

Time and Human Life

1700 Years after Scipios Dream



Raphael's Sleeping Scipio

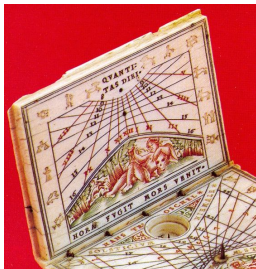


Philipp Uffenbach

R. Folk

Lviv October 2014

Time and men's death



Grave stone [1.1×0.8 m]

1200 BC Popiv Yar

©Larisa Vodolazhskaya

Vodolazhskaya: arXiv:1309.7238v1

in tomb of King's Valley

1100 BC Egypt

©Univ. Basel

arXiv:1408.0987

Memento mori

~ 1600 Nuremberg

©Mus. Hist. Science Oxford

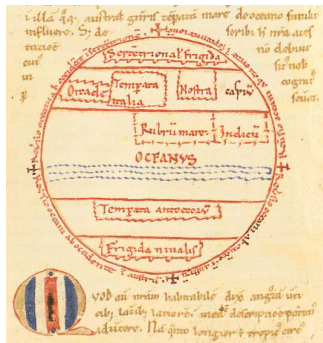
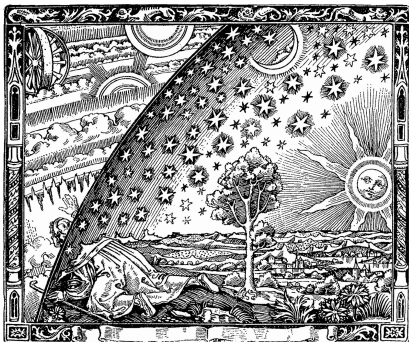
Scipio's vision 54 - 52 BC



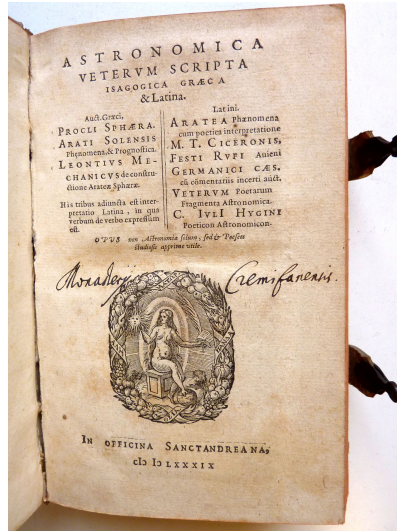
Scipio asleep in bed, above him: Earth with Rome and Carthage shown in centre of the heavenly spheres. Scipio, his father and grandfather as shown in the Milky Way in three scenes. In addition the planetary spheres are shown. **The souls of men are identified with the stars of the Milky Way.**

Cicero; Macrobius (commentary)
manuscript from 1383

Scipio's vision [54 - 52 BC]



Now the noblest [activities] are cares and exertions for our country's welfare. And the soul which has been enlivened and trained by these will speed more fleetly to this its resting-place and home. [*Sunt autem optimae curae de salute patriae, quibus agitatus et exercitatus animus velocius in hanc sedem et domum suam pervolabit.* Cic. rep. 6, (29)]



H. Tauber, *Die astronomischen Erkenntnisse des M. T. Cicero über den Sternenhimmel* 2014 Nuncius Hamburgensis Bd. 28

[The astronomical knowledge of M. T. Cicero about the starry sky]

Aratus [310 - 245 BC] and Hyginus [64 BC - 17 AC] constellations



from Dürer's map



Hyginus constellation Perseus
Poeticon Astronomicon



Mainz globe
150 - 220 AC

The time about 1600



Rudolf II (1552 - 1612)

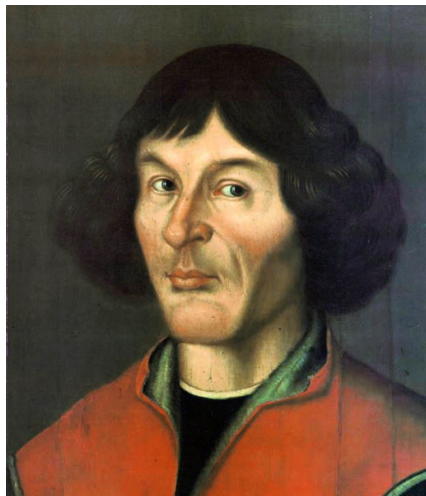


Ferdinand von Innerösterreich (1578 - 1637)

[Archduke of Inner Austria]

Cuius regio, eius religio [Whose realm, his religion]

The time about 1600



Kopernikus (1473 - 1543)



Tycho Brahe (1546 - 1601)

Curriculum and oeuvre of Philipp Uffenbach (1566 - 1636)

