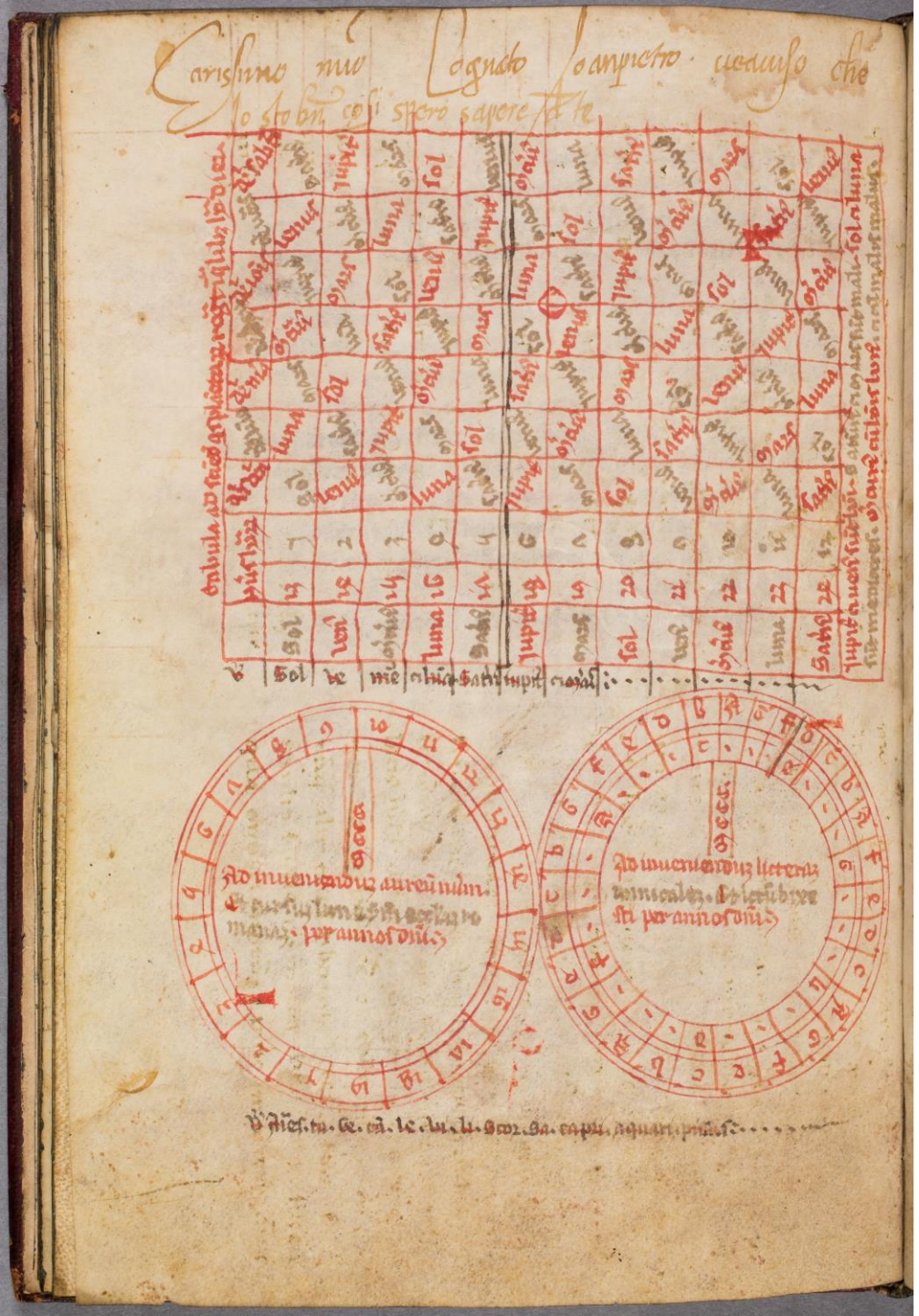


# *Tractatus de Sphera*, Johannes de Sacrobosco

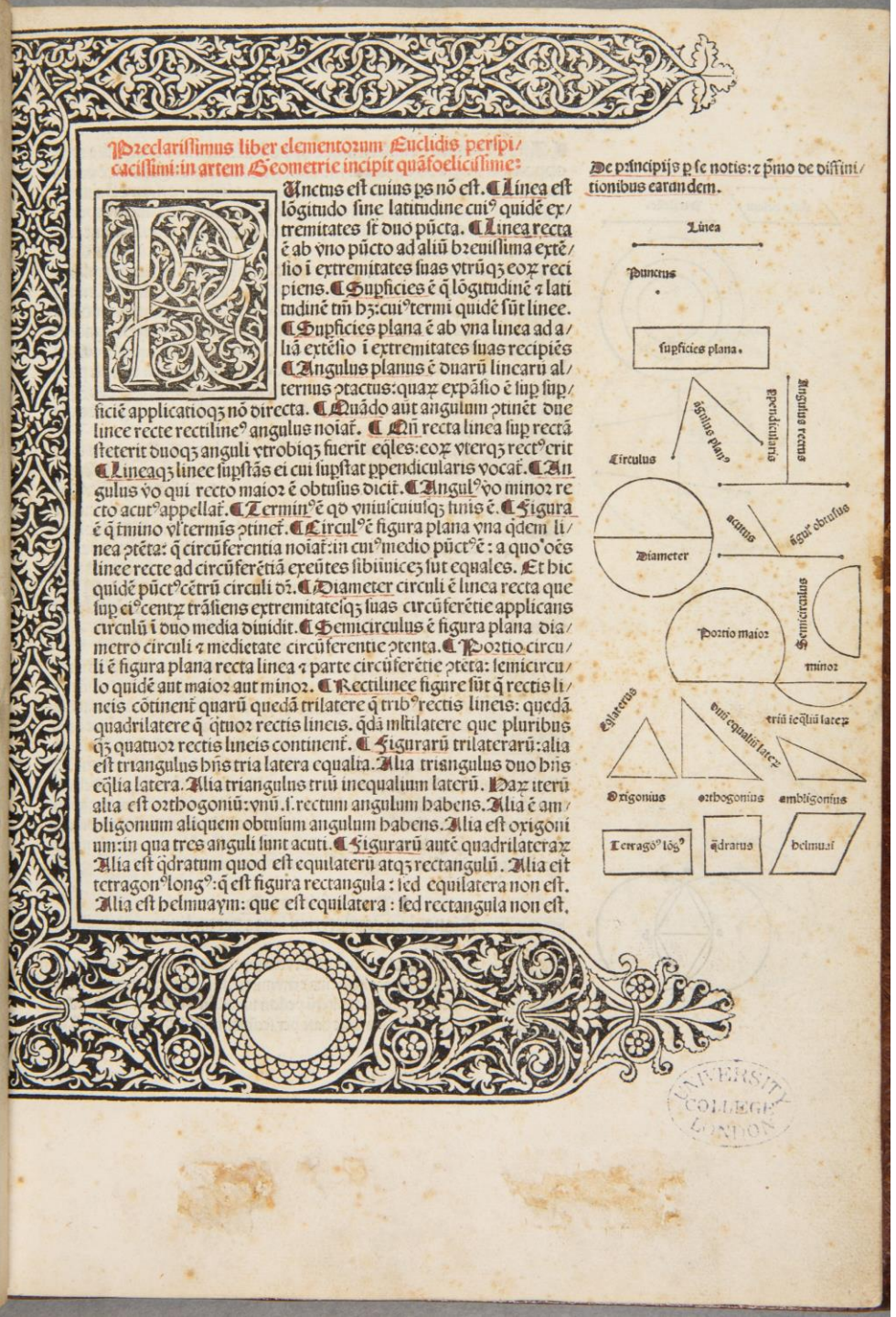
Manuscripts of the mathematician and astronomer Johannes de Sacrobosco (also known as John of Hollywood) circulated throughout the Middle Ages, but very little is known about the author; he is thought to have been born in Yorkshire, settling in Paris around 1220. Sacrobosco's other great text is the *Algorismus* or *Tractus de Arte Numerandi*, a textbook on arithmetic.

The *Tractatus de Sphera*, composed around 1233 is one of the greatest scientific textbooks of the 13th century and formed the fundamental work on astronomy in the medieval period. Based on Ptolemaic principles, it discusses the terrestrial globe, the rising and setting of stars, and the orbs and movements of the planets. The UCL manuscript is a palimpsest, the erased text still visible on some of the leaves.

