Take a Look at

Larne

Sun Dials

at Carnfunnock Country Park Time Garden and how to read them.

CARNFUNNOCK Country Park

50p

Carnfunnock Time Garden

The Time Garden traces the gradual growth in our understanding of "time" and is situated in the walled garden area.

From the days of the Babylonians, who gauged each day as starting at sunrise, through to the most sophisticated measurements of today, this display of dials traces the history of time.

The Beginning

Carnfunnock Country Park's sundials are living, working examples of how we have come to define time down the centuries.

The sun, that most regular, if unspoken, feature in all our lives, was the original and still enduring gauge for man to regulate his activities.

Having recognised, just as the day followed night that there was a natural, annual cycle to the seasons, man saw there was a relationship with the sun's height in the sky.

Development

Greater accuracy in measuring the cycle eventually led to finding that the orbit of the earth around the sun took 365.25 days. This is tidied up to make a year 365 days with a leap year of 366 days.

This leaflet aims to guide you through the time garden and explains how the dials should be read as well as explaining a little of the history of each particular dial.

Always apply the 'Equation of Time' before checking the sundials against your watch.

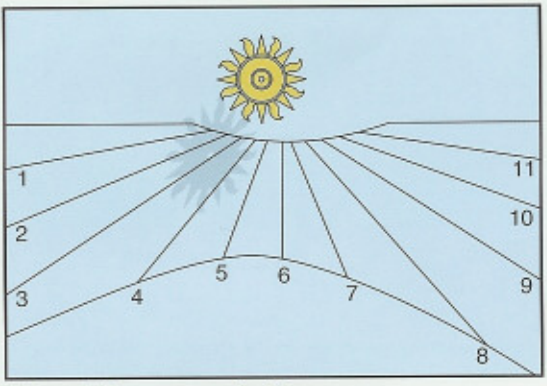
This is available from the Equation of Time dial and is necessary because of earth's ecliptic orbit around the Sun.

Greenwich Mean Time	**0° Longitude**
Local apparent time (Larne)	**GMT less 23 minutes 20 seconds**
British Summer Time (B.S.T.)	**April-Oct add one hour**

Nendrum Dial

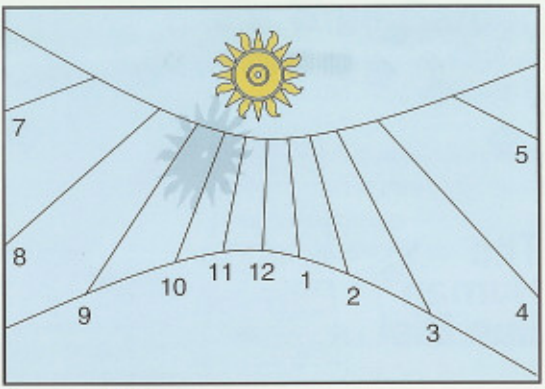
This is an ancient form of sun dial illustrating the time keeping methods of the Irish Monks. It takes its name from the place near Comber in County Down where the original is sited. This dial was used by the monks to indicate times of prayer throughout the day.

The daylight hours are divided into four main divisions and four sub-divisions. The main divisions indicate three hour periods, and the main rays mark the main offices of prayer at 9am, 12 noon and 3pm (terce, sext and none).



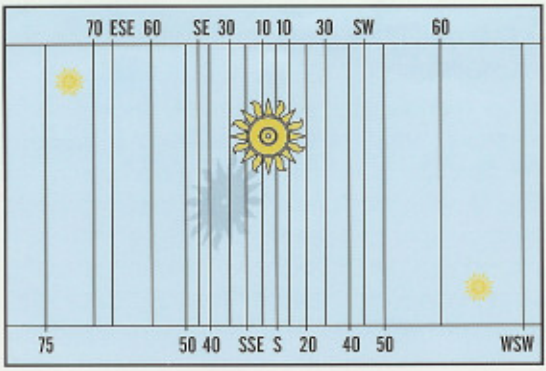
The Unequal Hours

This dial divides day and night into twelve equal parts, an ancient system predating modern time keeping. The 'unequal' term is the consequence of the instruments inability to take account of the variations in the length of days and nights throughout the different seasons, thus the hours are "unequal" from one season to the next.



