Michiel Florent van Langren and Lunar Naming

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Abstract

Michiel Florent van Langren produced a lunar map in 1645 in order to present a way to mariners to find their position at sea by observing which craters were either illuminated by solar rays or obscured during the waxing or waning of the moon. This required a detailed map of the moon and in order to be able to refer to lunar objects these had to be named. The lunar map he produced in 1645 bore over 300 names, following the system of subdividing lunar topography into land masses and seas (a distinction based on Plutarch), and craters or peaks. He is therefore the pioneer of both selenography and selenonymy. His nomenclature had no lasting impact, although some 50 names he introduced are still used for other craters. The same negative result was obtained by Johannes Hevelius who introduced in 1647 his own naming system based on geographical names. It was the nomenclature proposed by a third astronomer, Giovanni Riccioli, shown on his lunar map produced in 1651 that won the day. From the 244 names Riccioli proposed on his lunar map, 201 are still in use.

Nevertheless, despite Van Langren's lack of success, from a toponymical point of view his methodology is interesting as it provides insight into the contemporary world view of a seventeenth century scientist who was dependant on sponsors to allow him to carry out his work and transform his theories into practical instructions.

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Introduction

What are the principles behind lunar naming? Nowadays, brighter areas on the moon are called mountains and lands, and darker areas are called seas. The first are named after scientists, the seas after concepts or weather conditions. This principle goes back to Giovanni Battista Riccioli, but he was not the first to name lunar topographic objects; that was Michiel Florent van Langren (or Michael Florentius Langrenus, 1598-1675) who was the first to use the telescope to study the moon's surface in order to identify and name lunar topography.

The telescope and finding longitude

A first attempt to name lunar topography was made around 1600 by William Gilbert. His 'naked-eye-map' of the moon shows twelve names. Apart from the name Britannia they are purely descriptive. Contrary to most of his contemporaries, Gilbert believed that the light spots on the Moon were water, and the dark spots land.

In 1608, Dutch opticians in Middelburg perfected the telescope so that it became an instrument with which to discern more detail on the moon. With the help of this instrument the moon was studied in detail first by either the Italian Galileo Galilei or the Englishman Thomas Harriot who had likened the light areas of the moon to land and the dark areas to sea; he had even bestowed some names on the lunar surface, but no naming principles could be derived from this act. Galileo did not name lunar objects at all.

In 1621 the cosmographer Michiel Florent van Langren from the Netherlands invented a way to find out longitude at sea with the help of lunar topography. When at a specific time one could see that the first light reached the rim of specific craters, and had at one's

disposal a book with a list of the times the light reached this crater on a set longitude, then with this book one could calculate the time difference and thus the longitude of one's location. For this elaborate procedure to work, it became necessary to name all the relevant craters and other topographical objects on the Moon, so that was the reason for Van Langren's naming endeavours. In his proposed book, lunar maps should be included of the Moon in different phases as well as timetables. He demonstrated his invention to King Philip IV of Spain and asked him for a royal subvention to further work out his locating procedures.

To this end in 1628 he drew a manuscript map of the Full Moon with lunar objects named (fig. 1); later on (1645) he extended this map with more named objects and had it printed. Overall, on the printed version, some 325 objects are discerned and named on the first three states of his printed map, which was to be the general overview map of his proposed book on fixing longitudes. It was therefore titled *Plenilunii Lumina Austriaca Philippica* – The Lights of Philip of Austria, [map of] the Full Moon (fig. 2).

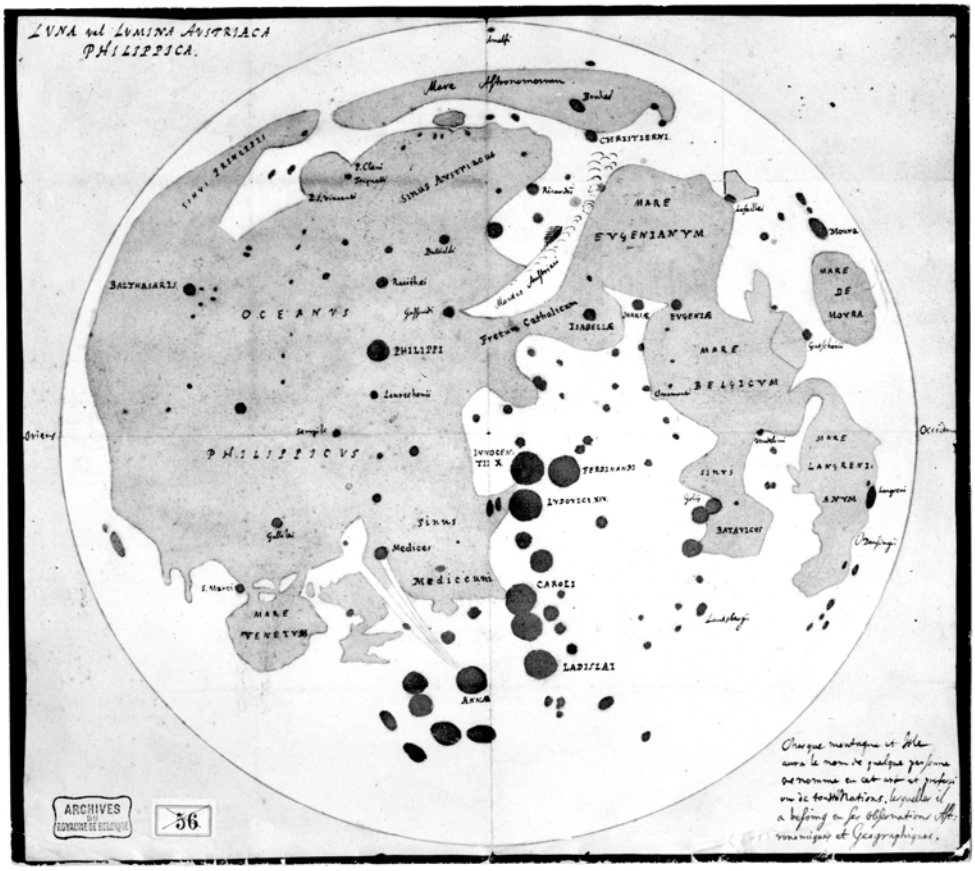


Figure 1. *Luna vel Lumina Austriaca Philippica* (1628).

Figure 2. *Plenilunii Lumina Austriaca Philippica* (1645).

Van Langren's naming principles

Like the Englishman Harriot, Van Langren adhered to the concept of lands and seas as represented by the lighter and darker areas on the Moon. Analogous to terrestrial topography Van Langren distinguishes on the lunar surface lands ('terra') with craters (no generic term, drawn as circles or ovals), mountains ('mons', 'montes'), capes ('promontorium'), lakes ('lacus'), coasts ('litus'), rivers ('fluvius'), marshland ('aestuari') and oceans and seas ('oceanus' and 'mare') with bays ('sinus'), straits ('fretum'), and harbours ('portus'). Van Langren's friend, the humanist and philologist Erycius Puteanus (1574-1646) had advised him not to name the lunar objects for worldly kings and counts (in order not to bring terrestrial strife to the universe), but only for scientists (letter of 14 December 1644, Moreau 1957, no. XC). Van Langren did not follow this advice and named the ocean after his patron King Philip IV of Spain, the seas after royalty (and himself), and the lands after royalty and nobility. Those he named objects after generally were important persons in the Roman Catholic Europe of the early seventeenth century. Individual craters were called after scientists, capes after saints. Most of these scientists reflected the namescape of his time (1630-1650); only a few scientists from antiquity were incorporated in the Moon.

