The Infeasibility of Projectiles for Use in Spaceflight

OK, Yih's escape velocity (really escape speed because direction doesn't matter as long as you don't hit the ground) is about 10.557 km/s. Let's assume the following:

1. a yinrih can survive a constant acceleration of 6G (relative to Earth gravity)
2. a projectile will continue accelerating at a constant rate until it leaves the bore of the cannon

If velocity = acceleration * time, and distance = 1/2 * acceleration * time ^ 2, then how long does the cannon have to be to achieve escape velocity at a survivable acceleration?

First we need to find the time it would take to reach escape velocity at a 6G acceleration. Solving for time we get 179.5454472 seconds, or about 3 minutes. Now we need to figure out how far the projectile will travel in that amount of time. Solving for distance gives us about 948 km, which is just too dang long.

And this is with some generous fudge factor in the yinrih's favor. Yih's gravity is actually lower than Earths, about 88%. If a human can withstand about 6 times Earth gravity, we'd have to scale that down for yinrih. Also, even if you could build a cannon that big, what propellant could possibly achieve a constant 6G acceleration.

The Bright Way eventually figures this out, but they go through a lot of martyrs. It's not that they don't know the math, but they don't know what conditions they can survive.

While I was in the middle of writing this, my dog (the very one I based Commonthroat on) flopped down under my desk at my feet, turning off the power strip my computer was plugged into, as if to say "O thou of little faith! We SHALL touch the stars!" Windows somehow recovered the state it was in when it lost power. Yay capacitors, I suppose.

Revision #1
Created 2026-06-05 22:47:25 UTC by Lurker
Updated 2026-06-05 22:47:25 UTC by Lurker