The 'diamond ring' effect, photographed at the 1973 June 30 eclipse from a ship off the coast of West Africa. Despite the spurious reflections caused within the camera lens, the striking effect shows clearly.

prominences may sometimes be observed protruding over the edge of the Moon's disc. Since the Earth and Moon are both moving in space, the Moon's shadow is continually moving and a total solar eclipse never lasts long for any one observer (unless he is in an aircraft moving with the shadow). Totality usually occupies no more than a few minutes, and a little over 7 minutes is the maximum. As the Moon moves across the Sun's disc, just before and just after totality, the mountainous nature of the Moon's surface gives it a serrated edge which allows patches of bright sunlight still to reach Earth-based observers, and the appearance of the Sun is like a curved string of bright jewels – the so-called **Baily's Beads** effect. Sometimes one last gap allows a final burst of sunlight, giving rise to the **diamond ring** effect. A word of warning here: for observing a solar eclipse always look through a *very* dark filter – welder's goggles, for example, or four or five completely dark photographic negatives – except during totality. As a general rule *never* look directly at the Sun, even with the unaided eye. With binoculars or a telescope permanent blindness will result, and projection methods simply *must* be used (see p. 82). The Moon, on the other hand, has no light of its own and is visible only because it reflects the light of the Sun, which is sufficiently dimmed in the process to make direct observation through a telescope quite safe. The fact that the Moon only reflects light is the reason why it displays phases, each phase depending only on the relative positions of the Sun and Moon with respect to an observer on Earth (Fig. 1·6).

The very short duration of a total solar eclipse underlines the fact that, even on Earth, we are always observing from a moving platform. This can be of use when measuring trigonometrical parallax, but it does make for some complications when we are measuring star positions. This is because right ascension (or celestial longitude, for that matter) is measured from the vernal equinox, the point where the ecliptic and celestial equator cross one another, and this crossing point is continually moving. The movement appears as a westward motion of the vernal equinox, and the effect of this 'backwards' motion is called **precession**, or more explicitly, 'precession of the equinoxes'. It is caused mainly by