Johannes de Sacrobosco, *Tractatus de Sphera*

*Latin. Parchment manuscript volume written in Italy, early 14th century.*

*MS LAT 15*




# First printed edition of Euclid's *Elements*

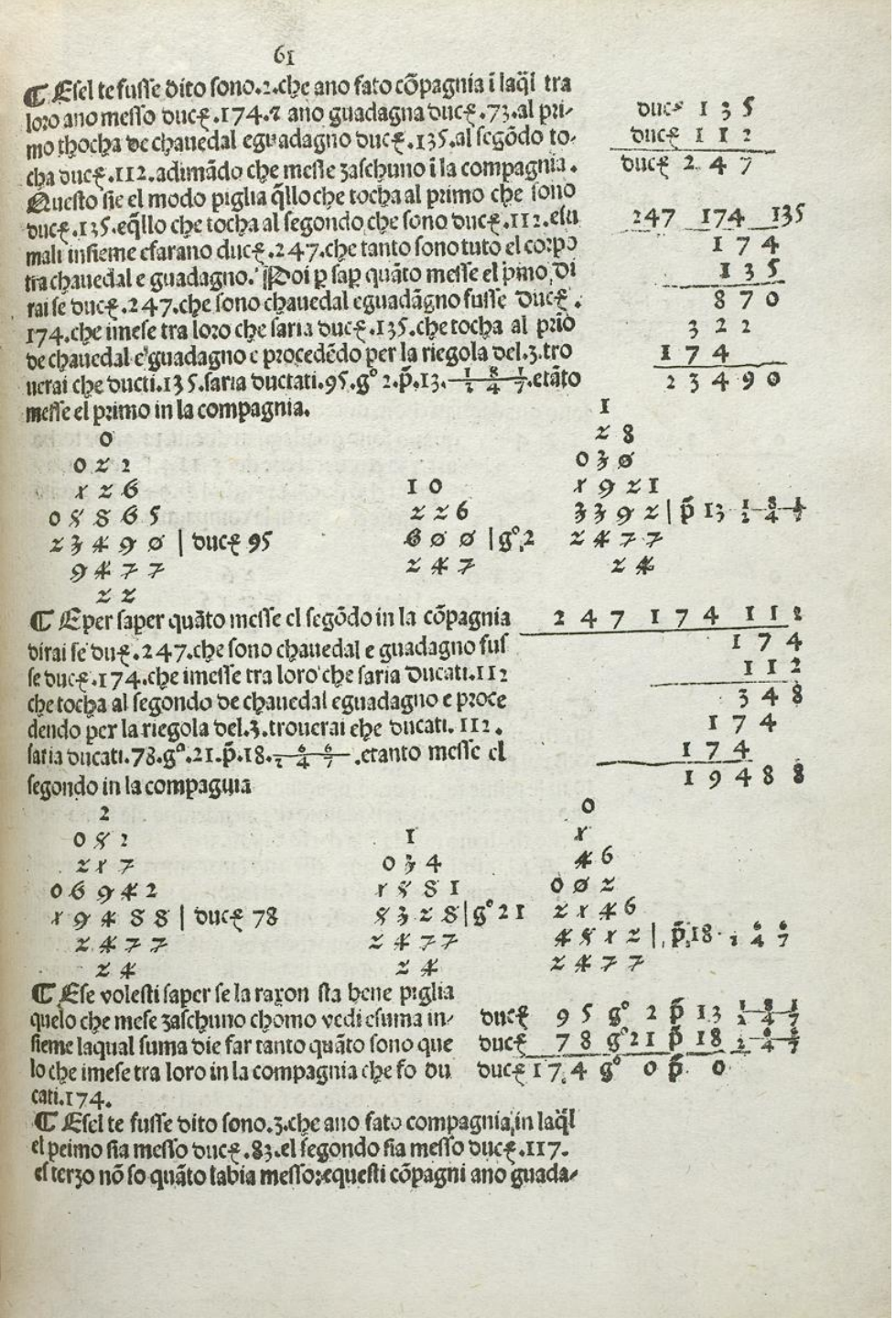
Euclid was a Greek mathematician often referred to as the "father of geometry". He was active in Alexandria during the reign of Ptolemy I (323–283 BC). His *Elements* is one of the most influential works in the history of mathematics serving as the main textbook for teaching mathematics (especially geometry) from the time of its publication until the late 19th or early 20th century.

The first printing of one of the most important texts from the Middle Ages and one of the very earliest mathematical works to be printed, posed a challenge to the new technology, requiring ingenuity, skill and innovation to replicate the all-important diagrams. The first printing to use colours and a title page, this 1482 edition of Euclid's *Elementa* is technically brilliant in integrating the diagrams with the text.

Euclid of Megara, *Elementa geometriae*

*Latin. Translated by Adelard of Bath, edited with a commentary by Giovanni Campano Novarese. Venice: Erhard Ratdolt [1st edition]. 25 May 1482.*

*INCUNABULA QUARTO 5q*



61

¶ Esel te fusse dito sono.2.che ano fato cõpagnia i laql tra
loro ano messo duc℔.174.e ano guadagna duc℔.73.al pri-
mo thocha de chauedal eguadagno duc℔.135.al segõdo to-
cha duc℔.112.adimãdo che messe zaschuno i la compagnia.
Questo sie el modo piglia q̃llo che tocha al primo che sono
duc℔.135.eq̃llo che tocha al segondo che sono duc℔.112.esu
mali insieme efarano duc℔.247.che tanto sono tuto el cor-po
tra chauedal e guadagno. ¶Doi p sap quãto messe el primo di
rai se duc℔.247.che sono chauedal eguadãgno fusse duc℔.
174.che imese tra loro che saria duc℔.135.che tocha al prõ
de chauedal e'guadagno e procedẽdo per la riegola del.3.tro
uerai che ducti.135.saria ductati.95.g°.2.p̃.13.$\frac{1}{2}$ $\frac{8}{4}$ $\frac{1}{7}$.etãto
messe el primo in la compagnia.

duc℔ 135
duc℔ 112
duc℔ 247

247 174 135
174
135
870
322
174
23490

¶ Eper saper quãto messe el segõdo in la cõpagnia
dirai se duc℔.247.che sono chauedal e guadagno fus
se duc℔.174.che imesse tra loro che saria ducati.112
che tocha al segondo de chauedal eguadagno e proce
dendo per la riegola del.3.trouerai che ducati.112.
saria ducati.78.g°.21.p̃.18.$\frac{6}{4}$ $\frac{6}{7}$.eranto messe el
segondo in la compagnia

247 174 112
174
112
348
174
174
19488

¶ Ese volesti saper se la razon sta bene piglia
quelo che mese zaschuno chomo vedi esuma in-
sieme laqual suma die far tanto quãto sono que
lo che imese tra loro in la compagnia che fo du
cati.174.

duc℔ 95 g° 2 p̃ 13 $\frac{1}{2}$ $\frac{8}{4}$ $\frac{1}{7}$
duc℔ 78 g° 21 p̃ 18 $\frac{6}{4}$ $\frac{6}{7}$
duc℔ 174 g° 0 p̃ 0

¶ Esel te fusse dito sono.3.che ano fato compagnia,in laql
el peimo sia messo duc℔.83.el segondo sia messo duc℔.117.
el terzo nõ so quãto labia messo:equesti cõpagni ano guada-

# Borghi's *Aritmetica*

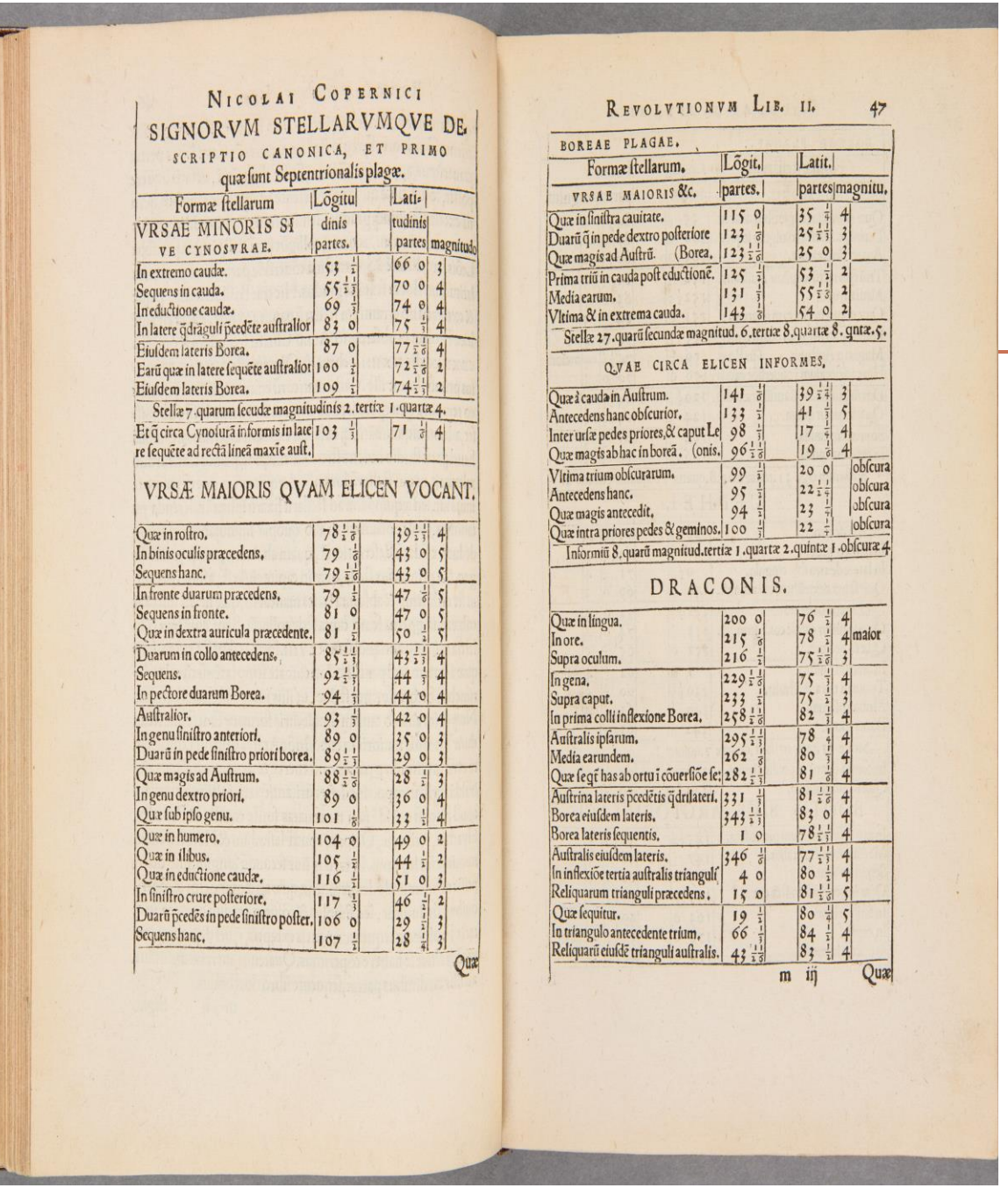
Piero Borghi was the author of several 15th century arithmetic books, including the highly successful *Qui comenza la nobel opera de arithmetica*, which ran to at least 17 editions. Nothing more is known about his life, apart from the fact that he came from Venice.