The division of the names he entered on the Moon over several professional classes including astronomers and mathematicians, historians, poets and painters, discoverers and his own friends, Jesuits, saints, royalty and nobility, and non-persons like virtues or terrestrial geographical names is indicated in table 1. On his lunar maps the named objects were also

differentiated through the style and size of the script used; these type styles also head the columns in table 1.

A: Large Roman capital letters indicated *major lands and seas*.
B: Roman capital letters indicated *major craters*.
C: Roman lower case letters indicated *mountain range*, *bays*, *straits and lakes*.
D: Roman lower case letters indicated *medium size craters*, *important capes*, *mountains and smaller bays*.
E: Italics indicated *lakes*, *rivers*, *harbours and less important capes*.
F: Italics indicated *small craters*.

	A	*B*	*C*	*D*	*E*	*F*	*Total*
Astronomer/Mathem.	1			2/1	7	69/9	79/10
Historian				4		6	10
Various scholars				2	1	17/3	20/3
Poet-Painter				2	1	6	9
Discoverer			1	2		1	4
Friends				1	2	6	9
'Civilians'	1		1	13/1	11	105/12	131/13
(Jesuits)				(1)	(1)	(20/4)	(22/4)
Saints			9/2	1	3	1	14/2
Royalty/Nobility	5	13	3	65/3	1	6/1	93/4
PERSONS	**6**	**13**	**13/2**	**79/4**	**15**	**112/13**	**238/19**
Virtues	9						9
Various						1	1
General	1		6		1		8
Geography	3	1	3		2		9
NON-PERSONS	**13**	**1**	**9**		**3**	**1**	**27**
UNKNOWN			**1**	**18/2**	**1**	**40/1**	**60/3**
TOTAL	**19**	**14**	**23/2**	**97/6**	**19**	**153/14**	**325/22**

Table 1. Division of Van Langren's names over various categories; additional names on the fourth state are given preceded by a slash.

Van Langren was not too practical from a map use point of view, as he had for instance three different craters named after Carolus: *CAROLI. I. Reg. Britt.* (Charles I of England), *Caroli D. Loth.* (Charles IV of Lorraine), and *Caroli D. Mant* (Charles III of Mantua); such a procedure would make it rather difficult to be sure which Charles one referred to. At the instigation of his friend Puteanus (who was better versed in Latin) all the names were put in the second case (genitivus), so *Ptolemei* referred to [the crater of] Ptolemeus or Ptolemy.

Another naming principle was geographical: Van Langren clustered names from persons originating from the same area: around the *Sinus Batavicus* (Batavian refers to the Dutch Republic) he put the names of the Dutch scientists Snellius and Golius, and he drew between *Terra Sapientia* and *Terra Honoris* another concentration of Dutchmen, with Barlaeus, Heinsius, Vossius, and Huygens. Other concentrations refer to Venice (with Venetians around the *Mare Venetum*), to France, around the *Mare Borbonicum* and the *Sinus Gallicus* (with Mazarin). Most royalty occupies the *Terra Dignitatis*, and there are also professional clusterings: scientists in general around the *Terra Laboris*, and more specifically astronomers, who inhabited the area around the *Mare Astronomicum*: Keppler, Aristarchos and Copernicus.

He also introduced a gender-based naming principle: around the *Mare Eugenianum* (named after the Infanta Isabella Eugenia of Spain, governor of the Spanish Netherlands 1601-1633) there is a cluster of nine craters named after female royalty; the only female addressed outside this cluster is Christina, Queen of Sweden. Van Langren's friends are located around the *Mare Belgicum*: Wendelinus, Puteanus and Lafaille.

Larger objects have more prominent patrons: the largest sea is named *Oceanus Philippicus* (after King Philip IV of Spain), other large seas are the *Mare Austriacum* (after Austria) and *Belgicum* (after the Spanish Netherlands); the *Sinus Batavicus* ('Dutch Gulf') is but a small appendix of the *Mare Belgicum*. Van Langren also introduced conceptual names: the countries he discerns are called after Justice, Dignity, Peace, Labour, Honour, Wisdom, Virtue and Temperance, a practice also copied later by Riccioli.

So, apart from his preference for Roman Catholic royalty and the statesmen of his time, he had objects named after scientists, objects named after astronomers, and clusterings of related names. This clustering of related concepts or objects is also found at the same time in fantasy maps, such as the maps of the country of love. Van Langren adhered to a hierarchical principle by naming larger objects for more important persons, and he introduced the custom of conceptual naming. Apart from the names of royalty and statesmen, all of these principles were later copied by Riccioli.

Competitors

Within the following years (when Van Langren was busy with minor corrections, as can be seen on the second and third states of his map, probably published in 1646), rival astronomers in the Baltic and Italy, as a reaction to Van Langren's naming proposal, came up with competing naming schemes. This says a lot about the possibilities for scientific communication at that time, both with Protestant (Hevelius) and Catholic (Riccioli) scholars.

In 1647 Johannes Hevelius (1611-1687) published in Danzig (now Gdansk) his *Selenographia sive Lunae descriptio,* a lunar atlas, in which he (like Harriot and Van Langren) also discerned seas and lands, but for which he copied the names from classical Earth (fig. 3). He thus conceived of the Moon as a second, parallel Earth, at least for part of it: most of his names refer to the Eastern Mediterranean and the Black Sea area, only a few names (Alps, *Paropamisus*) refer to

Earth topographical objects further distant from that terrestrial area. The only obvious omission in this list of names is that of Rome. The Lutheran Hevelius probably did not want to refer directly to this place, though he had no problems with Byzantium.

Figure 3. Johannes Hevelius' *Selenographia sive Lunae descriptio* (1647).

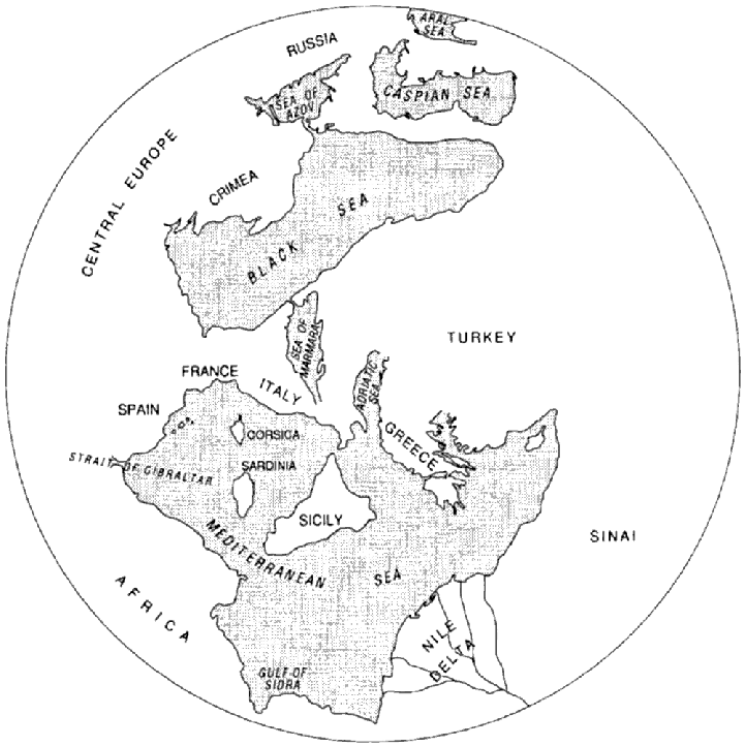


Figure 4. Reconstruction of Phil Stooke.

