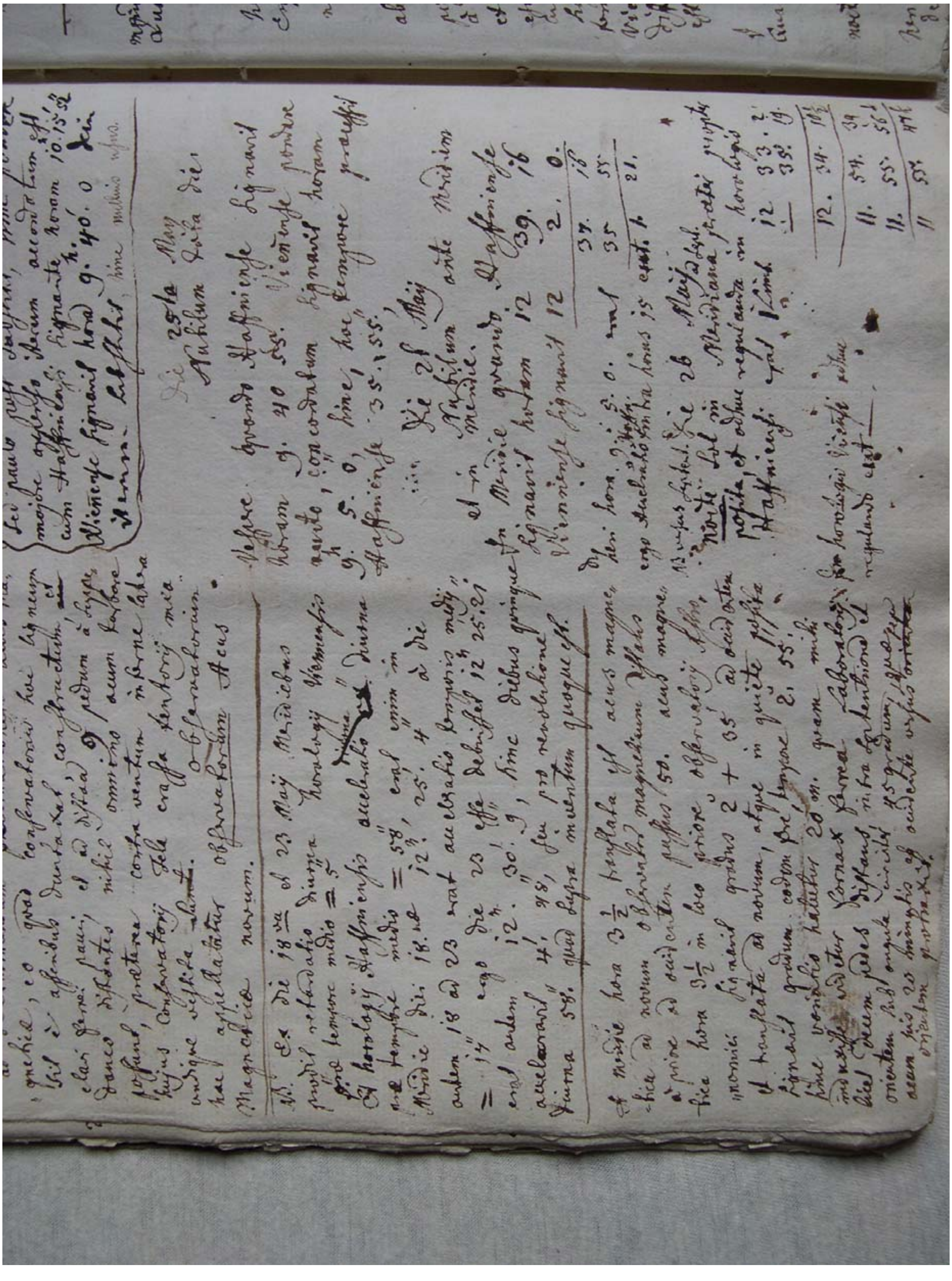
For notes on abbreviations and other palaeographical remarks, see above on MS *Hell a* and *Hell b*.

MS *Hell c* 23rd May 1769 pt 1



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

MS *Hell c* 23rd May 1769 pt 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.*

MS *Hell Kratzenstein* 1

8.

