

‡14 Recovering Hipparchos' Last Lost Lustrous Star

In *DIO 4.1* ‡3 fn 20, DR suggested that the Ancient Star Catalog's star PK964 (listed magnitude $m = 3$) was either δ Cen (pre-extinction magnitude $m_o = 2.60$) or μ Vel ($m_o = 2.69$). I there reasoned that PK964 was probably the former, because that hypothesis required but one error by the cataloger.

I now realize that, while connecting PK964 to μ Vel indeed requires presuming 2 errors, these errors are not independent — to the contrary, they're the very same error: an easy confusion of step-number with step-interval.¹ (Similar modern confusion-opportunity: an apartment's 5th floor is usually only 4 floors above ground.) The sole difference in the 2 mistakes is the reference frame: equatorial in one case, ecliptical in the other. As previously noted (*idem*), δ Cen is already accounted for by star PK960, whereas μ Vel is *the only star brighter than 3rd magnitude certainly missing² from the Catalog*. Details follow.

Zenith distance Z was pretty accurately recorded as 75° , giving (for Cape Prassonesi's presumed $35^\circ 5/6$ latitude) declination $\delta = -39^\circ 1/6$. The rt.asc α was observed³ as $9^h 7/12$ — and thus recorded as: 10th step plus $8^\circ 3/4$. This was erroneously converted to pure degrees by addition: $\alpha = 10 \cdot 15^\circ + 8^\circ 3/4 = 158^\circ 3/4$. Transformation to ecliptic coords (using Hipparchan obliq $\epsilon = 23^\circ 11/12$) would rigorously produce longitude $\lambda = 179^\circ 56'$ & latitude $\beta = -43^\circ 44'$. Anciently, this was: $\lambda = 13^{\text{th}}$ step plus 0° & latitude $\beta = -43^\circ 3/4$. Conversion of λ 's steps into degrees involved the same mistake (as for α), so $\lambda = 13 \cdot 15^\circ = 195^\circ$. And Hipparchos' position for PK964 is in fact: $\lambda = 195^\circ$ & $\beta = -43^\circ 3/4$.

This reconstruction provides a neat resolution of the last major identity-anomaly in Hipparchos' great Catalog.

[Note added 1995.] Incidentally, it now goes without saying that the Ancient Star Catalog is Hipparchos'. (As proved in 1977 by R.Newton *Crime of Claudius Ptolemy* & DR in *Skinq 2.1:62* p.73 n.6.) The curious 1989 paper⁴ of Fomenko *et al*, which dates the Catalog to the Arabic period, is inexplicably cited (as a solid contribution) in the otherwise high-quality paper, van Dalen 1994 (n.1). The Fomenko *et al* paper's incredible date is based upon several lapses of procedure, most notably the authors' mistaken use (when going from their Table 1 to Table 3) of the Catalog's 900 AD obliquity-error ($21'$: cited at their p.225) as a constant in time. (Since the 900 AD obliquity was $23^\circ 35'$, this error corresponds to the zodiac-cataloger's astrolabe-obliquity-setting = $23^\circ 56'$ — a result already derived by DR & published in 1982 at eq.27 of *PASP 94:359*.) Given the multiplicity of indicia (*DIO 2.3* ‡8 §C22) showing that the Catalog is Hipparchos', it is now way past time that the Catalog controversy be regarded as concluded. To yet continue stubbornly flying in the face of these evidences is to carry unfalsifiability to kook dimensions — and to raise the question of whether it is worth discussing historical issues at all. (Of course, one may easily understand why certain parties might wish to render reason and competence irrelevant to the evolution of ideas in this field.) For, if even the most logically & evidentially one-sided controversies are to be decreed⁵ as indefinitely irresolvable, then — why investigate anything?

¹ In ancient spherical astronomy, a "step" equalled 15° . See *idem*.

² Excluding stars whose light was either much dimmed by atmospheric extinction or totally blocked by the horizon.

³ This is about 15^m high. There are other Catalog errors this large, especially in the south (e.g., the latter stars of Cen). But it must be noted that the δ Cen hypothesis requires presuming less α observational error (6^m high). In gt-circ measure, both errors are ordmag 1° .

⁴ A.Fomenko, V.Kalashnikov, & G.Nosovsky *Acta Applicandae Mathematicae* 17:203 (1989). (The paper fallaciously damns the sane 1987 study by Yu.Efremov & E.Pavlovskaja, and ignores an independent finding [Rawlins 1982] of the Cataloger's epoch. [And site. Higher precision at *DIO 4.1* ‡3.] I understand that this citation was proposed not by van Dalen but by a Muffia-circle advisor.

⁵ E.g., by N.Swerdlow. (See *DIO 2.3* ‡8 §§C20&C25.)