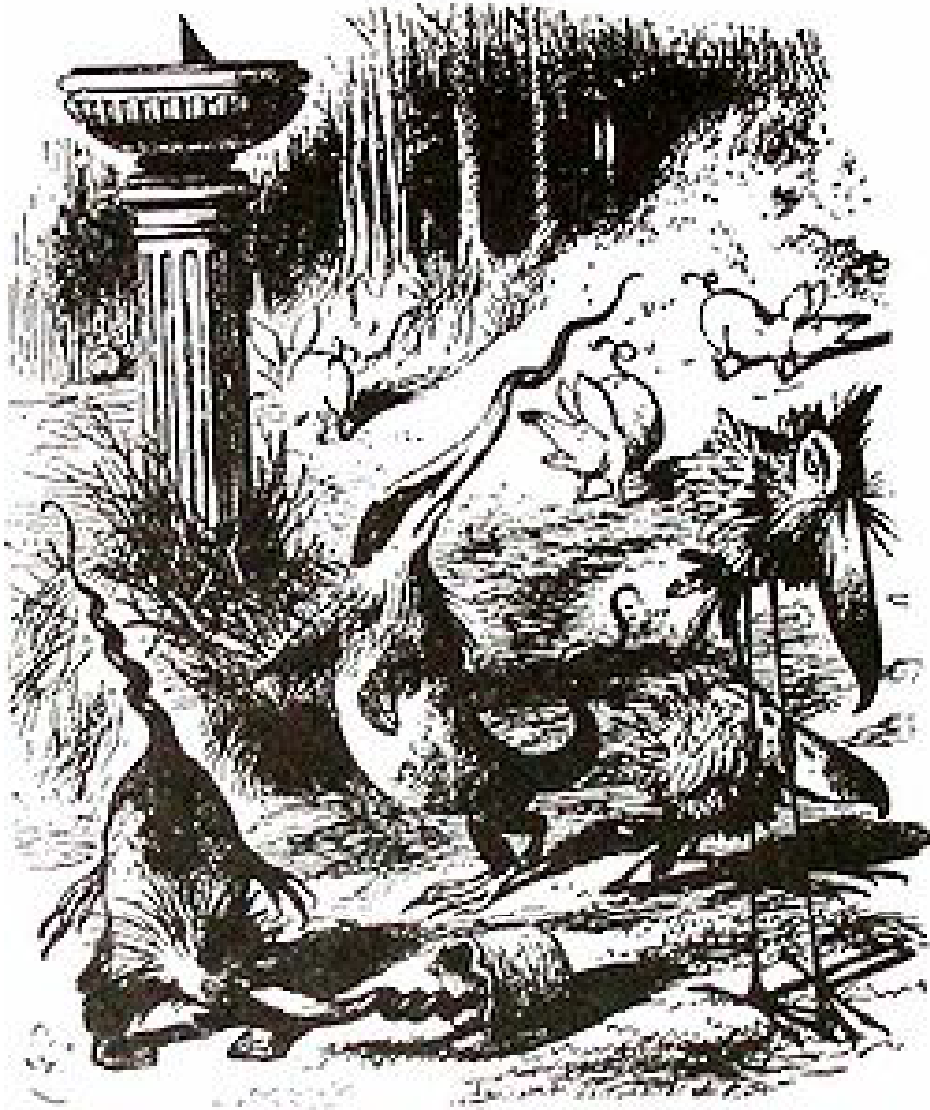


# SUNDIALS of the WORLD

Presented by Brian Albinson

Who has a lifelong fascination with sundials

# From: Alice Through the Looking Glass



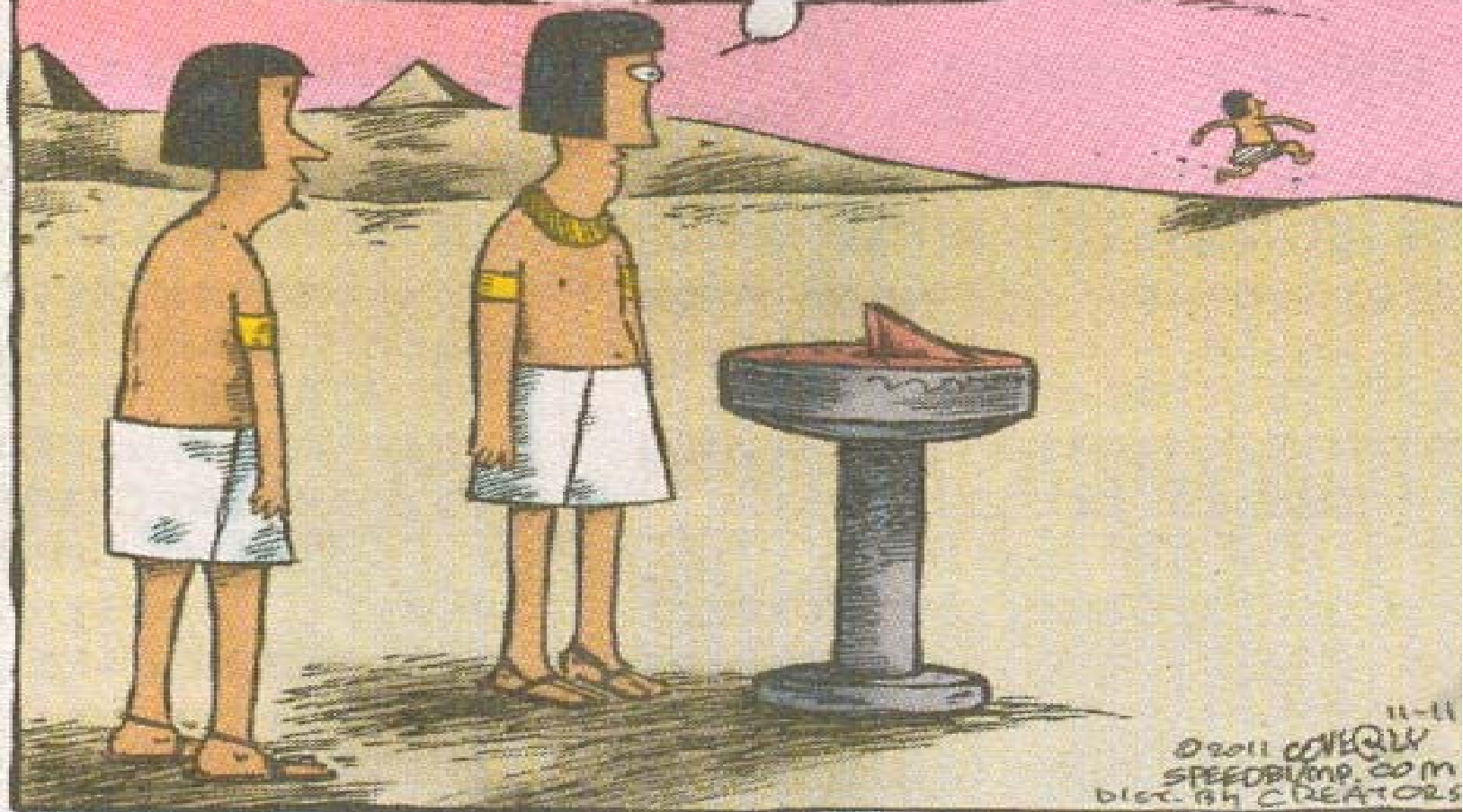
Humpty Dumpty says:

Toves are something like badgers, they're something like lizards, and they're something like corkscrews.

They make their nests under sun-dials, and they live on cheese.

