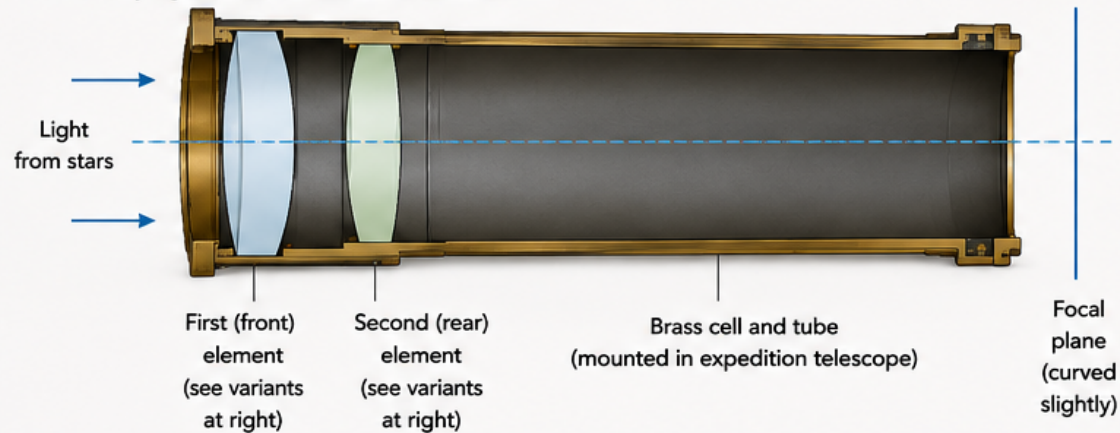


THE CARTE DU CIEL ASTROGRAPH OBJECTIVE USED IN THE 1919 ECLIPSE EXPEDITIONS

Oxford and Greenwich astrographic object glasses by Howard Grubb, Dublin
Aperture: 13 inches (33 cm) Focal length: 3.43 m Type: Photographic doublet

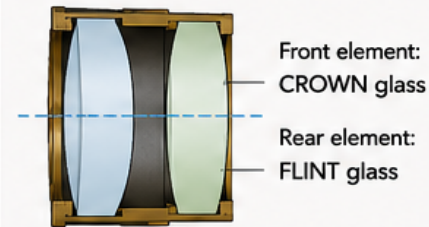
1. OPTICAL DESIGN: PHOTOGRAPHIC DOUBLET

Each objective consists of two large lens elements – a crown glass and a flint glass – accurately figured and mounted in a brass cell.

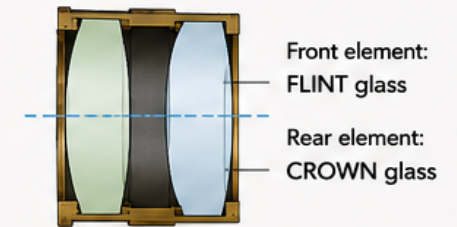


2. TWO VARIANTS (SAME SPECIFICATION)

GREENWICH OBJECTIVE (used at Sobral)



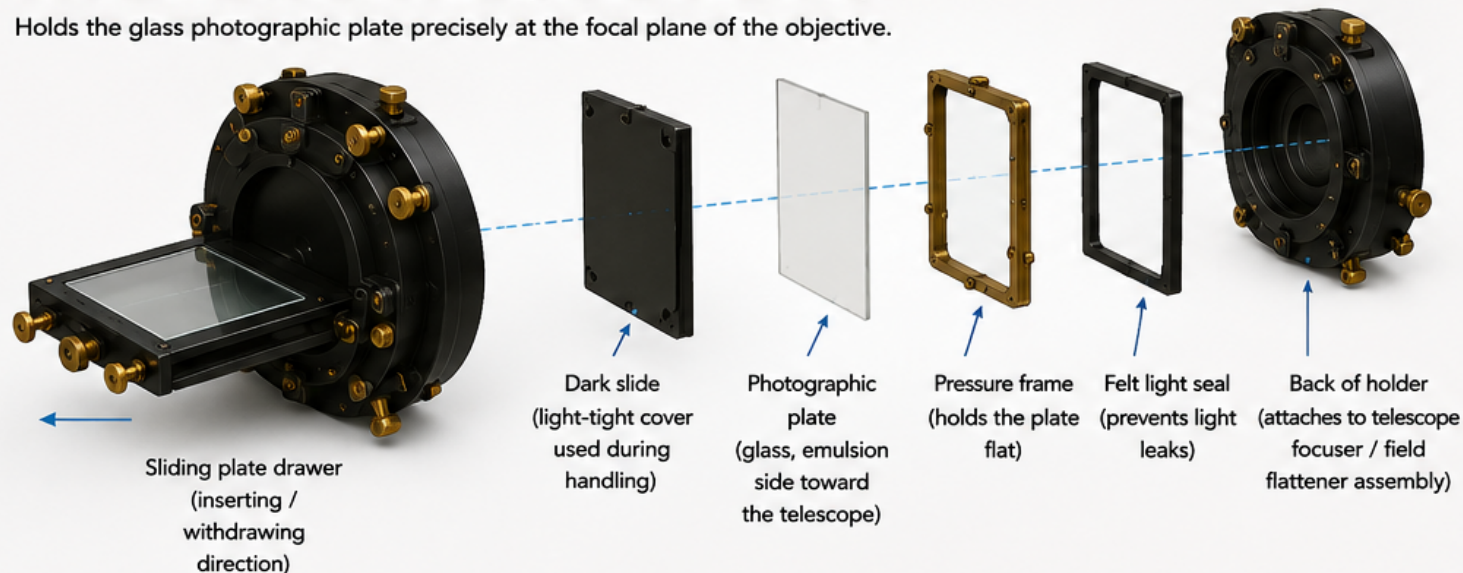
OXFORD OBJECTIVE (used at Príncipe)



- Aperture: 33 cm (13 inches)
- Focal length: 3.43 metres
- Designed for wide field photographic astrometry (flat field, minimal distortion)
- Manufactured and figured by Howard Grubb, Dublin (c. 1887–1889)
- Mounted in a brass cell; both elements carefully centred and spaced
- Not a multi-element system: only two lenses (a photographic doublet)

3. PHOTOGRAPHIC PLATE HOLDER (FOCAL PLANE ASSEMBLY)

Holds the glass photographic plate precisely at the focal plane of the objective.



KEY POINTS

- The plate is a glass photographic plate, typically 16×16 cm (some series 13×18 cm).
- The holder ensures the plate is perfectly flat and exactly at the focal plane.
- It must be rigid, light-tight and reproducible, so that plates taken at different times can be measured accurately.
- During an exposure, the dark slide is withdrawn to expose the plate, then replaced.

IN USE DURING THE 1919 ECLIPSE EXPEDITIONS

The objective lens (in its steel tube) was mounted at the front of the expedition telescope (illuminated by a 16-inch coelostat). At the rear, this focal plane assembly held the photographic plate during the exposure. After exposure the plate was removed in a dark tent and replaced with the next one.