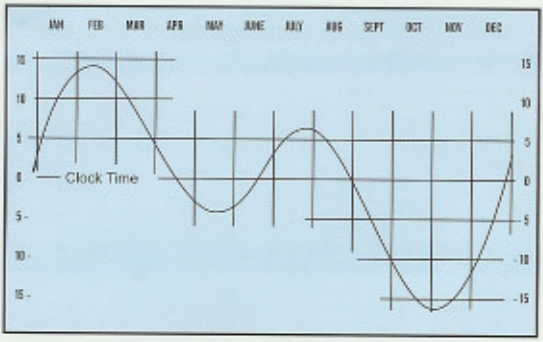
Equal Hours

The division of the day into 24 equal hours is illustrated in this device. As the world developed industrially and socially there was a need for a redefinition of time in terms of Time Zones. This instrument is calibrated to the meridian of Greenwich and shows Mean Time (GMT) at the spot of light. To obtain complete accuracy the small correction known as the Equation of Time must be applied.



Direction of the Sun

Indicating the direction of the sun during the day, this dial functions when the spot of light falls on one of the vertical lines. The figures to the right of the line giving the sun's bearing. By it's note of the direction of the sun, the bearing of any object directly above or below the sun can also be found.



The Equation of Time

Earth's orbital speed around the sun varies, and its axis tilts to the orbital plane. This means that every day, when measured from sunrise to sunrise, is not exactly the same length through the year. The notion of Mean Time was introduced by modern time keepers to compensate for this untidy fact.

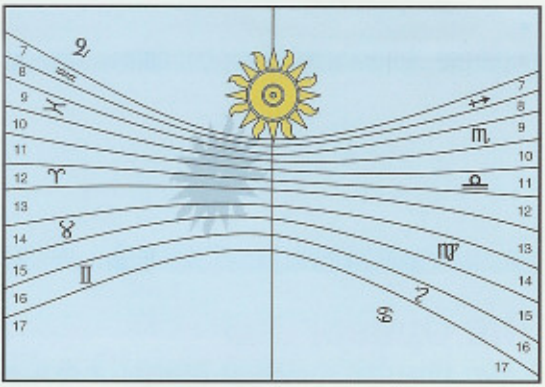
Sundials cannot make that adjustment and therefore Clock and Sundial diverge, if slightly.

The Equation of Time indicates the degree of that divergence and needs to be applied to Sundial Time to convert to Mean, or Clock Time.

To obtain clock time from a sundial.

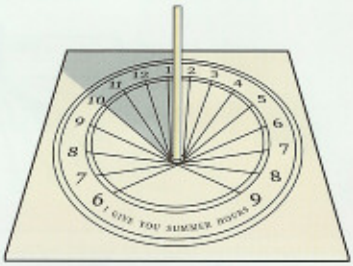
Follow the above equation of time curve until it coincides with the date on the horizontal scale. Read off the correction in minutes on the vertical scale designated "+" or "-". Apply this correction to the time shown by the sundial. When British Summer Time is in force, add one hour.

Time goes, you say? Ah no!
Alas, Time stays, we go.
THE PARADOX OF TIME



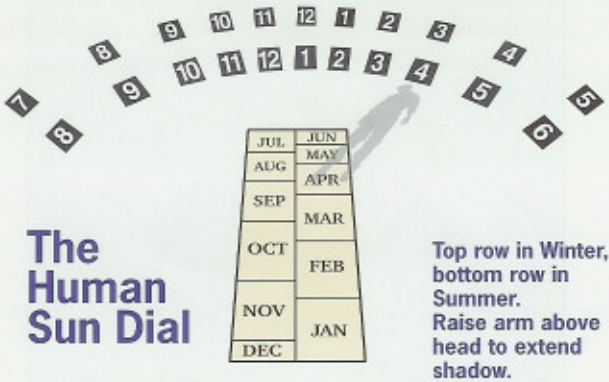
Hours in the Day

Sundials can do other than illustrate time and this dial indicates the number of sunlight hours in the day. The spot of light which falls on one of the above curved 'hour' lines gives us the hours of the day light. The same means shows us in which sign of the zodiac the Sun currently is situated.