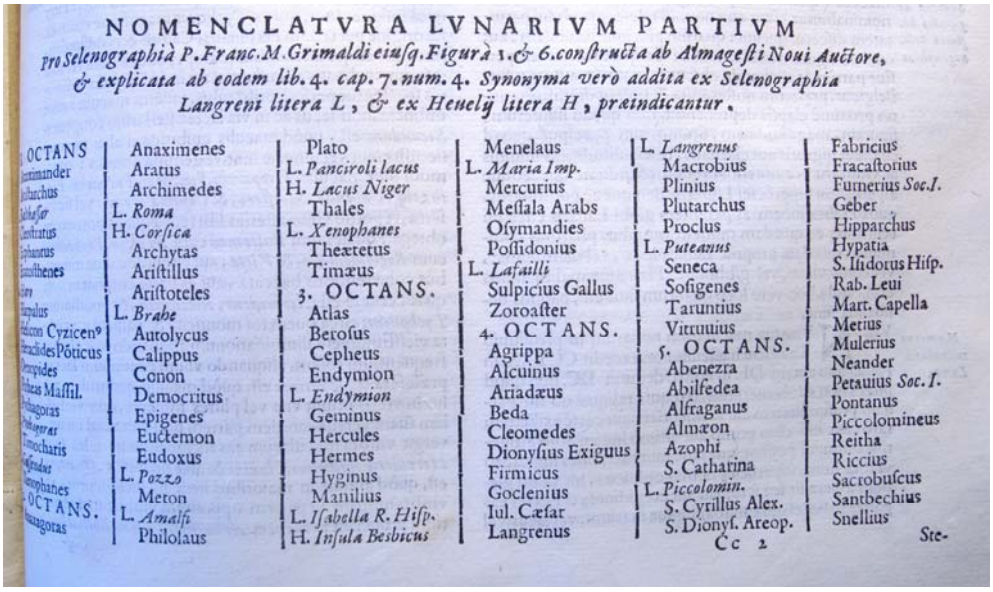
The reason why Hevelius chose this nomenclature was the striking likeness of the light and dark patches on the Moon's surface to the topography of the Eastern Mediterranean. The reconstruction by Phil Stooke in figure 4 already gives a convincing demonstration, but this likeness might even have been better on the basis of seventeenth century maps of this region, as the exact shape of the Caspian was not known then.

So Hevelius projected the classical geography of this region onto the Moon, individual lunar features being named after terrestrial regions which slightly resemble them in form or location. Only with considerable distortion could this scheme be applied at all. This practice of naming lunar objects after Earth objects of course made it rather awkward to refer to them, as one could never be sure whether a name out of context referred to the Earth or to the Moon. Hevelius had thought about naming lunar objects after scholars, and especially astronomers, like *Oceanum Copernicum*, *Oceanum Tychonicum*, *Mare Kepplerianum* etc. He rejected this idea because he was afraid that he would be accused of weighing the various astronomers against each other by using their name or not, or by naming larger or smaller objects for them (Hevelius, 1647: 224-225). According to John Keill (1739: 109), an eighteenth century astronomer: "But Hevelius, fearing lest the *Philosophers* should quarrel about the Division of the Lands, has spoiled them of this their Property, and gives the Parts of the *Moon* those *Geographical* Names, that belong to the different Islands, Countries and Seas of our *Earth*, without any Regard to Situation or Figure."

In total, Hevelius discerned some 250 objects for which he coined names (see figure 3). Although this nomenclature was published in a book and was used in Protestant countries until the eighteenth century, it did not stick, as did the names given by Riccioli.

Figure 5. Riccioli's *Figura pro Nomenclaturaet Libratione Lunari*.

Giovanni Battista Riccioli (1598-1671) was a Jesuit based in Rome who, together with Francesco Maria Grimaldi (1618-1663), elaborated a new map of the moon, with some 309 named objects, differently named from Van Langren. His criteria were that he named his objects only for astronomers. So he copied the best ideas of Van Langren. 51 names Van Langren used were also used by Riccioli, but not for the same objects (except for the craters Endymion, Langrenus and Pythagoras). He used 18 names earlier used by Hevelius. His map is presented in figure 5. He also did a partial concordance between his names and those given by Van Langren and Hevelius (see figure 6).



NOMENCLATVRA LVNARIVM PARTIVM

pro Selenographiâ P. Franc. M. Grimaldi eiuſq. Figurâ 1. & 6. conſtructa ab Almageſti Noui Auctore, & explicata ab eodem lib. 4. cap. 7. num. 4. Synonyma verò addita ex Selenographia Langreni litera L, & ex Heuelij litera H, præindicantur.

OCTANS
Anaximenes
Aratus
Archimedes
L. *Roma*
H. *Corſica*
Archytas
Ariſtillus
Ariſtoteles
L. *Brahe*
Autolycus
Calippus
Conon
Democritus
Epigenes
Euctemon
Eudoxus
L. *Pozzo*
Meton
L. *Amalfi*
Philolaus

Plato
L. *Panciroli lacus*
H. *Lacus Niger*
Thales
L. *Xenophanes*
Theætetus
Timæus
3. OCTANS.
Atlas
Beroſus
Cepheus
Endymion
L. *Endymion*
Geminus
Hercules
Hermes
Hyginus
Manilius
L. *Iſabella R. Hiſp.*
H. *Inſula Besbicus*

Menelaus
L. *Maria Imp.*
Mercurius
Meſſala Arabs
Oſymandies
Poſſidonius
L. *Lafaillii*
Sulpicius Gallus
Zoroaſter
4. OCTANS.
Agrippa
Alcuinus
Ariadæus
Beda
Cleomedes
Dionyſius Exiguus
Firmicus
Goclenius
Iul. Cæſar
Langrenus

L. *Langrenus*
Macrobius
Plinius
Plutarchus
Proclus
L. *Puteanus*
Seneca
Soſigenes
Taruntius
Vitruuius
5. OCTANS.
Abenezra
Abilfedea
Alfraganus
Almæon
Azophi
S. Catharina
L. *Piccolomin.*
S. Cyrillus Alex.
S. Dionyſ. Areop.

