Celio Calcagnini's Philosophical Defense of the Motion of the Earth (ca. 1518)

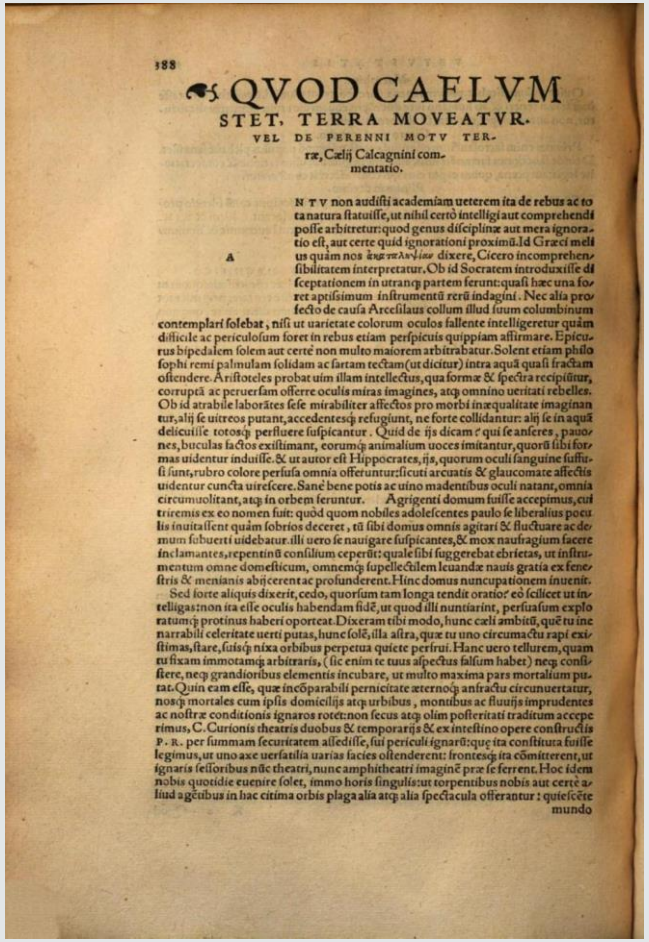
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FARE RICERCA IN ITALIA
FRAMEWORK PER L'ATTRAZIONE E IL RAFFORZAMENTO DELLE ECCELLENZE PER LA RICERCA IN ITALIA
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Overview

- *Quod caelum stet, Terra moveatur* - A neglected source of geokinetic cosmology in Copernicus's age
- Calcagnini's brief prosopographic information
- His philosophical perspective
- Terrestrial motions and their causes
- Concluding remarks

Quod caelum stet – A neglected source of geokinetic astronomy?

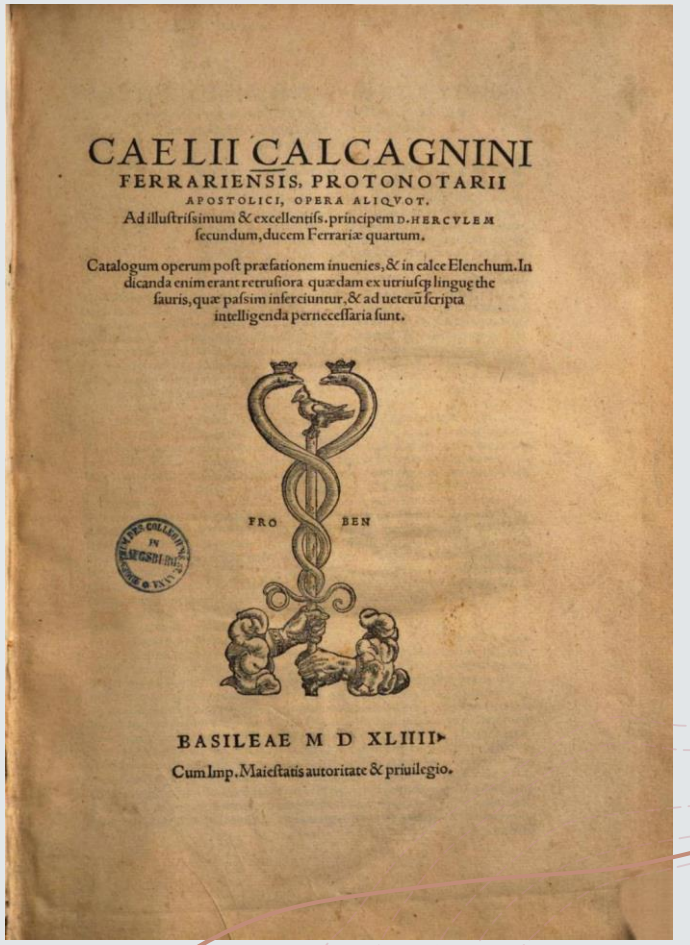


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QVOD CAELVM
STET, TERRA MOVEATVR.
VEL DE PERENNI MOTV TERræ, Cælij Calcagnini commentatio.

