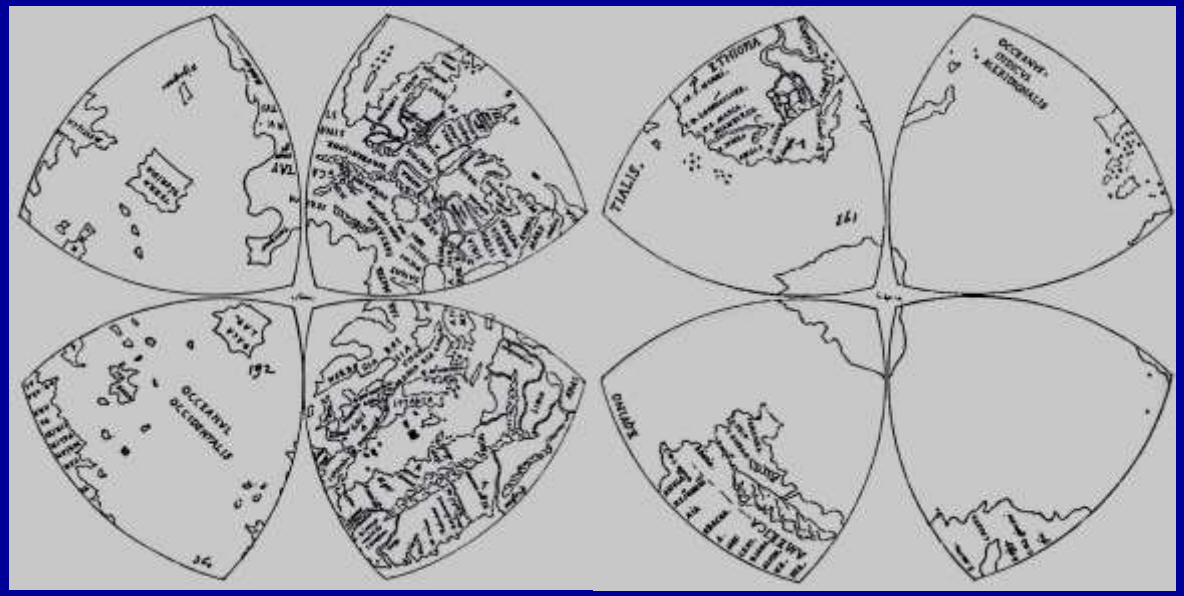
cARTography / kARTografija

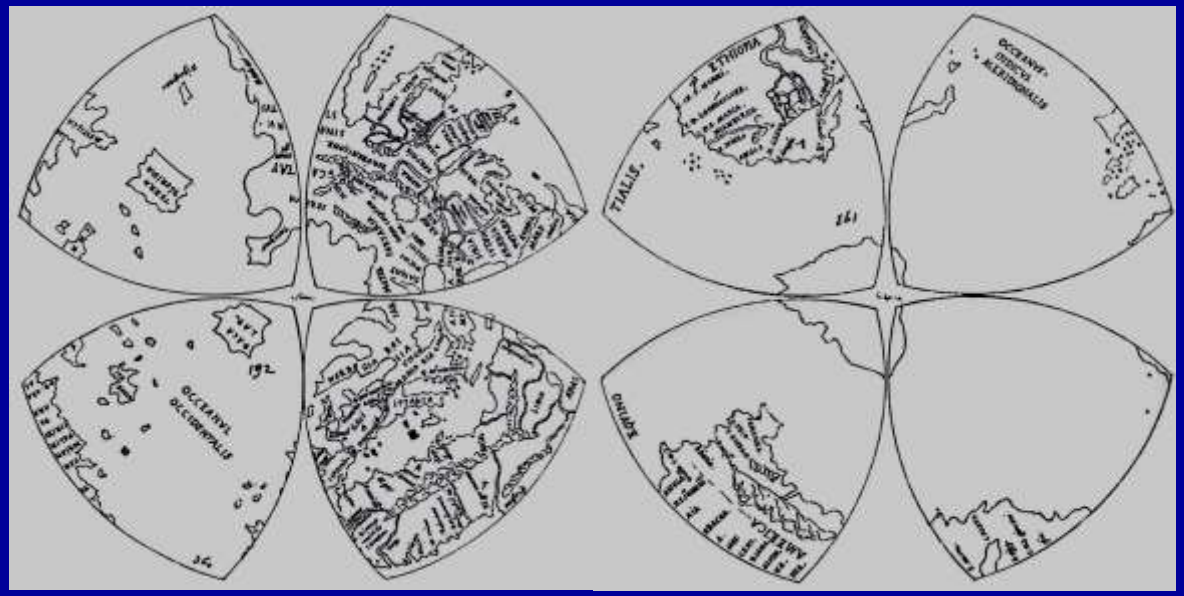
Map Projection of Mappa Mundi by Leonardo da Vinci

Miljenko Lapaine



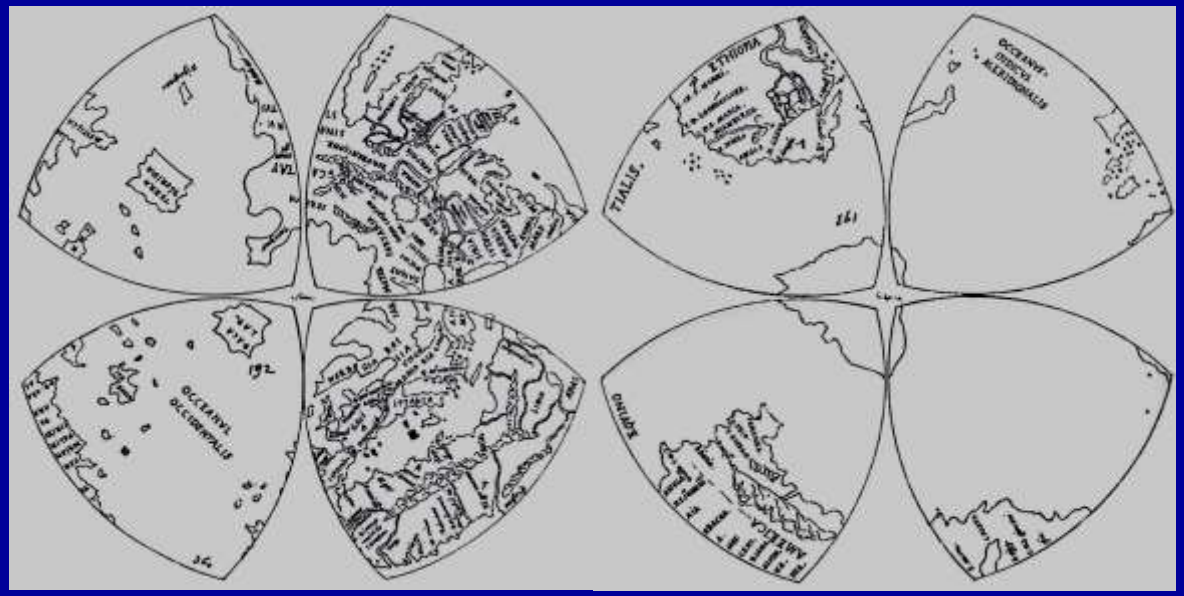
According to Major (1865), da Vinci world map has the following exceptional properties:

1. The earliest known world map with the name America
2. The earliest map showing that the Western coast of America is not connected to Asia
3. The only known map indicating the earlier notion of a great Southern continent, prior to the discovery of the Straits of Magellan



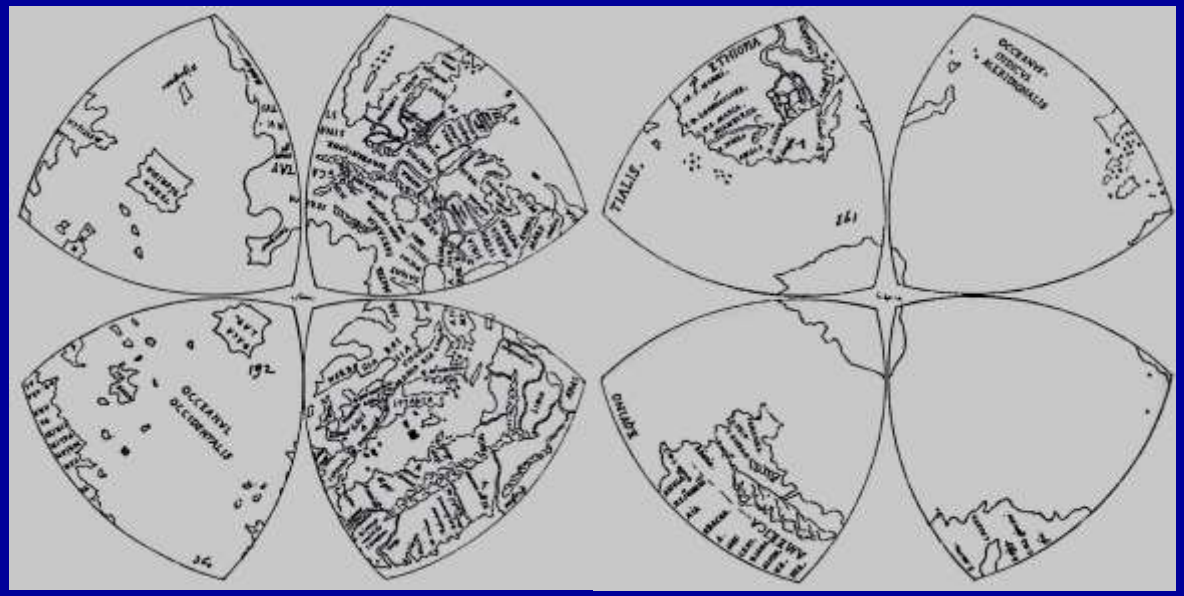
Questions:

1. Date of production
2. Authorship
3. Construction of da Vinci-Reuleaux triangles
4. Map projection
5. Da Vinci map projection after da Vinci



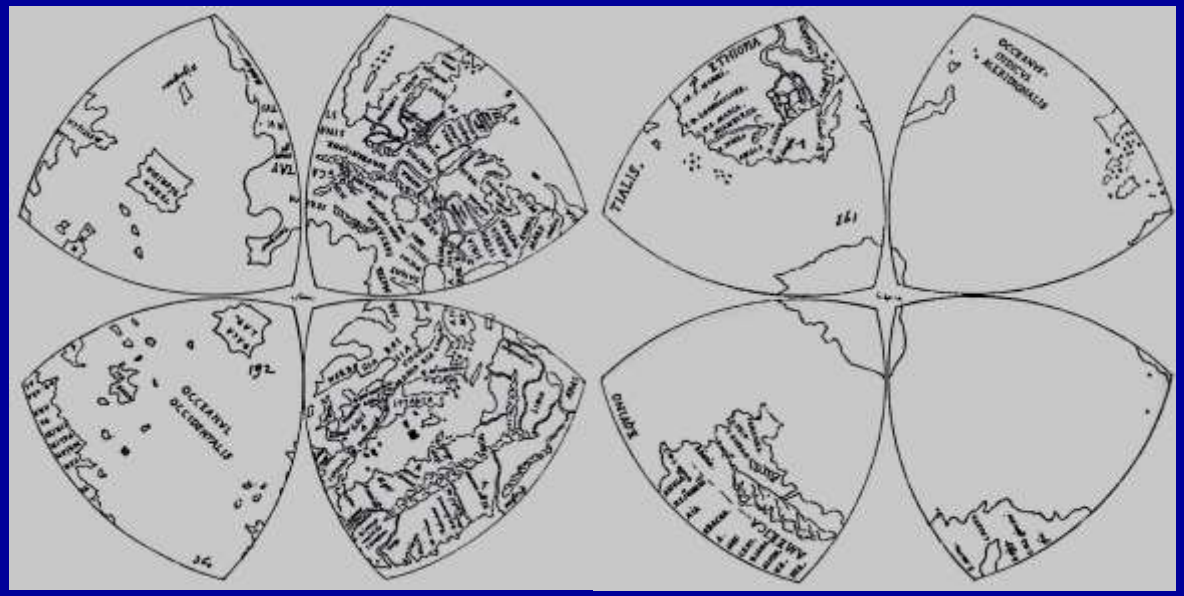
1. Date of production

1513, 1514, 1515 ?



2. Authorship

Da Vinci or his collaborators, students, pupils ?

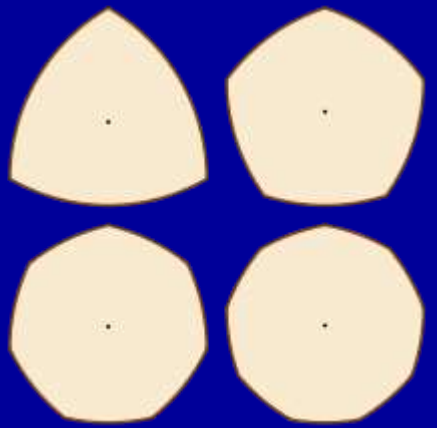


3. Construction of da Vinci-Reuleaux triangles

Why da Vinci-Reuleaux triangles ?
Who is Reuleaux ?