Fabricius
Fracaſtorius
Furnerius *Soc. I.*
Geber
Hipparchus
Hypatia
S. Iſidorus Hiſp.
Rab. Leui
Mart. Capella
Metius
Mulerius
Neander
Petauius *Soc. I.*
Pontanus
Piccolomineus
Reitha
Riccius
Sacrobuſcus
Santbechius
Snellius

Cc 2 Ste-

Figure 6. Riccioli's *Nomenclatura Lunarium Partium*.

Riccioli named large dark areas on the moon (oceans or seas) for weather conditions: *Oceanus Procellarum* (Ocean of Storms), *Mare Tranquilitatis* (Sea of Tranquillity), *Mare Nubium* (Sea of Clouds), *Mare Imbrium* (Sea of Downpours), *Sinus Roris* (Bay of Dew), *Sinus Iridum* (Bay of Rainbows). Large terrestrial areas were either named for concepts (*Terra Sanitatis*, or Land of Health, *Terra Fertilitatis*, *Terra Vitae* (Land of Life), *Terra Vigoris*) or for weather conditions (*Terra Caloris* (Land of Heat), *Terra Siccitatis* (Land of Drought), *Terra Grandinis* (Land of Hail Storms), *Terra Nivium* (Land of Snow Storms), *Peninsula Fulgurum* (Peninsula of Lightning)). He named craters for significant astronomers, grouping them by philosophies and time periods (Riccioli, 1651: 204).

c. 1670, new map by Van Langren

In 2010 in Belgium a fourth state of Van Langren's lunar map was found. This map was printed after Riccioli's book came out in 1651, since the names of Riccioli and Grimaldi were now included by Van Langren for identifying lunar objects. Overall, some 20 new names have been inserted, and 40 unnamed craters have been added as well. Two craters were renamed: *Pitati,* named after a sixteenth century Italian astronomer, became *Petauii* after the French astronomer Dionysius Petavius (1583-1652), and the crater *Mariæ D. Mant. F.* (after Maria Gonzaga, daughter of the Duke of Mantua) was renamed *MARIÆ Reg Pol*. after a more important member of the Gonzaga family, Marie Louise Gonzaga de Nevers (1611-1667), Queen Consort of Poland since 1645.

The crater *Bartholini* gives maybe a more precise dating possibility. It is named after Rasmus Bartholin (1625-1698), a Danish mathematician, who studied from 1646-1650 in Leiden and later in France and Italy, and who was appointed professor of mathematics in Copenhagen in 1657. He observed the comets of 1665 and published his observations in 1665 in his *De Cometis Anni MDCLXIV. & MDCLXV. Opusculum*. That could suggest that Van Langren made this fourth state after 1665 and before 1675, the year of his death.

Clearly, Van Langren did not think of abandoning his own naming scheme in favour of either Hevelius or Riccioli. But on this fourth state he left out all references (that were included on the first three states) to the fact that the map was to be one of a series in the book he was producing on finding longitude. The map title is different as well: it is now called *Selenographia Langreniana sive Lumina Austriaci Philippica* (Van Langren's Selenography or the Lights of Philip of Austria). See figure 7.

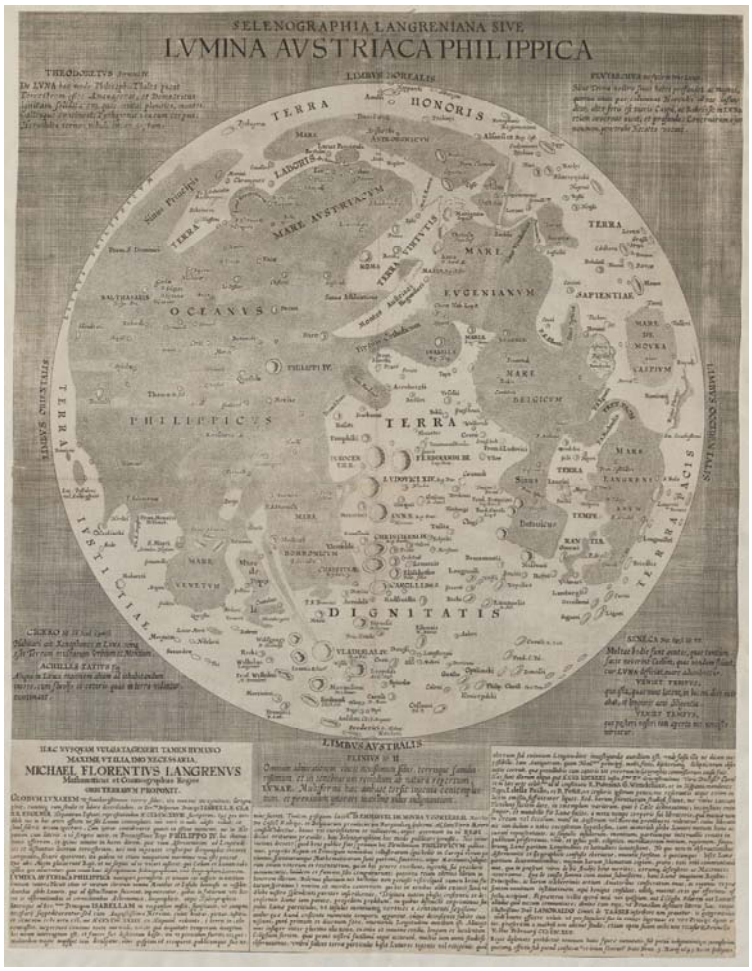


Figure 7. Van Langren's *Selenographia Langreniana sive Lumina Austriaci Philippica*.

Upon discovery of the map in 2010 our first reaction was that with the help of the changed names, it would be possible to date this fourth state and to identify a change in naming preferences after the Peace of Westphalia (1648). In the 1645 edition the nomenclature to an important degree reflected the Habsburg struggle for supremacy in Europe – it was only at the instigation of his friend Puteanus that Van Langren also included some scientists from the Dutch republic. This was necessary, Puteanus indicated, for this name set to be used all over Europe. "Men moet maecken, dat onse vianden geen oorsaecke en hebben, om een nieuwe Maen naer hunnen sin te stellen" (Moreau, 1957, letter XCVIII, 6 March 1645), in translation:

"We should see to it that our enemies have no occasion to produce a new [map of the] Moon, named to their preference". But from the additional names in the fourth state of the map, one can deduce that Van Langren did not change his views at all, he just continued with assigning names of Jesuits and other Catholic scientists with one exception, the name of the Amsterdam publisher Willem Jansz. Blaeu.

What is Van Langren's legacy?

Michiel van Langren was the first to apply the telescope to the Moon for systematically identifying and naming lunar topography. He further elaborated on Harriot's division of the lunar surface into seas and lands, and at least some 51 names he gave were also used by Riccioli, but not for the same objects – except for three, Pythagoras, Endymion and Langrenus, the crater Van Langren named after himself. To a very large degree the concepts and principles that Riccioli used were copied from Van Langren, the only exception being his reference to royalty and statesmen. Van Langren, Riccioli and his co-author Grimaldi have been as far as we know the only scholars who have named a lunar crater after themselves!

