

# Two-Page Bites of Astronomical Lore

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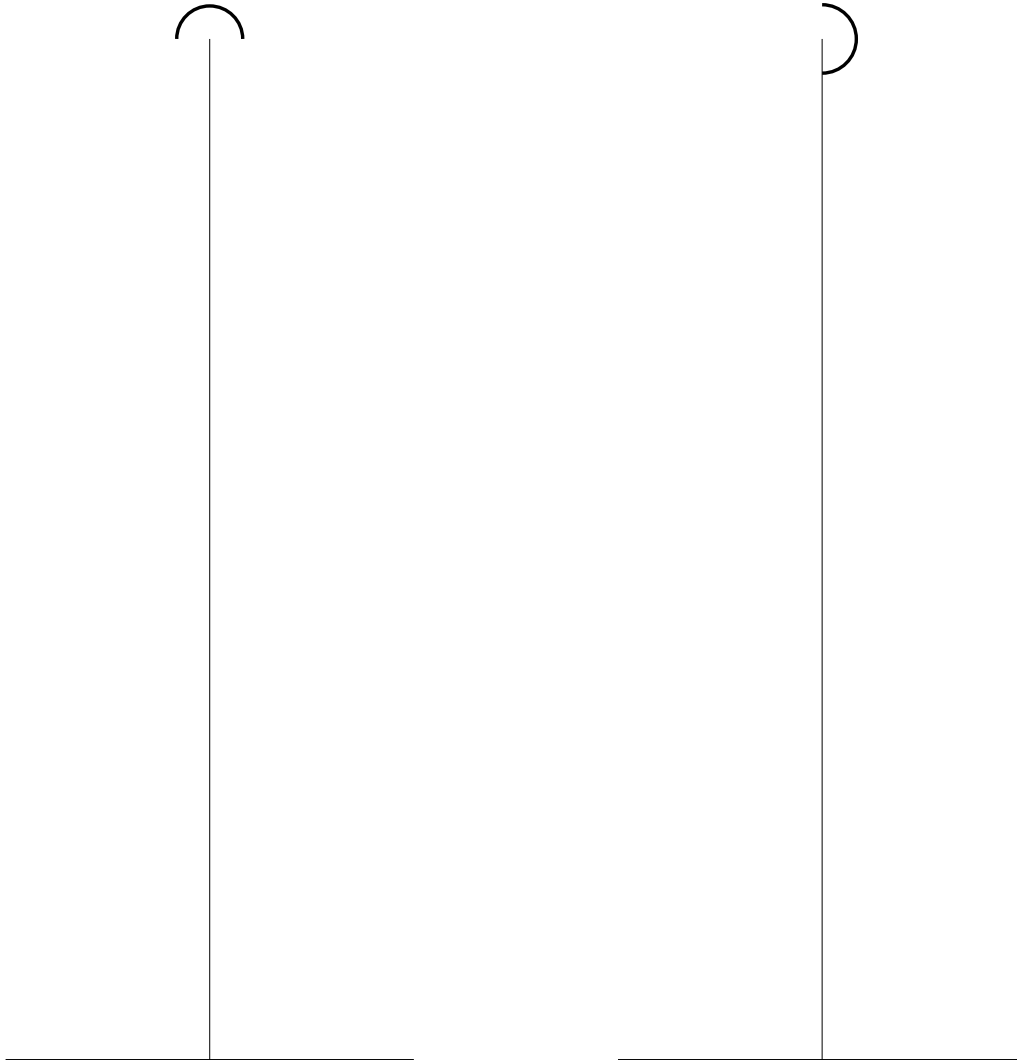


Figure 1: The Great Pyramid's geographical latitude  $L$  is  $29^{\circ}58'.7$ . So if we include the effect of  $1'.7$  of atmospheric refraction, the Celestial North Pole as seen from the Great Pyramid (and both of the other two Giza pyramids) is above the horizon's North point (azimuth  $0^{\circ}$ ) by  $30^{\circ}00'$ , within c.2 parts in 10000 ([www.dioi.org/dr.pdf](http://www.dioi.org/dr.pdf), §E2 considers if the coincidence is meaningful). In both left&right diagrams of the northern sky as seen from Giza at night, the horizon is the horizontal line at bottom. Perpendicular to the horizon in each diagram is  $30^{\circ}$  of the Giza meridian — from the horizon to the Celestial Pole. And each diagram bears a dark semi-circle centered on the Pole, depicting the counter-clockwise  $12^{\text{h}}$  path of one of the two circumpolar stars here considered, whose respective start&endpoints obviously differ by  $90^{\circ}$ . The left diagram's half-circle marks the night path of star  $10i$  Dra (magnitude 4.61) around the Pole from  $18^{\text{h}}$  to  $6^{\text{h}}$  Local Apparent Time on  $-2612/1/10-11$ , the Winter Solstice, when night's length is the year's greatest, and the interval cited is almost-entirely in full darkness or Astronomical Twilight. (Extremal solar altitude [ $18^{\text{h}}$ & $6^{\text{h}}$ ]  $h_S = -11^{\circ}.7$ , near enough to Astron.Twilight's  $-12^{\circ}$  bound.) The radius of  $10i$  Dra's semi-circular arc is  $0^{\circ}58'$ , so (dividing by  $\cos 30^{\circ}$ ) the star oscillates  $1^{\circ}07'$  in azimuth. The diagram on the right shows the semi-circular night path of star  $11\alpha$  Dra or Thuban (magnitude 3.65) around the Pole  $6^{\text{d}}$  later,  $-2612/1/16-17$ , from  $18^{\text{h}}$  to  $6^{\text{h}}$  LAT (extremal  $h_S = -11^{\circ}.6$ , again about  $-12^{\circ}$ ). The radius of  $11\alpha$  Dra's semi-circle is  $1^{\circ}03'$ , which swings it as far east as  $1^{\circ}13'$  in azimuth, en route from  $1^{\circ}03'$  below  $30^{\circ}$  altitude to same above. Both stars were visible from Giza throughout their semi-circular paths: see R.Tousey & M.Koomen, *Journal of the Optical Society of America* 43.3:177-183 (1953/3).