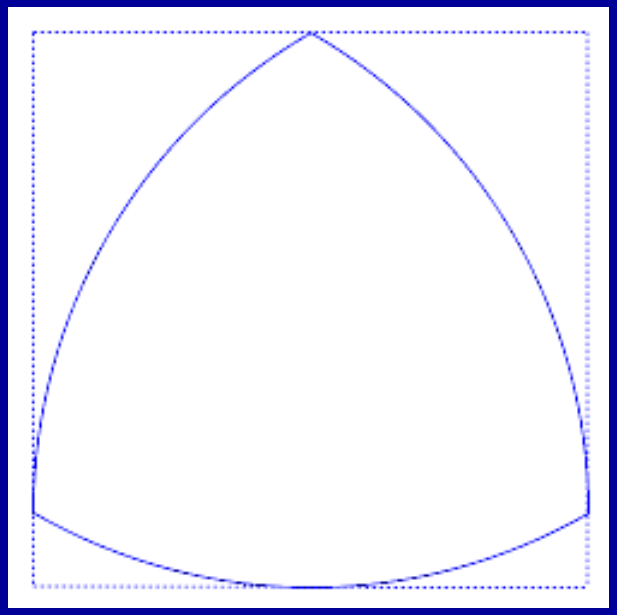
Franz Reuleaux (1829-1905)
German mechanical engineer and lecturer at the Berlin Royal Technical Academy, “father of kinematics”
Today, he may be best remembered for the Reuleaux triangle.

Reuleaux polygon: a curve with a constant width.
Odd number of sides only!



Width = perpendicular distance between two distinct parallel lines each having at least one point in common with the shape's boundary, but none with the shape's interior

If a given shape's width is constant in all directions,
is it necessarily a circle?
Can you imagine a non-circular wheel?



Multi-angle-wheel bicycle appears in Qingdao

Guan Baihua and his self-made multi-angle-wheel bicycle in 2009 in Qingdao of Shandong Province, China. He spent 18 months to complete this strange bicycle.

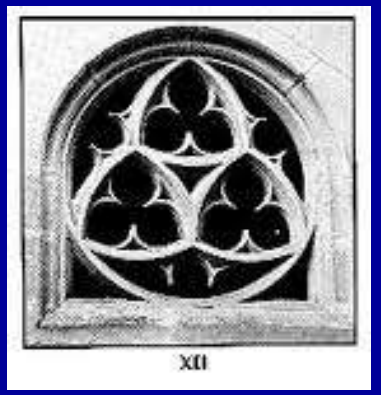

FIFTY PENCE


ELIZABETH·II·D·G·REG·F·D·1998

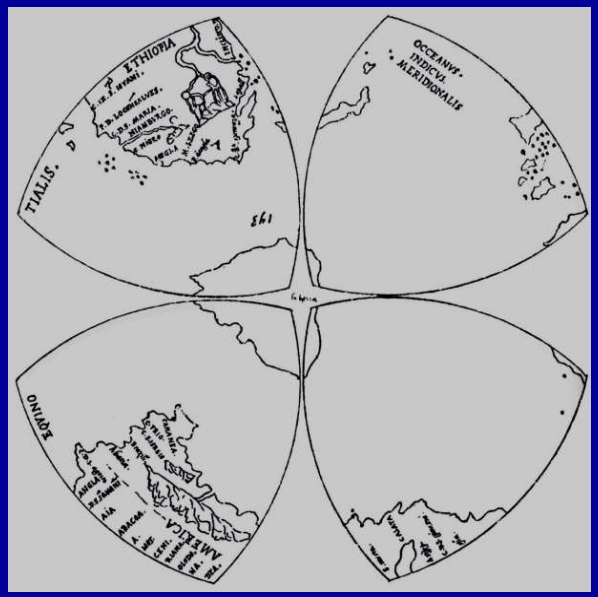

TWENTY PENCE


ELIZABETH II D·G·REGINA


CANADA
2003
DOLLAR



XII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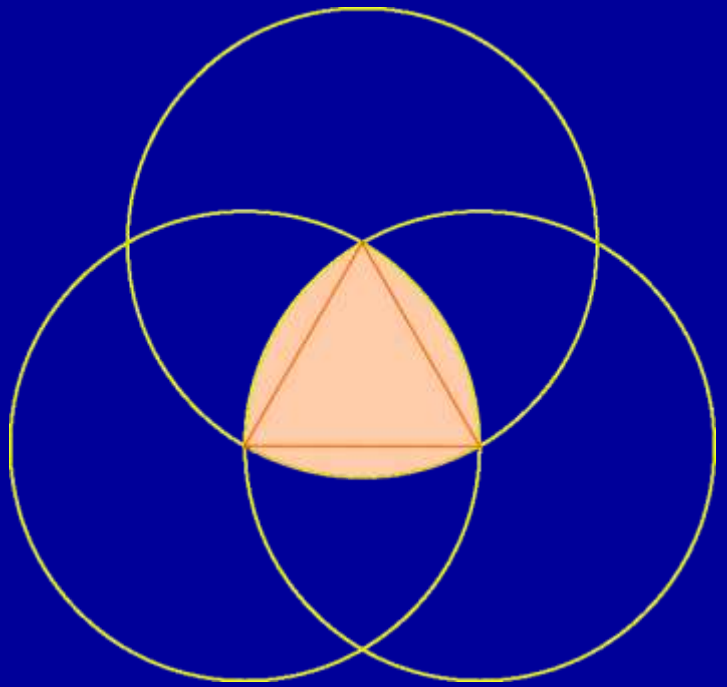