1566 born in **Frankfurt/Main**

Traveling in Germany and Italy

1592 Marriage with Margarete Hoffmann and taking possession of the workshop of the father in law

1598 Conferment of the citizenship Frankfurt's; *Zeitweiser*

1599 *Himmelfahrt Christi* (Ascension Christi) in the Dominikaner Church

1603 Coloring of the 'Rechneistube' (a room) in the 'Römer'

1619 *De quadratura circuli* several editions

1636 died in Frankfurt

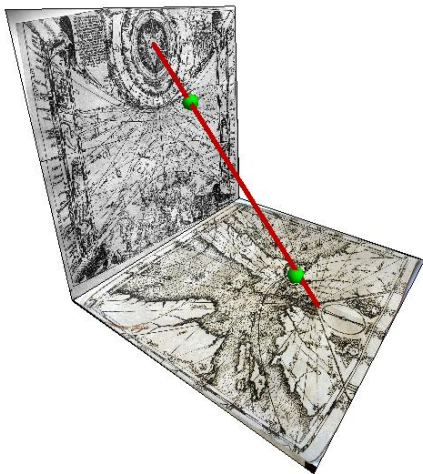
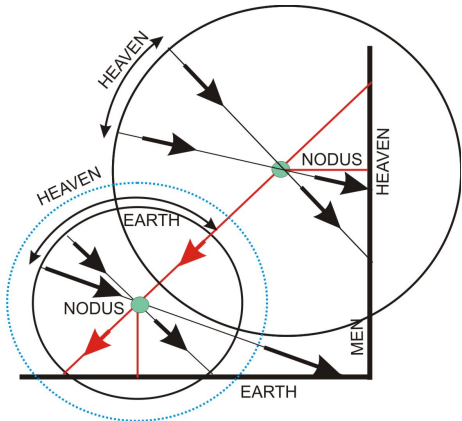
Interest in mechanics, geometry, anatomy and alchemy



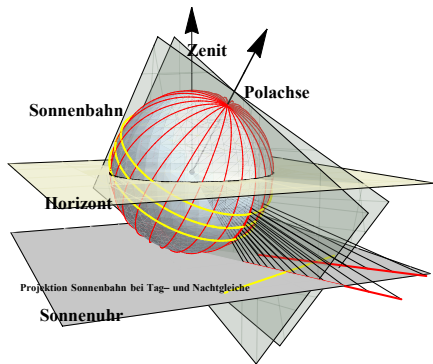
self portrait1591

Der Zeitweiser: /welches nun das ganze Werck auff die vier gröste Wunderwerk
GOTtes zeigt. Als Himmel/Erdt/die Zeit und der Mensch

*The Time Pointer: which now shows the four greatest marvels of GOD. As
Heaven/Earth/the Time and Men*



Gnomonic projection

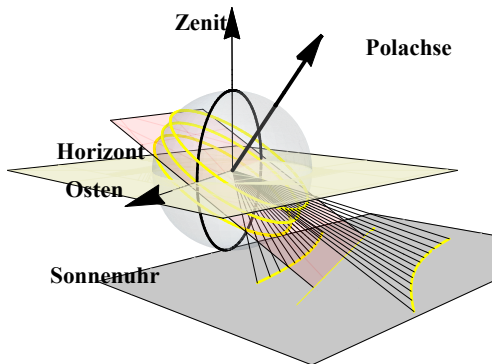


Equal hour lines

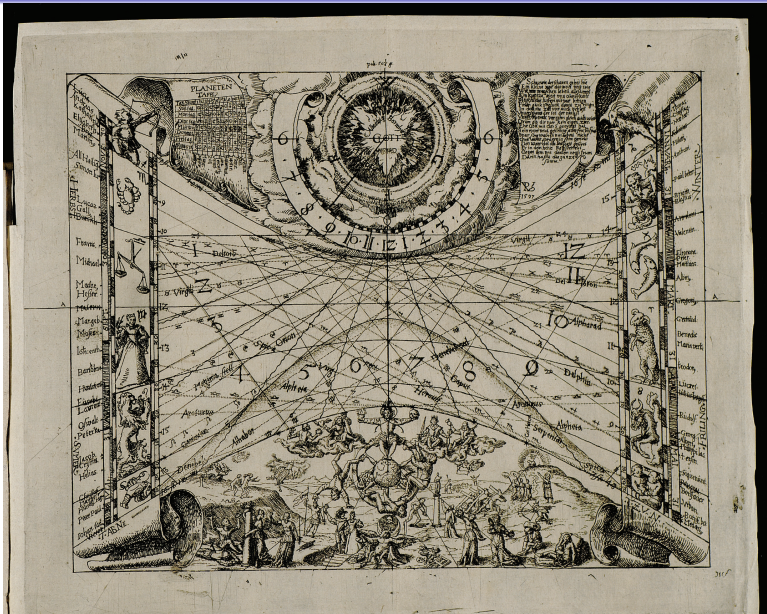
Great circles in straight lines; small circle in hyperbola