The *Arithmetica* was one of the earliest works on arithmetic, intended specifically as a practical guide for merchants. The book focuses on compound numbers and describes the basics of multiplication, addition, subtraction and division. It also covers fractions and the Rule of Three, with examples relating to partnership, profit and loss. There are also sections on barter and alloys and a chapter of applied problems.

Piero Borghi, *Qui comenza la nobel opera de arithmethica ne laquel se tracta tute cosse a mercantia pertinente facta [et] compilata per Piero borgi de Venesia*

*Latin. Venice : Nicolaus de Ferrariis, 1491*

*INCUNABULA 5eee*



NICOLAI COPERNICI
SIGNORVM STELLARVMQVE DE-
SCRIPTIO CANONICA, ET PRIMO
quæ ſunt Septentrionalis plagæ.

| Formæ ſtellarum | Lõgitu- dinis partes. | | Lati- tudinis partes | magnitudo |
|---|---|---|---|---|
| VRSAE MINORIS SI VE CYNOSVRAE. | | | | |
| In extremo caudæ. | 53 1/2 | | 66 0 | 3 |
| Sequens in cauda. | 55 1/2 1/3 | | 70 0 | 4 |
| In eductione caudæ. | 69 1/3 | | 74 0 | 4 |
| In latere q̃drãguli p̃cedẽte auſtralior | 83 0 | | 75 1/12 | 4 |
| Eiuſdem lateris Borea. | 87 0 | | 77 1/2 1/6 | 4 |
| Earũ quæ in latere ſequẽte auſtralior | 100 1/2 | | 72 1/2 1/6 | 2 |
| Eiuſdem lateris Borea. | 109 1/3 | | 74 1/2 1/3 | 2 |
| Stellæ 7. quarum ſecundæ magnitudinis 2. tertiæ 1. quartæ 4. | | | | |
| Et q̃ circa Cynoſurã informis in late re ſequẽte ad rectã lineã maxie auſt. | 103 1/3 | | 71 1/6 | 4 |
| VRSÆ MAIORIS QVAM ELICEN VOCANT. | | | | |
| Quæ in roſtro. | 78 1/2 1/6 | | 39 1/2 1/3 | 4 |
| In binis oculis præcedens. | 79 1/6 | | 43 0 | 5 |
| Sequens hanc. | 79 1/2 1/6 | | 43 0 | 5 |
| In fronte duarum præcedens. | 79 1/2 | | 47 1/6 | 5 |
| Sequens in fronte. | 81 0 | | 47 0 | 5 |
| Quæ in dextra auricula præcedente. | 81 1/2 | | 50 1/2 | 5 |
| Duarum in collo antecedens. | 85 1/2 1/3 | | 43 1/2 1/3 | 4 |
| Sequens. | 92 1/2 1/3 | | 44 1/3 | 4 |
| In pectore duarum Borea. | 94 1/3 | | 44 0 | 4 |
| Auſtralior. | 93 1/3 | | 42 0 | 4 |
| In genu ſiniſtro anteriori. | 89 0 | | 35 0 | 3 |
| Duarũ in pede ſiniſtro priori borea. | 89 1/2 1/3 | | 29 0 | 3 |
| Quæ magis ad Auſtrum. | 88 1/2 1/6 | | 28 1/2 | 3 |
| In genu dextro priori. | 89 0 | | 36 0 | 4 |
| Quæ ſub ipſo genu. | 101 1/6 | | 33 1/2 | 4 |
| Quæ in humero. | 104 0 | | 49 0 | 2 |
| Quæ in ilibus. | 105 1/2 | | 44 1/2 | 2 |
| Quæ in eductione caudæ. | 116 1/2 | | 51 0 | 3 |
| In ſiniſtro crure poſteriore. | 117 1/3 | | 46 1/2 | 2 |
| Duarũ p̃cedẽs in pede ſiniſtro poſter. | 106 0 | | 29 1/2 | 3 |
| Sequens hanc. | 107 1/2 | | 28 1/4 | 3 |

Quæ

REVOLVTIONVM LIB. II. 47

BOREAE PLAGAE.

| Formæ ſtellarum. | Lõgit. partes. | | Latit. partes | magnitu. |
|---|---|---|---|---|
| VRSAE MAIORIS &c. | | | | |
| Quæ in ſiniſtra cauitate. | 115 0 | | 35 1/4 1/3 | 4 |
| Duarũ q̃ in pede dextro poſteriore | 123 1/6 | | 25 1/2 1/3 | 3 |
| Quæ magis ad Auſtrũ. (Borea. | 123 1/2 1/6 | | 25 0 | 3 |
| Prima triũ in cauda poſt eductionẽ. | 125 1/2 | | 53 1/2 1/3 | 2 |
| Media earum. | 131 1/3 | | 55 1/2 1/6 | 2 |
| Vltima & in extrema cauda. | 143 1/6 | | 54 0 | 2 |
| Stellæ 27. quarũ ſecundæ magnitud. 6. tertiæ 8. quartæ 8. gntæ. 5. | | | | |
| QVAE CIRCA ELICEN INFORMES. | | | | |
| Quæ à cauda in Auſtrum. | 141 1/6 | | 39 1/2 1/4 1/3 | 3 |
| Antecedens hanc obſcurior. | 133 1/2 | | 41 1/2 1/3 | 5 |
| Inter urſæ pedes priores, & caput Le | 98 1/3 | | 17 1/4 | 4 |
| Quæ magis ab hac in boreã. (onis. | 96 1/2 1/6 | | 19 1/6 | 4 |
| Vltima trium obſcurarum. | 99 1/2 | | 20 0 | obſcura |
| Antecedens hanc. | 95 1/2 | | 22 1/2 1/4 | obſcura |
| Quæ magis antecedit. | 94 1/2 | | 23 1/4 | obſcura |
| Quæ intra priores pedes & geminos. | 100 1/3 | | 22 1/4 | obſcura |
| Informiũ 8. quarũ magnitud. tertiæ 1. quartæ 2. quintæ 1. obſcuræ 4 | | | | |
| DRACONIS. | | | | |
| Quæ in lingua. | 200 0 | | 76 1/2 | 4 |
| In ore. | 215 1/6 | | 78 1/2 | 4 maior |
| Supra oculum. | 216 1/2 | | 75 1/2 1/6 | 3 |
| In gena. | 229 1/2 1/6 | | 75 1/3 | 4 |
| Supra caput. | 233 1/2 | | 75 1/2 | 3 |
| In prima colli inflexione Borea. | 258 1/2 1/6 | | 82 1/2 1/3 | 4 |
| Auſtralis ipſarum. | 295 1/2 1/3 | | 78 1/4 | 4 |
| Media earundem. | 262 1/6 | | 80 1/3 | 4 |
| Quæ ſeq̃ has ab ortu i cõuerſiõe ſe. | 282 1/2 1/3 | | 81 1/6 | 4 |
| Auſtrina lateris p̃cedẽtis q̃drilateri. | 331 1/3 | | 81 1/2 1/6 | 4 |
| Borea eiuſdem lateris. | 343 1/2 1/3 | | 83 0 | 4 |
| Borea lateris ſequentis. | 1 0 | | 78 1/2 1/3 | 4 |
| Auſtralis eiuſdem lateris. | 346 1/6 | | 77 1/2 1/3 | 4 |
| In inflexiõe tertia auſtralis trianguli | 4 0 | | 80 1/2 | 4 |
| Reliquarum trianguli præcedens. | 15 0 | | 81 1/2 1/6 | 5 |
| Quæ ſequitur. | 19 1/2 | | 80 1/4 | 5 |
| In triangulo antecedente trium. | 66 1/3 | | 84 1/2 | 4 |
| Reliquarũ eiuſdẽ trianguli auſtralis. | 43 1/2 1/3 | | 83 1/2 | 4 |

