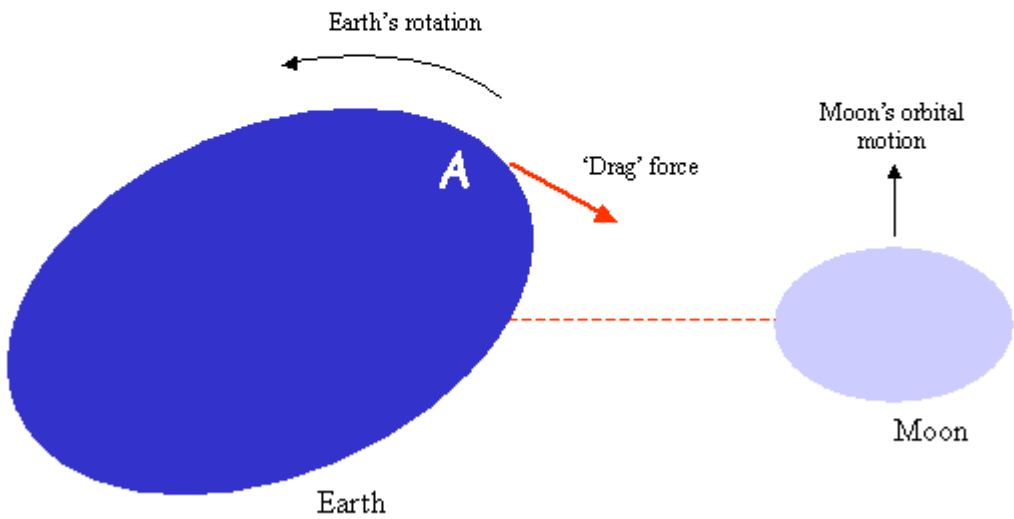
Even if there were no tidal force on the Earth from the Sun, the Earth's tidal bulge would **not** lie along the Earth-Moon axis. This is because of the Earth's rotation.

The Earth's rotation carries the tidal bulge ahead of the Earth-Moon axis. (The Earth's crust and oceans cannot instantaneously redstribute themselves along the Earth-Moon axis due to friction)

The Moon exerts a drag force on the tidal bulge at A, which slows down the Earth's rotation.

The length of the Earth's day is increasing by 0.0016 sec per century.



At the same time, bulge A is pulling the Moon forward, speeding it up and causing the Moon to spiral outwards. **This follows from the conservation of angular momentum.**

The Moon's semi-major axis is increasing by about 3cm per year.