One needs only compass and straight-edge Dürer *UNderweysung der messung ...*

[Four Books on Measurement] 1525



Diurnal lines



The calendar



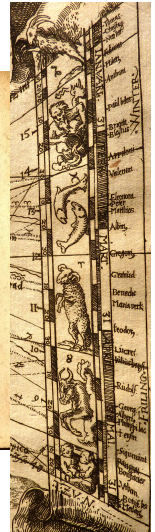
- Names of the day
- Division of the month
- Signs of zodiac
- Division of signs into 30 degrees
- Length of the day
- Length of the night

612

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																										
1	11	10	9	8	7	6	5	4	3	2	1	11	10	9	8	7	6	5	4	3	2	1	11	10	9	8	7	6	5	4	3	2	1																							
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9	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2	1		
10	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1				
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							

Length of the day as function of pole height

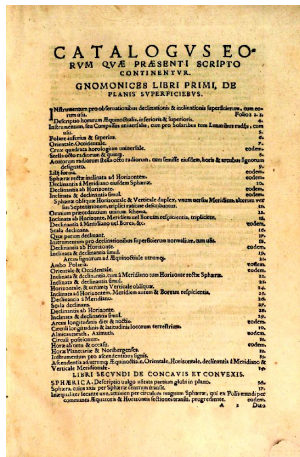
Andreas Helmreich
Rechenbuch 1595



Equinox on March 11. according to the Julian calendar!

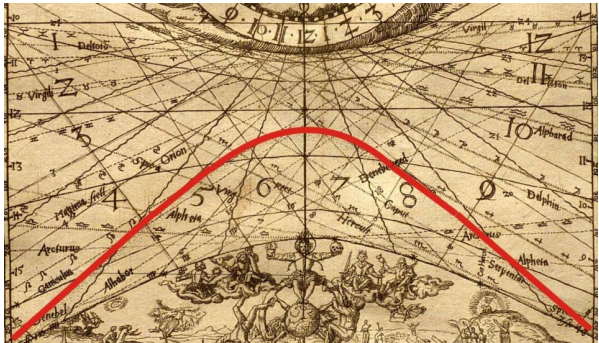
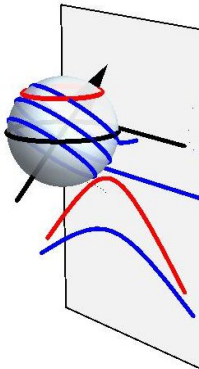
The lines of the vertical sundial

- the clock with common hours
- the Babylonian and Italian hours
- the planetary hours
- the diurnal arc when entering a sign of zodiac
- the alcumantar for 45 degrees
- the ascending signs of zodiac
- some of the brightest stars



Lit.: Andreas Schöner, *Gnomonices* 1562; Eberhard Welper, *Gnomonica* 1672, *Neu-Vermehrte Gnomonica* 1708; Johann Stengel, *Gnomonica* 1675

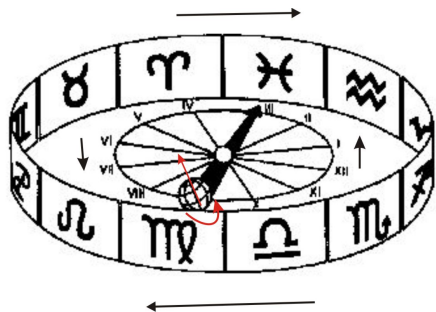
The almucantar or contour line



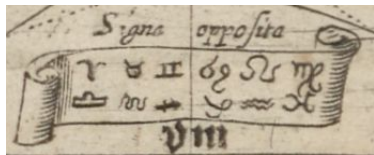
In Europe introduced by **Hermann from Reichenau** (or Hermann the Cripple) in the 11. century from arabic manuscripts.

Example: **Queens' College in Cambridge (UK)**

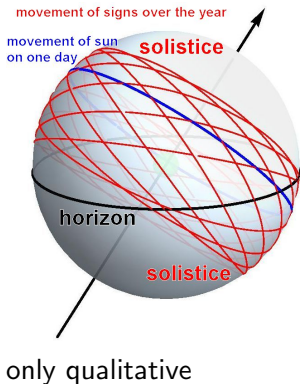
The ascending signs of zodiac until noon



☼ in	Asc 1	Asc 2	Asc 3
♈	♌	♍	♎
♌	♍	♎	♏
♍	♎	♏	♐
♎	♏	♐	♑
♏	♐	♑	♒
♐	♑	♒	♓
♑	♒	♓	♈
♒	♓	♈	♉
♓	♈	♉	♊
♈	♉	♊	♋
♉	♊	♋	♌
♊	♋	♌	♍
♋	♌	♍	♎
♌	♍	♎	♏
♍	♎	♏	♐
♎	♏	♐	♑
♏	♐	♑	♒
♐	♑	♒	♓
♑	♒	♓	♈
♒	♓	♈	♉
♓	♈	♉	♊
♈	♉	♊	♋