m iij Quæ

# Copernicus – the first publication on a heliocentric universe

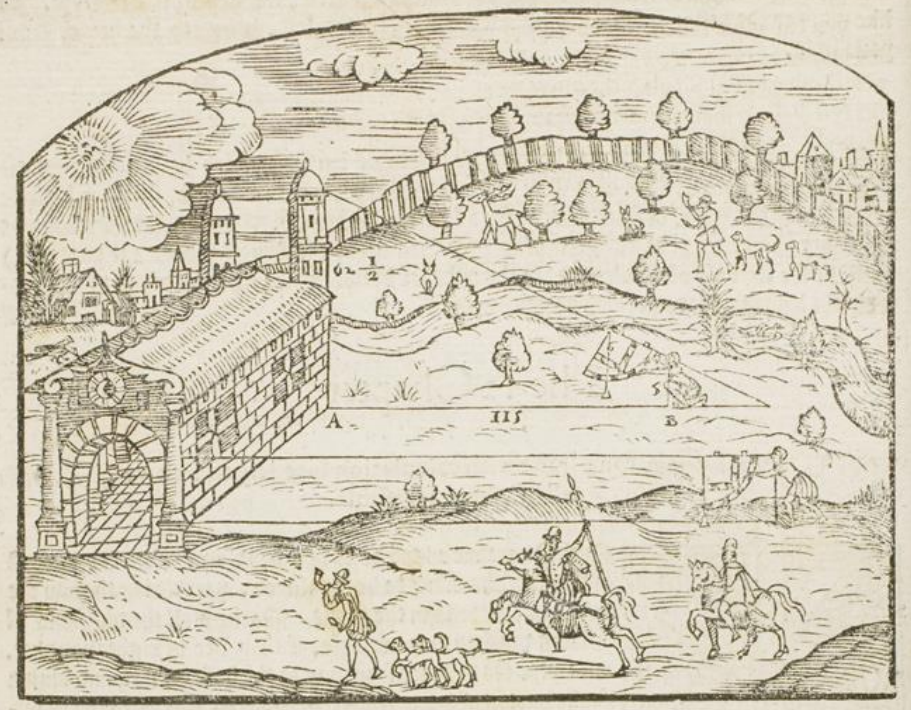
The Polish astronomer Copernicus (1473-1543) asserted that the earth and planets revolved around the sun; the earth was no longer at the centre of the universe, but merely an orbiting body. His observations were neither entirely original nor especially accurate, but he did inspire debate and laid the path that others, such as Brahe, Kepler and Gallileo would follow. Copernicus' famous text circulated in manuscript for many years before its first publication in 1543.

This first edition of *De Revolutionibus*, the most famous scientific work of the 16th century, is undoubtedly one of UCL Library Services' most treasured possessions. This extract from Book II provides detailed calculations of the astronomy of fixed stars.

Nicolaus Copernicus, *De Revolutionibus orbium coelestium, Libri IV*.

*Latin. Nuremburg: Apud Joh. Petreium, 1543.*

*S R C 1543 C6*



## The 13 Chapter.

To get inaccessible heights by supputation (with the helpe of two places) supposing either side of the Scale diuided, 100 partes.

IF your thread in the first station fall vpon 50 points of contrarie, with those diuide 100, so haue ye 2. In the other place (going right backe or forward no way declining) admit it note 25 of contrarie, now 100 diuided with 25 riseth 4, withdrawe 2 from 4, 2 is left your diuident, meete the space betweene both standings, and diuide that by 2, your diuisor, so haue yee the heigth from the eye vp. Note, if the difference of the Quotient be 1, the space betweene the standings shalbe equall with the desired heigth, adding your stature. If 2. the space is double to the altitude, if 3, threefolde, &c.

Or thus worke: Reduce the parts of contrarie shadow vnto portions of right, and then doo as you would with pointes of right: that reduction is made thus, multiplie 100 in himselfe, so haue ye 10000, the which diuided by euery parte of contrarie shadowe, so shall they be as points of right shadowe: And if yee haue made two stations, pull the lesse Quotient from the great, the rest waighe as you haue beene instructed. No end hath the Geometer in finding true measures, many I might saye infinite moe wayes heightes are founde, by anye two equall thinges orthogonally ioyned with Staffe, Corde, Squire, Triangle, Glasse, &c. as breefely followeth.

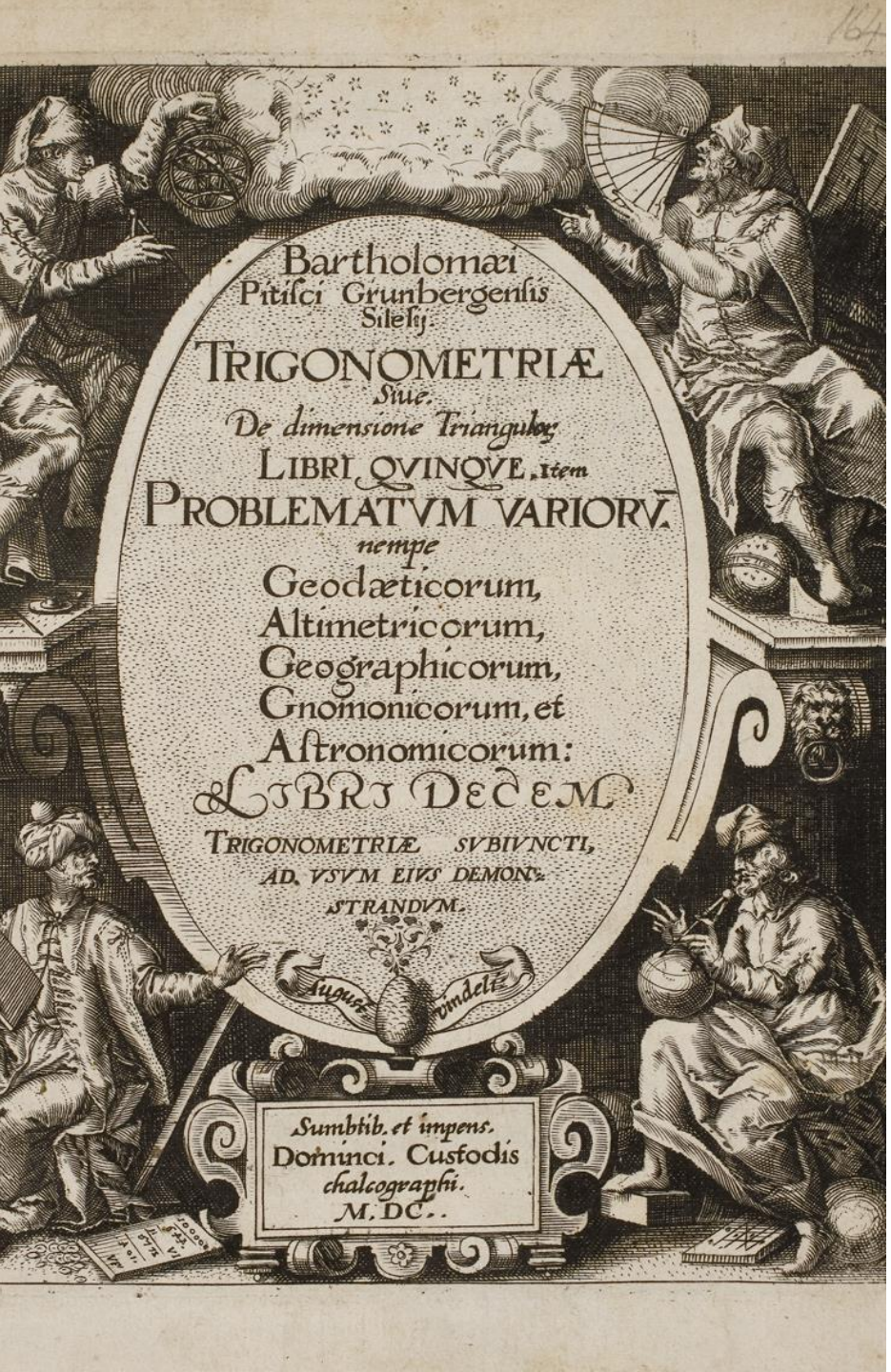
# *Pantometria:* a guide to applied geometry by Thomas Digges

*A geometrical practical treatize, named Pantometria* was a guide to applied geometry published by Thomas Digges (1546-1595) in 1571. It was completed by Thomas from a manuscript left by his father Leonard Digges, also a mathematician, who died when Thomas was 13 years old. After his father's death, Thomas became the ward of John Dee (1527-1609), sometime scientific advisor to Queen Elizabeth I. Thomas Digges became an astronomer and the leader of the English Copernicans as well as having a career as a member of parliament and a civil engineer.

This 1591 edition is an expansion of the first published version and contains fine woodcut mathematical and topographical diagrams and illustrations, The book sets out the principles of geometry and explains how to take a variety of measurements of length, areas and volumes, using real-world surveying problems as examples.

