

Prism3

Prism-experiments 2011 and 2012

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In the **prism** experiments four prisms were in use per night. The thin edge of the prism was turned gW in 2 prisms and gE in the 2 remaining prisms. The purpose was to test for a spurious reaction on starry nights towards the thin edge.

If the thin edge of the prism is turned gN the starry sky as observed by the bird in the funnel beneath the prism appears “displaced” 4° to the S, corresponding to a latitude on the border between Poland and the Czech Republic. Under this condition the bird normally shows reverse northerly orientation which could be interpreted as a compensatory navigational response. However, it may also or instead be considered as a positive reaction towards the thin end of the prism (more light coming in here, or a tilted horizon, etc.). Formerly (see reports on www.jorgenrabol.dk), we tested birds under non-starry conditions or when the thin edge in the four prisms in four bird samples was turned towards gN, gE, gS and gW, respectively. The results were mostly in favour of a weak and close to statistical significant spurious effect of the thin edge of the prism. As a last contribution we now tested birds under the conditions of the thin edge turned gW and gE, respectively. Here the stellar latitude should appear the same, though there still could be some significant differences between the starry skies observed.

In the autumn of 2012 experiments were carried out on the starry nights of 16 Sep., and 6 and 10 Oct. Furthermore, in 2011 experiments were carried out on 6 starry nights in September, on some nights only three prisms were in use (1 gW and 2 gE).

Fig.14 shows the results for the W- and E-funnels, respectively.

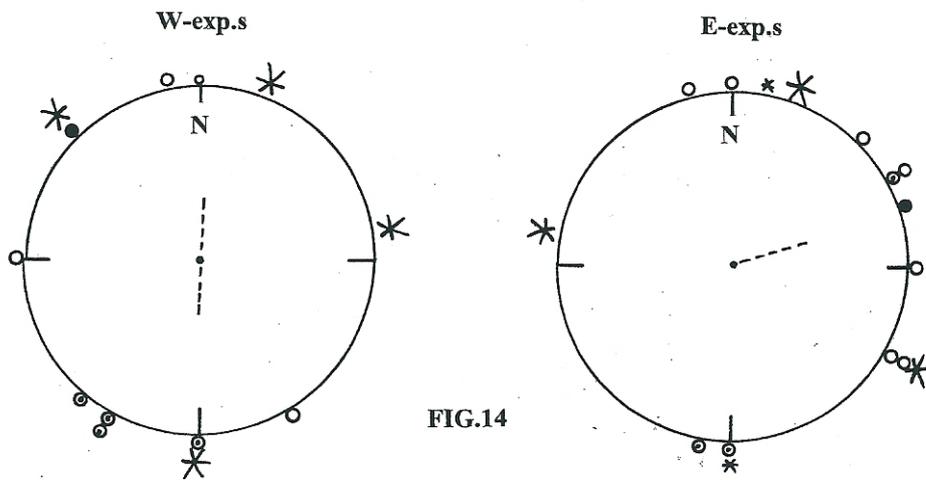


FIG.14

The W-birds look random and the mean vector is $250^\circ - 0.196$ ($n = 13$), or – if doubling the angles - $183^\circ/3^\circ - 0.344$ ($n = 13$), i.e. there is nothing like a response directed towards the thin edge of the prism (270°). Perhaps the insignificant N/S-pattern could be interpreted as a weak tendency to standard/reverse orientation

The E-birds looks more oriented as a sample as the mean vector is $72^\circ - 0.438$ ($n = 14$). Here four cases of non-axial patterns were averaged into a single mean direction: $55^\circ/300^\circ = 0^\circ$, $45^\circ/190^\circ = 120^\circ$, $90^\circ/360^\circ = 45^\circ$, and $45^\circ/285^\circ = 345^\circ$. The sample concentration of 0.438 corresponds to $0.05 < P < 0.10$, i.e. the ENE-orientation is close to statistical significance and furthermore directed about towards the thin edge of the prism (90°). So perhaps the E-birds considered in isolation display thin edge response.

If the W- and E-birds are combined in reference to gN a bimodal pattern describes best and the sample mean vector was $9^\circ/189^\circ - 0.180$ ($n = 28$).

If the W- and E-birds are combined in reference to the thin edge of the prism directed gN the sample mean vector was $-17^\circ - 0.321$ ($n = 27$). The concentration 0.321 is close to statistical significance (i.e. $P = 0.05$), and the mean direction close to the thin edge.

In conclusion, perhaps there is a slight thin edge response.

Unfortunately, we have no controls in these 2010 and 2011 prism experiments. However, the sample mean vector of the four nearby starry nights 17 Sep., 18 Sep., 8 Oct., and 11 Oct. compiled is $129^\circ - 0.329$ ($n = 22$). I.e. the orientation is not statistically significant (P about 0.10). Furthermore, the orientation is not in the standard direction. The question is whether this makes the interpretation of the orientation observed more easy or more difficult (compared to the situation where the controls had been oriented in the standard direction)? First, in advance I would had

expected a stronger component of thin edge orientation in the W-exp.s because the standard direction (SSW-SW) and the thin edge direction (W) work more or less in the same direction. Now the controls were oriented SE so on the contrary the seemingly thin edge effect in the E-exp.s could be partly spurious. Anyway and in general, a low sample concentration in the controls should make it more easy to detect a thin edge effect of the prism. Therefore, I consider the thin edge effect to be slight and so slight that a strong northerly orientation in prism experiments carried out under a starry sky is likely to be partly explained in terms of stellar navigation. However, this should not necessarily be understood too strict as gradient navigation towards a goal area between Chr.ø and a latitude 4° to the S. We do not know the orientation/navigation mechanism behind to a sufficient degree.