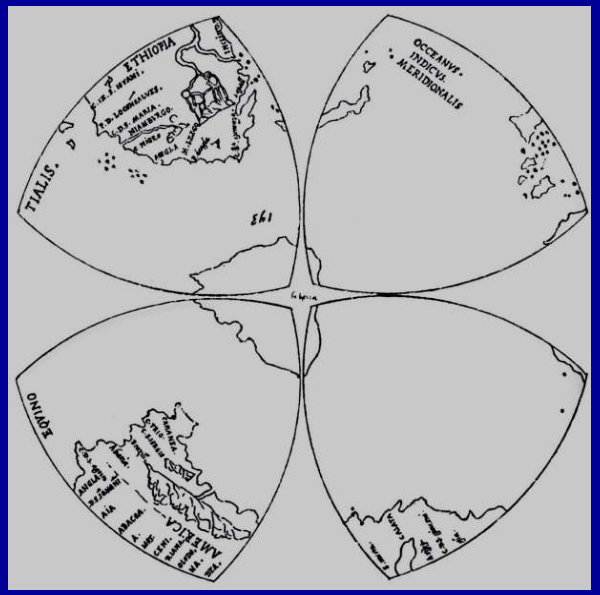

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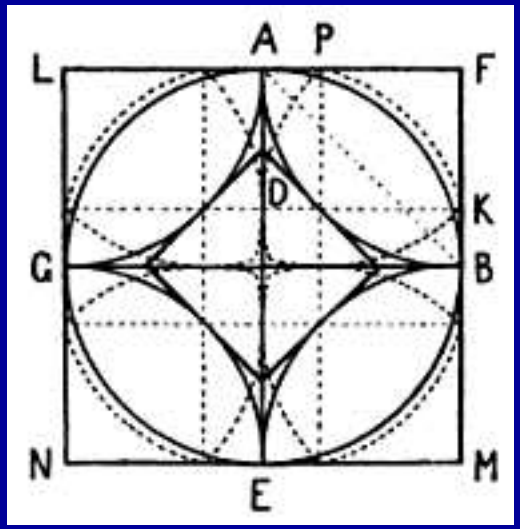
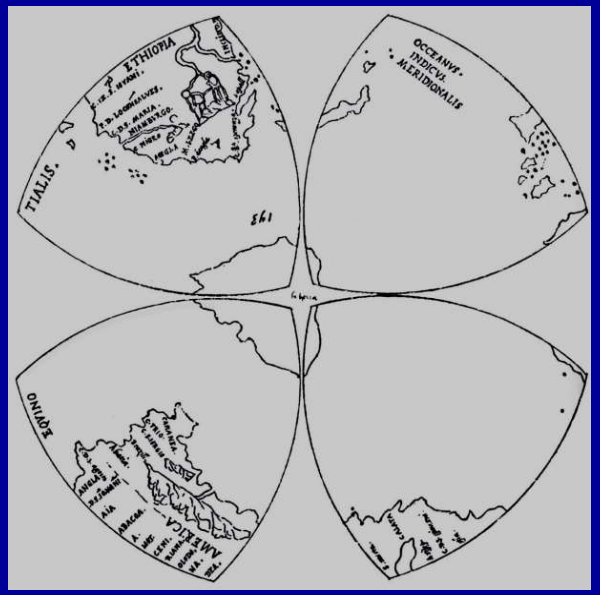
Fiorini (1894), a possible construction
Uhden (1938), a possible construction





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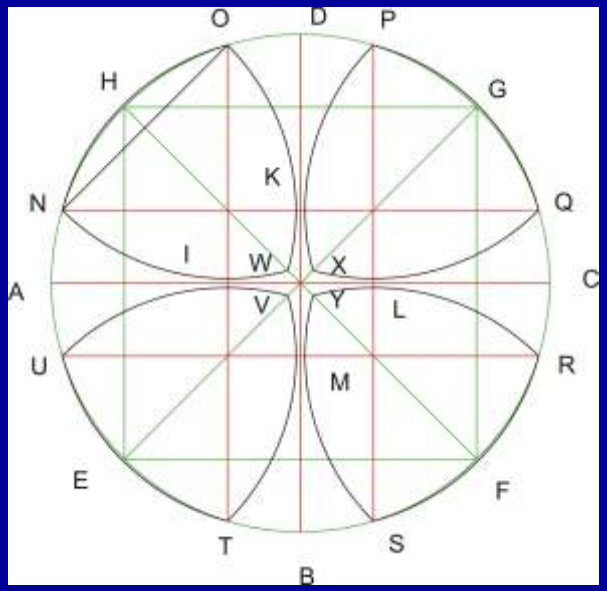
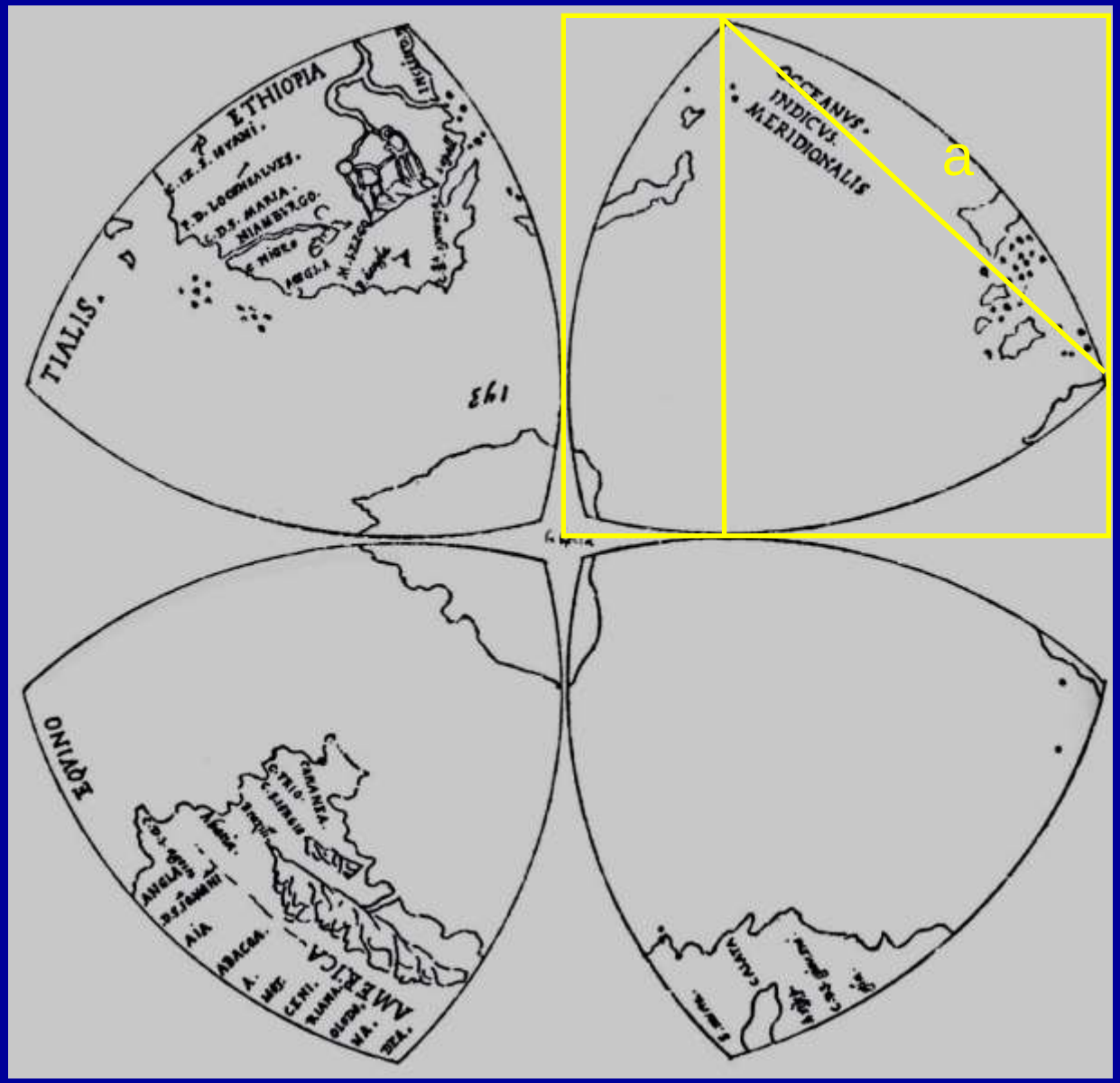