*London: Printed by Abel Jeffes, 1571*

*S R Q 1591 D4*




# Pitiscus: first textbook on trigonometry

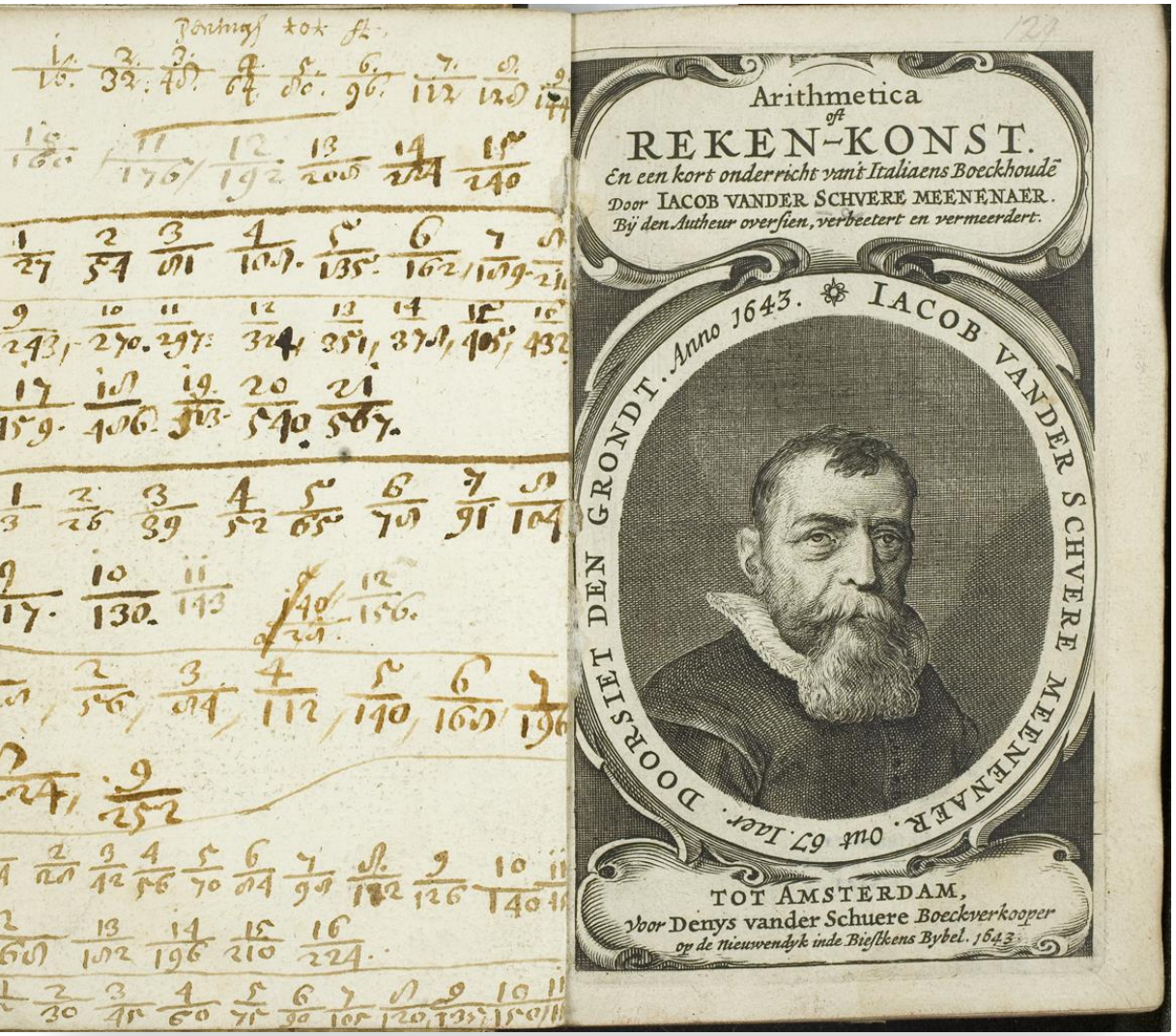
Bartholomeo Pitiscus (1561-1613) was Professor of Mathematics at the University of Heidelburg from 1603. Previously, he had been tutor, cpurt chaplain and court preacher to Frederick IV, Elector of the Palatine of the Rhine.

Pitiscus achieved fame with his influential work written in Latin, called *Trigonometria: sive de solutione triangulorum tractatus brevis et perspicuus* (1595, first edition printed in Heidelberg), which is said to have introduced the word *trigonometry* to the English and French languages. In 1600, a revised version of the work was published in Augsberg as *Trigonometriae siue de dimensione triangular libri quinque* and this is the version held by UCL Special Collections. It consists of three sections, the first of which comprises five books on plane and spherical trigonometry.

Bartholomeo Pitiscus: *Trigonometriae siue de dimensione triangulor libri quinque*

*Latin. Augustae Vindelicorum : typis Michaëlis Mangeri, sumtib. et impens. Dominci Custodis Chalcographi, 1600*

*GRAVES 142.B.25*




# Jacob van der Schuere: a Dutch arithmetic book

Jacob van der Schuere (1576-) was a Dutch schoolmaster who published educational books. In 1612 he published the work *Nederduytsche spellinge*, which was a proposal for a comprehensive spelling of the Dutch language and in 1643 he published *Arithmetica oft reken-konst*.

Not much is known about van der Schuere's life. The title page of the *Arithmetica* is an engraving of him by Salomon Savery.

Jacob van der Schuere: *Arithmetica oft Reken-konst : en een kort onderricht van't Italiaens Boeckhoudē*

*Dutch. Amsterdam: Denys van der Schuere, 1643*

*GRAVES 122.B.11*


# *Geometrica Theorietica Practica*

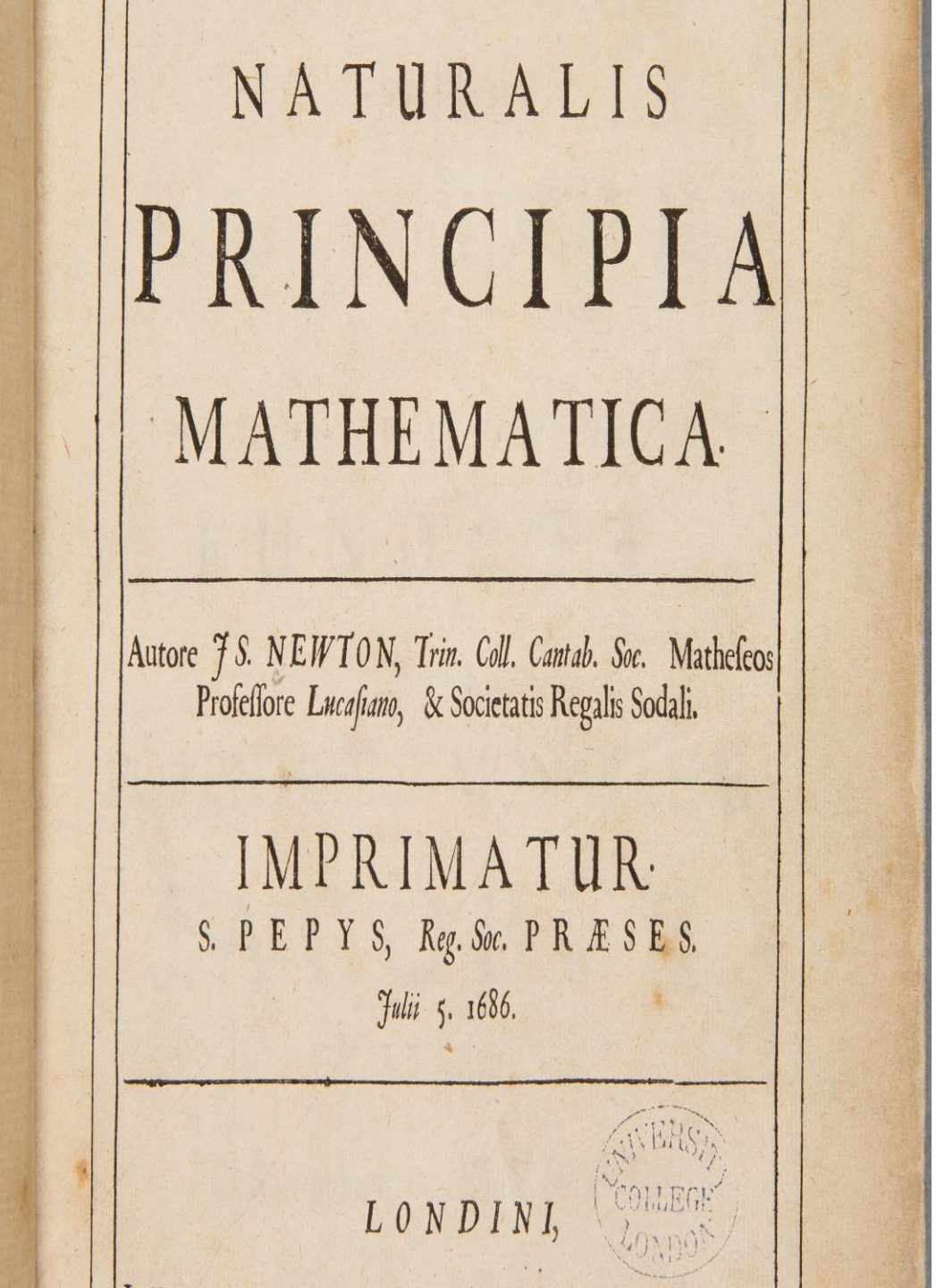
Samuel Charles Kechel worked as an assistant to Jacobus Golius (1596-1667), who was Professor of Mathematics and Arabic at the University of Leiden in the Netherlands.

The manuscript is a handwritten geometrical text, beautifully illustrated with maps, geometrical figures and diagrams.

