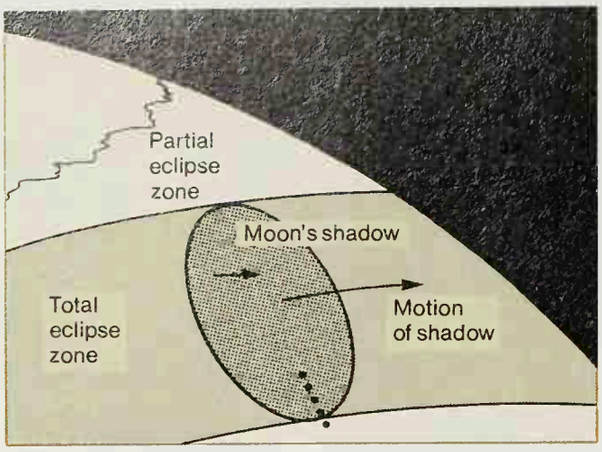
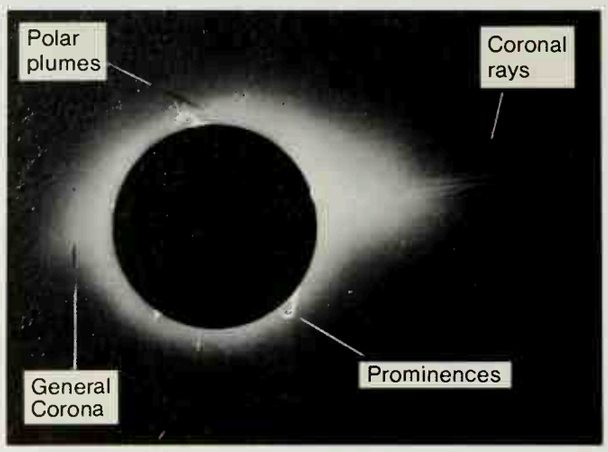
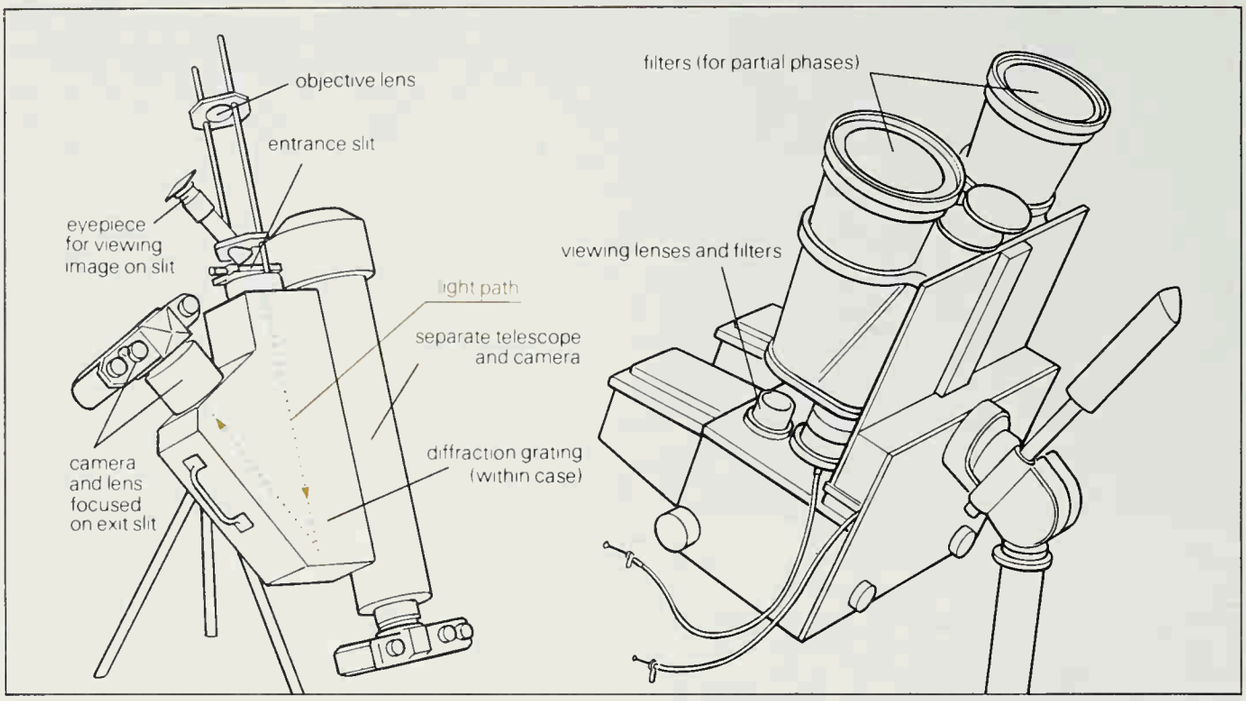




Far left:
Teams of observers located near the edge of the band of totality can provide important information about the exact size of the Moon's shadow, and hence of the Sun itself.



Far left:
A portable spectrograph; the instrument illustrated was specially designed for use at solar eclipses.

Left:
Even the simplest camera equipment may be adapted for eclipse photography, as in this case where a pair of binoculars (divided into two halves) is used in conjunction with two basic twin-lens reflex cameras.

eclipse, most observers will try to use more than one camera. In any case, as with all aspects of eclipse observation, plenty of practice is needed beforehand to take advantage of those few moments of totality.

Another factor which must be borne in mind is that of the sensitivity of the film used to hydrogen-alpha light, this being essential for prominence photography. It should not be assumed that colour films will not suffer from a lack of response, as some, most annoyingly, have red sensitivity curves which drop to zero just short of the hydrogen-alpha wavelength.

It is usual for amateurs to photograph the corona in white light, although sometimes various colour filters are used. The great difference between the brightness of the inner and outer coronal regions means that a series of exposure times is really necessary to record detail at various distances from the solar limb. To record the great extent of the faint outer corona a driven telescope mount will be required, but naturally in such pictures the inner corona will be greatly overexposed. Great success has been achieved by astronomers who have made special radial-density filters, i.e. neutral filters in which the density decreases outwards from the centre. These enable a single exposure to capture detail throughout the corona, but unfortunately they are not readily available. The ray structure of the corona is also made more pronounced by suitably orientated polarizing filters, and these are well worth trying.

Ciné-photography of both the partial and total phases can be very successful, but here a well-driven mount is essential, and care must be taken at the appropriate times to remove and replace the filters used for the partial phases.

It is interesting to note the other objects which can be seen during the total phase. These may include bright stars, planets and, if one is exceptionally lucky, comets. In a few cases comets are only known from observations made during eclipses; and in any event *any* details which can be observed and recorded are very valuable indeed.

There are a number of other effects of solar eclipses which are also often observed, although they may not be strictly astronomical in nature. They include the ripple-like shadows known as shadow bands, caused by varying refraction in the atmosphere, and only seen for a few seconds when the Sun is very nearly completely covered. The appearance of the surrounding landscape and of the sky during the period around totality is also worth recording, perhaps by ciné-photography. Continuous records of the brightness of the sky at the zenith and of the changing air temperatures are of considerable value. The drop in temperature during the eclipse is the cause of the 'eclipse wind' which may, on occasions, be of considerable force. Finally, a solar eclipse has a significant effect upon the ionosphere and thus alters conditions for radio propagation, the changes in which can be studied even by those not fortunate enough to be within the zone of totality.

Opposite page, top left:
Projection of the Sun's image – in this case by means of a right-angle telescope – is the best way of enabling several observers to see the partial phases.