NTV non audisti academiam ueterem ita de rebus ac tota natura statuisse, ut nihil certò intelligi aut comprehendi posse arbitretur: quod genus disciplinæ aut mera ignoratio est, aut certe quid ignorationi proximũ. Id Græci melius quàm nos ἀκαταλη̃ψιαν dixere, Cicero incomprehensibilitatem interpretatur. Ob id Socratem introduxisse disceptationem in utranq; partem ferunt: quasi hæc una foret aptissimum instrumentũ rerũ indaginí. Nec alia profecto de causa Arcesilaus collum illud suum columbinum contemplari solebat, nisi ut uarietate colorum oculos fallente intelligeretur quàm difficile ac periculosum foret in rebus etiam perspicuis quippiam affirmare. Epicurus bipedalem solem aut certè non multo maiorem arbitrabatur. Solent etiam philosophi remi palmulam solidam ac fartam tectam (ut dicitur) intra aquã quasi fractam ostendere. Aristoteles probat uim illam intellectus, qua formæ & spectra recipiũtur, corruptã ac peruersam offerre oculis miras imagines, atq; omnino ueritati rebelles. Ob id atrabile laborãtes sese mirabiliter affectos pro morbi inæqualitate imaginantur, alij se uitreos putant, accedentesq; refugiunt, ne forte collidantur: alij se in aquã deliquisse totosq; perfluere suspicantur. Quid de ijs dicam? qui se anseres, pauones, buculas factos existimant, eorumq; animalium uoces imitantur, quorũ sibi formas uidentur induisse. & ut autor est Hippocrates, ijs, quorum oculi sanguine suffusi sunt, rubro colore perfusa omnia offeruntur: sicuti arcuatis & glaucomate affectis uidentur cuncta uirescere. Sanè bene potis ac uino madentibus oculi natant, omnia circumuolitant, atq; in orbem feruntur. Agrigenti domum fuisse accepimus, cui triremis ex eo nomen fuit: quòd quom nobiles adolescentes paulo se liberalius poculis inuitassent quàm sobrios deceret, tũ sibi domus omnis agitari & fluctuare ac domum subuerti uidebatur. illi uero se nauigare suspicantes, & mox naufragium facere inclamantes, repentinũ consilium ceperũt: quale sibi suggerebat ebrietas, ut instrumentum omne domesticum, omnemq; supellectilem leuandæ nauis gratia ex fenestris & meniánis abiicerent ac profunderent. Hinc domus nuncupationem inuenit.

Sed forte aliquis dixerit, cedo, quorsum tam longa tendit oratio? eó scilicet ut intelligas: non ita esse oculis habendam fidẽ, ut quod illi nuntiarint, persuasum explo ratumq; protinus haberi oporteat. Dixeram tibi modo, hunc cæli ambitũ, quẽ tu inarrabili celeritate uerti putas, hunc solẽ, illa astra, quæ tu uno circumactu rapi existimas, stare, fixisq; nixa orbibus perpetua quiete perfrui. Hanc uero tellurem, quam tu fixam immotamq; arbitraris, (sic enim te tuus aspectus falsum habet) neq; consistere, neq; grandioribus elementis incubare, ut multo maxima pars mortalium putat. Quin eam esse, quæ incõparabili pernicitate æternoq; anfractu circunuertatur, nosq; mortales cum ipsis domicilijs atq; urbibus, montibus ac fluuijs imprudentes ac nostræ conditionis ignaros roteri: non secus atq; olim posteritati traditum accepe rimus, C. Curionis theatris duobus & temporarijs & ex intestino opere constructis P. R. per summam securitatem assedisse, sui periculi ignarũ: quę ita constituta fuisse legimus, ut uno axe uersatilia uarias facies ostenderent: frontesq; ita cõmitterent, ut ignaris sessoribus nũc theatri, nunc amphitheatri imaginẽ præ se ferrent. Hoc idem nobis quotidie euenire solet, immo horis singulis: ut torpentibus nobis aut certè aliud agẽtibus in hac citima orbis plaga alia atq; alia spectacula offerantur: quiescẽte mundo



CAELII CALCAGNINI
FERRARIENSIS, PROTONOTARII
APOSTOLICI, OPERA ALIQVOT.
Ad illustrissimum & excellentiss. principem D. HERCVLEM secundum, ducem Ferrariæ quartum.