Keuning (1955), erroneus construction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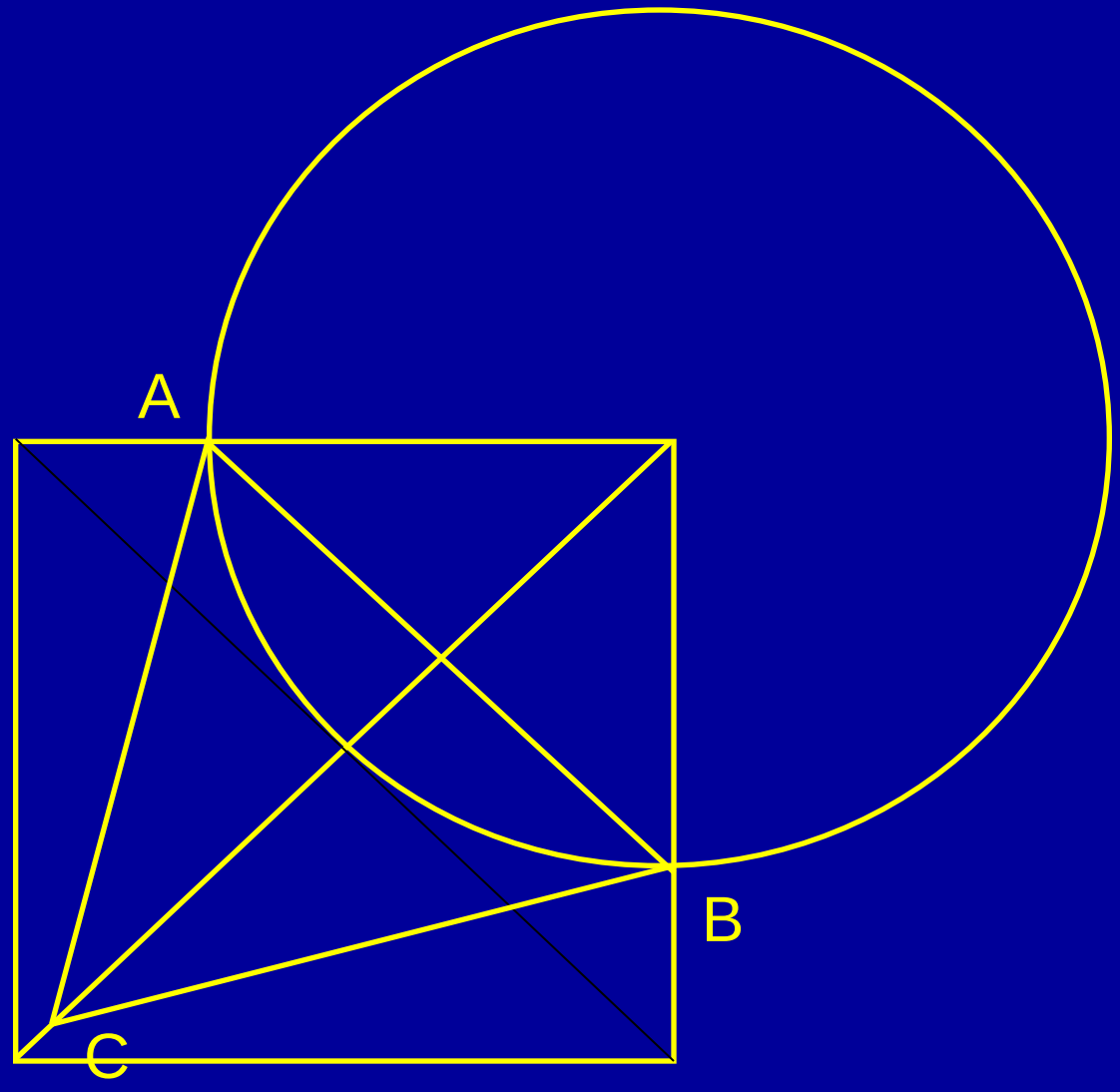
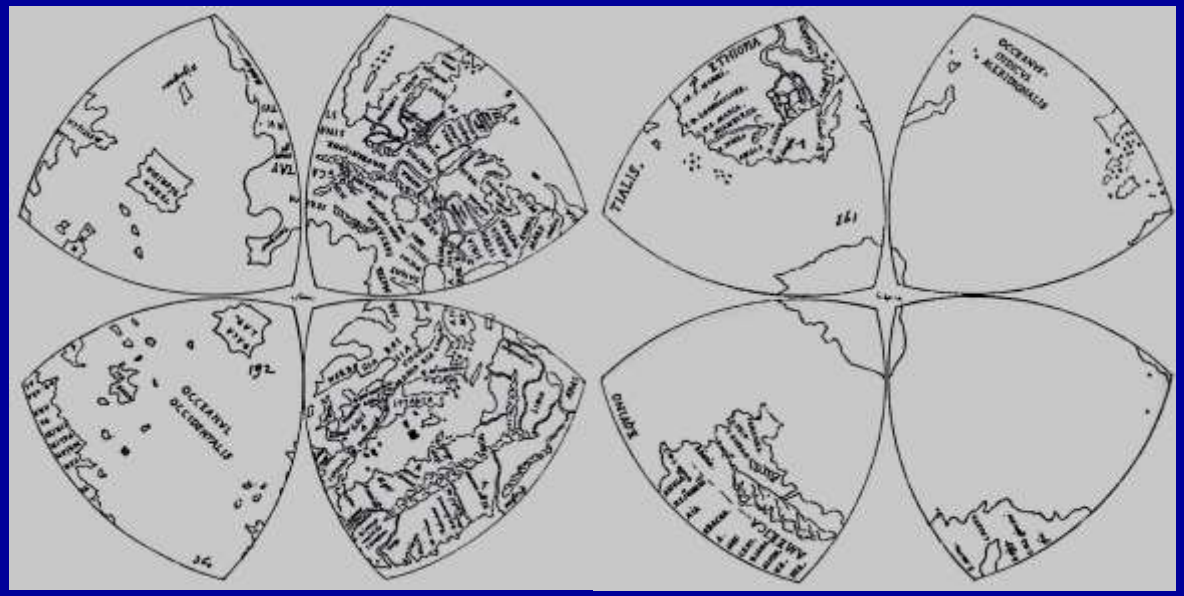
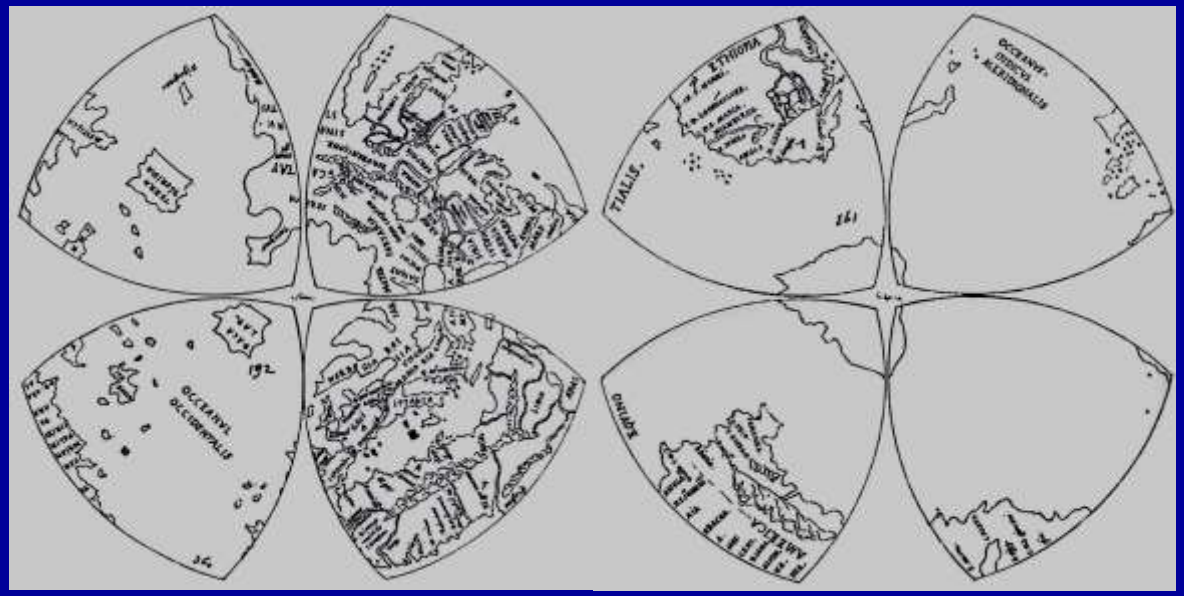

