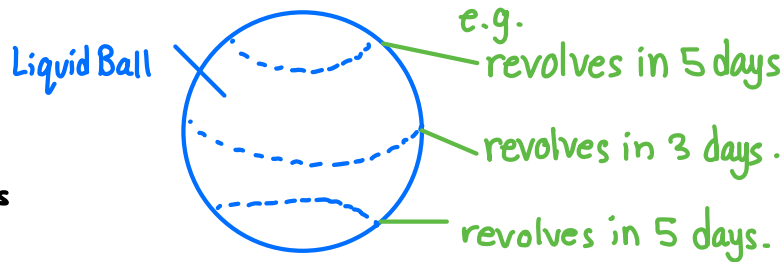
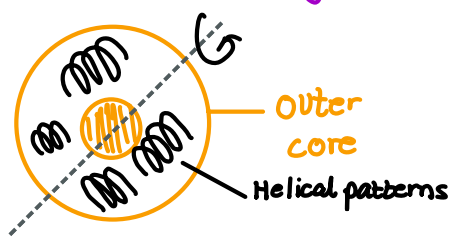


A Closer look: The effect of rotation on the magnetic fields.

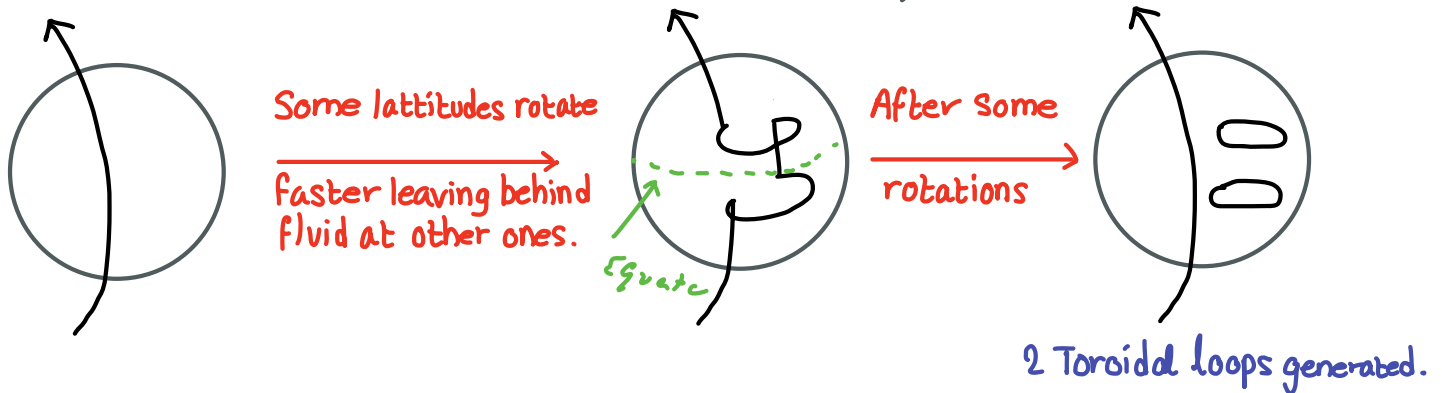
The rotation of Earth also plays a significant role in geomagnetism.

Also,
Helical flow patterns aligned with the rotation axis tend to form in the outer core. Different "latitudes" travel at different angular velocities.

