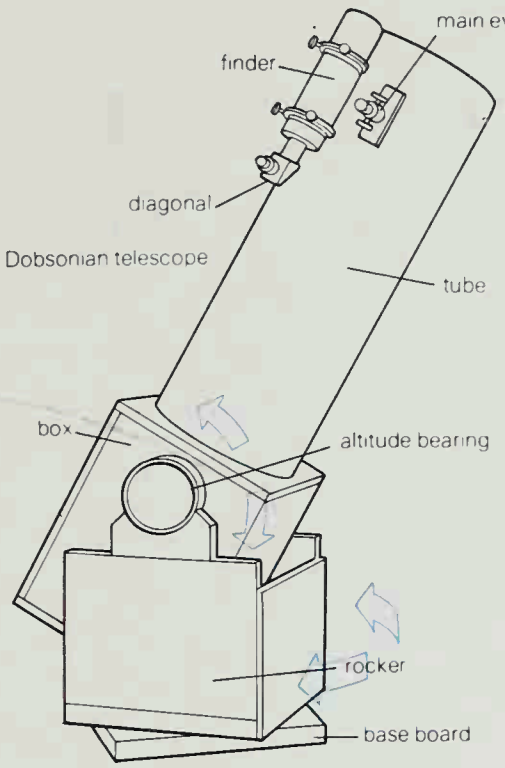
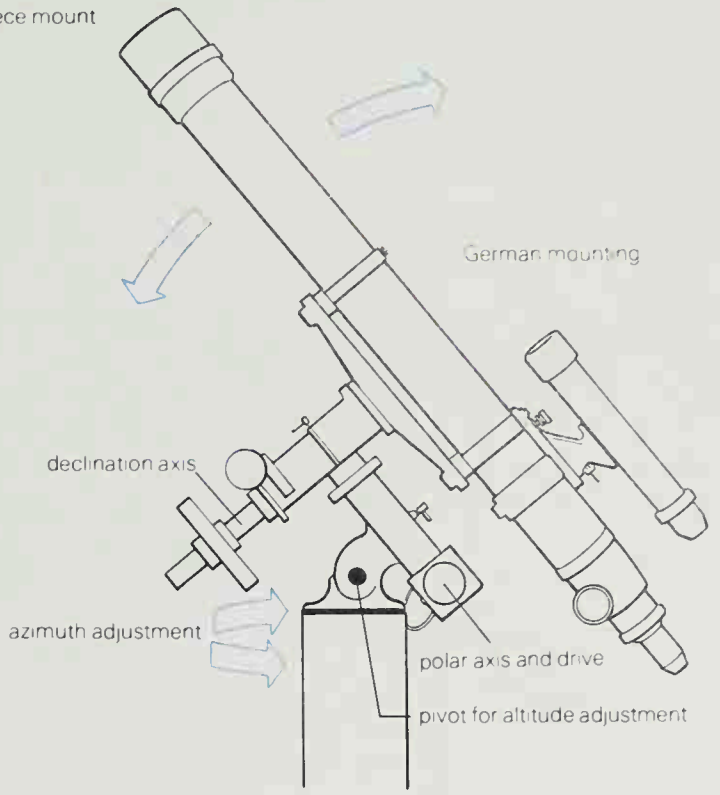
Right:
An altazimuth reflector of the type known as a Dobsonian is particularly easy to construct from ordinary materials.





Far right:
The long focal ratios of most refractors make them very useful for solar work and, in the larger sizes, for double star measurements and planetary observation.

binoculars for all serious observing purposes. Aperture for aperture, 'ordinary' Newtonian reflectors are usually much cheaper than refractors or the compound types, and this is why they tend to predominate at the larger sizes.

A 75mm refractor is widely regarded as the ideal instrument for the beginner. It is sufficient to show considerable detail on the Moon, the belts of Jupiter and the rings of Saturn, countless double stars, clusters and nebulae, and can be used to advantage for observation of the Sun by one of the safe methods described on pages 82–83, and certain variable stars. However, if the observer is certain that his interests lie in areas where light-grasp is likely to be the most important consideration – particularly variable star work – a reflector might well be the first choice, especially as one of about 150mm aperture would be comparable in cost to the 75mm refractor. In the larger sizes reflectors are usually the first choice, on the grounds of cost if nothing else. They may also be made of shorter focal lengths, and thus have 'faster' f-ratios than equivalent refractors; for this reason they are favoured for photographic work on, for example, nebulae and galaxies.

Cassegrain reflectors and the Dall-Kirkham form are easier for amateurs to construct, and are particularly suitable for planetary work, where high magnifications and good light-grasp may be required to discern detail on small planetary disks. The Maksutov and Schmidt-Cassegrain types usually have fairly long focal ratios (f/12 or more) and are thus best suited to examination of restricted fields such as planets. The Maksutovs are particularly suitable for solar work when a proper full-aperture filter is fitted. Both of these types have undoubtedly become so popular because of their comparative portability, which means that their owners can often dispense with a proper observatory.

Somewhere in between binoculars and the usual form of telescopes come the types sometimes described as 'comet-seekers' and 'rich-field telescopes'. Strictly speaking there is only one true 'richest-field telescope' – one which shows the greatest number of stars at a time – but the term has been extended to wide-aperture, wide-field telescopes. Such equipment is frequently used, along with the large binoculars, for comet and nova searching, and may consist of short-focus reflectors as well as specially computed and manufactured achromatic refractors with fast focal ratios.

Telescope-making itself is a very popular branch of amateur astronomy, with every type of optical system, including the most complex ones, having been made by enthusiasts, as well as instruments of very large aperture – 600mm and more. Even for those with little mechanical aptitude it is well worth considering the purchase of the finished optical parts for, say, a 150mm Newtonian reflector, and the construction of a simple, wooden tube and mounting for them. Such an instrument offers a moderate aperture capable of good results for a reasonable cost. Objectives for refractors may also be purchased, but the mounting of these requires a greater degree of engineering skill than is needed for the mirrors in a reflector. Anyone taking up telescope making should perhaps be warned that it has a tendency to become all-absorbing and leave little time for actual observing!

Mountings, observatories and accessories

There has been a move recently for reflectors to be mounted in simple, altazimuth mountings – particularly in the so-called 'Dobsonian' mount – and this design is well worth consideration by any beginner for its simplicity and cheapness. It can even share some advantages with other altazimuth designs for certain types of work where the field orientation is not critical, or when the somewhat faster movement from one portion of the sky to another might be an advantage. However, most serious observers will require a proper equatorial mount which can be driven easily to follow the sidereal motion, as well as allowing the use of setting circles which can be essential for locating faint objects in the absence of a finder chart. The portable Maksutov and Schmidt-Cassegrain instruments