Samuel Charles Kechel: *Geometria theoretica practica*

*Latin. Manuscript volume written in 1665*

*MS GRAVES 33*


NATURALIS

PRINCIPIA

MATHEMATICA.

Autore J S. NEWTON, Trin. Coll. Cantab. Soc. Matheſeos Profeſſore Lucaſiano, & Societatis Regalis Sodali.

IMPRIMATUR.

S. PEPYS, Reg. Soc. PRÆSES.

Julii 5. 1686.

LONDINI,

UNIVERSITY COLLEGE LONDON

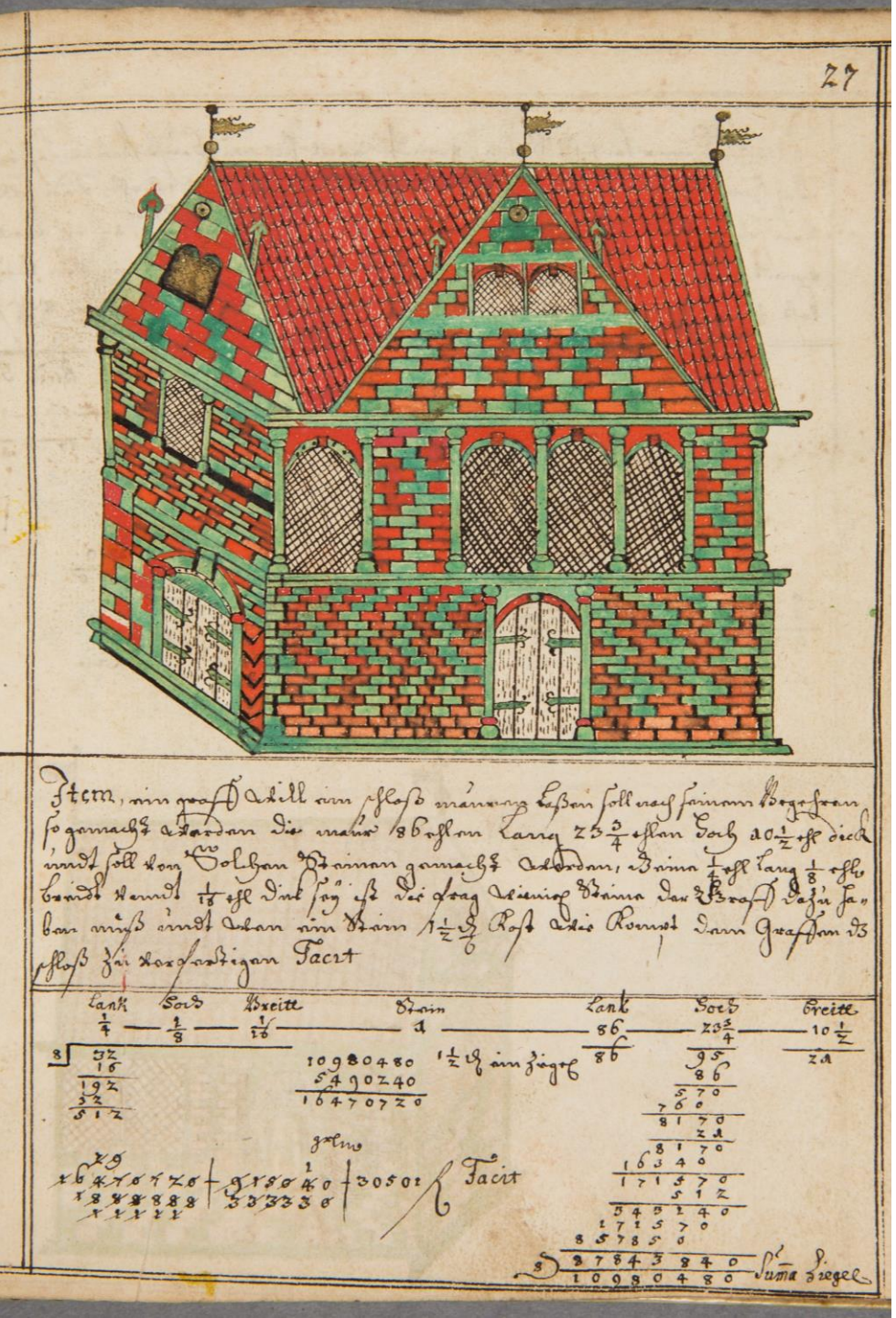
# Sir Isaac Newton: *Mathematical Principles of Natural Philosophy*

Sir Isaac Newton's *Philosophiae naturalis principia mathematica*, or *Principia,* as it is widely known, was first printed in 1687. The work has been called 'the greatest work on exact science that the human mind has ever conceived' and it established a conception of the universe that remained unchallenged until Einstein. The subject of the book is the 'mechanics of ponderable bodies' and it sets out the three laws of motion. Two were derived from Galileo and the third was Newton's own, with some help from others.

The nucleus of the work was Newton's lectures at Cambridge in the years preceding the publication of the work, but he wrote the entire text in about 18 months. The cost of printing was paid for by the astronomer Edmund Halley and only about 250 copies were printed.

*Sir Isaac Newton, Phiosophiae naturalis principia mathematica. Londini: Jussu Societatis Ragiae ac typis Josephi Streater. 1sr edition, 1st issue, 1687.*

*S R E 810 N2 (1)*



# *Rechenbuch*: a 17th-century manual for mathematical calculations

This delightful rare, possibly unique work is most striking for the numerous intricate and detailed hand-coloured ink drawings it features. Predominantly red and green, all are neatly executed. Bound in pale yellow vellum, the *Rechenbuch* sets out mathematical problems and gives their solutions, often written in verse. These include such calculations as finding the age of the world, the date of Judgement Day and the Golden number, together with astrological information.

The text is written in German and Latin by the same hand throughout. The script is 17th-century gothic, very small and written with a fine pen in black ink. Wording on the title page suggests that the work at one time belonged to a Johann Best, of whom nothing is recorded: he may well be the scribe and artist.

*Rechenbuch, auff der Feder, Johann Best Vater.*

Paper manuscript written in Germany, dated 1694.

*MS GERM 3*


# *Abacus disguised as a bound book*

This unusual item is an abacus adapted from a Chinese Suanpan to count French coinage of the 18th century, and folding to resemble a book.

The book itself offers very few clues as to its history apart from the writing above and below the abacus which states 'Machine d'arithmetique imitee des Chinois'.

*Machine d'arithmetique imitee des Chinois*

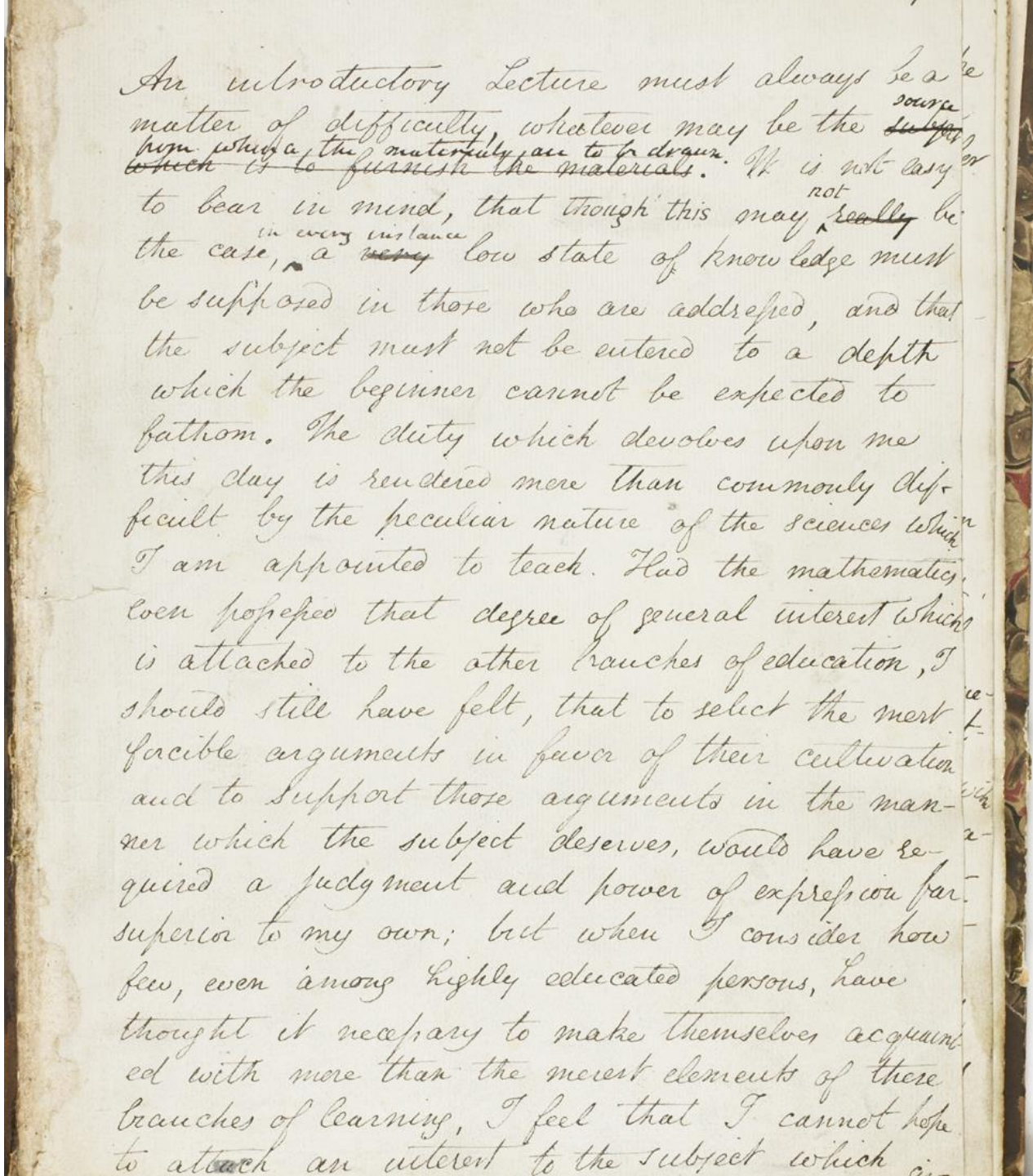
*French. Paris, 17--?*

# *De Morgan's introductory lecture, 1828*

Augustus De Morgan (1826-1871) was a British mathematician and logician. He was elected the first Professor of Mathematics at the new University College London in 1828, at the age of 22. With a short gap between 1831 and 1836, he remained in this position for over 30 years,