The ascending signs (vertical sundial)

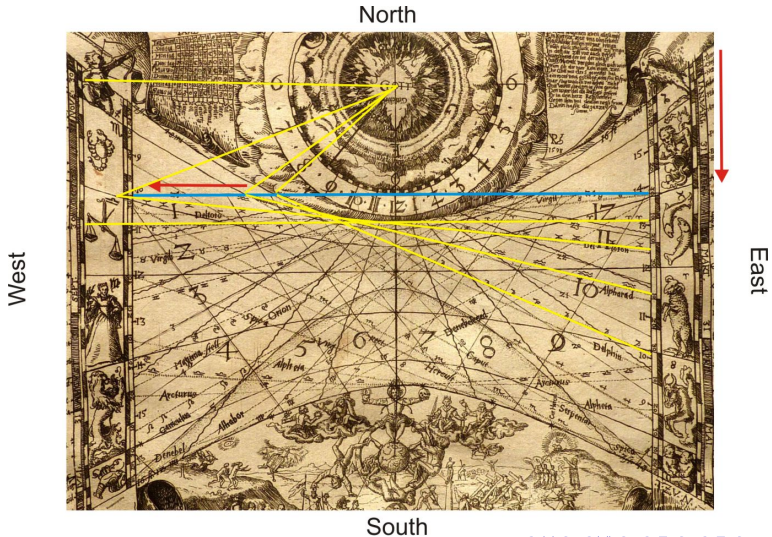


...if the top of the gnomon touches with his shadow such a line, one may conclude that the sign ascends with which the line is labeled

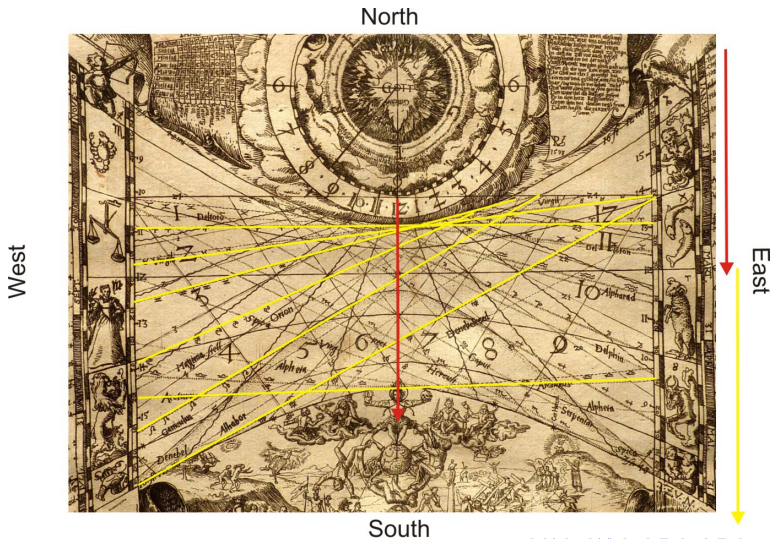
But one has first to judge if this sign can ascend or not on this day. This can easily be concluded from the sign in which the sun stays.

E. Welper *GNOMONICES...* 1672 [Zweyter Theil Chapter 14 page 73]

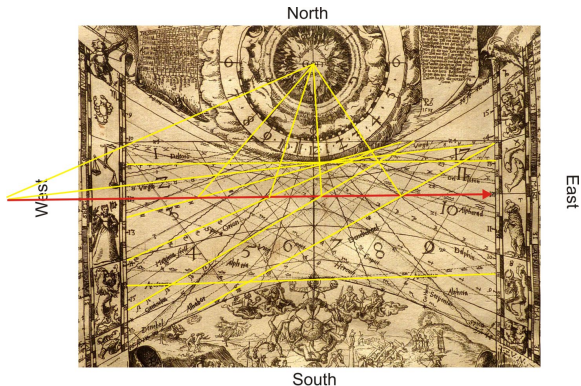
The signs (in which the sun stays) ascend or descend on the horizon with the sun (vertical sundial)



The signs which ascend at the horizon at noon (vertical sundial)



The signs which ascend at equinox (vertical sundial)



sign	time
♈	06:00-07:00
♉	07:00-08:15
♊	08:15-10:00
♋	10:00-12:30
♌	12:30-15:15
♍	15:15-18:00
♎	18:00-20:45