The Horizontal Dial

This is the design most commonly associated with sundials. However the development of the horizontal face, able to indicate time accurately, came relatively late. It was the Moors in the middle ages who realised that if the gnomon is tilted at an angle and points North (to the North Star in effect) then an array of lines could be derived which were accurate throughout the year and could take account of seasonal changes in the sun's height and the varying length of the daylight hours.



The Human Sun Dial

Top row in Winter, bottom row in Summer. Raise arm above head to extend shadow.

Perhaps the most interesting of all the dials as it is the person who becomes the gnomon. It is the shadow cast by each person standing with his/her back to the sun, which will indicate the time of the carefully calibrated ground dial. Use the nearest numbers from end of March to end of October (British Summer Time). The winter sun gives longer shadows, so the distant numbers show Standard time.

The Armillary Sphere

The armillary sphere has an assembly of rings representing the principal circles of the heavens. Think of this armillary as imitating the position of the earth with reference to the sun. As the earth rotates, the sun's apparent movement across the sky over the armillary, is traced by the movement of the gnomon's shadow across the hour line indicator. The gnomon (pictured yellow) is parallel to the earths axis and shows clearly the earth's tilt of 234° to the plane of its orbit around the sun. The gnomon also points at the pole star. The "Equator" of the armillary has the daylight hours transcribed on its inner surface illustrating British Standard Time (BST). Notice 11.00am in the following illustration.

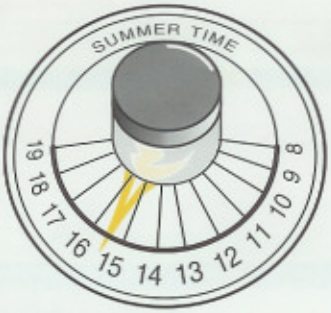
To match your watch, carefully read the time as shown by the shadow then refer to the month

on the zodiac ring and add or subtract the minutes as indicated. This is necessary because the Earth's orbit around the Sun. (See the Equation of Time for further information.)

The two longetudes of Greenwich (red) and Larne (purple) are represented in the dial by the two Meridian bands shown below.

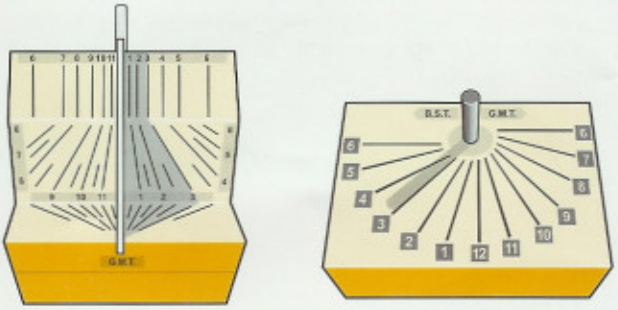
The Tropics of Cancer and Capricorn are significant because they represent the northern and southern most limits of the sun's varying height in the sky throughout the seasons.

The Ecliptic is the band along which the sun moves amongst the constellations; which we know as the zodiac.



The Optical Dial

On this dial the focus of light indicates summer time when the sun is above the celestial equator. The hour lines are at equal 15' intervals, reflecting the 24 divisions of one 360' rotation of the earth. When the sun is below the celestial equator (i.e. autum/winter) light will not show on the dial.



a) b)

The Multi-Dial

Incorporating several distinct dials, the Multi-Dial (*designed by Ian Potts*), takes its name for that reason. Dial (a) shows Greenwich Mean Time (G.M.T.)

The Equatorial Dial (b) has a regular array of hour lines and operates only in summer, and is constructed in such a way that the shadow of the dial reads both British Summer Time (B.S.T.) and Greenwich Mean Time on the left and right hand edge of shadow respectively.

The Clown Dial

Local Apparent Time is indicated on this vertical south facing wall dial by the clown's flute gnomon. Deduct 23"2' from your watch then refer to the Equation of Time for the time of year, to compensate for the exact local time.

The Cut Cube Dial

Unusual in that it uses cutaway surfaces to illustrate time, this dial does not apply the normal protrusion or gnomon. In daylight hours the sun's shadow moves from one facet of the dial to the next. It is calibrated to show Local Apparent Time – which in Larne is 23 minutes 20 seconds behind Greenwich Mean Time.

CARNFUNNOCK COUNTRY PARK
Coast Road, Larne, County Antrim
NORTHERN IRELAND
BT40 2QT

Tel: (028) 2827 0541