Catalogum operum post præfationem inuenies, & in calce Elenchum. In dicanda enim erant rerrusiora quædam ex utriuscp linguę thesauris, quæ passim inferciuntur, & ad ueterũ scripta intelligenda perneccssaria sunt.

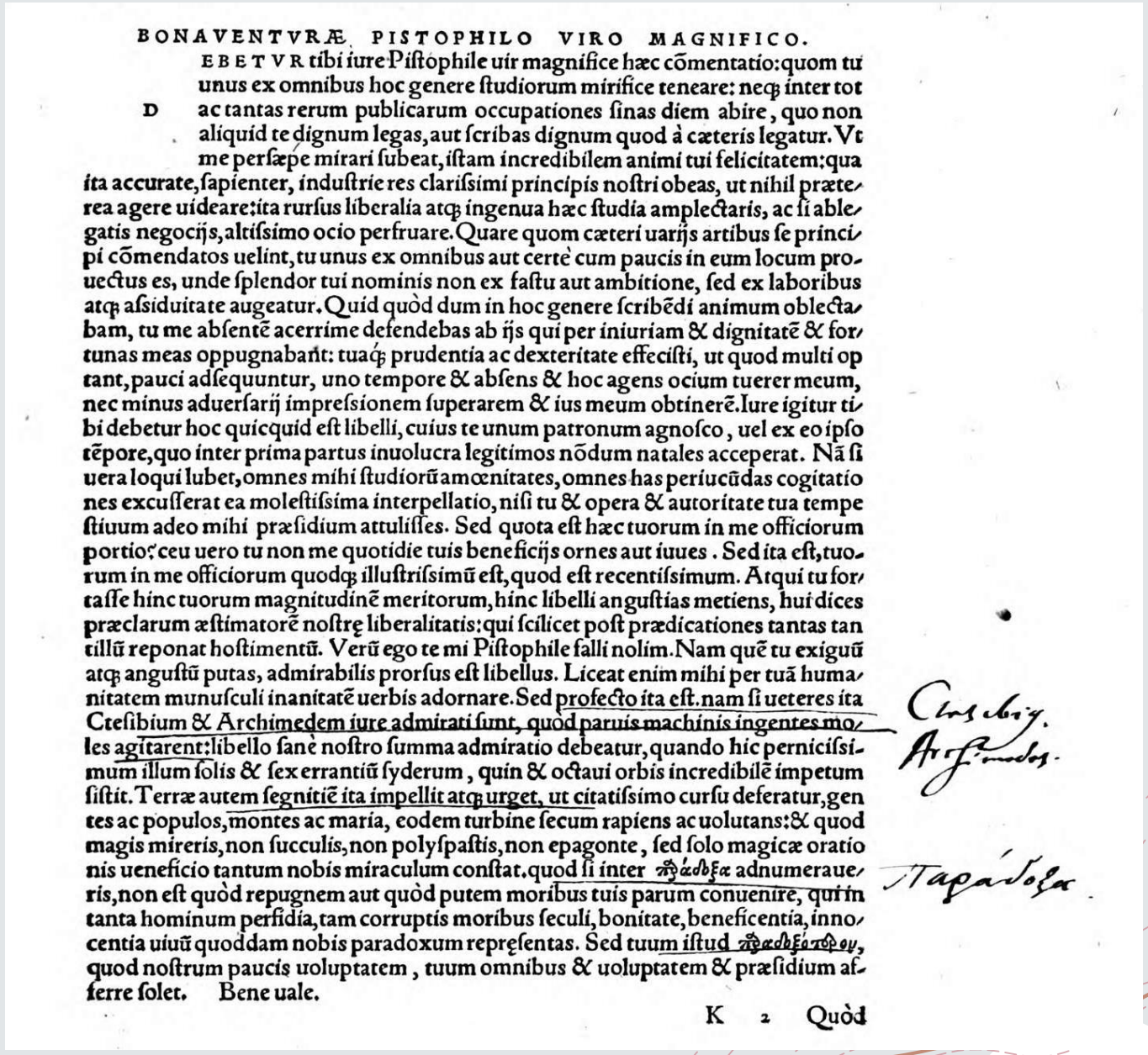
BIBLIOTECA COLLEGIUM IN ROMA

BASILEAE M D XLIIII
Cum Imp. Maiestatis autoritate & priuilegio.