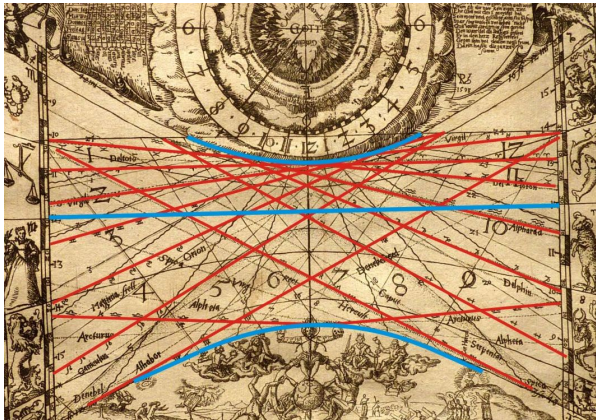
Begin of April 2012

©HUG Industrietechnik und

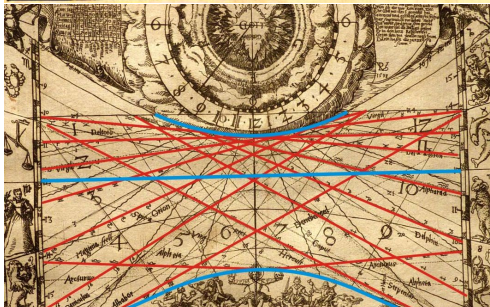
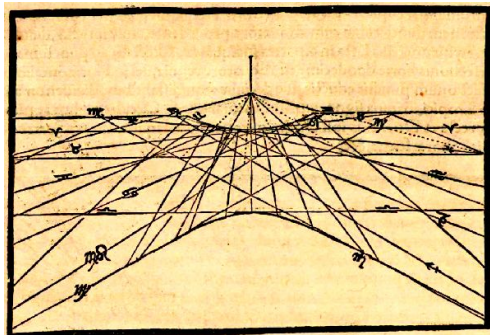
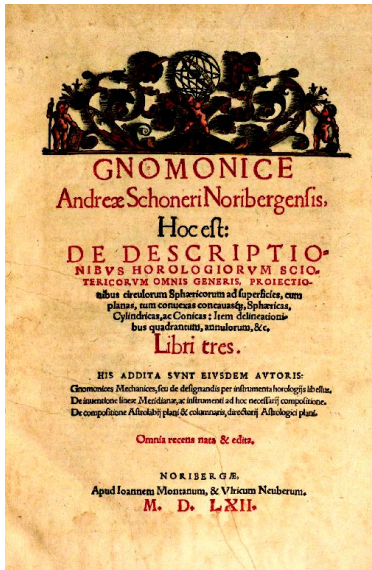
Arbeitssicherheit GmbH

Ergolding/Germany

The ascending signs (vertical sundial)



See: E. Welper *GNOMONICES...* 1672 [Zweyter Theil Chapter 14 page 72] after Andreas Schöner *GNOMONICE* 1562; *Neu-Vermehrte Gnomonica* 1708; Stengel *Gnomonica* 1675 Chapter 7 Figure 39

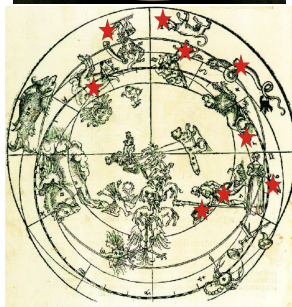
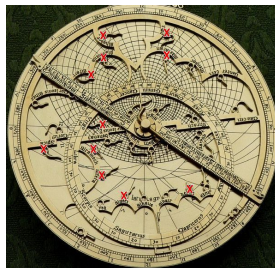


upper Fig. right side on page XXXV verso

Names

Name	Ident.	Apian/Perb.
Alhabor	α CMa	1/9
Alpharad	α Hya	3/11
Alpheta	α CrB	-/19
Arcturus	α Boo	7/18
Caniculus	α CMi	2/-
Caput Serpentar	α Oph	-/23
Delphin	Del	-/27
Deltoto		
Deltoton	Tri	-
Denebel		
Denebeled	β Leo	5/14
pect Herculi	Her	
Spics Virg, Spica	α Vir	6/16
Virgil, Virgili	Tau	13/-

P. Apian, *Instrument Buch...* Ingolstadii 1533
 Hatice Skarits, *Die Sterne des Peurbach- Astrolabiums und ihre arabische Namen*. Peurbach-Symposium 2008



