# ANCIENT EGYPTIAN SUNDIALS

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Ancient Egyptian dials were the subject of the Somerville Memorial Lecture given by Dr Sarah Symons in May 1998. This was subsequently published in the *Bulletin*.[1]

**Obelisks**

Obelisks are widely thought of as likely gnomons for large horizontal sundials, but it was explained that this is mistaken. Not only is there a complete absence of any associated dials, but inscriptions on the obelisks themselves indicate a purely symbolic and commemorative function. Of course, this has not prevented later rulers from appropriating existing obelisks to form the gnomon of their own commemorative dials. Best-known is the 'Dial of Augustus', remnants of which remain buried in Rome.[2]

**Staircase**

Ludwig Borchardt, the doyen of scholars studying ancient Egyptian systems of timekeeping,[3] mentioned an artefact in the Cairo Museum consisting of steps ascending to a central elevated platform.[4] He thought it might have been used as a sundial, but most subsequent researchers appear to be agreed that it is more likely to be exactly what it resembles – an architect's model for a proposed temple.

Elimination of the above reduces ancient Egyptian dials to quite a small number of existing examples.

**'Sloping' Sundials**

Described by Symons and most writers on sundials is the 'sloping' or 'inclined plane' sundial. The type example is a stone object found in 1913/14 at Qantara, near the Suez canal, and described by Clédat[5]. Further details were given by Sottas[6] and Kuentz,[7] and became the source of the drawings published by Borchardt[3] (Fig.1). These have been widely copied because the artefact itself appears to have been lost, and no photographs are known. However, similar sloping dials (from which the shadow-casting blocks have been broken away) are in Paris and in the Flinders Collection at University College London[8] (Fig.2).

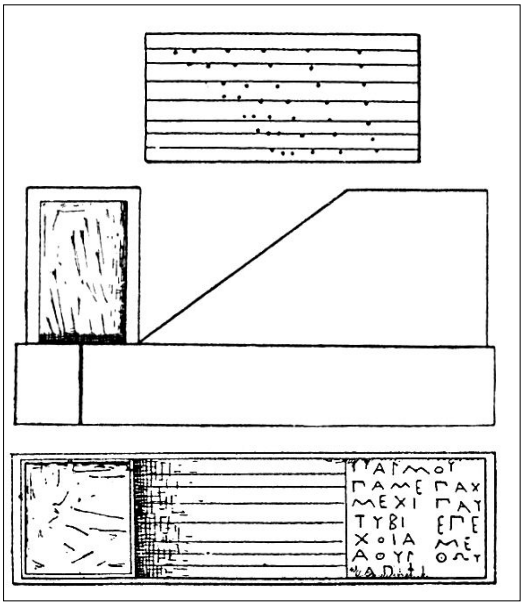


*Fig. 1. The 'sloping' sundial found at Qantara. (Borchardt)*




*Fig. 2. Part of a 'sloping' sundial at University College London.*

Figure 1 shows the drawings of the Qantara dial reproduced by Borchardt. Dated to Ptolemaic times (*ca* 380-310 BC) it was soon recognized to be a portable, seasonal-hour altitude dial, with the abbreviated Egyptian month names (showing which scale line must be read) written in Greek letters. Altitude dials need only to be pointed at the Sun,[9] knowledge of the direction to north not being required. However, for reasonable accuracy they must be used around the latitude for which they were designed, and held level. Calibration may be in seasonal or equal hours.[10] Construction of the Qantara dial (or at least its prototype) by direct observation would require some independent method of finding the seasonal hour, but at the late stage of Egyptian history with which it is associated Greek influence was strong, and a hemicyclium[11] or linear water clock[12] could have been employed.

Figure 3 shows a working model made to demonstrate the principle of this sundial. Some authors have suggested that the inclination of the dial plane to the horizontal was made equal to the latitude, and this was followed here by employing an angle of 30°. (Memphis is 30° N; Qantara about 31°.) However, there appears no great advantage in this; any shallow angle will serve to shorten the scale to manageable length. The dial pattern was calculated by standard methods[10] for a latitude of 30° N, and a more detailed view is given in Fig. 4. A line weighted with a lead plummet is coincident with an inscribed mark when the instrument is held horizontally. (A plastic bead proved unsatisfactory,