## SPEED BUMP

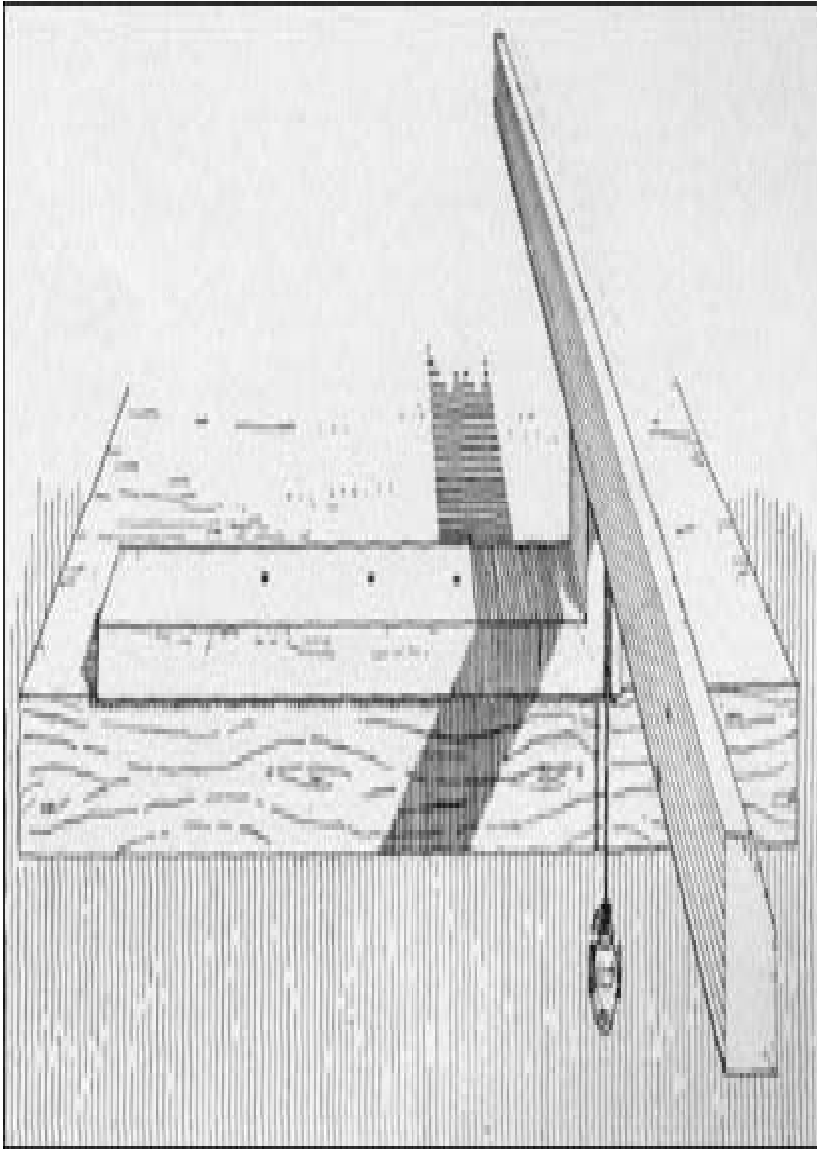
I DUNNO...HE INVENTED THIS  
"SUNDIAL", YELLED SOMETHING  
ABOUT BEING LATE FOR A  
"MEETING", AND RAN OFF.



The definition of an optimist is  
someone who builds sundials in  
Vancouver

Sundial interest today is not  
primarily as time keepers but as  
objects of art, cultural history  
and scientific curiosity.





This is the oldest  
known sundial from  
the time of  
**Tuthmosis III** ;  
3,300 years ago

A different dial was  
needed every 2  
weeks and they  
weighed half a ton

Sundials were a personal and community necessity for 3 millennia.

Clocks began to appear about the 14<sup>th</sup> Century but until the pendulum was introduced in the mid 17<sup>th</sup> Century, clocks were only accurate to +- half an hour a day;  
they had to be frequently reset by a sundial.