TAVRVS.							
Longi- tudo.			Lati- tudo.		Magni- tudo.	Signa octa- uæ sphaera.	Nomina
G.	M.	P.	G.	M.			
2	30	B	6	0	5	Australior in rictu Arietis	
3	40	A	6	20	4	Capilli Ceti	
8	0	A	5	0	4	Extremum posterioris pedis	
8	40	B	6	0	6	Lumbus Arietis	
9	0	A	1	30	5	Poplus Arietis	
10	40	B	1	30	5	Posterior cruris Arietis	
12	20	B	4	50	5	Radix caudæ Arietis	
14	50	B	1	40	4	Præcedens in cauda Arietis	
16	20	B	2	30	4	Media trium in cauda	
17	0	A	7	15	4	Sequens in sectione Tauri	
17	20	A	6	0	4	Borealior sectionis Tauri	
18	0	B	1	50	4	Vltima caudæ Arietis	
23	10	B	4	30	5	Ex Virgilijs	
23	20	B	3	40	5	Ex Virgilijs	
24	40	B	3	20	5	Ex Virgilijs	
24	40	B	5	0	5	Præcedens in collo Tauri	
28	0	B	0	40	5	Australior antecedentium quæ	
29	0	B	5	0	5	Borealior antecedentium quæ	
29	30	B	7	20	5	Sequens in collo Tauri	
30	0	B	1	0	6	Ex Sucleis	
3	0	A	5	15	3		

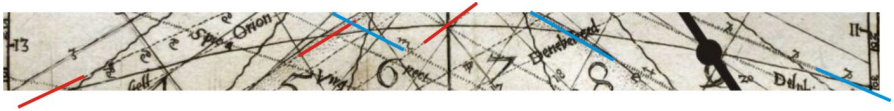
D. Santbech *Problematum Astronomicum...* 1561

708 RVDIMEN. COSMOGR.
CIRCVLORVM AC SY-
derum quorundam Sy-
nonyma.

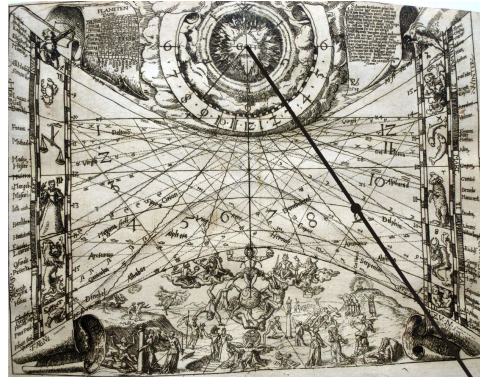
Zodiacus,	Idem signifer: qui duodecim signa capit	
Aequator,	Aequinoctialis,	
Antarcticus,	Australis,	
Arcticus,	Boreus,	
Lacteus,	Galaxias,	
Horizon,	Finitor,	
Tropici,	Solstitiales,	
Cynosura,	Visa minor,	
Helice,	Visa maior,	
Septentriones,	Plultrum,	
Arctophylax,	Bootes,	
Erichthonius,	Auriga,	
Hercules,	Engonasin,	
Procyon,	Canis minor,	
Sirius,	Canicula,	
Cygnus,	Auis,	
Ophiuchus,	Serpentarius,	φίξ
Claron,	Centaurus,	
Fera,	Lupus,	
Cetus,	Pisces,	
Ara,	Thuribulum,	
Pleades,	Vergiliae,	
Hyades,	Suculae,	
Lyra,	Fidicula,	
Deltoton,	Triangulus,	
Ophiuchus,	Serpentarius,	φίξ
Chele,	Libra,	
Aquila,	Vultur,	Milvus,
	Argo,	

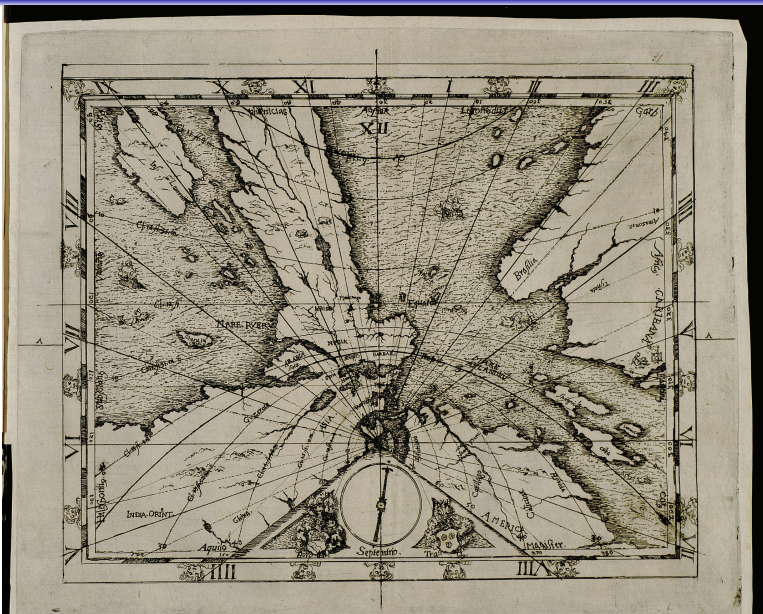
J. Honter de *Cosmographiae rudimentis*, Basel 1561, 1585