Date?

1518/19?

1533 (terminus ante quem)



BONAVENTVRÆ PISTOPHILO VIRO MAGNIFICO.

DEBETVR tibi iure Pistophile uir magnifice hæc cõmentatio: quom tu unus ex omnibus hoc genere studiorum mirifice teneare: neq; inter tot ac tantas rerum publicarum occupationes sinas diem abire, quo non aliquid te dignum legas, aut scribas dignum quod à cæteris legatur. Vt me persæpe mirari subeat, istam incredibilem animi tui felicitatem: qua ita accurate, sapienter, industrie res clarissimi principis nostri obeas, ut nihil præterea agere uideare: ita rursus liberalia atq; ingenua hæc studia amplectaris, ac si ablegatis negocijs, altissimo ocio perfruare. Quare quom cæteri uarijs artibus se principi cõmendatos uelint, tu unus ex omnibus aut certè cum paucis in eum locum prouectus es, unde splendor tui nominis non ex fastu aut ambitione, sed ex laboribus atq; assiduitate augeatur. Quid quòd dum in hoc genere scribẽdi animum oblectabam, tu me absentẽ acerrime defendebas ab ijs qui per iniuriam & dignitatẽ & fortunas meas oppugnabant: tuaq; prudentia ac dexteritate effecisti, ut quod multi optant, pauci adsequuntur, uno tempore & absens & hoc agens ocium tuerer meum, nec minus aduersarij impressionem superarem & ius meum obtinerẽ. Iure igitur tibi debetur hoc quicquid est libelli, cuius te unum patronum agnosco, uel ex eo ipso tẽpore, quo inter prima partus inuolucra legitimos nõdum natales acceperat. Nã si uera loqui lubet, omnes mihi studiorũ amœnitates, omnes has periucũdas cogitationes excusserat ea molestissima interpellatio, nisi tu & opera & autoritate tua tempestiuum adeo mihi præsidium attulisses. Sed quota est hæc tuorum in me officiorum portio? ceu uero tu non me quotidie tuis beneficijs ornes aut iuues. Sed ita est, tuorum in me officiorum quodq; illustrissimũ est, quod est recentissimum. Atqui tu fortasse hinc tuorum magnitudinẽ meritorum, hinc libelli angustias metiens, hui dices præclarum æstimatorẽ nostrę liberalitatis: qui scilicet post prædicationes tantas tantillũ reponat hostimentũ. Verũ ego te mi Pistophile falli nolim. Nam quẽ tu exiguũ atq; angustũ putas, admirabilis prorsus est libellus. Liceat enim mihi per tuã humanitatem munusculi inanitatẽ uerbis adornare. Sed profecto ita est. nam si ueteres ita Ctesibium & Archimedem iure admirati sunt, quòd paruis machinis ingentes moles agitarent: libello sanè nostro summa admiratio debeatur, quando hic perniciosissimum illum solis & sex errantiũ syderum, quin & octaui orbis incredibilẽ impetum sistit. Terræ autem segnitiẽ ita impellit atq; urget, ut citatissimo cursu deferatur, gentes ac populos, montes ac maria, eodem turbine secum rapiens ac uolutans: & quod magis mireris, non succulis, non polyspastis, non epagonte, sed solo magicæ orationis ueneficio tantum nobis miraculum constat. quod si inter παράδοξα adnumeraueris, non est quòd repugnem aut quòd putem moribus tuis parum conuenire, qui in tanta hominum perfidia, tam corruptis moribus seculi, bonitate, beneficentia, innocentia uiuũ quoddam nobis paradoxum repręsentas. Sed tuum istud παράδοξότατον, quod nostrum paucis uoluptatem, tuum omnibus & uoluptatem & præsidium afferre solet. Bene uale.