To recapitulate Van Langren's contributions: he initiated the systematic naming of lunar topography, he applied geographical clustering of names to the moon (areas with objects named after Frenchmen, Venetians, Dutchmen, female royalty, etc), he first used scientists to name lunar objects after, and he first used conceptual names; for land mass names he used concepts like dignity, peace, honour, virtue, work, wisdom and temperance. Finally, he adhered to a hierarchical principle by naming larger objects for more important persons.

In retrospect, he was also the first that used toponymy for propaganda, as most of the names he bestowed reflected the protagonists of the Habsburg power struggle for supremacy in seventeenth century Europe.

Copies of the lunar map by Van Langren can be found:

1st state: Leiden, Universiteitsbibliotheek, COLLBN 505-10-003
2nd state: Edinburgh, Royal Observatory, Crawford Library c15.6(4)
3rd state: Paris, Bibliothèque nationale, Cartes et plans GE D-17925
San Fernando, Real Instituto y Observatorio de la Armada, 17277/L-18 [bound in John Flamsteed's Atlas Coelestis (1729)].
4th state: Private collection

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APPENDIX

List of names on Van Langren's Lunar map per category and with the meaning of the name (dates of reigning monarchs given as "1605-(1621)-1665" mean born 1605, beginning of reign 1621, died 1665):

A: Major lands and seas (19 names)

FRET. PACIS (Strait of Peace)
LITTVS PHILIPPICVM (Philippian Coast (King Philip IV of Spain, 1605-(1621)-1665))
MARE ASTRONOMICVM (Astronomers' Sea)
MARE AVSTRIACVM (Austrian Sea)
MARE BELGICVM (Belgian Sea)
MARE BORBONICVM (Bourbon Sea)
MARE DE MOVRA siue CASPIVM (Sea of Moura or Caspian Sea (Manuel de Moura y Cortereal, 1590-1651; adjunct governor of the Spanish Netherlands, 1644-1647))
MARE EVGENIANVM (Eugenian Sea (Infanta Isabella Clara Eugenia of Spain, 1566-1633, governess of the Spanish Netherlands))
MARE LANGRENIANVM (Sea of Van Langren)
MARE VENETVM (Venetian Sea)
OCEANVS PHILIPPICVS (Philippian Ocean (King Philip IV of Spain, 1605-(1621)-1665))
TERRA DIGNITATIS (Land of Dignity)
TERRA HONORIS (Land of Honour)
TERRA IVSTITIAE (Land of Justice)
TERRA LABORIS (Land of Labour)
TERRA PACIS (Land of Peace)
TERRA SAPIENTIAE (Land of Wisdom)
TERRA TEMPERANTIÆ (Land of Temperance)
TERRA VIRTVTIS (Land of Virtue)

B: Major craters (14 names)

ANNÆ Reg. Fran. (Anne of Austria (1601-1666, wife of Louis XIII of France and sister of Philip IV))
BALTHASARIS Hispa. Pri. (Baltasar Carlos, prince of Spain, 1629-1646)
CAROLI. I. Reg. Britt. *[4th state: CAROLI. I. Brit. R.]* (King Charles I of England, Scotland and Ireland, 1600-(1625)-1649)
CHRISTIERNI IV Reg. Daniae (King Christian IV of Denmark, 1577-(1588)-1648)
CHRISTINÆ Reg. Suec. (Queen Christina of Sweden, 1626-(1653-54)-1689)
EVGENIÆ (Infanta Isabella Clara Eugenia of Spain, 1566-1633, governess of the Spanish Netherlands)
FERDINANDI. III. Imp. Rom. (Emperor Ferdinand III, 1608-(1636)-1657)
INNOCENTII X (Pope Innocent X, born Giovanni Battista Pamphili, 1574-(1644)-1655)
ISABELLÆ Reg. Hisp. (Elizabeth of France, 1602-1644)
LVDOVICI. XIV. Reg. Fran. (King Louis XIV of France, 1638-(1643)-1715)
MARIÆ Imp.cis Rom. (Maria Anna of Spain, 1606-1646, sister of Philip IV and wife of Ferdinand III)
PHILIPPI IV (King Philip IV of Spain, 1605-(1621)-1665)
ROMA (The Holy City of Rome)
VLADISLAI. IV. Reg. Pol. (King Władysław IV Vasa of Poland, 1595-(1632)-1648)

C: Mountain range, bays, straits, and lakes (23 names)

Fretum Catholicum (Catholic Strait)
Lacus Panciroli (Giovanni Giacomo Panciroli, c. 1587-1651; Cardinal)
Lacus Scientiæ (Lake of Science)
Mare de Popoli (André Cantelmo, duc de Popoli, 1598-1645, general)
Montes Austriaci (Austrian Mountains)
P. Colombi (Cape Columbus)
P. S. Alberti (Cape Saint Albertus)
P. S. Dionisii (Cape Saint Dionysius)

P. S. Ignatii (Cape Saint Ignatius)
P. S. Michaelis (Cape Saint Michael)
P. Salamona *[4th state: P. Salamonæ]* (Cape of Salamona)
P. Sti. Vincetii (Cape Saint Vincent)
Prom. Henrizi D. Venet. (Cape Erizzo (Francesco Erizzo, Doge of Venice, 1566-(1631)-1646))
Prom. S. Dominici (Cape Saint Dominicus)
Prom. S. Iacobi (Cape Saint James)
Prom. S. Ludovici (Cape Saint Louis)
Prom. S. Petri (Cape Saint Peter)
Sinus Athlanticus (Atlantic Gulf)
Sinus Batauicus (Batavian Gulf)
Sinus Geometricus (Gulf of Geometry)
Sinus Medius (Middle Gulf)
Sinus Opticus (Gulf of Optic)
Sinus Principis (Prince's Gulf)
Additions on state 4:
Pr. S. Gabrielis (Cape Saint Gabriel)
Sinus Vrsulinicus (Ursulines Gulf)

D: Medium size craters, important capes, mountain, smaller bays (97 names)