The shadow on the sundial



- already touched by the shadow: ascending **Cancer, Lion, Virgin**; descending **Scorpio, Sagittarius** in the next hour **Capricorn**
- it is **3** hours after noon;
- about the **11.** of **April** - the day of **Julius bapst**;
- the sun is **0** degrees in **Taurus**
- the length of the day is approximately **13 h 40 min**
- about **20** hours since sunset
- about **10** hours after sunrise
- it is the **9te** planetary hour







Space and time - local time

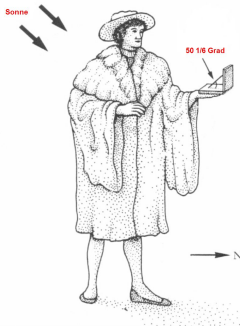
If we can compare different local times, we know our position on earth

local time

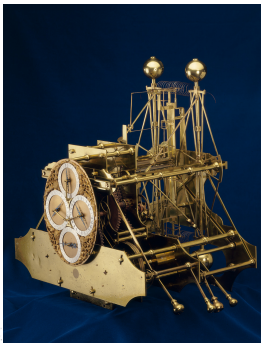
local time moved

again 'local time'

Lorentz 1895, Poincare 1904



sundial



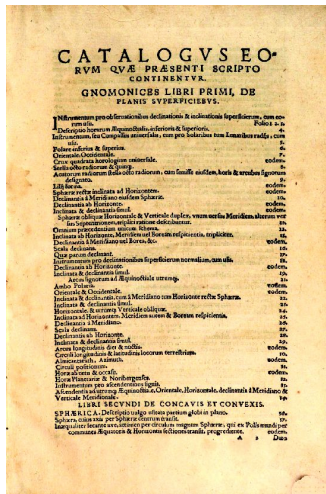
Harrison H1 1730-35



Hafele Keating 1971

The lines on the horizontal dial

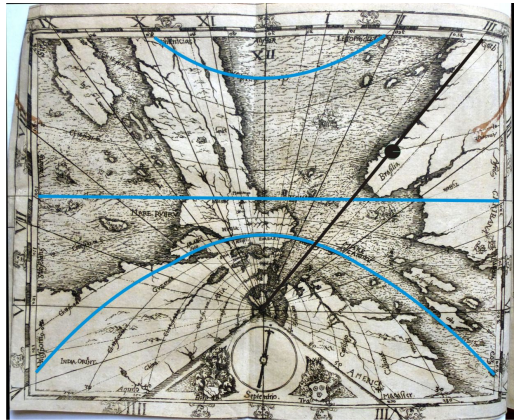
- The lines of equal hours (IIII - XII - VIII) and the *Meridionales*
- the longitudes through the pole (0 - 160; 270 - 360 every 10th degree, rews. together with the hour lines evry 15th degree)
- projections of the great circles through the zenith over Frankfurt (every 22.5th degree) in the 16 wind directions
- the maximal lengths of the day (denoted by C.L.) on the 'Parallelos', latitudes (70 degrees north to 20degrees south every 10 degrees)
- the tropics (of Cancer, of Equinox and Capricorn)



Lit.: Andreas Schöner, *Gnomonice* 1562; Eberhard Welper, *Gnomonica* 1672

The sun with one eye vieweth all the world. (Shakespear, Henry VI)

- in Frankfurt it is 3 o'clock in the afternoon
- 45 degrees west of Frankfurt it is noon e.g. in province Pernambuco in Brasilia
- 10 degrees south of the Equator is the maximal length of the day 12 h 31 min
- there is MACEIO, the most dangerous city in Brasilia
- there the sun is directly overhead [subsolar point (Wetzel DGC Jahresschrift 2003)], the latitude corresponds to the diurnal arc



©Monastery Chremsminster

- The Almucantars in the projection are circles around Frankfurt
- The great circles of the Twelve Houses correspond straight lines through Frankfurt

The centers



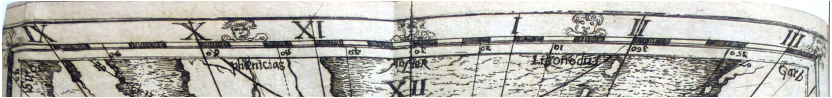
Great Circles through **Frankfurt**
Zenith

Center of the horizontal sundial
North

Classical compass winds

SIROC

GARB



J. Honter, *de Cosmographiae rudimentis*, Basel 1561, 1585

©Monastery Chremsminster

Beginning in the south clockwise: Auster S [Notus], Libonodus SSW [Libonotus, Austroafricanus], **Garb** SW [Lips, Liba], Africus WSW, Favonius W [Zephyr], Corus WNW [Caurus, Argestes], **Magister** NW, Tractus NNW [Thrascias, Circius], Septentrio N [Aparctias], Boreas NNE [Meses], Aquilo NE [Caecias], Helespontius ENE, Subsolanus E [Apeliotes], Vulturius ESE [Vulturius], **Siroc** SE [Eurus], phenicias SSE