K 2 Quòd

Copernican principle stated

[Hiketas and Archimedes] believe that the heavens, the Sun, the Moon, the stars, and the rest of the higher things, are stationary, and that **nothing in the world moves except for the Earth**, which, as it turns and twists around its axis at maximum speed, itself accomplishes everything that, if the Earth were stationary, would involve the motion of the heavens.

Calcagnini's Prosopography (1479-1541)

- Chair *utriusque linguae* at Ferrara (1509)
- Canon of the Ferrara cathedral (1510)
- Secretary to cardinal Ippolito d'Este
- Conclusion of jurisprudence studies at Ferrara (1514)
- 1517 Hungary (Eger) / interactions with Jacob Ziegler
- 1518 Cracow (Sigismund and Bona Sforza)
- 1531 Opening poem for Ziegler's commentary to Pliny's *Natural History* (Basel 1531).
- *Opera aliquot* (post. Basel 1544)

Opera aliquot

- Epistolicarum quaestionum, et epistolarum familiarium lib. XVI
- Poems, court orations and diplomatic discourses
- Philosophical summaries (Aristotle's *Ethics*, *Politics* and *De sensu* + *Meteorology*)
- Minima moralia: *De patientia*, *De concordia*, *De calumnia*, *De salute ac recta valetudine*
- *Apologus super inscitia*
- *De imitatione, De verborum et rerum significatione, Compendium rhetoricae*
- *De libero animi motu, In sacramentum Eucharistiae sermo*
- *Quod studia sunt moderanda, Encomion artium liberalium*

Conception of the arts

Our forefathers wanted those arts to be called liberal, which are worthy of the free man. For they were sedentary occupations to which men of servile and lowly condition were not admitted. Indeed, it was not lawful to teach painting and optics to servants. Or they are called such because those who are introduced to such arts are liberated from the lordship of vices in a supreme and legitimate way. **They are indeed so conjoined with each other that without the support of each other they are unable to stand. That is why the Greeks called them an encyclopedia, since they are kept bound together in a circular sphere, as if embraced.** This is how things must be. **Indeed, it is not possible for someone to learn one of them without the support of the others. Each requires the support of the one next to it and akin to it, and needs to be enlightened by the rays of others.** Therefore, we are wont to **collect them under one name, either philosophy or humanity**. In fact, the study of humanity is what is most proper and peculiar to man, since this appellation encompasses all that pertains to human knowledge. There is nothing in heaven or under heaven that man is not interested in exploring.

Calcagnini, *Quod studia sunt moderanda*

The philosophical perspective of *Quod coelum stet*: constructive scepsis

Have you not heard that in the ancient Academy it was thought, concerning things and the entire nature, that nothing can be understood or comprehended with certainty? **Such a doctrine is mere insipience** [*ignoratio*] or at least something like insipience.

Beyond the senses: terrestrial motion

Some might ask me what such a long speech is aimed at: to make it clear to you that you should not trust your eyes to the point of accepting as convincing and established what they tell you. I told you that this celestial sphere [*ambitum*], which you believe to be revolving on itself at unspeakable speed, and this Sun and those stars, which you think to be involved in a single circular motion, are not only stationary, and enjoy perpetual stillness embedded in their spheres, but also, in truth, this Earth, which you believe to be fixed and motionless (so your sight deceives you) does not stand still or at rest by the weight of its matter [*grandioribus elementis*], as most believe.

Moral and cognitive limitation of the senses

Malum maximum hominibus opinio falsa (Gorgias)

Provehimur portu terraeque urbesque recedunt (Eneid III 72)

'We turn away from the harbor, and the land and the cities turn away.'

Terrestrial motions

- Daily rotation
- Inclination / libration of the axis
- Trepidation? Annual revolution?

On the Sun: excellence and immobility

Often, as I contemplate the perennial nature of celestial things, I am amazed by the greatness and brightness of the 'eternal light,' to which nothing less befits than motion, and of all kinds of motion that which is called circular. As it descends from itself and returns to itself, it seems not suitable, since no other contains more contrary elements and (more than any other thing) is divided within itself.

The Sun: Seasons and distance

From this [the Sun] nourishment is given to animate beings, from this the years and seasons follow one another. Certainly not because it [the Sun] sometimes departs [*abscedat*] from us and then turns back [*revertatur*]-which is common opinion-but because we sometimes approach it and sometimes turn away from it. And really it cannot be considered sufficiently acceptable that what for nothing needs us should desire and be conditioned by our desire; on the contrary, what without it can neither be nourished nor formed nor propagated, would cease and neglect to provide for its own needs.