## 18<sup>th</sup> Century Watch Check using a Sundial Cannon





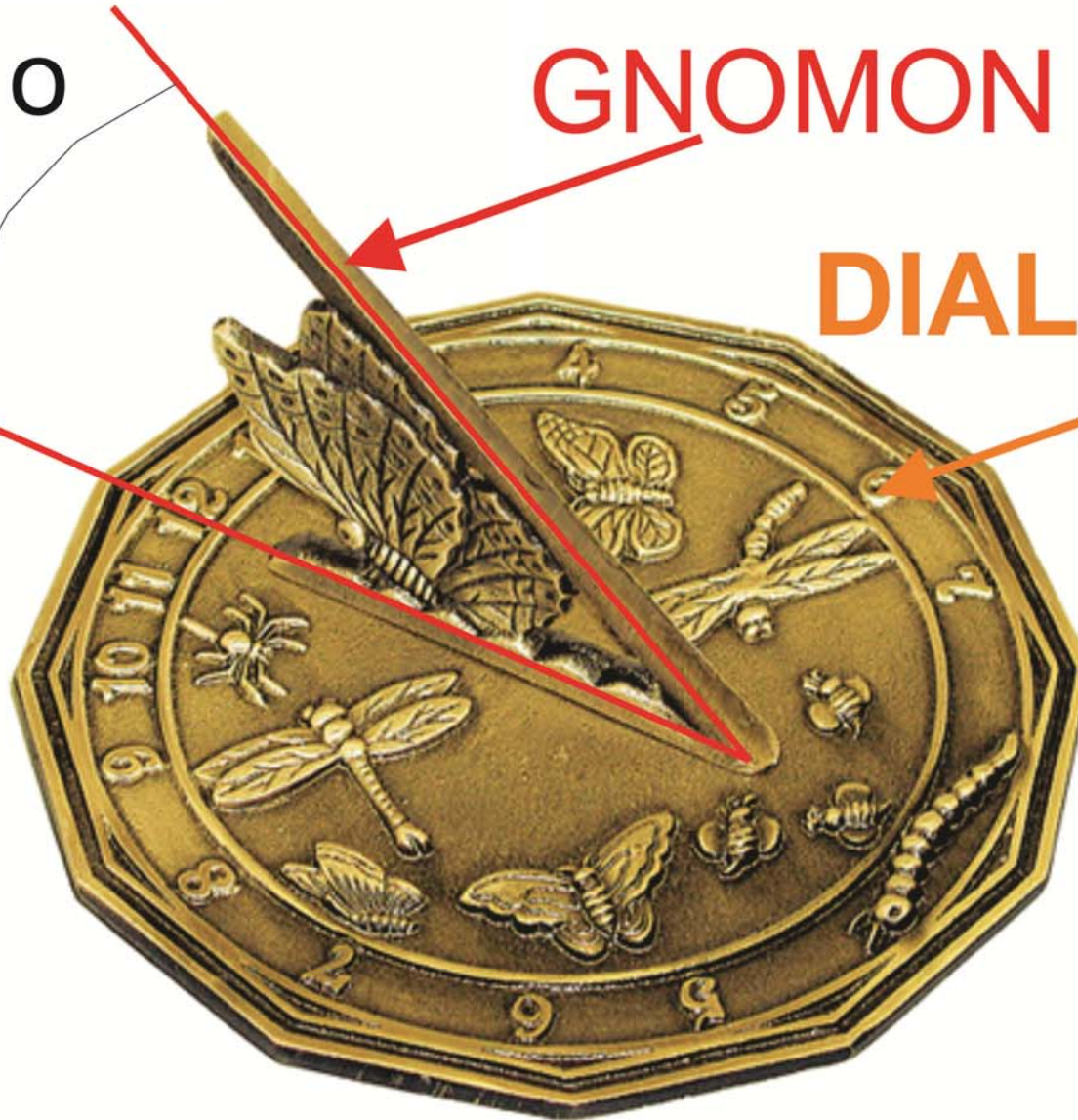
Some basic background

LATITUDE of  
EDGEMONT VILLAGE

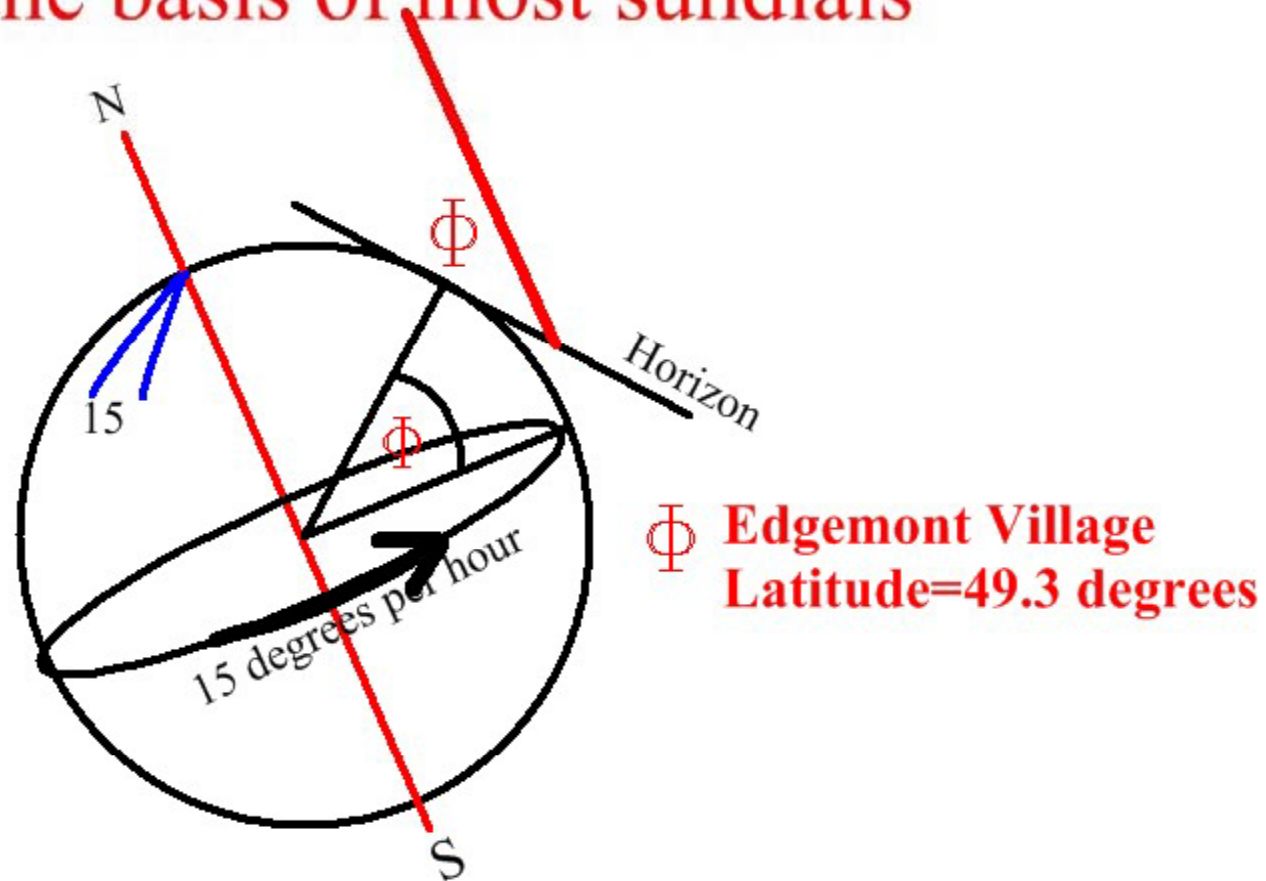
49.3°

GNOMON

DIAL FACE



Gnomon parallel with the earth's axis.  
This is the basis of most sundials



The Earth rotates an **inclined axis** once a day; and round the sun in an **elliptical orbit** once a year

Basic Sundials tell Sun Time.

To read Mean Time (or clock time) we have to account for

❖ The Equation of Time ( $\pm 16$  minutes)  
caused by the earth's elliptical orbit and  
axis inclination. This results in an  
**ANALEMMA** “8” shape Gnomon

❖ The Longitude correction (+ 12 minutes in  
Vancouver)

The **ANALEMMA** photographed at Delphi, Greece  
Taken at the same mean time every 10 days of the year



(c) 2005-6 Cenk E. Tezel  
& Tunc Tezel

There are hundreds of different kinds of sundial;  
for simplicity I have divided them into the  
following broad types.

- ❖ Horizontal or Garden Dials

  - ❖ Walk-on dials

  - ❖ Equatorial Dials

  - ❖ Elevation Dials

  - ❖ Hemispherical Dials

  - ❖ Vertical Dials



# HORIZONTAL or GARDEN DIALS

These are the simplest type of dial.  
Ananalemmas for garden dials cannot be  
used

# Russian girl bronze sculpture



# French oil lamp dial





## French and English Garden dials

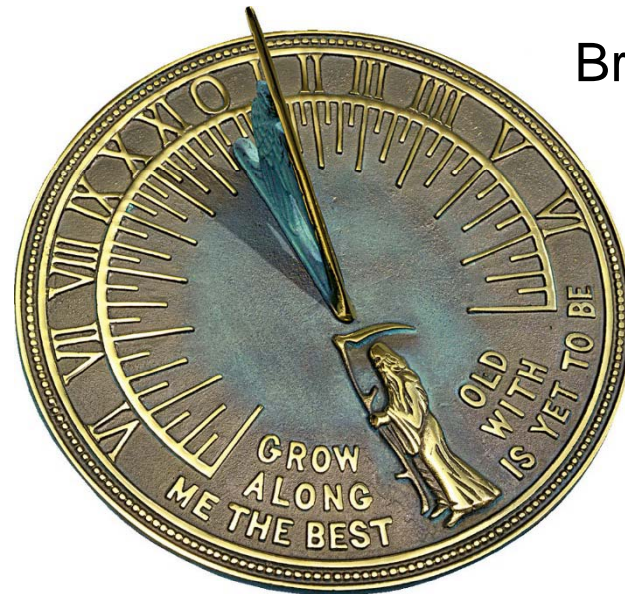




FRENCH Dial



British Dials



USA Dial







# ARGENTINIAN Dial





Spanish  
spiral

# TOKIO Dial



Horizontal or  
garden  
sundial.

Gnomon  
inclined at the  
local

**Latitude**



## Air India Memorial Dial



# Charleston Dial







Berkeley,  
California



# St Louis Botanical Garden





# Terrehaute In





# Flemington , New Jersey



# English Butterfly Dial



# WALK-ON DIALS

Without an Analemma

Tell sun time

not mean time.



# Ontario dial ?



# Australian Walk-on Dial



# German Walk-on



# Walk-on in Al Gore's Garden





# Walk-on in Banff



# Ontario Park



# School in England



# WALK-ON DIALS

With a

## SINGLE ANALEMMA

- ❖ Tell Sun Time all day
- ❖ Tell mean time during school hours



# SKAHA Beach Single Analemma Walk-on Dial, 1970's. Possibly the first in Canada



A walk-on dial at Braemar.





Gleneagles  
single  
analemma  
opening day



## CLEVELAND SCHOOL Single Analemma Dial: Opening Day



The mathematics for a much more  
sophisticated form the

## Double Analemma

Which tells Mean Time and Sun Time all  
day  
Were only published in 1996.

All my recent dials have been double  
analemma.

Prof. Berggren and the SFU Double Analemma Walk-On dial  
2002  
(the first in Canada)