The world and the time: Rumold Mercator 1587

Atlas sive Cosmographicae Meditationes de Fabrica Mundi et fabricati figura (1595)



The Caribbean Islands

CUBA

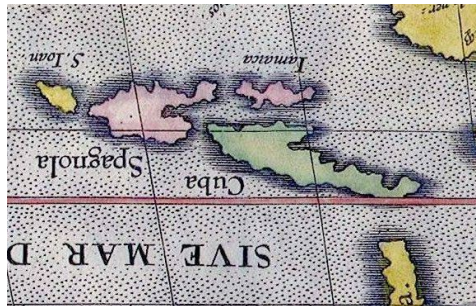
JAMAICA

SPAGNIOLA

S. IOHAN

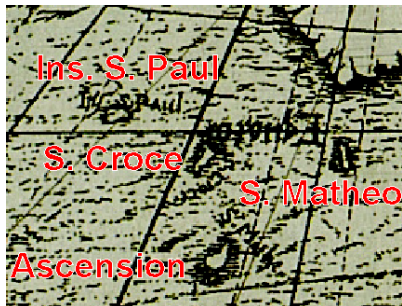


Uffenbach 1598 ©Univ. Göttingen

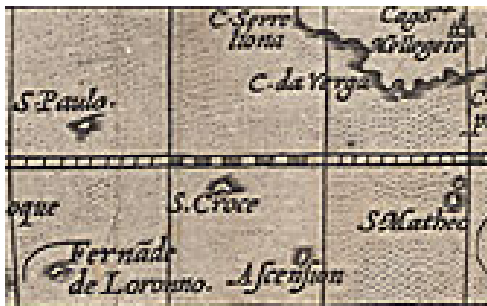


Ortelius 1589 ©Wikimedia Commons

The islands on the South America route



Uffenbach 1598 ©Univ. Göttingen



Hogenberg 1590 ©Univ. Salzburg

Socotra, the Christian island in the Arabic Sea



St. Sever Mappa Mundi 780 - 980

Socotra, the Christian island in the Arabic Sea



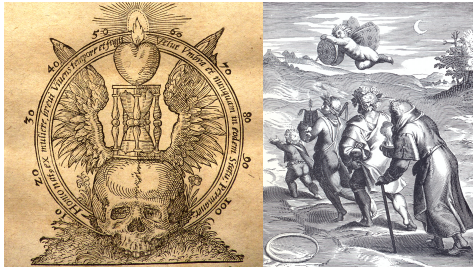
Waldseemüller 1507

Uffenbach 1598 © Monastery Chremsminster

Men and Time

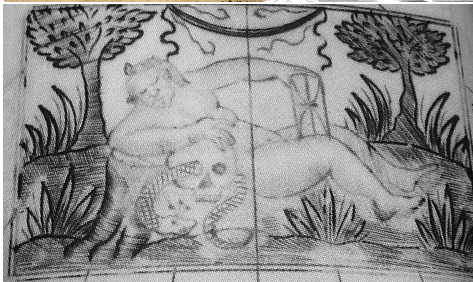
Frontispiz *Zeitweiser*
Man who is born of a woman is few of days and full of trouble. ... he flees like a shadow and continues not.

Hiob 14,1-2



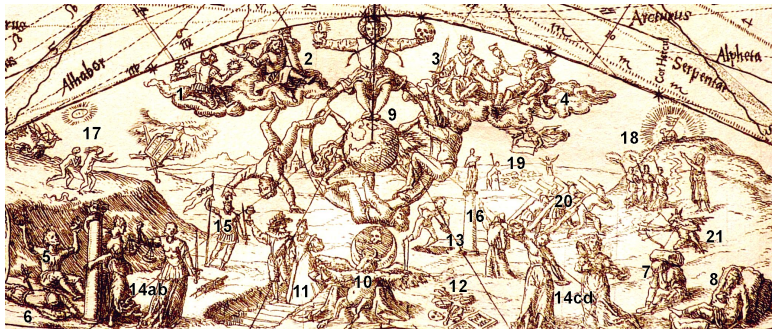
Marin Le Roy, Sieur de Gomberville *La Doctrin des Moeurs* 1646

Ivory Diptych Sundial



Michael Lesel
 Beginning of 17. cent.

The life of men



1: profane art 2: healthiness, strength 3: violence, wealth 4: peace, amity 5: lost of reputation 6: reduction of life 7: poverty 8: illness 9: wheel of life 10: monstrem of darkness 11: luxuriousness, gluttony 12: idleness, beguilement, lying 13: desperation 14: the four secular virtues a: courage, b: justice, c: temperance, d: prudence 15: pagan emperor 16: philosopher who adores his idol 17: Jewish people, expulsion from the Garden, Tables of the Law 18: Mount Zion, Lamb of God, John the Baptist 19: Annunciation to the shepherds 20: cross-carrying Christ 21: devil shooter