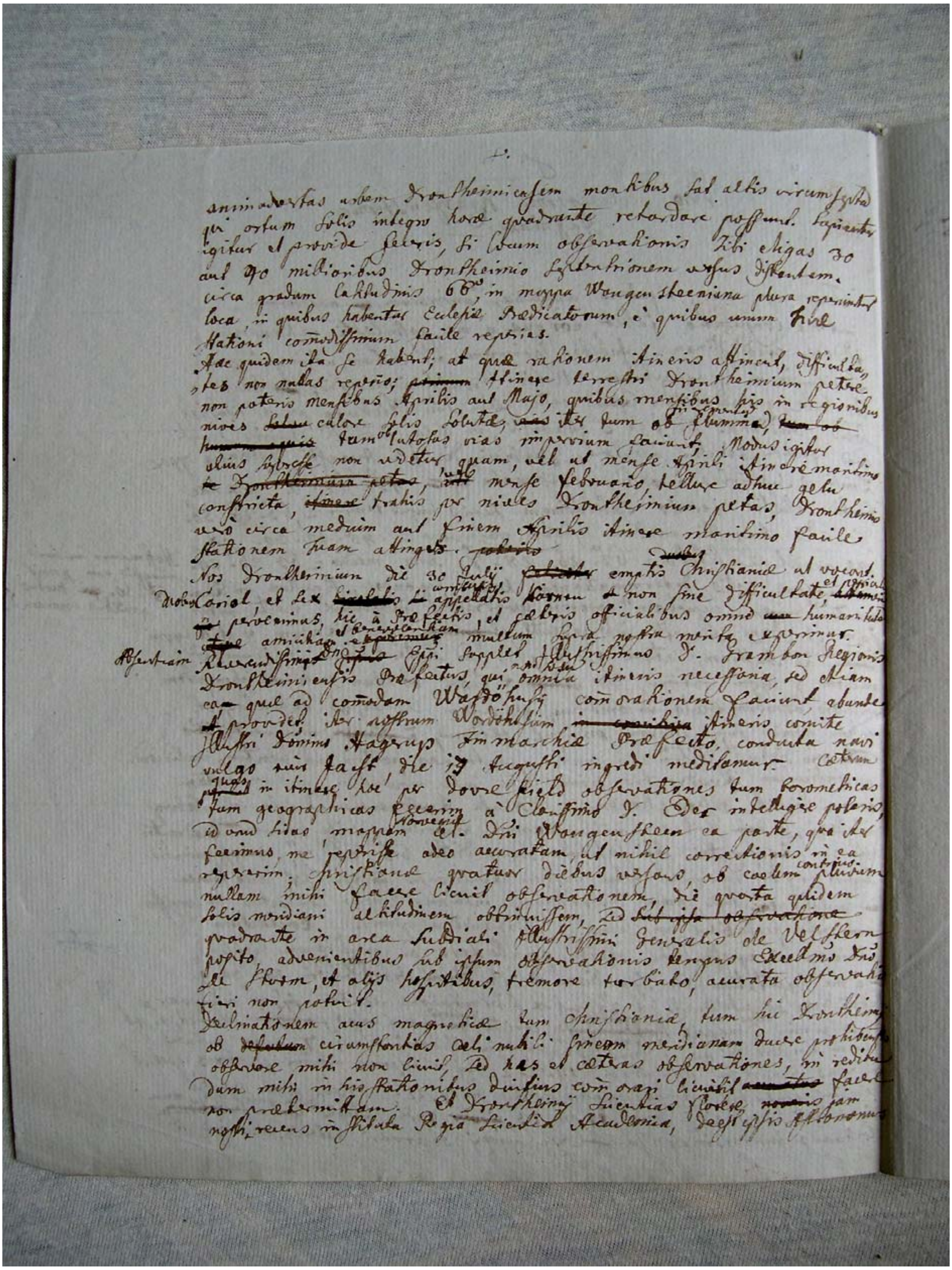
Viro Celeberrimo Kratzensteinio 1222 22

Hafniam

Tua erga me singularis amicitia, animorumque nostrorum intima conjunctio jubet, eorum, quae a me postulasti rationem reddere candidissimam. Jubebas primum in certam, ut inquirerem Latitudinem geographicam Urbis Drontheimiensis; hanc ita habe, quemadmodum Quadrante Cel. Dni Nieburg per altitudines Solis meridianas die 1 et 2 Augusti, in area subdiali Turris Templi quod Frauen Kirchen appellant, obtinui, die 1a Augusti, distantia appar. Limbi ☉ Superioris à vertice observata est = 45°. 17'. 0. Ex hac factis calculis reperio Latitudinem Turris hujus templi = 63°. 26'. 30". Die 2da Augusti eandem distantiam observavi = 45°. 32'. 30" ex qua prodit Latitudo = 63°. 26'. 28". 7, hinc media = 63°. 26'. 29". Hoffmanus in suis mappis eam ponit 63°. 30'. duobus gradibus ironice.