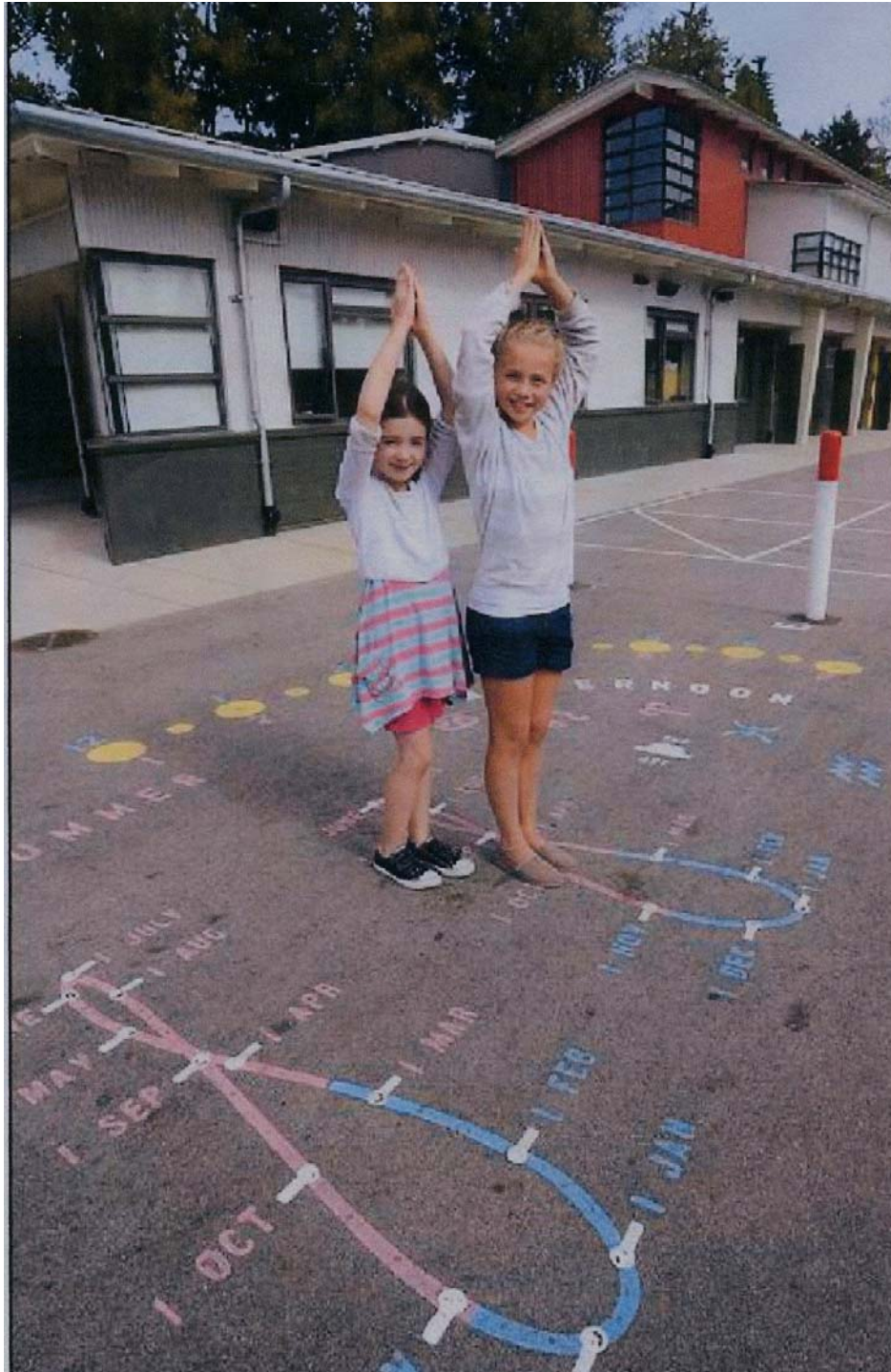




# Highlands School Double Analemma Dial 2010







# HIGHLANDS SCHOOL DOUBLE ANALEMMA DIAL

In use!