A
B
C



4. Map projection

No meridians, no parallels
Unique, without predecesors in Antique and Middle Ages



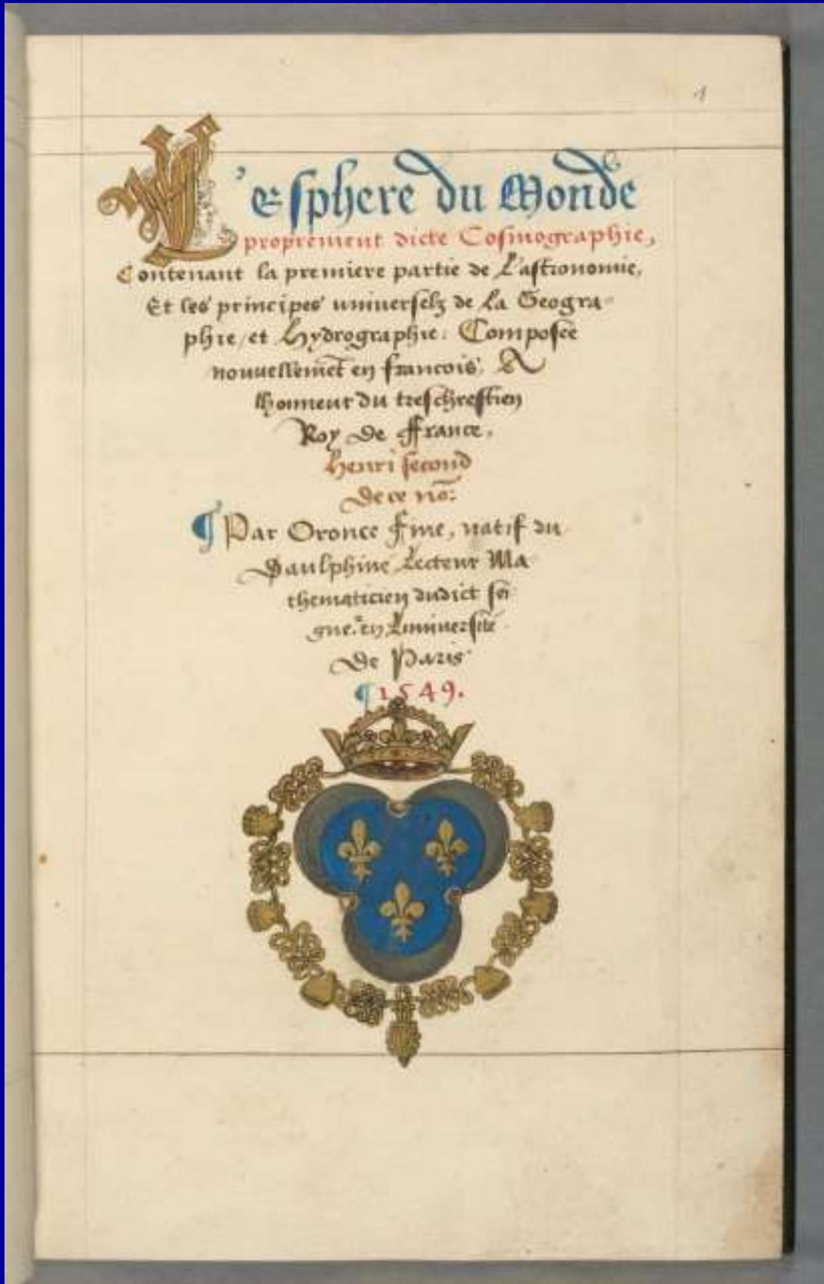
5. Da Vinci projection after da Vinci

Finé (1549)
Le Testu (1556)
Fiorini (1894)
Anthiaume (1916)
Uhden (1938)
Keuning (1955)