Sed notare velis, determinationem hanc supponere, nullum in Quadrante esse errorem; cupiebam errorem quadrantis inquirere nocte inter 1am et 2dam Augusti intercedente, ope fixarum γ et α Cygni in meridiano ad Austrum, atque β Cephei ad Septentrionem [illegible], et quidem γ Cygni obtinui, sed α Cygni, ob [illegible] tubi ipsum pedem [illegible] admodum oculo incommodum, β autem Cephei, ob nubeculas, et coelum nimis jam lucidum omnino obtinui, in sequentibus vero diebus et noctibus partim ob nubes continuas, partim ob ventum validiorem perpendiculum Quadrantis nimis hinc inde moventem, nullum certam facere licuit observationem. Ex usu Quadrantis ab ipso Cel. Nieburg intellexi, se tribus minutis nunquam majorem reperisse errorem Quadrantis hujus; Quapropter etsi latitudo supra dicta 63°. 26'. 29". minutis aliquot propter incognitum adhuc errorem Quadrantis incerta sit, haec tamen quaestioni tuae, num Drontheimii internus Veneris contactus in egressu certo spectabitur an secus satisfaciet, ut opinor. Contactum interiorem in egressu, sine effectu parallaxeos ad meridianum Viennensem à me supputatum (vide Appendicem Eph. mea 1762 pag. 112) reperi 14h. 36'. 9". Hafnia Vienna occidentalior est 14'. 29" aut ex determinatione recentiori 14'. 21" in tempore. Drontheimium autem è mappa Hoffmanniana circiter occidentem versus situm est, 1°. 40' seu in tempore 6'. 40", et hinc Drontheimium Vienna 21'. 7". igitur contactus internus in egressu geocentricus 14h. 12'. 2". cui si addamus effectum parallaxeos 9 vel 10' habebitur contactus internus apparens circiter h. 14. 22. oritur vero Sol die 3 Junii Drontheimii hora 14. m. 23 inde colligis dubium valde esse num contactus interni in egressu Drontheimii observari poterit, maxime si

MS *Hell Kratzenstein* 2



4.

animadvertas urbem Drontheimicensem montibus sat altis circumseptam
per ortum solis integro horæ quadrante retardare possunt. Sapienter
igitur et provide feceris, si locum observationis tibi eligas 30
aut 40 milliaribus Drontheimio septentrionem versus distantem.
circa gradum latitudinis 66, in mappa Wangensteeniana plura reperiuntur
loca, in quibus habentur Ecclesiæ Prædicatorum, e quibus unum tuæ
stationi comodissimum facile reperias.
Hæc quidem ita se habent; at quæ rationem itineris attinent, difficulta-
tes non nullas reperio; [illegible] itinere terrestri Drontheimium petere
non poteris mensibus Aprilis aut Majo, quibus mensibus fere in regionibus
nives [illegible] calore solis solutæ, [illegible] iter tum ob flumina [illegible] [illegible]
[illegible] tum ob lutosas vias imperviam faciunt. Modus igitur
alius superesse non videtur, quam, vel ut mense Aprili itinere maritimo
[illegible] Drontheimium petas, vel mense Februario, tellure adhuc gelu
constricta, itinere trahis per nives Drontheimium petas, Drontheimio
vero circa medium aut finem Aprilis itinere maritimo facile
stationem tuam attinges. [illegible]
Nos Drontheimium die 30 Julii [illegible] emptis Christianiæ ut vocant
Cariol, et sex [illegible] appellatis Kornen et non sine difficultate, et speciali
[illegible] pervenimus, hic a Præfectis, et ceteris officialibus omni [illegible] humanitate
tæ amicitia [illegible] multum supra nostra merita experimur.
Reverendissimo D. Episcopo [illegible] Suppleet Illustrissimo D. Gramboe Regionis
Drontheimiensis Præfectus, qui omnia itineris necessaria, sed etiam
ea quæ ad comodam Wardöhusii comorationem faciunt abunde
et providet. Iter nostrum Wardöhusium [illegible] itineris comite
Illustri Domino Hagerup Finmarchiæ Præfecto, conducta navi
vulgo ein Jacht, die 17 Augusti ingredi meditamur. Ceterum
quas in itinere hoc per Dovre field observationes tum barometricas
tum geographicas fecerim a Clarissimo D. Eder intelligere poteris,
id unum tibi mappam Norvegiæ Cl. Dni Wangensteen ea parte, qua iter
fecimus, me reperisse adeo accuratam, ut nihil correctionis in ea
reperierim. Christianiæ quatuor diebus versans, ob coelum continuo pluvium
nullam mihi facere licuit observationem, die quarta quidem
solis meridiani altitudinem obtinuissem, sed [illegible]
quadrante in area [illegible] Illustrissimi Generalis de Velstern
posito, advenientibus sub ipsum observationis tempus Excellmo Dno
de Storm, et aliis hospitibus, tremore turbato, accurata observatio
fieri non potuit.
Declinationem acus magneticæ tum Christianiæ, tum hic Drontheimii
ob [illegible] circumstantias coeli nubili lineam meridianam ducere prohibentes
observare mihi non licuit, sed has et ceteras observationes, in reditu
dum mihi in his stationibus diutius comorari licebit [illegible] facere
non prætermittam. Et Drontheimii scientias florere, [illegible] jam
nosti, recens instituta Regia Scientiarum Academia, deest ipsis Astronomus