His introductory lecture "On the study of mathematics" is a discourse upon mental education of permanent value and was delivered at the opening of classes in mathematics at UCL on the 5th of November 1828.

MS ADD 3


An introductory Lecture must always be a matter of difficulty, whatever may be the source from which it is to furnish the materials. It is not easy to bear in mind, that though this may not really be the case, in every instance a very low state of knowledge must be supposed in those who are addressed, and that the subject must not be entered to a depth which the beginner cannot be expected to fathom. The duty which devolves upon me this day is rendered more than commonly difficult by the peculiar nature of the sciences which I am appointed to teach. Had the mathematics been professed that degree of general interest which is attached to the other branches of education, I should still have felt, that to select the most forcible arguments in favor of their cultivation and to support those arguments in the manner which the subject deserves, would have required a judgment and power of expression far superior to my own; but when I consider how few, even among highly educated persons, have thought it necessary to make themselves acquainted with more than the merest elements of these branches of learning, I feel that I cannot hope to attach an interest to the subject which is

# *First edition of the Educational Times, 1847*

The College was founded in 1846, as the Society of Teachers, by a group of private schoolmasters who were concerned about standards within their profession. Three years later it was incorporated by Royal Charter as the College of Preceptors. The College pioneered a system for the formal examination and qualification of secondary school teachers. It was also one of the first bodies to examine and provide certificates for secondary school pupils of both sexes, from all over England and Wales, at different levels, and in a wide variety of subjects.

The Educational Times was the Journal of the College and, unusually, contained examples of the mathematics questions asked in examinations of teachers and pupils.

*COP/K/1/1*

THE EDUCATIONAL TIMES.

A Monthly Stamped Journal of Education, Science, and Literature,

VOL. I., No. 1.] SATURDAY, OCTOBER 2, 1847. [PRICE 6d.

Tuition.—London.—A Gentleman, a Member of the College of Preceptors, who ssed the higher classical examination last June, having the ernoon of Wednesday and Saturday at his disposal, is xious to enter into an Engagement with any Gen- man requiring the assistance of a CLASSICAL and NERAL MASTER, either in Scholastic or Private Teach- . The Advertiser can refer to his present Principal, the opriet'or of a School of the first respectability.—Address L. M., 7, Northampton-place, Old Kent-road.

Grammar School, West Cowes, Isle of Wight, conducted by MR. STOCKMAN, M.C.P. rms, Thirty Guineas per Annum. Summer Vacation from ne 18th to July 18th. Winter Vacation from December h to January 18th.

South Islington Commercial and Mathematical SCHOOL.—WINTER LECTURES, 1847-8.

Courses of Lectures on Natural Philosophy, Chemistry, History will be delivered to the senior pupils by M. EDERIC I. MINASI and the Rev. EDWARD PLAYER, M.A., on. School classes of eight each, 1l. the whole term; sters free. Prospectuses may be had of J. H. Jackson, ington-green.

Scholastic.—A Gentleman who passed the Lower Classical Tests of the College of Pre- tors at Christmas last is desirous of an ENGAGEMENT a SCHOOL, to teach Latin, and assist in the general routine school duties.—Address, P. T. M., office of the College of ceptors, 42, Great Russell-street, Bloomsbury.

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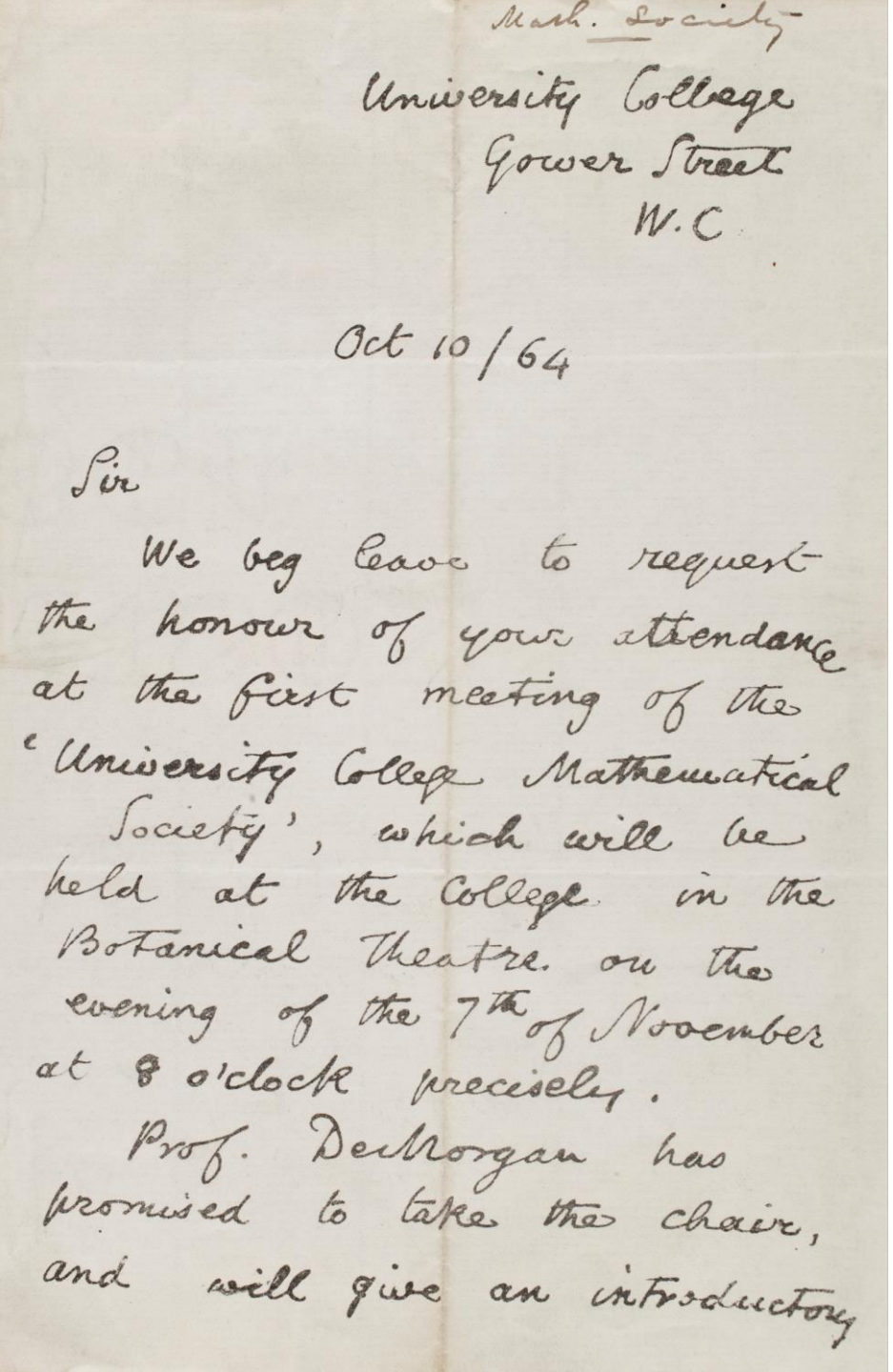

