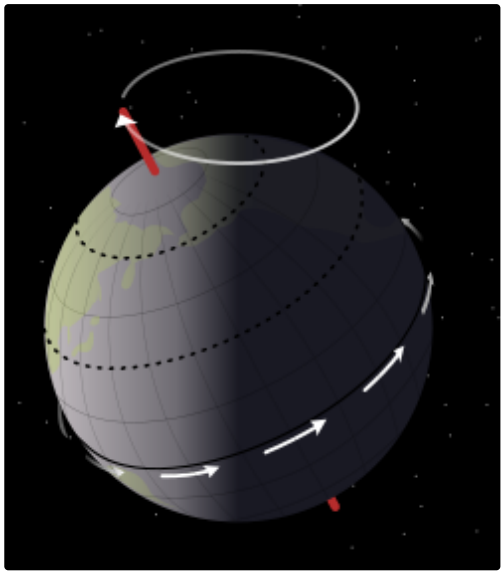
Precession and Zodiac

See also: Signs of the zodiac



One of the most common arguments used against astrology is that the statements astrologers make have long become obsolete. Astrology claims that someone born on 30th March has the sun at 10° Aries, whereas in reality on 30th March the sun is clearly in the fixed star constellation of Pisces.

Claims such as this one are very confusing for those interested in astrology. Do astrologers really live on the far side of the moon, continuing to cling onto beliefs that science has long since debunked? Confusion arises because both of the above statements regarding the sun's position on 30th March are correct. On this date the sun is in both the zodiacal sign of Aries and in the fixed star constellation of Pisces. These statements differ because they are made within different frames of reference. Something similar would occur if you were to call a friend in London from Germany to discuss the time of day. The person in London might claim that it is 10 am, whereas for you in Germany it would be 11 am. Both claims are, of course, correct - within different frames of reference i.e. time zones.

The constellations are groups of fixed stars in the sky. Since ancient times humans have pondered over their significance. The strip of sky which is particularly relevant for astrology is the ecliptic within which the planets of our solar system move. It is here that we find (going round anti-clockwise) the twelve fixed star constellations of Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius and Pisces. These constellations are of widely varying sizes and at times they even overlap. Because the patterns formed by these constellations can be interpreted in a variety of ways, it impossible, for example, to say where Capricorn ends and Aquarius begins. It is into this zone of the sky (or celestial sphere) that astronomers project a perfect circle - the ecliptic - formed by the earth's yearly orbit around the sun - or, for an observer on the earth, the sun's apparent orbit around our own planet. The ecliptic remains practically stable against the background of the fixed stars. Astronomers today continue to use this circle as a point of reference. In the ecliptical coordinate system a planet's location is given using two numbers: the ecliptical longitude is ascertained by measuring in an anti-clockwise direction from the zero-point on the ecliptic, and the ecliptical latitude by measuring the planet's deviation from the circle. Both of these readings are given in degrees. The ecliptical longitude is measured from 0 to 360°. But where is the zero-point on the ecliptic? The fixing of the zero is necessarily arbitrary - i.e. a matter of definition. For geographical coordinates on earth, for example, zero degrees longitude has been fixed at the astronomical observatory at Greenwich in London. The zero-point on the ecliptic has been established by using the vernal equinox in the northern hemisphere (Aequinoktium) - 20th or 21stMarch - the day on which day and night are of equal length over the entire planet. This point is mathematically defined using the point of intersection between the equator and the earth's orbit around the sun, i.e. the ecliptic. The celestial equator is given by the position of the earth's axis in space. If this axis were to remain stable the vernal equinox on 21st March would be a fixed point in space.

At astronomy's high point in antiquity during the hellenistic age from around 200 BC - 200 AD, the vernal equinox in the northern hemisphere was situated on the border between the fixed star constellations of Aries and Pisces. Astrologers at the time divided the circle of the ecliptic into twelve equal segments of 30° using this zero-point as a frame of reference. These segments were given the same names as the fixed star constellations lying behind them. It is important to distinguish these 30° degree segments of the ecliptic (or signs of the zodiac) from the background of fixed star constellations carrying the same name, which are both vaguely defined and of irregular size.

However, the earth's axis is not stable. The earth is not a perfect sphere, but flattens out at the poles and bulges at the equator. It reacts to the the gravitational influence of the sun and moon like a spinning top whose rotation is distorted by some external force: this causes what has been termed the earth's precession - which means that the earth's axis itself rotates in a circle, leading to a conical movement

around the fixed pole of the ecliptic. One complete rotation around this cone takes roughly 26000 years. This shifting of the earth's axis causes the celestial equator to shift so that the point of intersection between it and the ecliptic - the vernal equinox - moves from east to west along the circle of the ecliptic, i.e. in the opposite direction to the standard zodiac.

It takes about 26000 years for the vernal equinox to make one complete revolution around the ecliptic, i.e. through all of the twelve constellations. It takes around one twelfth of this time - roughly 2160 years - to traverse one sign of the zodiac. In antiquity the vernal equinox was situated between the signs of Pisces and Aries, and because of its retrograde movement through the zodiac is at present situated in the border zone between the constellations of Pisces and Aquarius, moving slowly towards Aquarius. Because the constellations lack clear boundaries, it is difficult to say exactly when the vernal equinox will move from the constellation of Pisces into that of Aquarius, i.e. when the so-called Age of Aquarius will begin. Depending on where the boundary is drawn this will occur somewhere between 2100 and 2500 AD.

Western astrology no longer uses the background of fixed stars as a point of reference. Modern western astrology uses the same system of reference as that of astronomy, i.e. it divides the ecliptic into segments starting at the vernal equinox. Although these segments have been given the same names as the fixed star constellations, the earth's precession means that they are no longer in line with the constellations of the same name. It is only in certain specialist areas of astrology - such as mundane astrology when studying larger epochal changes - that the relationship between these constellations of fixed stars and the ecliptic has any significance. References are then made to the "Ages" of Pisces, Aquarius etc. Other non-western systems of astrology still work to some extent with alternative systems to the ecliptical equinoctial coordinate system used by western astrologers. Indian astrology uses a system which refers to the fixed stars as its method of measurement, leading to a situation in which the position of the zero-point has become a matter for dispute. This is because different astrological schools in Indian astrology refer to different zero-points.