Planetary theory?

And what shall I say about the trepidation of the eighth sphere, what shall I say about the motion of the various epicycles and deferents? Although all this—as Proclus said—was introduced καθ᾽ὑπόθεσιν (as a hypothesis) by recent authors, nevertheless they were accepted and approved with great consensus of mathematicians by those who found no other way to prove the various aspects of the universe and what of them they call τὰ φαινόμενα. Why is it that what is inherent in the Earth they nevertheless attributed to the heavens, with supreme conflict of mind?

(Pythagorean) discretion

If [the supporters of terrestrial immobility regarding the eighth sphere and planetary theory] will privately present to me some explanation regarding these topics, then I promise that I will do the same in good faith—even by taking an oath.

Terrestrial motion: reasons & arguments

- Self-preservation of the imperfect/corruptible bodies
  - Sunflowers metaphor (*elitropia*)
  - Magnet metaphor
- Excellence/imperfection argument
- Vital principle rel. to an animal-like Earth
- ‘Achilles’ argument (velocity of rotation)
- Background argument (rel. to the fixed stars)
- Sea tides
- Mythology: *terra volitat* (Hesiod's winged Earth and Mimnermus’s sleeping Sun)

Classical authorities

Calcagnini

Nicetas et ipse Archimedis popularis, caelum, solem, lunam, stellas, supera denique omnia stare censet, neque praeter terram rem ullam in mundo moveri: quae quom circum axem se summa celeritate convertat et torqueat, eadem effici omnia, quae si stante Terra caelum moveretur. Atque hoc etiam Platonem in Timaeo dicere quidam arbitrantur, sed paulo obscurius, ut etiam apud Ciceronem annotatum reperimus.

Copernicus, Uppsala *Copernicana* 12

Apud Ciceronem libro secundo academicarum quaestionum Nicetus Syracusius, ut ait Teophrastus, caelum, Solem, Lunam, stellas, supera denique omnia stare censet, neque praeter Terram rem ullam in mundo moveri. Quae cum circa axem se summa celeritate convertat et torqueat, eadem effici omnia, quae si stante terra caelum moveretur, atque hoc etiam Platonem in Timaeo dicere quidam arbitrantur, sed paulo obscurius.

"See Cicero's *Academicae quaestiones*, Book II: Hiketas of Syracuse, according to Theophrastus, argues that the heavens, the Sun, the Moon, the stars, and everything above is motionless and that nothing in the world moves other than the Earth. If it rotates and revolves around its axis with maximum speed, it produces the same effects as if the Earth were motionless and the heavens were moving. Some are of the opinion that Plato stated these ideas in the *Timaeus* though in a more obscure way, on which we have found an annotation by Cicero."

Copernicus, gloss to Pliny's *Natural History* (*Copernicana* 12)

Some conclusions

Io vorrei poter avere la veridica eloquenza di **Mimnermio poeta (dirò, Copernicano)**, il quale, **come referisce Celio Calcagnino nel *Discorso del moto della Terra***, finse ne' suoi poemi, il Sole giacere in letto, e così essere rapito da luogo a luogo, alludendo allo stabile moto di quello nel mezzo del cielo, perché sperarei avere ragionevole maniera da poter ringratiare il mio Sig.re Galileo; ma vaglia il silente affetto **in vece d'un furore poetico, e credasi più a una sincerità matematica**, quale è il ringraziamento cordialissimo che nudamente io porgo con la presente a V.S Ecc.ma dell'honore ricevuto dal S.re Prencipe Cesis nell'havermi ascritto al rotolo de' S.ri Lincei col mezzo di lei.

Cesare Marsili to Galileo (Bologna, 22 April 1625)

Calcagnini's position in the cosmological debate of the Renaissance

- **Establishment of commonplaces:**
- Earth-ship metaphor
- Achilles argument
- Earth-magnet metaphor
- Sea tides argument
- **Establishment of authorities:**
- Hiketas et alii
- Vergil's 'Copercian' verse "*Provehimur portu terraeque urbesque recedunt*"
- Timaeus
- **Style:**
- Humanistic erudition and dialectic rather than mathematical deduction
- A reservoir of images, references, arguments…
- An open-ended project

Celio Calcagnini's Philosophical Defense of the Motion of the Earth (ca. 1518)

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