Observatoriam [margin]

Discussion on p. 27

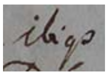
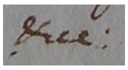
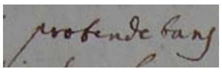
Manuscript *Sajnovics* – the diary of Hell's assistant

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.

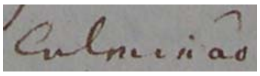
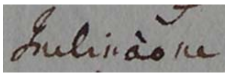
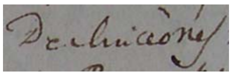
Below each picture we have indicated where in our report the reader will find translations or discussions.

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.

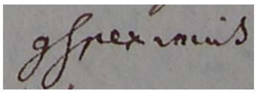
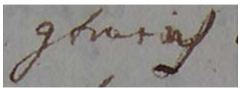
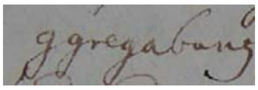
- Sajnovics uses several of the same abbreviations described above for MS *Hell a* and *Hell b*, but they may look slightly different:

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

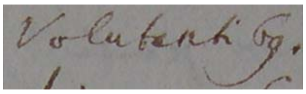
- Note also the abbreviation sign for the suffix *-atio*:

 = *Culminatio*  = *Jnclinatione*  = *Declinationes*

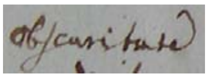
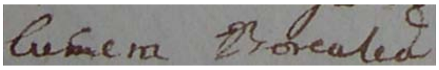
- The prefix *con-* is frequently written like the letter *g*:

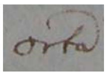
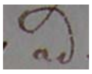
 = *conspeximus*  = *contrarius*  = *congregabantur*

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

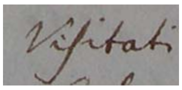
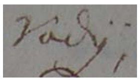
 = *Volutantibus*