# SEYCOVE Double Analemma Dial Built by students





# PROPOSED DOUBLE ANALEMMA SUNDIAL at FOUR CORNERS, EDGEMONT VILLAGE



# PLAIN EQUATORIAL DIALS

Without analemmas

Tell Sun Time only

The GNOMON parallel with the  
earth's axis

The Dial face parallel with the equator



Henry Moore,  
CHICAGO



Jaipur Dial, India

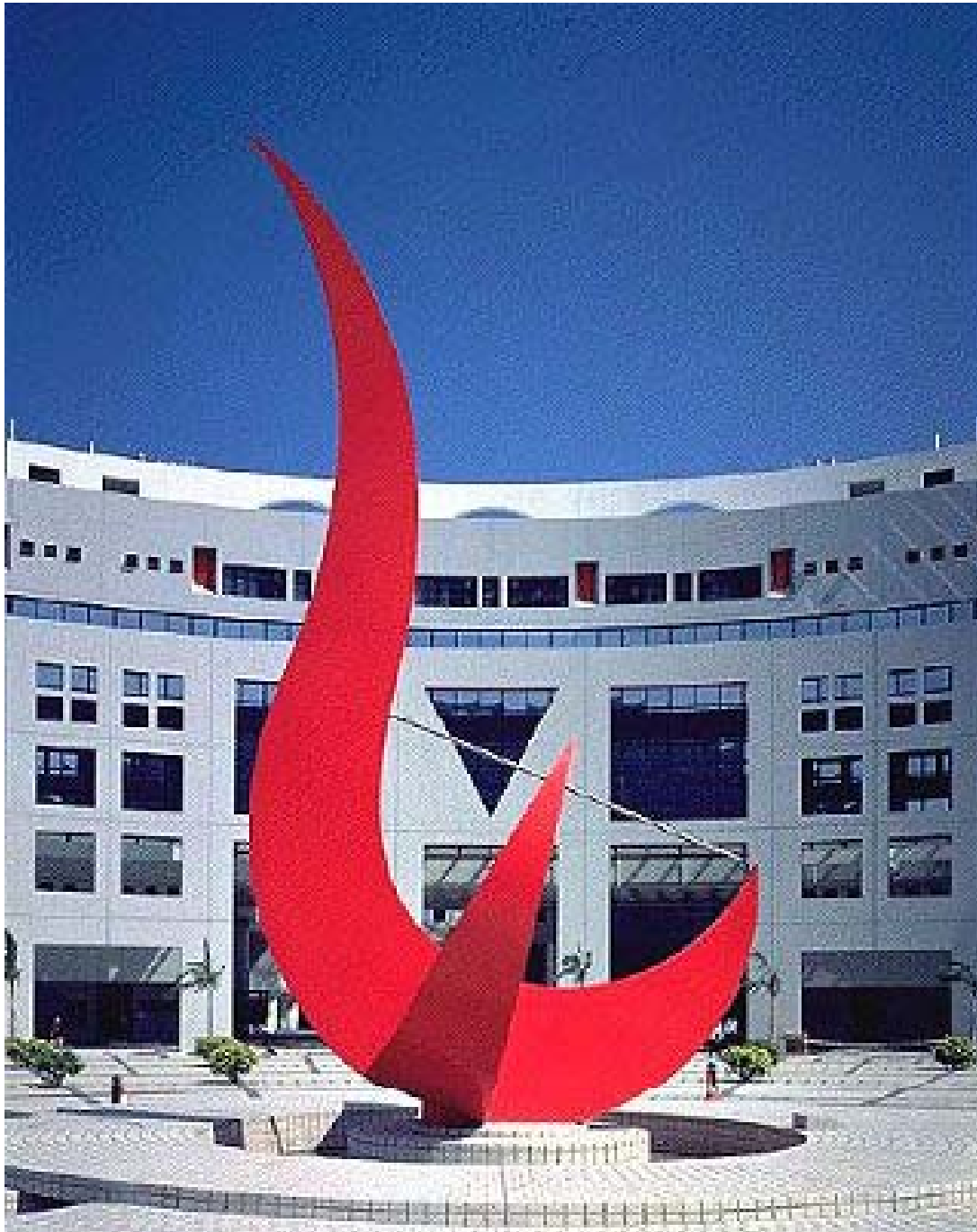




## Burlington Champlain Dial







HONG  
KONG



# Cupid Florida

Solid bronze



\$35,000

# Grenwich, London

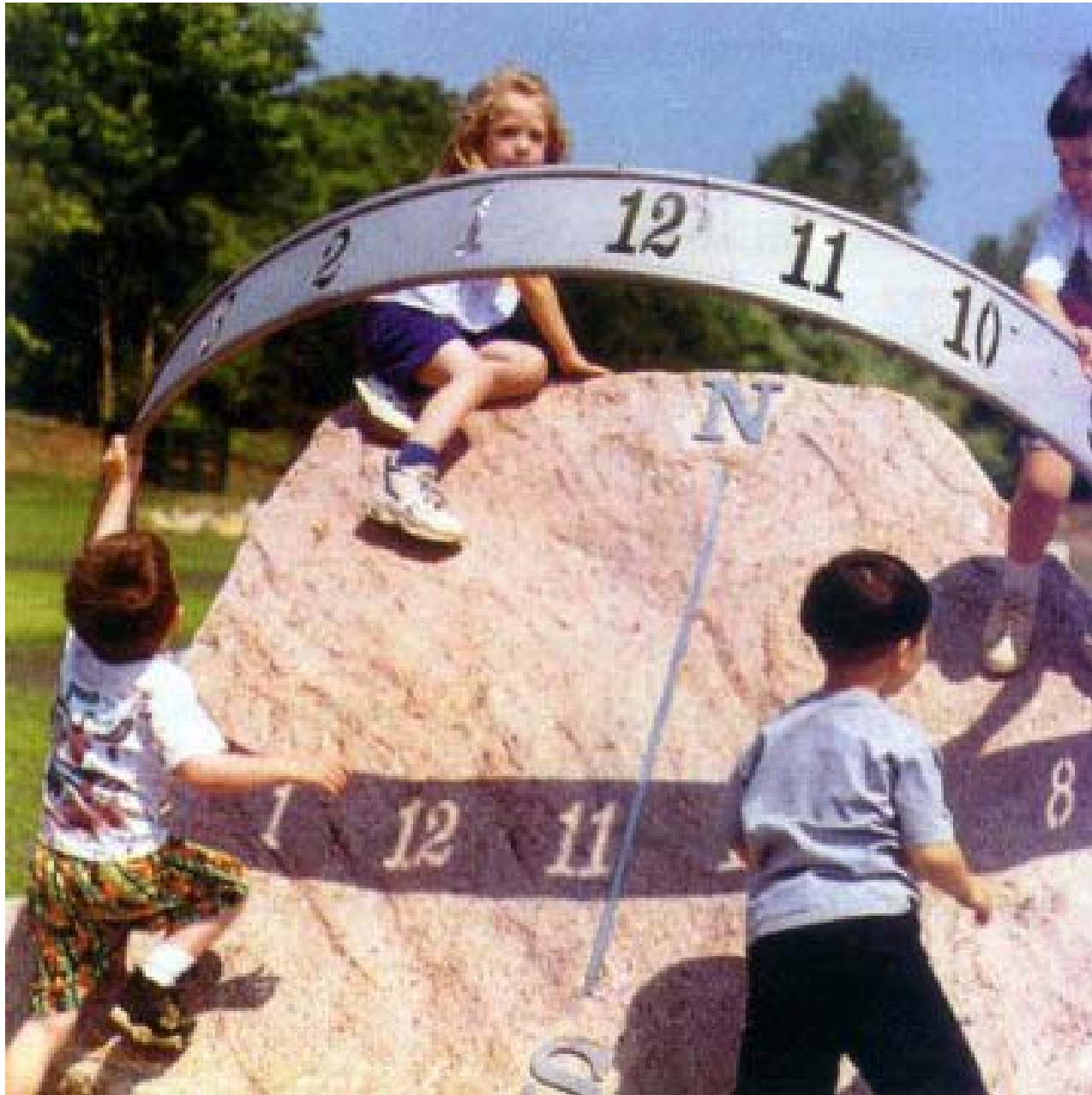


# London England

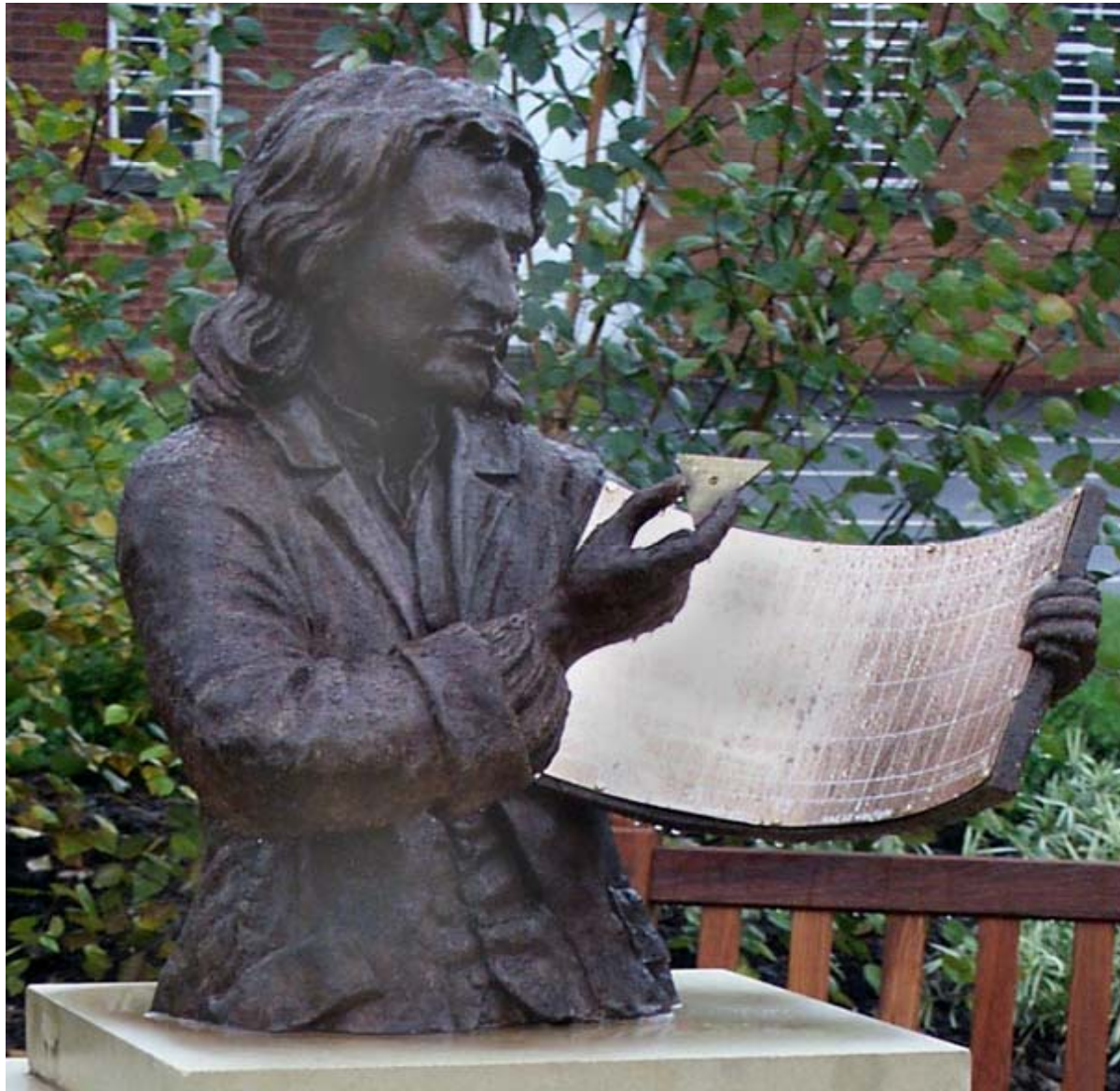




# Branford



Sir Isaac Newton Dial. Depicts Newton with a prism



# EQUATORIAL DIALS

With

## Analemmas

They tell clock time

The GNOMON parallel with the earth's axis



# CALIFORNIA







Aperture analemma

Water cut stainless  
steel

# EQUATORIAL SOLID ANALEMMA







# SOLID EQUATORIAL ANALEMMA



# SCHMOYER Dial

# ELEVATION DIALS

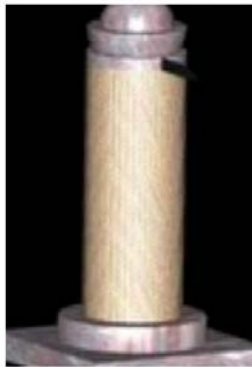
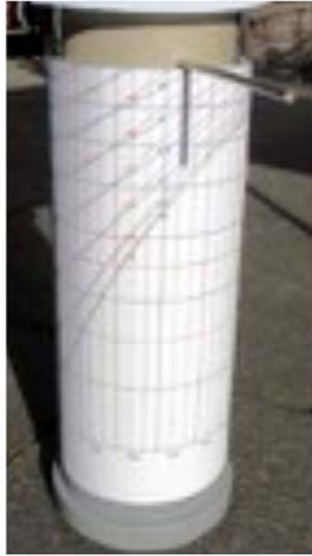
They use only the sun's  
elevation

Not

Direction



# 17<sup>th</sup> Century French shepherds in the Pyrenees



## Shepherd's Dial at school demo







Cylinder or  
Shepherd's dial  
in stone.