Alfonsi IX Reg. Cast. (King Alfonso IX of Léon and Castile, 1171-1230, astronomer)
Amalfi (House of Amalfi)
Annae D. Aurel. F. (Anne Marie Louise d'Orléans, 1627-1693)
Anselmi Elect. Mogunt. (Anselm Casimir Wambold von Umstadt, Elector of Mainz, 1579-(1629)-1647)
Arenbergii (Philippe-François duc d'Arenberg, 1625-1674, military officer)
Arondelii (prob. Thomas Arundell, c. 1560-1639, military officer)
Aytona *[4th state: Aytonæ]* (Francisco de Moncada, marquis d'Aitona, 1586-1635, diplomat)
Barbarini (Pope Urban VIII, born Maffeo Barberini, 1568-(1623)-1644)
Bazan (prob. Álvaro de Bazán, 1526-1588, Spanish admiral)
Bekii
Benauidi (prob. Fray Alonzo Benavides, 1603-?, geographer)
Bichi
Boiuinii (prob. François de Boivin, d. 1618, French chronicler)
Bracamonti (Caspar de Bracamonte y Guzmán, c. 1595-1676, Spanish diplomat and statesman))
Brunii
Cantelmi (André Cantelmo, duc de Popoli, 1598-1645, general)
Caroli D. Loth. (Duke Charles IV of Lorraine, 1604-1675, duke from 1624-1634 and 1661-1675)
Caroli D. Mant (Duke Charles III of Mantua, 1629-(1637)-1665)
Casimiri Pol. P. (John II Casimir Vasa, Prince of Poland, 1609-1672, became king 1648)
Cerda *[4th state: Cerdæ]* (Antonio Juan de la Cerda, 1607-1671, Spanish nobleman)
Chigi (Fabio Chigi, Apostolic Nuncio to Cologne, 1599-1667, became Pope Alexander VII in 1655)
Claræ Isab. Leop. F. (Isabella Clara of Austria, 1629-1685)
Conde *[2nd state: Prin. Conde]* (Louis II de Bourbon, Prince de Condé, 1621-1686)
Crani
Crequii (Charles I de Blanchefort, Marquis de Créquy, 1578-1638, French marshal)
Croii (Philippe François de Croy, 1609-1650, governor of Luxembourg)
Cueuio (Alfonso de la Cueva, 1572-1655, cardinal, Spanish diplomat)
Doriae (Giovanni Doria, 1573-1642, cardinal, viceroy of Sicily)
Elisabethæ Palat. filiæ (Elizabeth of Bohemia, Princess Palatine, 1618-1680)
Emanuelis D. Sab. (Duke Charles Emmanuel II of Savoy, 1634-(1638)-1675)
Estensis D. Mutinae (Francesco I d'Este, Duke of Modena, 1610-(1644)-1658)
Farnesii D. Parmae (Odoardo Farnese, Duke of Parma, 1612-(1644)-1646)
Ferd. Caroli Leop. F. (Archduke Ferdinand Charles of Austria, 1628-1662)
Ferd. Francisci Imp. Rom. F. (Ferdinand IV, 1633-1654, son of Emperor Ferdinand III)
Ferdinandi Elect. Col. (Ferdinand of Bavaria, Prince-Elector of Cologne, 1577-(1612)-1650)
Francisci D. Loth. (Duke Francis II of Lorraine, 1572-1632, duke in 1625)

Fred. C. Pal. (Frederick, Count Palatine of Zweibrücken, 1616-1661)
Fred. Wilhelmi M. Brandenb. (Frederick Wilhelm, Elector of Brandenburg, 1620-(1640)-1688)
Frederici D. Holsat. (Frederick III, Duke of Holstein-Gottorp, 1597-(1616)-1659)
Gastoni D. Aurel. (Gaston Jean-Baptiste de France, Duc d'Orléans, 1608-1660)
Gauræi (prob. Charles de Gaure, governor of Le Quesnoy)
Guasco
Haro
Ioanni D. Sax. *[4th state: Ioannis D. Sax.]* (Johann Georg I, Elector of Saxony, 1585-(1611)-1656)
Isenburgi (Member of the Von Isenburg family)
Kintschotii (Caspar van Kinschot, 1622-1649, poet)
Koniecpolski (Stanisław Koniecpolski, 1590/94-1646, Polish nobleman)
Laurini (Marcus Laurinus, 1530-1581, humanist)
Lennoxis
Leopoldi Arch. Aust. (Archduke Leopold Wilhelm of Austria, 1614-1662)
Ligni *[4th state: Lignei]*
Lini
Longeualli (Charles Albert de Longueval, 1607-1663, military commander)
Longeuilli *[4th state: Longeuillei]* (Henri II d'Orléans, Duke of Longueville, 1595-1663)
Maluezzi (Virgilio Malvezzi, 1595-1653, court historian to Philip IV)
Mariæ D. Mant. F. *[4th state: MARIÆ Reg Pol.]* (1: Maria Gonzaga, 1609-1660, daughter of Duke Francesco IV of Mantua; 2: Marie Louise Gonzaga de Nevers, 1611-1667, Queen Consort of Poland from 1645)
Mariannæ Imper. F. (Mariana of Austria, 1634-1696, married in 1649 to Philip IV)
Martinitzi (Jaroslav Borsita von Martinitz, 1582-1649, Bohemian statesman)
Masii
Maximiliani Duc. Baua. (Maximilian I, Elector of Bavaria, 1573-(1623)-1651)
Mazarinii (Jules Mazarin, 1602-1661, cardinal and statesman)
Medicæi (prob. Ferdinando II de' Medici, Grand Duke of Tuscany, 1610-(1621)-1670)
Mexiae (prob. Pedro Mexia, 1496?-1552?, Spanish historian)
Moura (Manuel de Moura y Cortereal, 1590-1651; adjunct governor of the Spanish Netherlands, 1644-1647)
Naßauii (Nassovius (van Nassau), mathematician (or House of Nassau))
Noyelles (Charles de Noyelle, 1615-1686, Jesuit priest)
Ocariz *[4th state: name erased]*
Ossolinski (Jerzy Ossoliński, 1595-1650, Polish statesman)
Oxensterni (Axel Gustafsson Oxenstierna, 1583-1654, Swedish statesman)
Pamphilii (Pope Innocent X, born Giovanni Battista Pamphili, 1574-(1644)-1655)
Philip Christ. Elect. Treu. (Philipp Christoph von Sötern, Elector of Trier, 1567-(1623)-1652)
Piccolomini *[4th state: name erased]* (Ottavio Piccolomini, Duc d'Amalfi, 1599-1655, Italian general)
Quesada *[4th state: Quesadæ]* (Gonzalo Jiménez de Quesada, 1495-1579, Spanish conquistador)
Radseuillii (Albrycht Stanisław Radziwiłł, 1595-1656, Grand Chancellor of Lithuania)
Ramirii *[4th state: Ramiresii]* (Lorenzo Ramirez de Prado, Castilian statesman and bibliophile)
Rantsouii (Heinrich von Rantzau, 1526-1598, German humanist and astrologer)
Recki
Rosetti
S. Marci (Saint Mark)
Saauedræ (Miguel de Cervantes Saavedra, 1547-1616, Spanish author)
Segueri
Sfondrati (Sigismondo Sfondrati, 1618-1652, Spanish general)
Silgero *[4th state: Silgeri]*
Slauatae (Vilem Slavata of Chlum, 1572-1652, Czech nobleman)