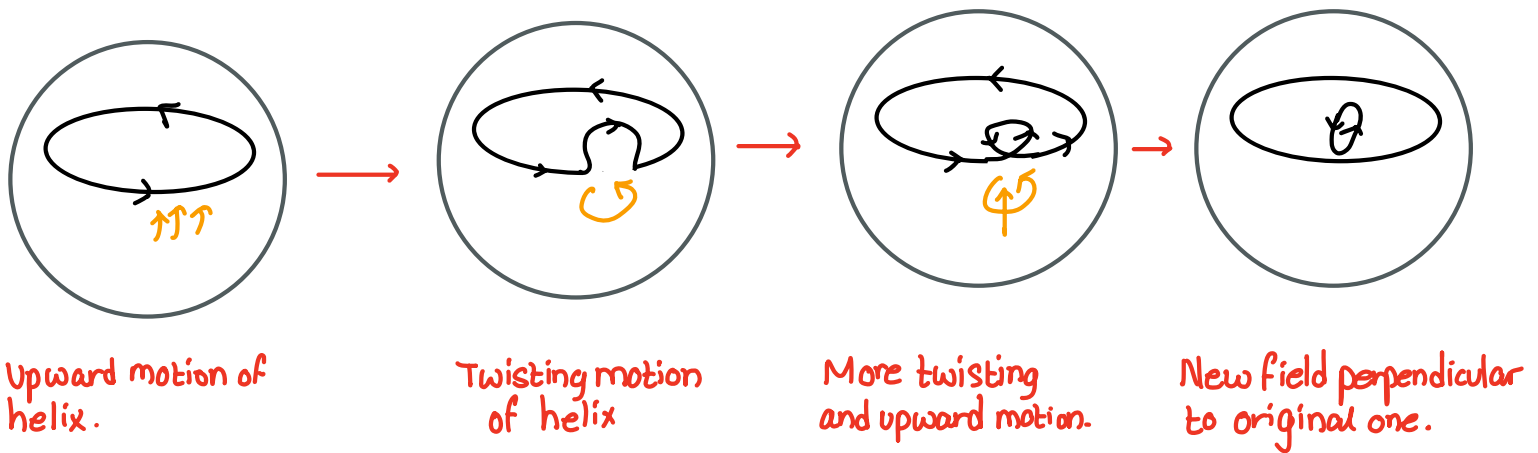


It should also be noted that in the core, magnetic field lines are "frozen" in the fluid allowing them to move together and be distorted by fluid motions. - Alfven's Theorem.

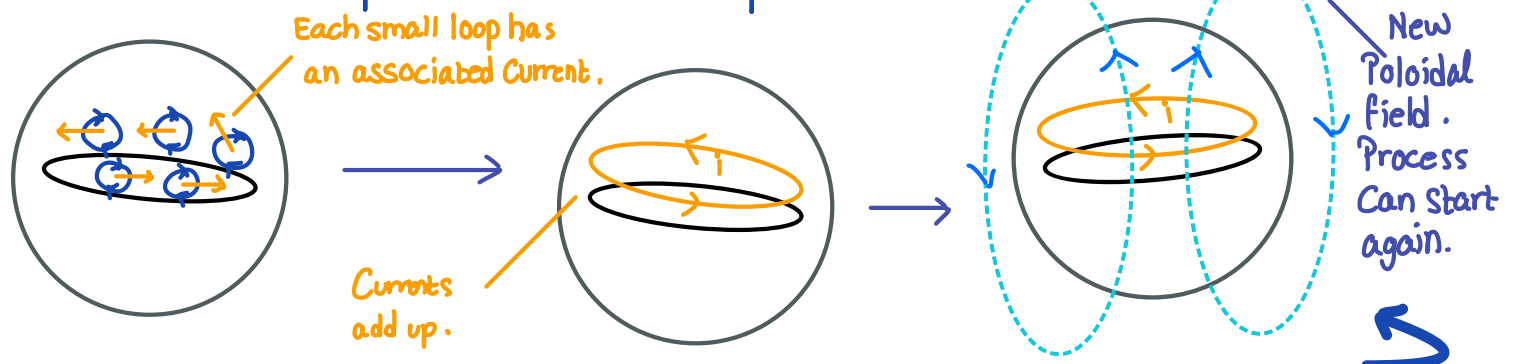
ω -effect: Poloidal to Toroidal (Due to differential Rotation)

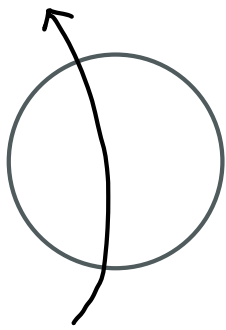


α -effect: Toroidal to Poloidal (Due to Helical Rotation)



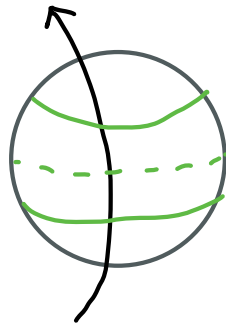
α -effect at several points in a Toroidal loop:





If no differential rotation then whole moves as 1 block & no new B-field is generated

With differential rotation



These 2 latitudes move faster than the poles (which do not move)

As liquid continues rotation, this eventually breaks & new toroidal fields are generated.