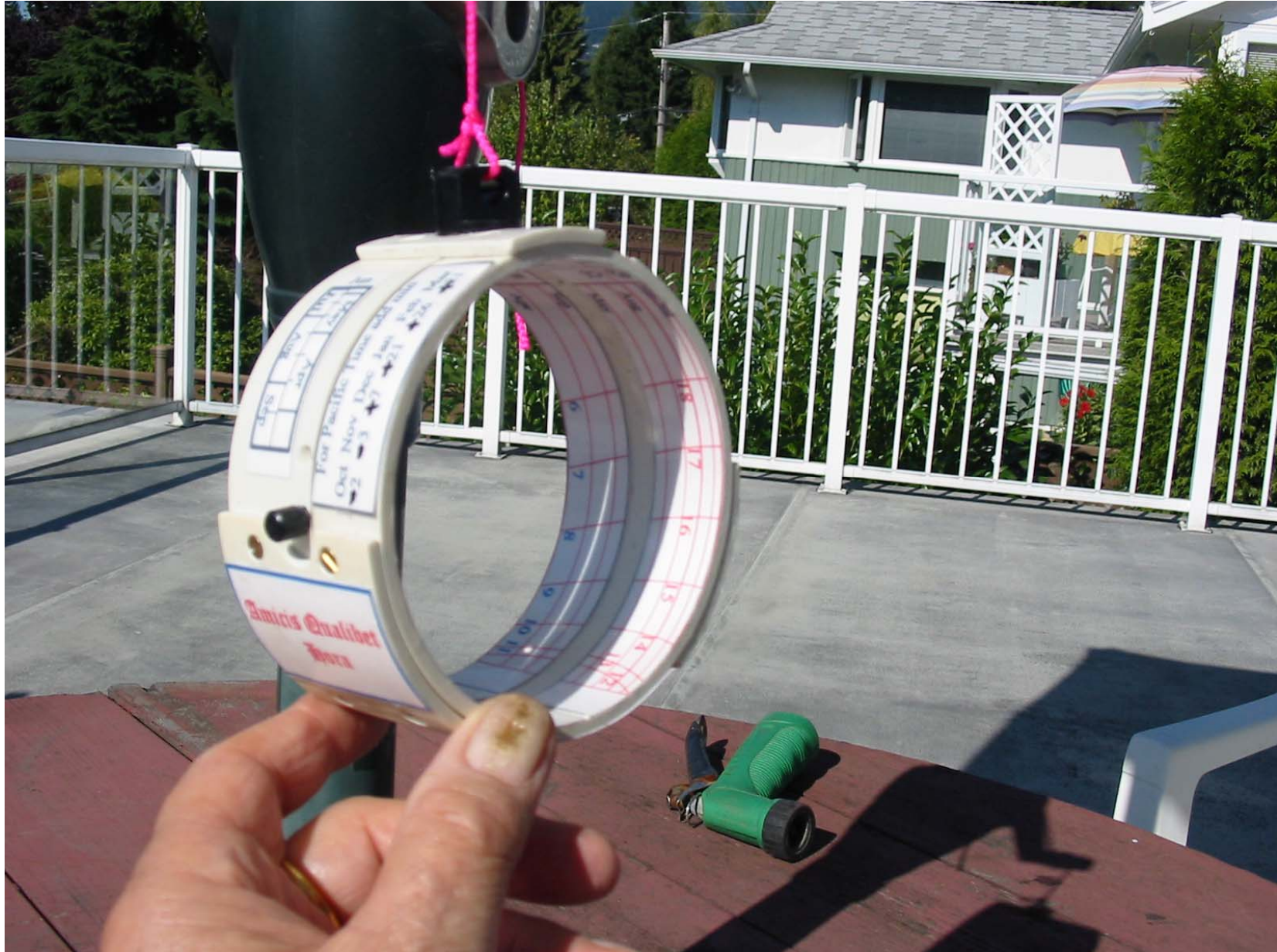


SEATTLE  
Washington

Large  
cylinder  
elevation dial



Aquitaine Dials (after Eleanor of Aquitaine) who gave a miniature dial to King Henry II.





14<sup>th</sup> Century  
QUADRANT

ELEVATION  
DIAL



- Hemispherical Dials

These dials were very popular in ancient Rome;

Cezar's wife is said to have complained that with all these hemisphericals everyone arrived in time for lunch.

SEOUL Dial





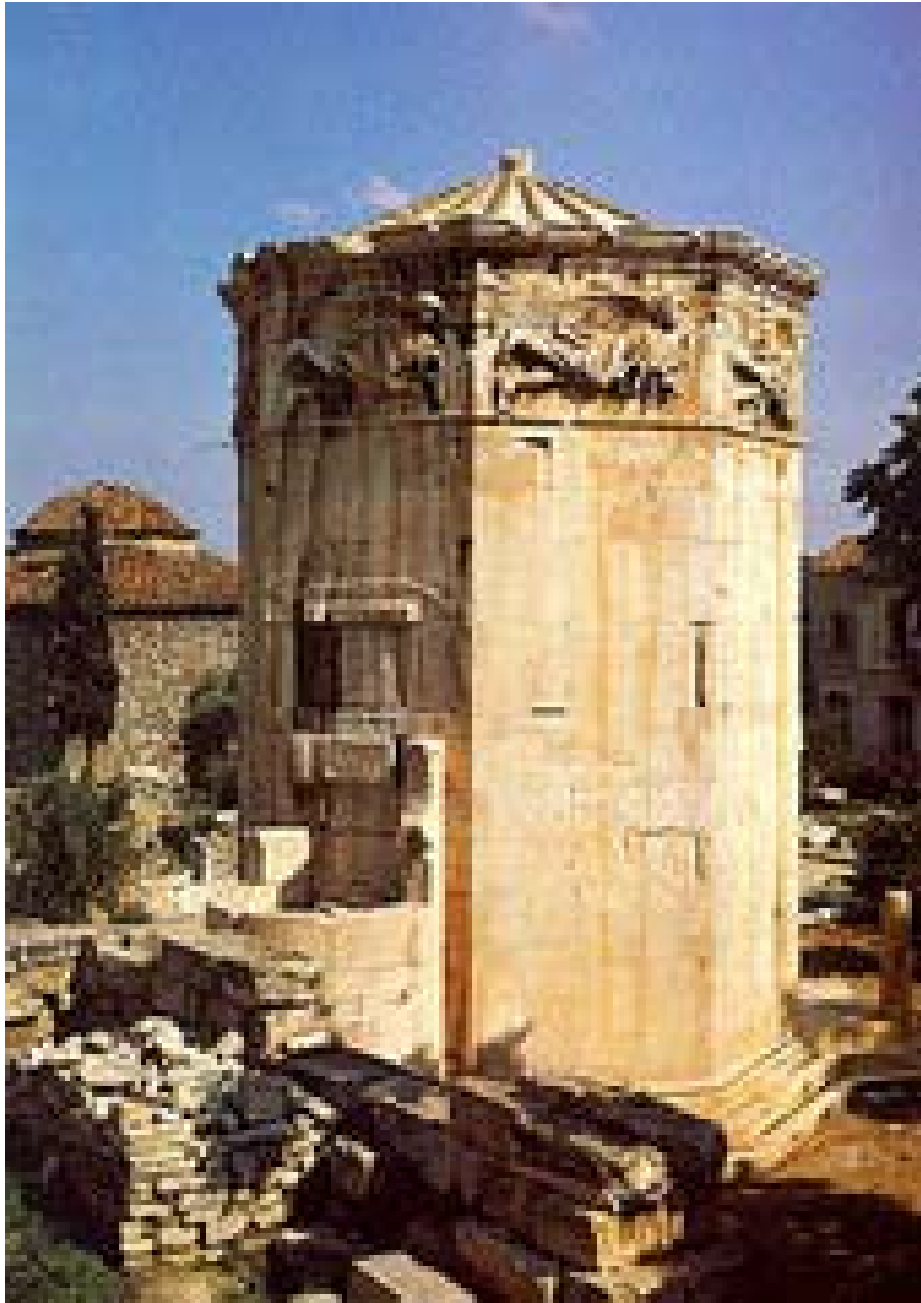
Ottawa





Greek Hemicyclium

- VERTICAL
  - and
- WALL DIALS
- No analemma possible
  - Sun time only



## Tower of the Winds, Athens

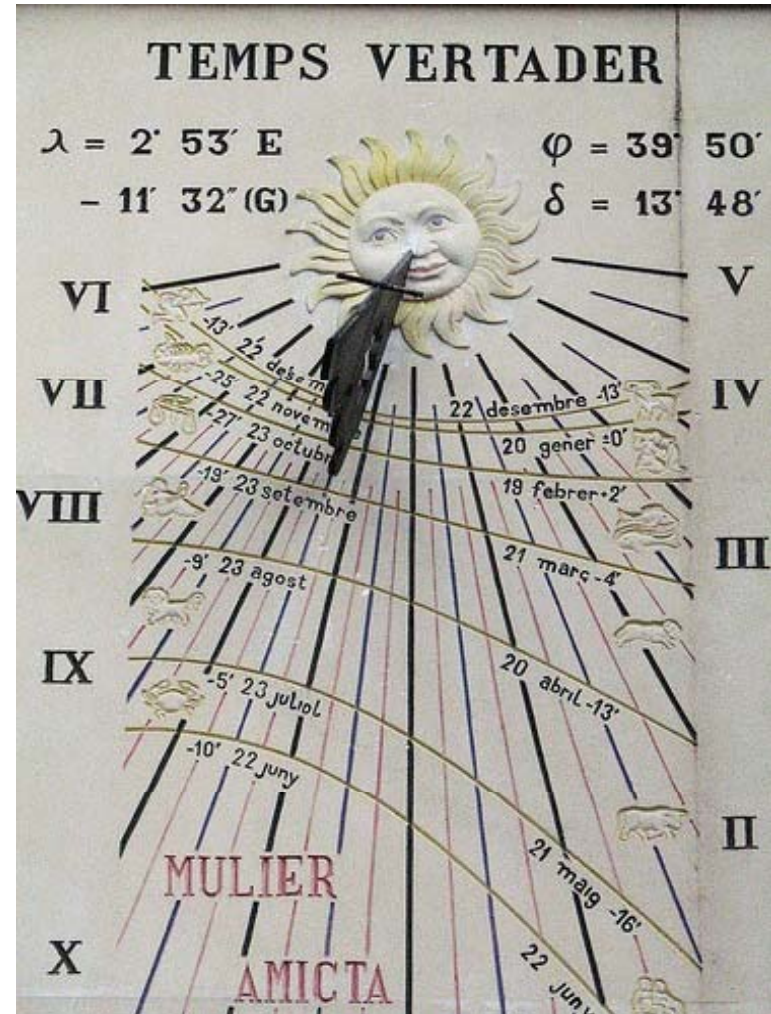
8 dials representing  
the direction of  
named winds