Spada *[4th state: Spadæ]* (Bernardino Spada, 1594-1661, Cardinal)
Spinola *[4th state: Spinolæ]* (Ambrogio Spinola, 1569-1630, Spanish general)
Taßis (Iñigo Vélez de Guevara y Tassis, Comte d'Oñate (1566-1644), Spanish statesman)
Taye
Theresæ Hispa. Inf. (Infanta Maria Theresa of Spain, 1638-1683)
Thomae D. Sab. (Thomas Francis of Savoy, 1596-1656, military commander)
Trautmansdorffii (Maximillian von Trautmannsdorff, 1584-1650, Austrian statesman)
Tristis *[3rd state: Triestis]* (Antoine Triest, Bishop of Bruges and Gent, 1577-1657)
Vlloæ (prob. Francisco de Ulloa, d. 1540, discoverer of Mexico)
Vrselii
Wilhelmi Lantgrauii (Landgrave Wilhelm VI of Hessen-Kassel, 1629-(1637)-1663)
Wolfgangi D. Neoburgi (Wolfgang Wilhelm, Count Palatine of Neuburg, Duke of Jülich and Berg, 1578-(1614)-1653)
Zamosci (Jan Zamoyski, Duke of Zamość, 1542-1605, Polish-Lithuanian nobleman)
Additions on state 4:
Hegemileri (prob. Hans Ruprecht Hegenmüller, 1617-1631, Austrian marshal)
Huÿni (Godfried Huyn van Geleen, c. 1598-1657)
Lambergi
Opalinski (Krzysztof Opaliński, 1611-1655, Polish politician and writer)
Vlenfeldii
Volmari (Johannes Volmar, d. 1536, German mathematician)

E: Lakes, rivers, harbours and less important capes (19 names)

Aestuaria Bamelrodia (Estuary of Bamelrode (Puteanus' family estate))
Flu. S. Augustini (Saint Augustine)
Lac. Poßidoni vel Antecaspi *[4th state: Lac. Poßidoni vel Anticaspius]* (Lazaro Bonvicini Possidoni, son-in-law of Puteanus)
Lacus Masii
Mons S. Xauerii (Saint Francis Xaver)
P. Argolii (Andreas Argoli, 1570-1657, Italian astronomer)
P. Arzahel (Arzachel, 1028-1098, Arab mathematician)
P. Calippi (Calippus, Greek astronomer and mathematician)
P. Methonis (Meton of Athens, Greek mathematician and astronomer)
P. Procli (Proclus Diadochus, Greek philosopher)
P. S. Francisci (Saint Franciscus of Assisi)
Portus Adriaticus (Adriatic Harbour)
Portus Gallicus (French Harbour)
Prom. Caßiodori (Cassiodorus, Roman statesman and writer)
Prom. Cesaris (Julius Caesar, 90-44 B.C.)
Prom. Clavii (Christoph Clavius, 1537-1612, German Jesuit mathematician and astronomer)
Prom. Cleomedis (Cleomedes, Greek astronomer)
Regius Fluvius (Royal River)
Sinus Erathostenis (Eratosthenes, Greek mathematician and astronomer)

F: Small craters (153 names)

Albategni (Albategnius - Al-Battani, c. 853-929, Arab astronomer)
Andradæ *[4th state: name erased]* (Antoine Andrada, c. 1580-1634, Portuguese Jesuit)
Annulus Neptuni (Neptune's Ring)
Arati (Aratus of Soloi, 3rd cent. B.C., Greek poet)
Archimedis (Archimedes. 3rd cent. B.C., Greek philosopher)
Aristarchi (Aristarchus of Samos, c. 310-210 B.C., Greek astronomer)
Auberi
Baduari (Giacomo Badoaro, 1602-1654, Venetian nobleman and poet)
Baieri (Johann Bayer, 1572-1625, German astronomer)
Bakii (Claude-Gaspar Bachet de Mézirac, 1581-1638, French mathematician)

Barlæi (Gaspard van Baerle (Barlaeus), 1584-1648, Dutch historian)
Barreæ
Bechleri
Beruoeti
Bettinii (Mario Bettini, 1582-1657, Italian Jesuit astronomer)
Bici
Bickeri (Andries Bicker, 1586-1653, magistrate of Amsterdam)
Blancani (Giuseppe Biancani (Blancanus), 1566-1624, Italian Jesuit astronomer)
Blitterswycki (Willem van Blitterswyck, councillor of Gelre)
Bonuicini (Lazaro Bonvicini Possidoni, son-in-law of Puteanus)
Brahei (Tycho Brahe, 1546-1601, Danish astronomer)
Briggi (Henry Briggs, 1561-1630, English mathematician)
Bullialdi (Ismaël Boulliau, 1605-1694, French astronomer)
Caleni
Cambieri *[2nd state: Cambierii]* (Andreas Cambier, historian)
Caramuelis (Juan Caramuel Lobkowitz, 1606-1682, Spanish mathematician)
Cartesii (René Descartes, 1596-1650, French mathematician)
Chifletii (Johannes Jacob Chifletius, physician to Archduke Leopold William)
Ciermanni (Jean Ciermans, 1602-1648, Dutch Jesuit astronomer)
Claramontii *[4th state: Claramontis]* (Scipione Chiaramonti, 1565-1652, Italian astronomer)
Cobaui
Cocci (Lorenzo Cocchi, Italian astronomer)
Coci
Conradi (Conradus Celtis, 1459-1508, poet and historian)
Contarini (Nicolò Contarini, 1553-1631, doge of Venice)
Conti (Cardinal Carlo Conti, 1556-1615, or other member of the Conti family (cardinals and popes))
Copernici (Nicolaus Copernicus, 1473-1543, Polish astronomer)
Cornaro (Cardinal Federico Cornaro, 1579-1653; Patriarch of Venice, 1631-1644)
Crugeri (Peter Crüger, 1580-1639, Prussian astronomer)
Curtii (Albert Curtz (Curtius), 1600-1671, German Jesuit astronomer)
Cusæ (Nicholas of Cusa, 1401-1464, German cardinal and astronomer)
D'auxoni
Danesii (Pierre Danès, 1497-1577, French historian)
Derienni
Derkenni (Ignace der Kennis, 1598-1656, Jesuit)
Edelherii *[4th state: name replaced to left of crater]* (Jacques Edelheer, magistrate of Antwerp, inventor of a telescope)
Endymionis (Endymion, Greek mythological astronomer, the lover of Selene, the moon)
Euclidis (Euclid, Greek mathematician,)
Eychstadi (Lorenz Eichstadt, 1596-1660, German mathematician and astronomer)
Finiæ (Saxo van Finia, Poet?)
Fournerii (Georges Fournier, 1595-1652, French Jesuit astronomer)
Fromi
Fromondi (Libertus Fromondus, 1587-1653, professor of Sacred Scriptures in Louvain)
Gallilaei (Galileo Galilei, 1564-1642, Italian astronomer)
Gansii
Garsioli
Gaßendi (Pierre Gassendi, 1592-1655, French astronomer)
Geuartii (Jan Gaspar Gevartius, 1593-1666, poet and historiographer)
Ginnari
Giouanelli
Golii (Jacobus Golius, 1596-1667, Dutch Orientalist and mathematician)
Graßi (Orazio Grassi, 1583-1654, Italian Jesuit astronomer)
Grimbergeri (Christoph Grienberger, 1561-1636, Austrian Jesuit astronomer)
Gualteri
Guldini (Paul Guldin, 1577-1643, Swiss Jesuit mathematician and astronomer)
Gutschovii (Gerard van Gutschoven, 1615-1668, assistant of Descartes)