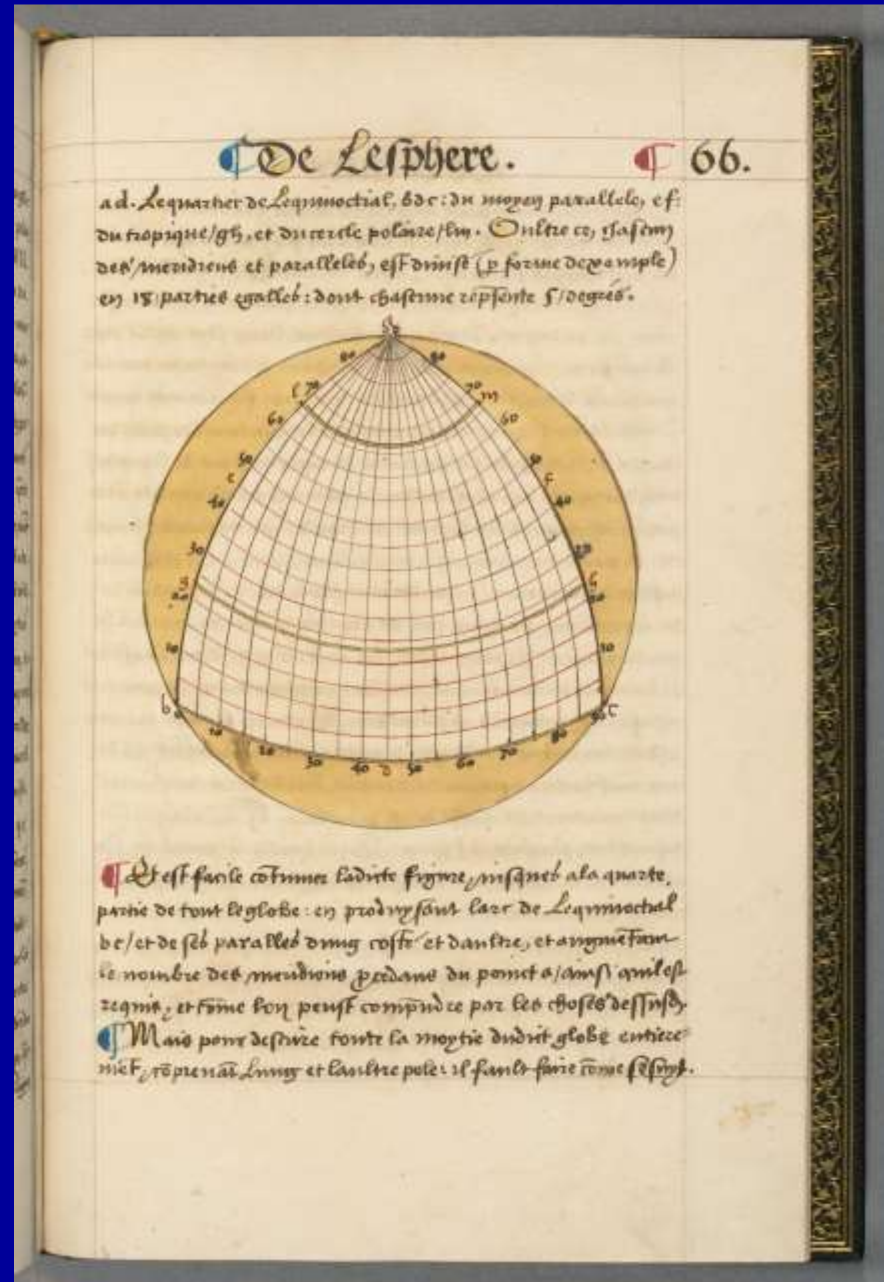
Oronce Finé, Orontius Finaeus (1494–1555)

Le sphere du monde, proprement ditte Cosmographie, ...
De Mundi Sphaera, sive Cosmographia, lib. V

several editions in French and Latin



Harvard University – Houghton Library / Fine, Oronce, 1494-1555. Le sphere de monde : proprement dicte Cosmographie : manuscript, 1549. MS Typ 57. Houghton Library, Harvard University, Cambridge, Mass.



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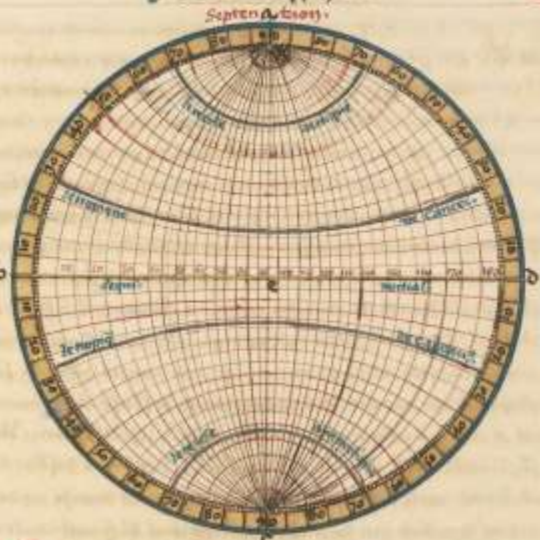
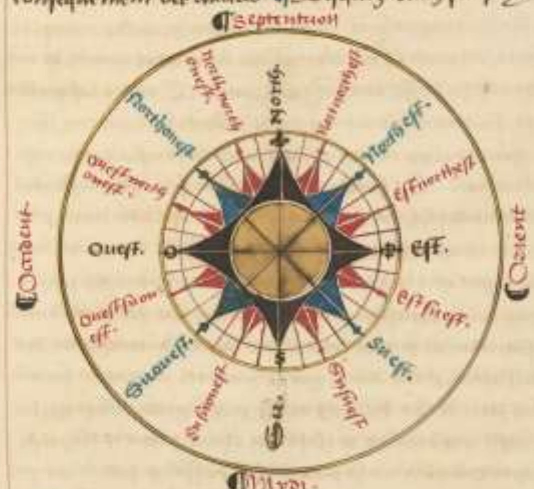