# MacDonald Dial



# Mallorca Dials (there are over 600 of them)

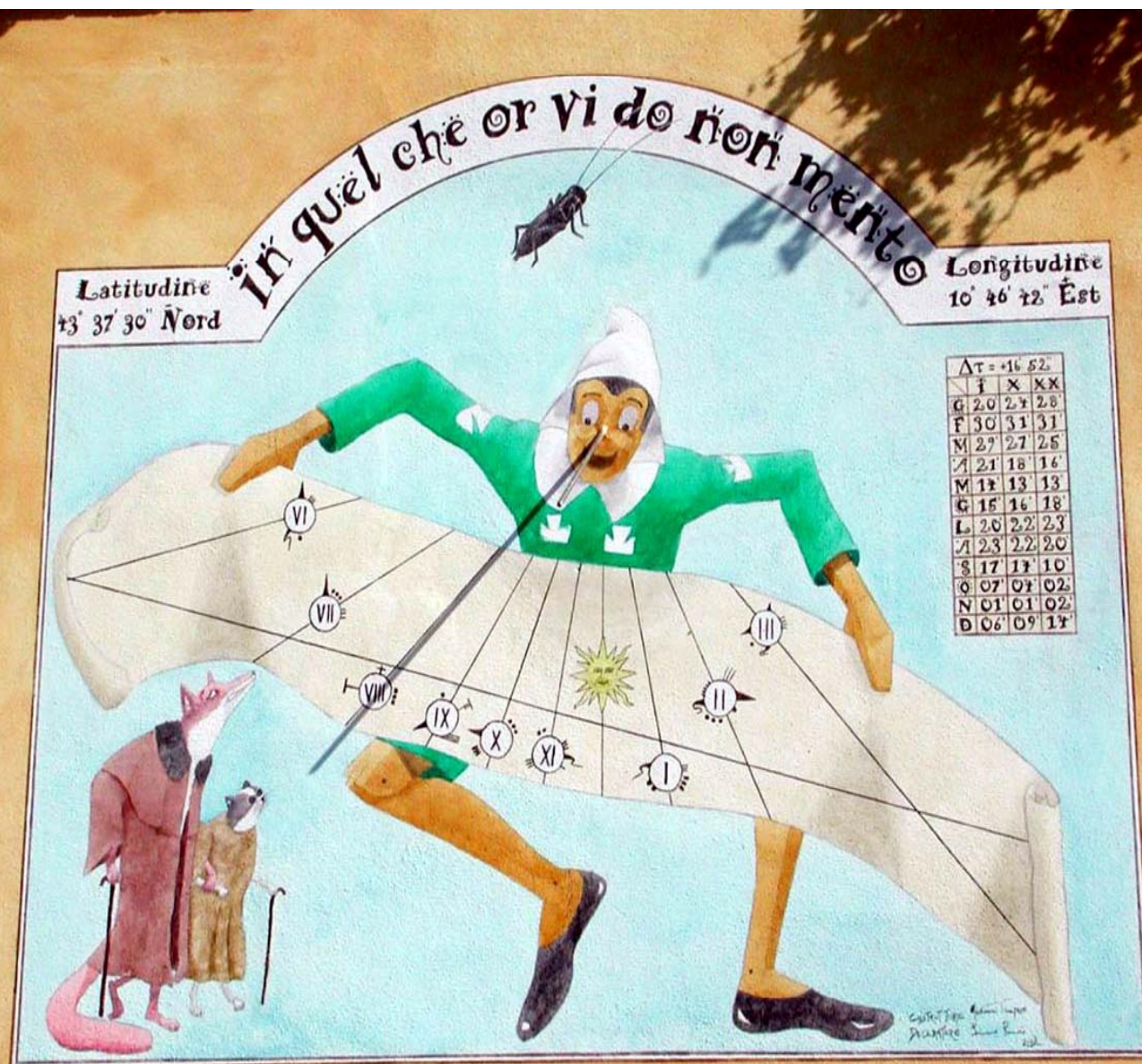




British Army  
dial in  
Pittsburgh  
1740 –Do not  
tread on me



# PIALA Italy



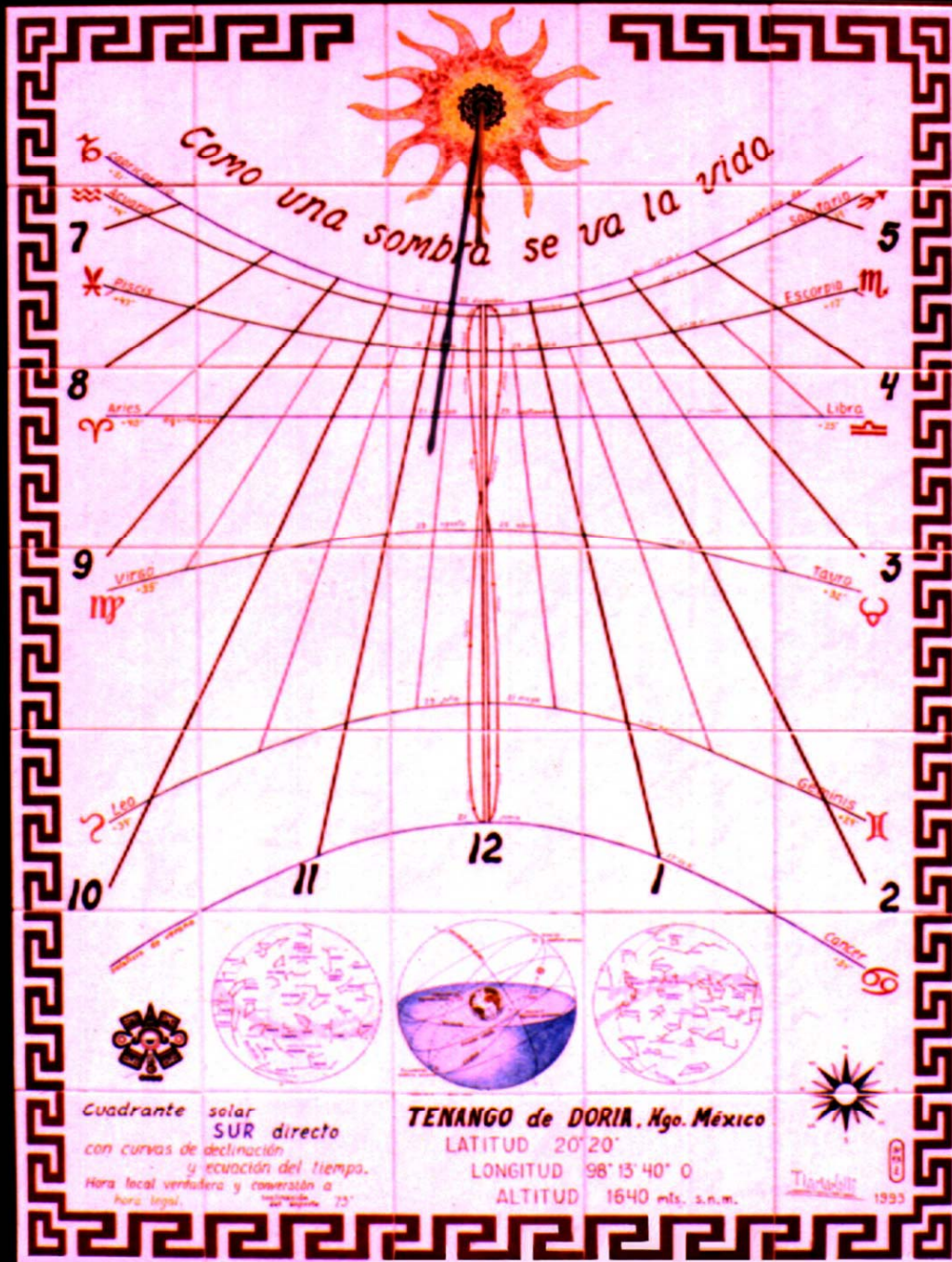


# English Pub Dial





# MEXICAN Wall Dial







MOLINE  
France

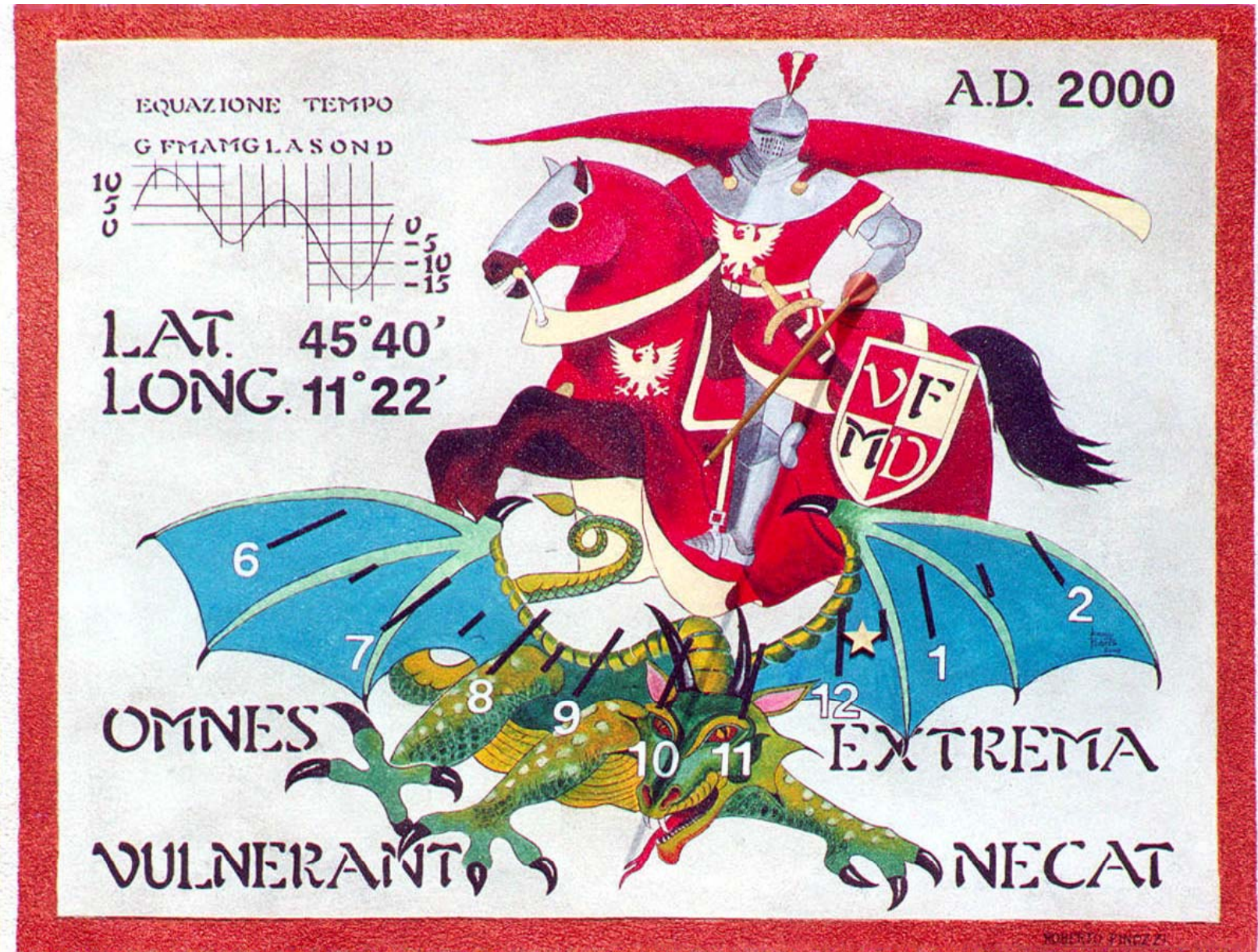


# SYSTRANA Tyrol





# German wall dial





STAINED GLASS