Haesteni (Benedict van Haeften (Haestenus), author of Regia via Crucis (Antwerp, 1635))
Hardii
Hensii (Daniel Heinsius, 1580-1655, Duch scholar)
Herlici (David Herlicius (Herlitz), 1557-1636, German mathematician)
Heuelii (Johannes Hevelius, 1611-1687, Polish astronomer)
Hugenii (Constantijn Huygens, 1596-1687, Dutch poet and diplomat)
Hypatiæ (Hypatia of Alexandria, d. 415, Greek mathematician)
Hypparchi (Hipparch of Nicaea, 2nd cent. B.C., Greek astronomer)
Kepleri (Johannes Kepler, 1571-1630, German astronomer)
Kircheri (Athanasius Kircher, 1602-1680, German Jesuit scholar)
Lafaillii (Jean-Charles della Faille, 1597-1652, Flemish Jesuit mathematician)
Langreni (Michael-Florent van Langren, 1600-1675)
Lantsbergi *[4th state: Lantsbergii]* (Philips van Lansbergen, 1561-1632, Dutch astronomer)
Laucii
Le Peßier (Joannes Le Pessier, b. 1596, Jesuit astronomer)
Leototi
Leurechonii (Jean Leurechon, c.1591-1670, French Jesuit priest and mathematician)
Longomontani (Christian Severinus Longomontanus, 1564-1647, Danish astronomer)
Lutiani
Magini (Giovanni Antonio Magini, 1555-1617, Italian astronomer)
Magni (prob. Albertus Magnus 1193/1206-1280, German philosopher and theologian)
Marci
Mersenni (Marin Mersenne, 1588-1648, French philosopher and mathematician)
Moleri
Moreti (Balthasar Moretus, 1574-1641, publisher of Antwerp)
Morgues *[4th state: Morguesi]* (prob. Jacques le Moyne de Morgues, c. 1533-1588, French artist and explorer)
Morini (Jean-Baptiste Morin, 1583-1656, French mathematician and astronomer)
Nachara *[4th state: Nacharæ]*
Naudei (Gabriel Naudé, 1600-1653, French librarian and scholar)
Nauei (Mattheus Navea (Naveus), clergyman in Tournai)
Neperi (John Napier, 1550-1617, Scottish mathematician)
Nirenbergerii (Eusèbe Nieremberg, 1595-1658, Jesuit scholar)
Nobelarii (prob. Cornelis de Nobelaer, heer van Cabau, 1600-in or after 1674)
Nuti *[4th state: Nutij]* (Philippus Nutius, 1597-1661, Jesuit mathematician)
Pappi (Pappus of Alexandria, Greek mathematicians)
Parigi
Phorylidi (Johannes Phocylides Holwarda, 1618-1651, Frisian astronomer and philosopher)
Piperii (Joachimus Piperius, author of 'Exercitatio Physica de Corpore mixto in genere' (Frankfurt, 1624))
Pironi
Pitati *[4th state: Petauii]* (1-3: Pietro Pitati, d. c. 1550, Italian astronomer and mathematician; 4: Denis Pétau (Dionysius Petavius), 1583-1652, French Jesuit astronomer)
Pozzo ('Cavalier Pozzo', in Rome, friend of Puteanus)
Pratii
Ptolemæi (Claudius Ptolemy, 2nd cent. A.D.)
Puteani (Erycius Puteanus de Bamelrode, 1574-1646, Flemish humanist, friend of Van Langren)
Pythagoræ (Pythagoras, Greek mathematician)
Pÿthias (Pytheas of Massila, Greek geographer and explorer)
Quaresini (François Quaresima, d. c. 1650, Italian astronomer)
Rechbergeri (Wilhelm Rechberger, correspondent of Kepler, 1619)
Regiomontani (Johannes Regiomontanus, 1436-1476, German mathematician and astronomer)

Rheitæ (Anton Maria Schyrleus de Rheita, 1597-1660, Czech astronomer and optician)
Rho *[4th state: Rhoi]* (Giovanni Rho, 1590-1662, Jesuit mathematician)
Ricci (Matteo Ricci, 1552-1610, Italian astronomer)
Richardi (Claude Richard, 1589-1664, French mathematician)
Roberualis (Gilles de Roberval, 1602-1675, French mathematician)
Rubenii (Pieter-Paul Rubens, 1577-1640, Flemish painter)
S. Bedæ (Saint Bede)
Scala *[4th state: Scalæ]* (Chevalier de la Scala, friend of Puteanus)
Scheineri (Christoph Scheiner, 1573-1650, German Jesuit mathematician)
Schonbergeri
Schotenii (Frans van Schooten jr., 1615-1660, Dutch mathematician)
Schÿrlei (Anton Maria Schyrleus de Rheita, 1597-1660, Czech astronomer and optician)
Scialli
Seneschali
Simpilii (Hugh Sempill (Simpilius), 1589/96-1654, Scottish Jesuit mathematician)
Snellii (Willebrord Snellius, 1580-1626, Dutch mathematician)
Stratii
Tacquetti (Andreas Tacquet, 1612-1660, Jesuit mathematician)
Thales (Thales of Miletus, 5th cent. B.C., Greek philosopher)
Thebit (Thabit ibn Qurra, 836-901, Arab mathematician and astronomer)
Timochari (Timocharis, Greek astronomer and philosopher)
Tirelli (Carolus Tirelli, author of 'De apostasia a religione quaestio')
Torrii
Trederi
Tucheri
Valerii (Adriaen Valerius, c. 1575-1625, Dutch poet and composer)
Vici
Vlacci *[4th state: name erased]* (Adriaen Vlacq, 1600-1666, Dutch book publisher and author of mathematical tables)
Voßii (Gerard-Jan Vossius, 1577-1649, Dutch classical scholar and theologian)
Vulleri
Waßenarii
Wegii
Welperi (Eberhard Welper, c. 1600-after 1668, German mathematician)
Wendelini (Godefroy Wendelin, 1580-1667, friend of Puteanus and Van Langren)
Wisilii
Wolfii
Xenophanis (Xenophanes of Colophon, c. 570-c. 480 B.C., Greek philosopher)
Zylii
Additions on state 4:
Bartholini (Rasmus Bartholin, 1625-1698, Danish mathematician and physician, published 1665 on his comet observations)
Blaeuii (Willem Jansz. Blaeu, c. 1571-1638, Dutch publisher and amateur astronomer)
Brechti
Caualleri (Francesco Bonaventura Cavalieri, 1598-1647, Italian mathematician and astronomer.)
Feroncei (Eleazar Feronce, French amateur astronomer)
Fontanæ (Francesco Fontana, 1580-c. 1656, Italian lawyer and astronomer)
Grimaldi (Francesco Maria Grimaldi, 1618-1663, Italian Jesuit astronomer)
Niceronis (Jean François Nicéron, 1613-1646, French mathematician)
Pellii (John Pell, 1611-1685, English mathematician)
Plempii (Vopiscus Plempius Fortunatus, 1601-1671, Dutch scholar)
Riccioli (Giovanni Battista Riccioli, 1598-1671, Italian Jesuit astronomer)
Stocmanni (Pierre Stockmans, 1608-1671, Belgian diplomat and scholar)
Torricelli (Evangelista Torricelli, 1608-1647, Italian mathematician)
Walderodi (prob. Johannes Walderode, 1593-1674, Czech politician)