A solar eclipse is widely regarded as one of the most magnificent natural spectacles, and astronomers have always had a tendency to rush off to far-away places to catch sight of one. They still do, even though coronagraphs (page 77) and satellite-borne instruments are available to professionals, who can thus study the corona at any time. Few astronomers can hope to have an eclipse occur close to their homes, but in recent years 'eclipse chasing' has become a very popular – if rather expensive – hobby for a lot of people.

Some astronomers find the experience so awe-inspiring that they quite deliberately do not try to make any 'proper' observations, perhaps contenting themselves with taking one or two photographs. others may carry vast amounts of complicated equipment halfway round the world and have such a busy programme that they leave no time actually to look up and enjoy the sight. However, at any eclipse the duration of the total phase is so short – the longest possible is only 7½ minutes, and it is usually much less – that even attempts at simple photography need to be carefully planned beforehand.

It should be emphasized once again that all the usual precautions for viewing the Sun (page 82) *must* be followed during the partial phases, and that it is particularly important for astronomers to remember that they may be encouraging ordinary bystanders to look at the Sun, so their safety should also be borne in mind. The projection method is probably the best one to adopt, especially as many people can view the one image. The equipment need not be at all elaborate, and one side of a pair of binoculars, hand-held, and a piece of card, will frequently suffice. It is still useful to be able to take a quick look through a suitable filter to see the progress of the partial phase, and some astronomers make a habit of carrying with them a number of simple, cheap filters which they can give to anyone for viewing the Sun. These filters consist of two layers of fully exposed, fully developed black-and-white film, firmly fixed in a card (or other) holder. (Colour film is not suitable.) Such filters are quite safe, but it should be noted that photographic neutral density filters, polarizing filters (even with polarizers crossed), and most other forms of filter – except some of the very dense welding glasses – are *not* safe as they may allow invisible, yet still harmful, infrared and ultraviolet radiation through to the eye. The filters made from exposed film are worth having in any case – you can use them at any time to look for naked-eye sunspots.

The only time that it is ever safe to use ordinary unfiltered optical equipment, such as binoculars, on the Sun is when the hot photosphere is completely covered during the total phase. Then, indeed, removing the filters is necessary to photograph, or to observe visually, the detail of the inner corona or prominences. Again for reasons of safety it is a good idea to arrange for a timer (or a very dedicated timekeeper) to warn of the approach of the end of totality, so that the proper filters may be replaced. Such a warning can also serve to prepare the observers for their fleeting glimpse of Baily's Beads or the diamond-ring effect.

The accurate timing of solar eclipses is a form of observation which can be carried out relatively easily and which has many applications. The equipment used is more or less the same as that required for work on lunar occultations (page 109), although it is normally necessary to rely upon radio time signals

Below:
Total solar eclipses are typically plotted on diagrams such as this one for the event on 1983 June 11.