Math. Society

University College
Gower Street
W.C

Oct 10/64

Sir

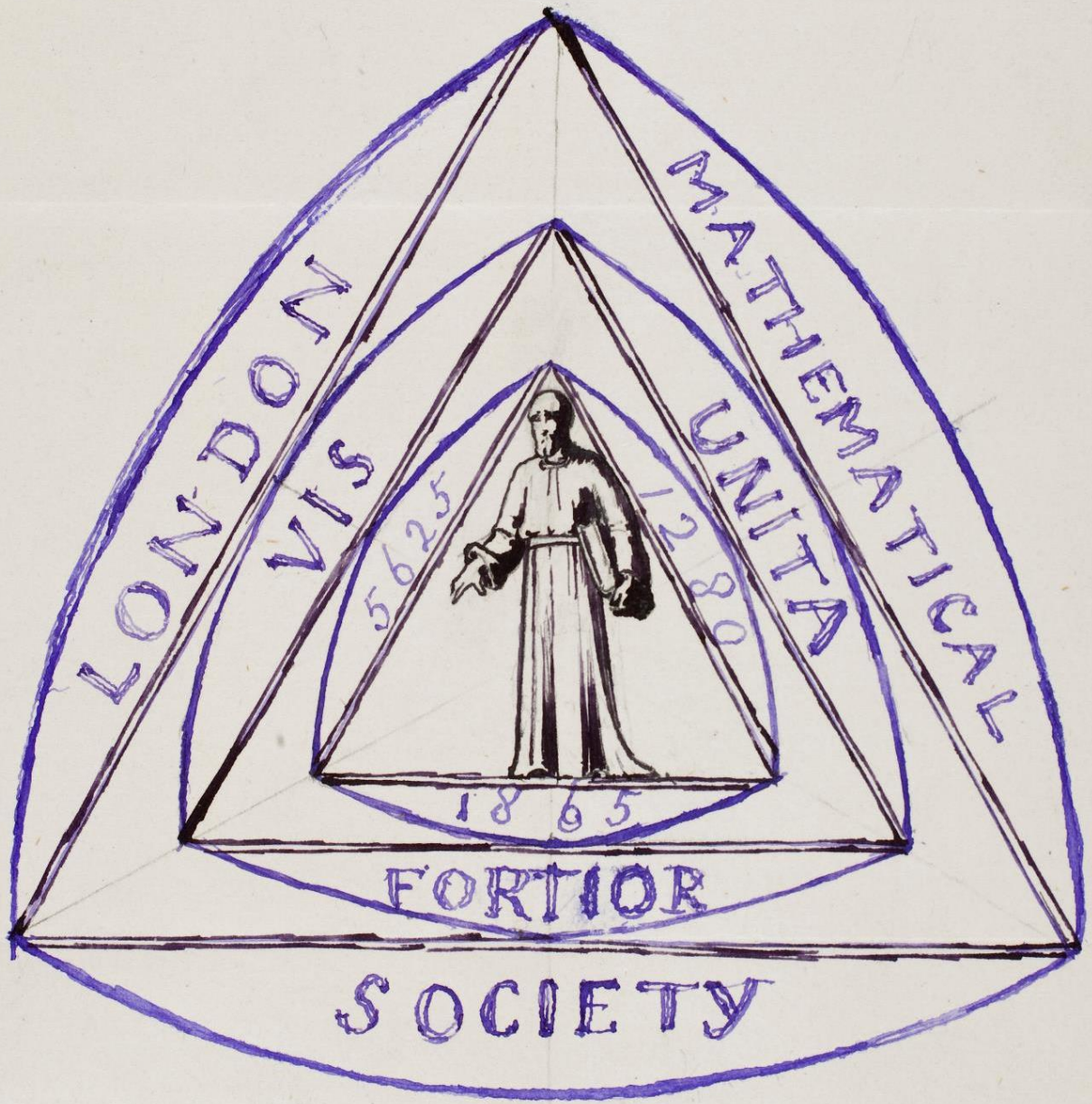
We beg leave to request the honour of your attendance at the first meeting of the 'University College Mathematical Society', which will be held at the College in the Botanical Theatre on the evening of the 7th of November at 8 o'clock precisely.

Prof. DeMorgan has promised to take the chair, and will give an introductory

# *Letter from George De Morgan and Arthur Ranyard, 1864*

The London Mathematical Society (LMS) was founded as the University College Mathematical Society in 1865, for the promotion and extension of mathematical knowledge. It was granted a royal charter in 1965.

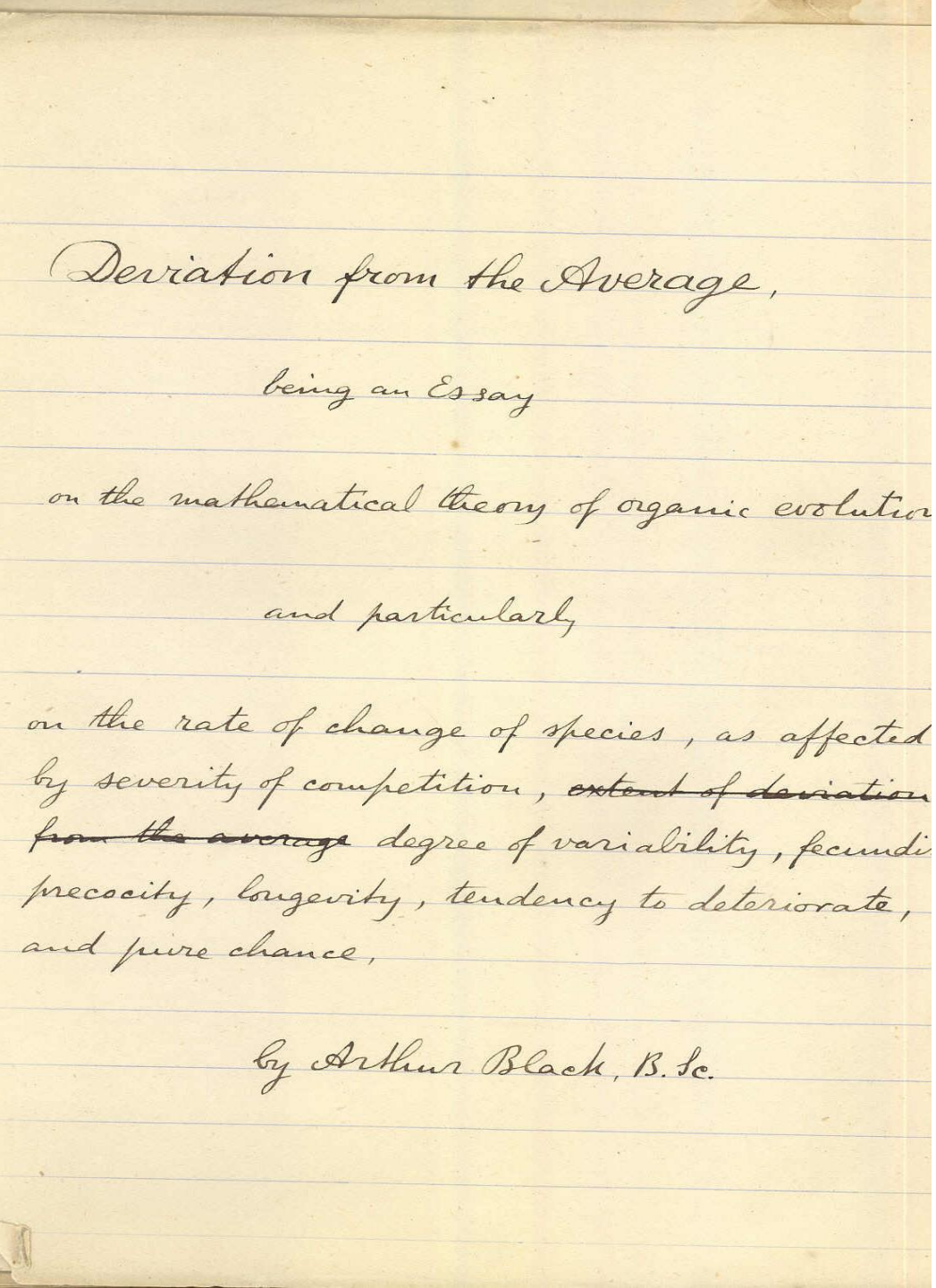
The Society was founded by 2 UCL students, George Campbell De Morgan (1841-1867) and Arthur Cooper Ranyard (1845-1894), who became a noted astronomer. During a discussion of mathematical problems, it occurred to them that 'it would be very nice to have a society to which all discoveries in Mathematics would be brought, and where things could be discussed, like the Astronomical [Society].' Conscious of the role his father's reputation could play in attracting members to the Society, George persuaded him to take the chair at its first meeting, held at UCL on 16th January 1865.




# *Sketch of the LMS logo by Sophia De Morgan, 1865*

In a letter accompanying this drawing, Sophia De Morgan, Professor De Morgan's wife and mother of George De Morgan, one of the founders of the LMS, comments 'The Society will understand the device; but I cannot quite make out the triangles and curves, which have a look of circle-squaring – nor the two dates at the sides, 5625 and 1280'. The Society's current logo is considerably less complicated.

*London Mathematical Society papers*


Derriation from the Average,

being an Essay

on the mathematical theory of organic evolution

and particularly

on the rate of change of species, as affected by severity of competition, ~~extent of deviation from the average~~ degree of variability, fecundity, precocity, longevity, tendency to deteriorate, and pure chance,

by Arthur Black, B. Sc.

# *Arthur Black mathematical notebooks, [1890]*

Arthur Black (d 1893) studied mathematics under William Kingdon Clifford, Professor of Applied Mathematics at University College London. He was a favourite pupil of Clifford, who was impressed by Black's brilliance. He took his degree by private study and achieved his BSc in 1877. After this he worked as an army coach and tutor in Brighton, while pursuing his mathematical and philosophical interests. The main focus of Black's work seems to have been an attempt to use his mathematical skills to develop a quantitative theory of evolution.

The collection contains twenty-three manuscript notebooks on mathematical statistics which include 'The theory of deviation from an average', the introduction to 'An algebra of evolution', and 'Problems relating to the mathematical treatment of statistics: periodicity and deviation'.

*MS ADD 257*