# Still more physics

The Whorl list — 1 messages, 1 voices, 11 Oct 1997

https://urth.darkrealm.vip/thread/whorl/454



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## John Eric Ivancich — 11 Oct 1997, 14:07

Regarding mantis' (10/8/97) assertion that if the floater countered only a portion the Whorl's rotational velocity, it would be that much easier for it to achieve non-standard heights...

That's a good point. It's actually better than he suspected, though. Since

$$a = \frac{v^*v}{r}$$

and since the outward force is proportional to the rate of acceleration (F=ma), if the velocity were to be reduced to half (and r were held constant), the outward force would be 1/2*1/2, or 1/4th of the normal force. If you could counter three-fourths of the rotational velocity, then the outward force is only 1/16th of the normal force!

In the scene [Calde, pp. 303-7**] where the floater does seem to float, there are two described effects:

1. Items (and people) in the floater seem to float.
2. The floater achieves an atypical height.

If the floater only counter-acted a portion of the Whorl's rotational velocity, it might explain effect 2 but not effect 1. "Before Silk recognized it, it had completed a leisurely quarter revolution, scarcely a span in front of his nose [Calde, p. 304**]." Things are actually floating, and not simply lighter than usual.

There are two possibilities for explaining effect 1. Either the floater completely counter-acted the Whorl's rotational velocity OR the floater counter-acted part of it, then achieved a significant height, and then started falling again back towards the surface (i.e., like the "vomit comet").

The second explanation doesn't seem likely, as they're floating for quite a period of time. "Silk's lungs filled and emptied before he realized that the oars were the barrels of guns, and a half minute crept by before he made out the blood-red triangle on its bottom [Calde p. 305**]." And quite a bit more conversations between the characters takes place during all this.

With respect to the reduced gravity-effect as one gets "higher", that is proportional to the distance from the center (no squares or such). So those on a tower half way towards the center would weight half as much.

Depending on the size of the Whorl and the size of the mountains separating the cities, the mountains may not be so formidable. The troops might be able to leap 20 feet with each step as they approach the top. Maybe their leg muscles atrophy during the march. :-)

Mantis says:

> Still, quite the apparant dilemna: the bigger the Whorl, the faster the "groundspeed"; the greater difficulty for the simulated gravity to be overcome by a normal civilian ground vehicle.

Indeed!

Eric

** All page numbers referred to are from the mass paperback version of TBotLS.