Window

DIALS

Sun time only

Oldest known stained glass dial, Germany 1529





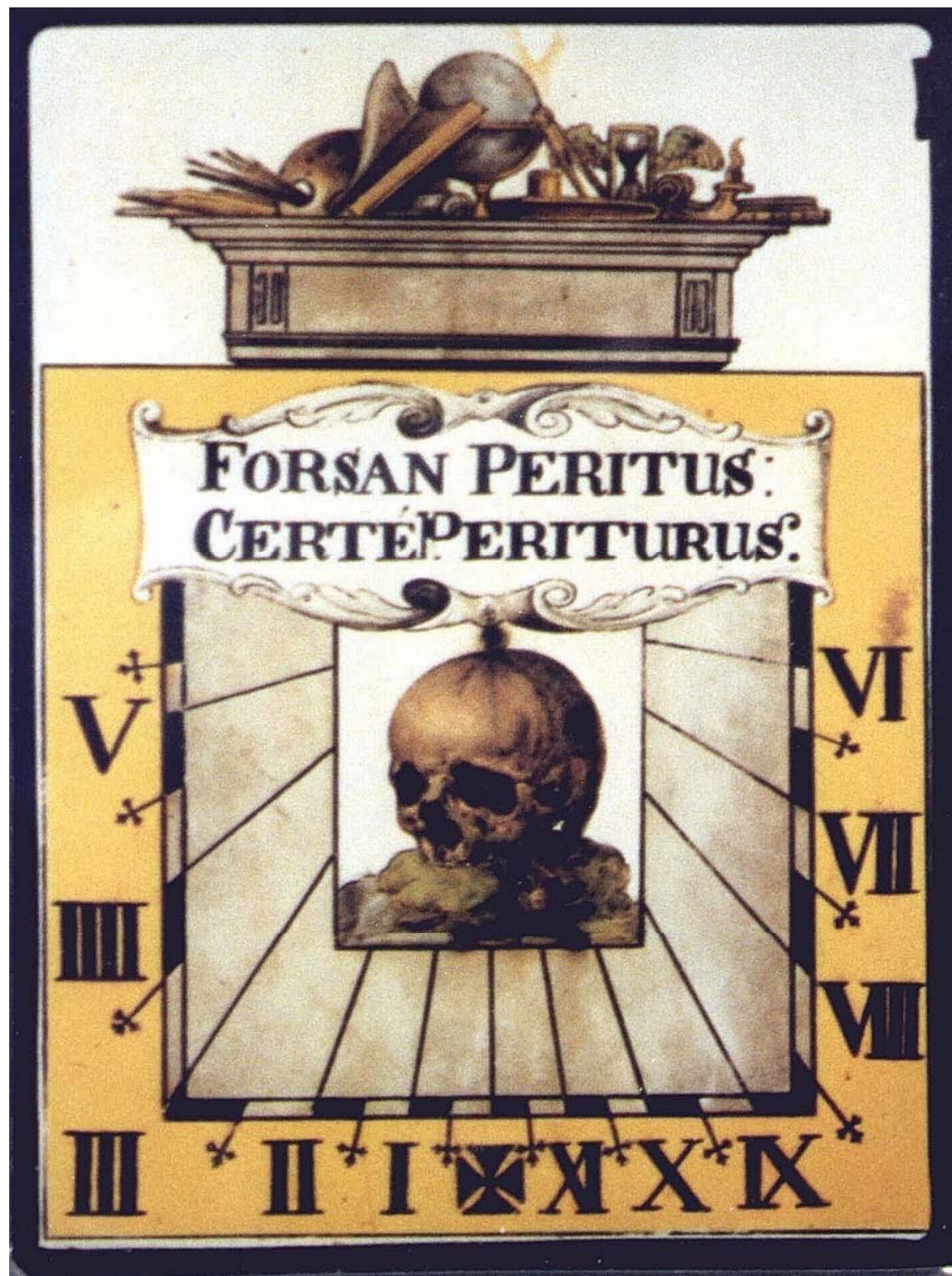
# Swiss dial, 1731





## The Goldfinch Dial, London





Perhaps  
clever,  
certainly  
dead

## Modern German Stained Glass Dial





# English manor house dial



# The Watcher

Watch every hour carefully, one will be your last