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

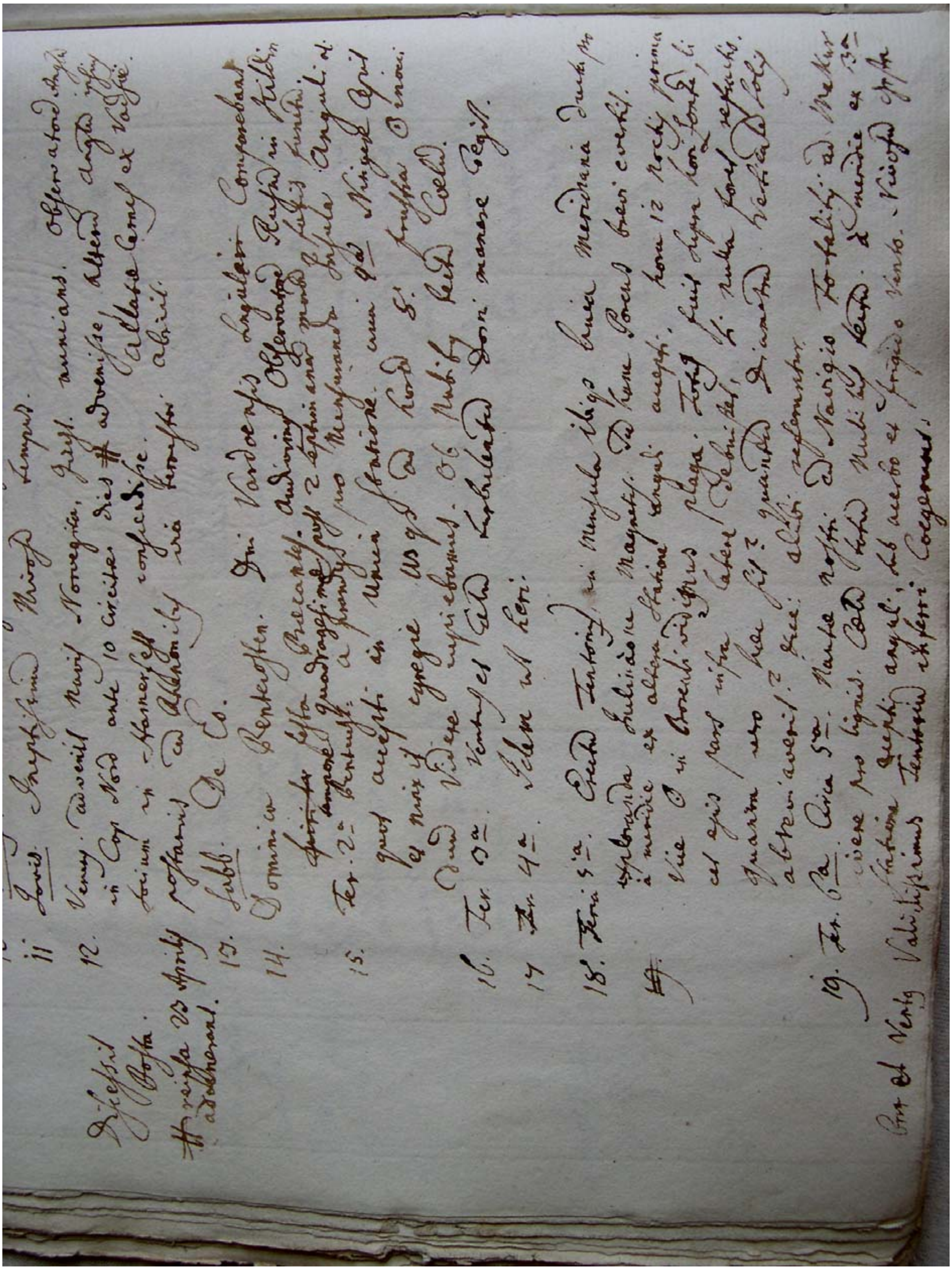
 = *obscuritatem*  = *lucem Borealem*[?]

