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Dolphins feel the earth's spin

Even without the sun and the stars, we would be able to tell that the earth goes round on its axis, says S.Ananthanarayanan.

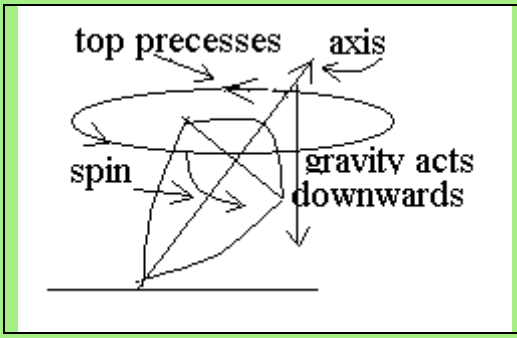
The way we can tell that a railway carriage is moving is when we see the trees and houses moving the opposite way. The ancients also figured out the earth's rotation when they saw the same stars reappear every 24 hours.

Scientists now find that dolphins too, perhaps, feel the rotation of the earth as they swim in circles in the sea

Acceleration produces a force

Back to the train carriage, if we did not look out of the window and the ride was quite smooth, we should not be able to make ou the motion at all. But if the train speeded up or slowed down, we should feel a force and come to know.

But in the case of the rotating earth, even if the earth did not speed up or slow down, we still do not need to look into the sky to make out that we are moving. This is because spinning objects fix a direction, the axis of spin, within themselves and this can take the place of external objects, like sun, stars, to help make out the motion.

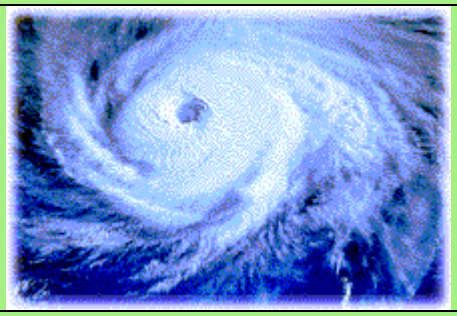


It has to do with the remarkable thing that is the spinning top. We all know that a top placed on the ground, tilted to one side, will just fall over. But still, if the top is spinning, it manages to stay upright! The reason is that the spinning top contains energy, which

is identified by the axis of spin, which is the same as the axis of the top. Now, when this axis is leaning to one side, the way gravity effects it is not by pulling it down but by pushing it the third way! We have all seen that when a top leans over, like when it begins to slow down, the tilted axis itself begins to go round. This motion is called 'precession'.

Coriolis force

The whole spinning object apart, any article on the object would feel this kind of force it started moving on the object. In the case of the earth, which is spinning from west to east, anything that moves from south to north feels a force towards west, while it is in the Southern Hemisphere and towards the east if it is in the Northern Hemisphere. This effect was discovered by Gaspard-Gustav de Coriolis, a French scientist-mathematician (1892-1843)

and finds spectacular verification in the way the monsoon winds change direction when they cross the equator. It is the same effect, again, that makes for the vortices in stormy winds – the cyclones.	

Dolphins feel the force?

The force, in fact, is quite feeble, except with winds at high speeds and the effects a discernable after the air has been in motion for hours or days. It works out to speeding up by 1/6 of a cm per second, every second, for an object moving N-S at 100 km/hour. This is about 2 km an hour every hour, for these fast winds. But slow moving objects like birds or fish may hardly feel anything.

Still, scientists have recently found that dolphins, which settle down to swimming in gentle circles when they sleep, seem to experience some feather-touch of a force that affects the direction they chose. It is seen that dolphins favour anti-clockwise circles in the Northern Hemisphere, but follow clockwise circles in the Southern Hemisphere.