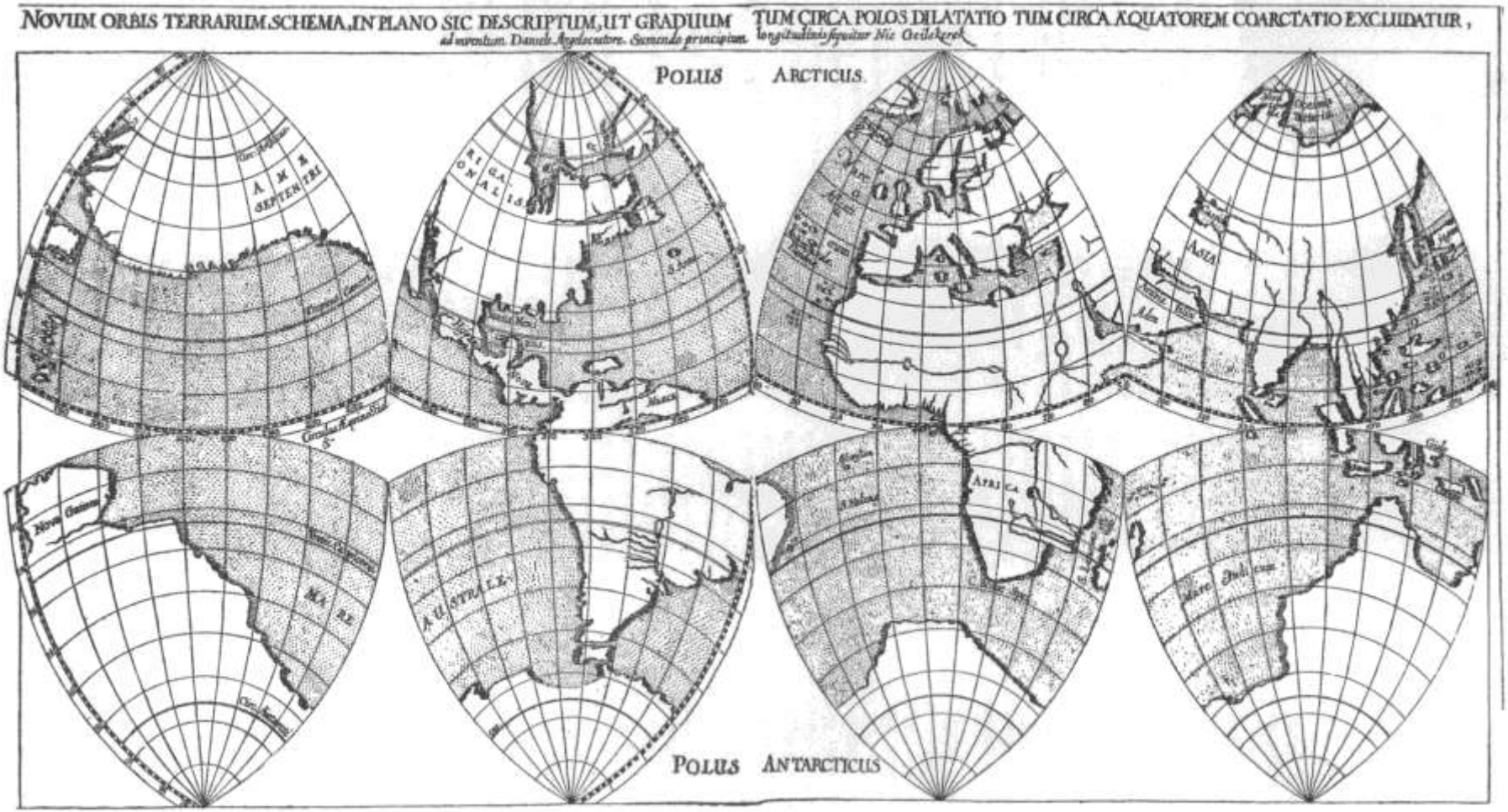
De la distinction des ventz, selon les hydrographes: Et de la vraye composition des cartes, que lon appelle marines, Chappitre VIII.

En delaissant pour le present la distinction des vetz, faicte iadis par les naturelz philosophes; qui mettoyent 12 ventz, et leur donnoyent les noms prins en partie des regions desquelles ilz procedoyent, et en partie des effectz et qualites quilz introduysent sur la terre: Nous descrirons les ventz dessusdictz, selon lart et usaige des hydrographes et mariniers, tant pour lusaige de naviger, que pour la composition des cartes marines: qui contiennent

chascun intervalle desdictz 16 ventz, est de rechief party en deux moytiees, qui designent les quartz des ventz dessusdictz: Dont les noms sont pareillement composez des deux principaulx collateraulx. Come le quart de vent qui est entre le North et northnortheest, est nomme North ung quart de northest: Et celluy qui est entre le Northest et ledict North northest, est appelle Northest ung quart de north. Et ainsi consequemment des aultres. Lesquelz ventz sensuyt la figure.



Pour descrire doncques lesdictz ventz en platte forme, et faire les cartes marines appellees hydrographiques: Il convient noter, que les cartes marines representent commodement la moytie de lesphere, exprimee sur la platte forme de lhorizon.

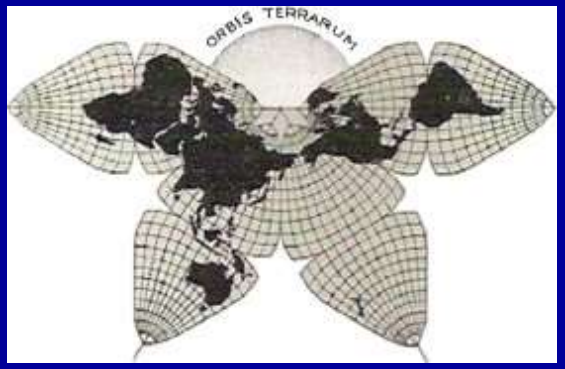


Globe gores by N. Geelkerken, *c.* 1616. (Owned by C. R, Linga, Mexico D.F.).

Daniel Angelocrator, Nicolaas Geelkercken 1616

Da Vinci map projection had no practial application during 18th and 19th century

In 1914 Cahill projection appeared (published 1909, patented 1913) Globe was divided into 8 equal parts (octants) and mapped into plane arranged to resamble a butterfly – a Butterfly Map



Cahill map projection inspires researchers even in the present days!

ICC 2013, Dresden, August 25–30, 2013

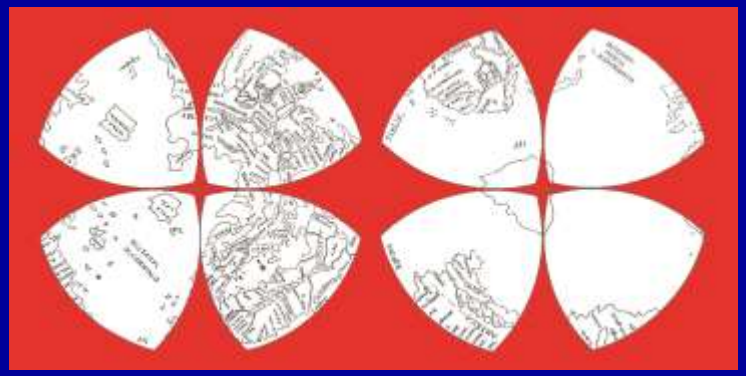
10 abstracts/papers submitted from Croatia

ICA Committee on Map Projections will have a meeting in Dresden on August 24, 2013, 17:00-19:00 in the lecture roome at TU Dresden, Bergstraße 64, 01069 Dresden.

Everybody is welcome!

Conclusions on Leonardo da Vinci world map

Open questions:
Date of production
Authorship
Map projection



Known:
Unique, without predecesors
Da Vinci-Reuleaux triangle
Oronce Finé map projection
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even in the present days!

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Thank you!