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

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

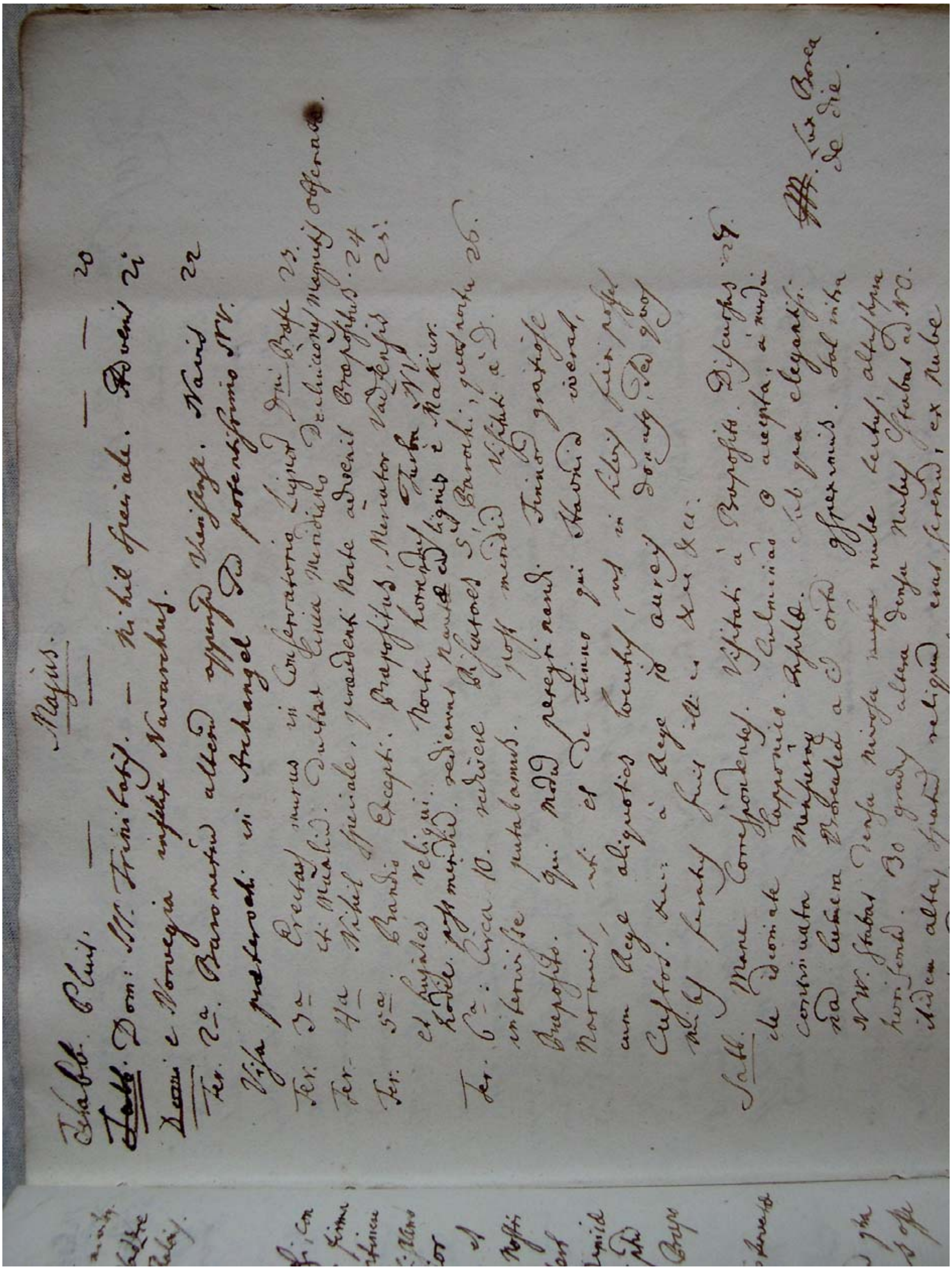
 = *Visitati*  = *Radij*

MS *Sajnovics* 18th May 1769


11 Jovis. Ineptissimum Nivosum tempus.
12. Veneris. advenit Navis Norvegica, Jussi. nuncians Observatorem Anglum in Cap Nord ante 10 circiter dies # advenisse, alterum Anglum ipsius socium in Hamerfest consedisse. Allatae Literae ex Vardoë.
Discessit Posta. Postarius cum [illegible] via terrestri abiit.
reipsa 23 Aprilis advenerant.
13. Sabb. De Eo.
14. Dominica Pentecosten. Dni Vardoenses singulari Comparebant festo precantes. Audivimus Observatorem Russum in Kildin tempore quadragesimae post 2 septimanarum morbum fatis functum.
15. Fer. 2a Pentecost. a prandio pro Mensuranda Insula Angulos quos accepti in Unica statione. cum 9a [illegible] coepit et nix usque egregie usque ad horam 8. frustra ☉ [illegible] Dum videre cupiebamus. Ob Nubibus tectum Coelum.
16. Fer. 3a. Ventus et Coelum turbulentum Domi manere coegit.
17 Fer. 4a. Idem ut heri.
18. Feria 5a. Erectum Tentorium, in Mensula ibique linea meridiana ducta pro exploranda Inclinatione Magnetis. Tum hanc Boreas brevi evertit.
à meridie ex altera Statione angulos accepi. hora 12 Noctis prima vice ☉ in Boreali vidimus plaga. Totus fuit supra horizontem, si cui ejus pars infra latere debuisset, si nulla foret refractio. Quanta vero haec sit? quantum Diametrum verticalem solis abbreviaverit? etc: alibi referuntur.
19. Fer. 6a Circa 5am. Nautae nostri cum Navigio Fortalitii ad Makur iere pro lignis. Coelo toto Nubibus tecto. à meridie ex 3a statione accepti angul. sub acerbo et frigido vento. Nivosum postea
Eurus et Ventus validissimus Tentorium inferri Coegerunt.

