Most eclipse tracks cross large expanses of the oceans, and sometimes a ship may offer more favourable conditions than occur onland. The picture above was taken on 1973 June 30.

for precise information, as a telephone service may be neither convenient, nor even available. A more difficult problem in many countries is that of obtaining the accurate latitude and longitude, and the exact height above sea-level, of the observing site. The lack of this precise information can greatly reduce the value of the observations, lessening their accuracy for further analysis; it may be better to select a site for which the positional co-ordinates are well established but which is somewhat away from the eclipse central line (although still within the zone of totality), rather than choose a position which is theoretically ideal, but for which the position is poorly known.

Generally the times of the first and last contacts, at the beginning and end of the partial phases, are not very precisely established because of the difficulty of deciding exactly when the Moon's limb touches and leaves the photosphere. The second and third contacts, marking the start and end of totality, are much more definite and easy to observe, giving a correspondingly greater accuracy. The timings may not only be used to check the predictions and the accuracy of the theory of lunar motion – one of the most complex problems in dynamical astronomy – but also to establish the exact diameter of the Sun. In conjunction with historical observations, this information is being used in modern studies of the possible variations in the size – and presumably also in the energy output – of the Sun, which some scientists believe take place over the course of time (page 90–91).

Just as with grazing occultations (page 109), the use of observers at the northern and southern edges of the total eclipse track makes it possible to establish where a true total eclipse occurs, as opposed to a deep partial phase. This is a rather different method of obtaining the solar diameter, and again has been used in connection with historical reports. Outside the zone of totality, i.e. where only a partial eclipse is seen, timings are still useful as they may be employed to measure the lengths of chords across the solar disk, and thus also establish the diameter. The method is less precise than the others mentioned, but it can be used to gain some useful information.

Observation of annular eclipses is valuable in an even more direct manner, especially when the apparent size of the sun is only just greater than that of the Moon. This can give rise to a more or less complete circle of Baily's Beads where the photosphere is visible through depressions of the Moon's limb. As the Moon's diameter is accurately known, this simple observation allows a very accurate determination of the size of the solar disk to be made.

The main eclipse activity is of course photography, and this is usually carried out with telephoto lenses or some form of camera/telescope combination. Excellent results have been obtained using just binoculars and an ordinary camera focused on infinity, but properly combined equipment will naturally give the best results. The size of film to be used will govern the image scale required, and thus the focal length needed, while the effect to be photographed will also have to be taken into account. For example, photographs of prominences around the Sun's limb will require a large image scale and are very suitable for a square film format. Baily's Beads, the diamond ring effect and the outer corona will require much wider fields. Exposures for the different effects will also vary widely. For this reason, and to overcome the problems encountered in hurrying to change lenses or telescopes during the progress of the