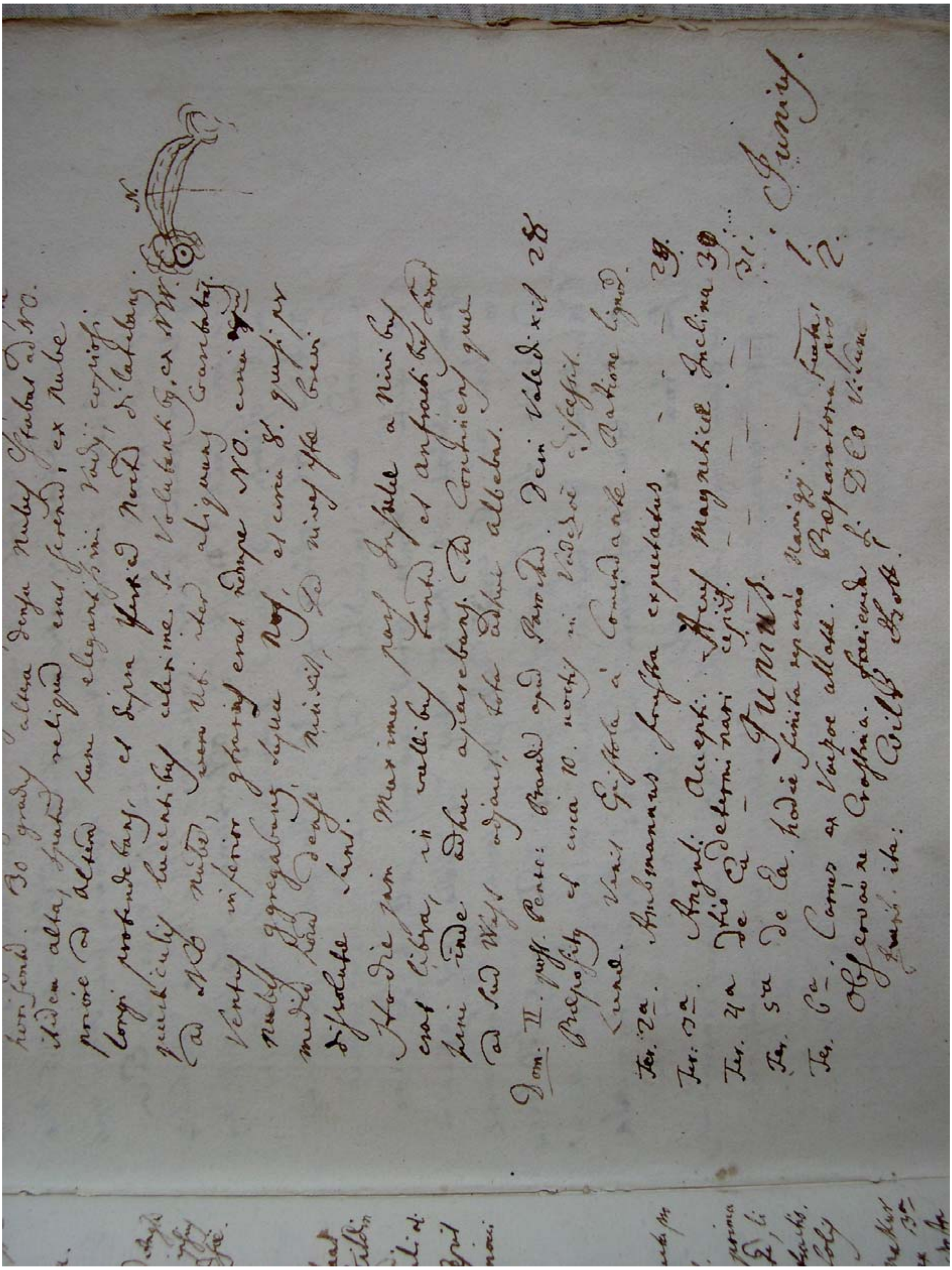
Translation on p. 14

MS *Sajnovics* 27th May 1769 pt 1



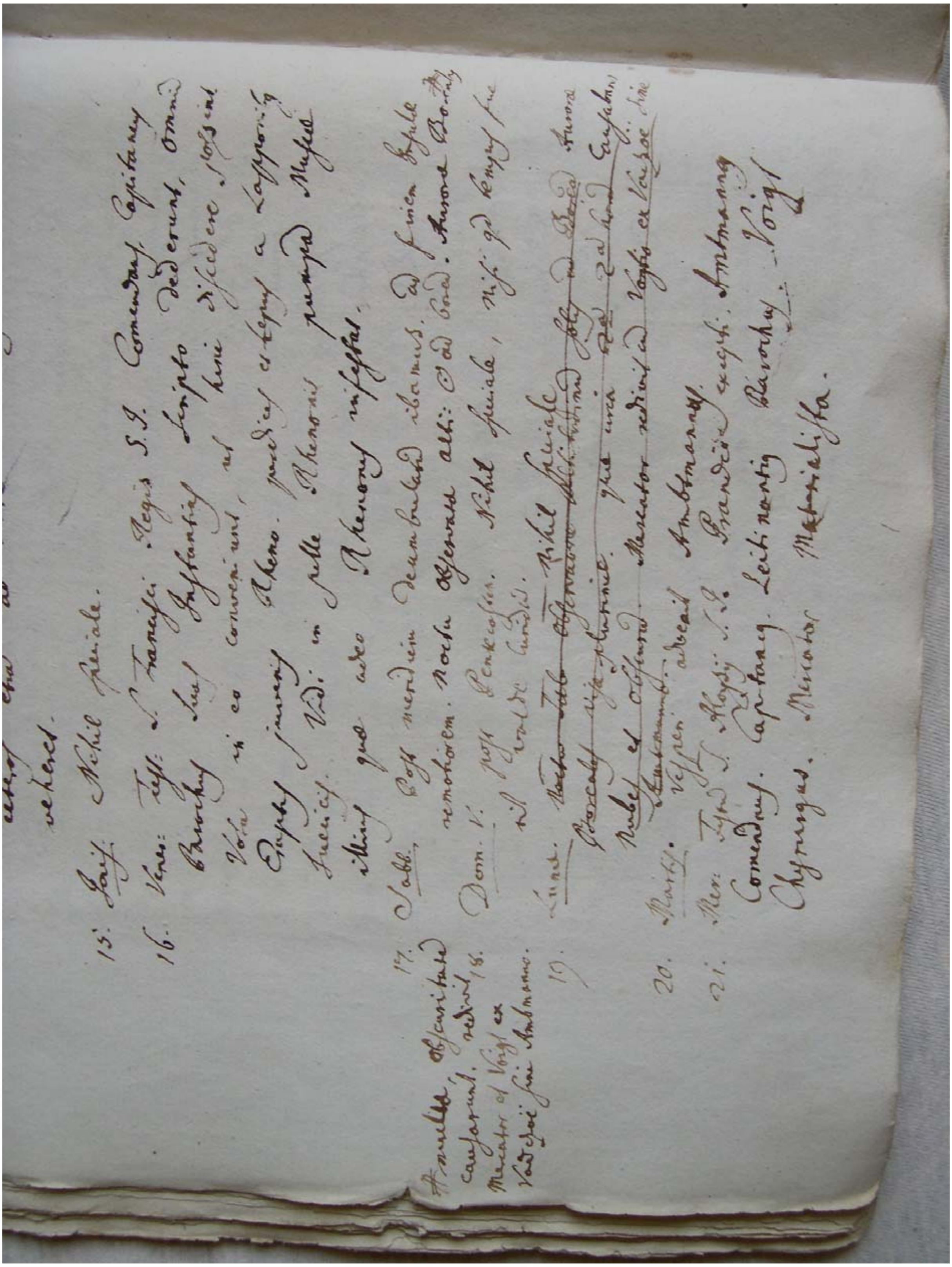
Translation on p. 25

MS *Sajnovics* 27th May 1769 pt 2



Translations on pp. 14, 25

MS *Sajnovics* 17th June 1769



Comments on p. 25