

Re: Tom Van Flandern and Newtonian Gravity

Source: <http://sci.tech-archive.net/Archive/sci.physics.relativity/2004-10/0297.html>

From: Tom Van Flandern (*tomvf_at_starpower.net*)

Date: 10/01/04

Date: Thu, 30 Sep 2004 20:37:12 -0400

This replies to Vern and Dennis McCarthy.

"Vern" <vern@bealenet.com> writes:

>>> *[Vern (quoting)]: "It was originally Galileo's discovery, that the trajectory of a falling body can be separated into two or more entirely independent components of motion, caused by separate and independent forces.*

>> *[tvf]: The horizontal component of motion is a velocity, not an acceleration, and therefore has no associated force. There is only one force of gravity, and it is purely radial (which is downward for falling bodies).*

> *[Vern]: In the historical context, it seems reasonable to assume two independent forces, based on the experiments and empirical evidence.*

No, that is not reasonable in any context. A transverse force causes the orbit to spiral because it changes the speed continually in the same direction. When speed continually increases or decreases, the orbit must spiral outward or inward, respectively. Only a central force can keep the orbit at some fixed size. In orbital mechanics, we call that "conservation of angular momentum".

>> *[tvf]: Uh, no, it falls 4.9 meters in the first second. But its speed becomes 9.8 meters per second. (Getting these mixed up is not a good sign.)*

> *[Vern]: The author's native language is not English and the book has many grammatical errors as he published it himself, so I would give him the benefit of the doubt on that one.*

I don't mind bad English or bad grammar. But this and several other points were mistakes in elementary physics. People who have never learned basic physics are usually not worthy of the time it takes to show everything they misinterpreted or didn't know, and rarely appreciate it when it is done for them. The usual rationale is that

education creates biases and closes minds. By that reasoning, we should elect uneducated idiots as our leaders.

>>> *[Vern (quoting)]: Nevertheless, the radial component of the moon's orbit is merely a fraction of a centimeter, while the tangential component is more than a kilometer/sec, 100,000 times greater.*

>> *[tvf]: This author doesn't understand mechanics or orbits, and is making elementary physics mistakes.*

> *[Vern]: The above is true if you consider the forces to be separate.*
> *This goes back to your belief that Newton's Law of Gravitation is more fundamental, but the argument that Kepler's Laws are more basic can still be made and are more indicative of a mechanical cause.*

No, the statement is wrong at the level of a young child being offered a hot dog and backing away because he is wary of things that are "hot". Velocities and accelerations are completely different physical entities, each independent of the other and each having different units, so they cannot be numerically compared. Moreover, the radial increase in distance of the Moon of less than a centimeter per year is caused by the very tiny tangential tidal forces, which do make the Moon's orbit an outward spiral, albeit a very slight one. So the quoted stat has exactly the opposite import that this author intended because it shows how unimportant tangential forces are.

and "Dennis McCarthy" <djmenck@aol.com> writes:

> *[McCarthy]: there has to be an explanation for why all the planets orbit in the same direction on the same plane. Attributing it to a rotating cloud of particles just begs the question. What sets all the particles of the cloud rotating? Yes, "most things in the universe already have relative motion" -- but not all in the same direction and in the same plane.*

Hi, Dennis. Indeed, these are important questions that must be addressed by any credible theory. But they have been, and Rado seems not to know enough physics to understand even the conventional explanation. That explanation (which I do not wish to defend, but which makes better sense to me than a vortex sink) is that a supernova blast wave encounters an amorphous cloud of gas and dust, flattening the cloud into a disk perpendicular to the direction of the blast wave. Because the original cloud was blotchy, the flattened cloud will have sites of condensations denser than other places. These are where stars or planets will start to form. Once a condensation forms, accretion accelerates as all nearby matter starts to fall in that general direction while conserving its relative momentum. The result is high-speed angular motion (like an ice skater spinning up when she pulls in her arms). Particle interactions and collisions will eventually ensure that one spin direction dominates all others, with the dominate direction depending on chance densities and motions in the original cloud.

A simpler explanation comes from the fission theory. As the Sun (or any planet) accretes, it too must spin up to conserve angular momentum. As it spins faster, its shape becomes oblate. Faster yet, and it becomes prolate. Finally, it reaches overspin (centrifugal force exceeds gravity), which causes a fission. A solid body would fission on just the weakest end of the "football" shape, with the rest of the parent body snapping back into a more spherical, slower-spinning shape. For a gaseous body, when the weaker end breaks off, the opposite end does too because the "football" does not have enough cohesive strength to remain intact. So solids spin off singlet satellites, and gaseous bodies spin off twin pairs. Tidal forces take over from there, and are quite strong when the satellites are close.

It should be evident already how this model easily explains the angular momentum of the solar system. For further model details, implications, and predictions, see <http://metaresearch.org/solar%20system/origins/original-solar-system.asp>, which also has a fission animation.

> [McCarthy]: *The point I often highlight is the lack of explanation for why most moons orbit near the plane of the equator of planets in the same direction as rotation. You correctly write that the "fission origin theory" would explain the Earth moon system.*

The fission model readily explains why natural moons orbit near the equatorial planes of their parent bodies. It explains the origin of the solar system's major planets and major moons with a single model. It also makes some predictions about exoplanets that will soon be tested.

> [McCarthy]: *However it would not explain Uranus, which rotates on its side, yet the moons still orbit its equator -- nearly perpendicular to the rest of the solar system. I think it self-evident that we should not seek to explain the coincidence of lunar orbits with planetary rotation and planetary equators one planetary system at a time. The current theory for the moons and rotation of Uranus is that it is the result of its collision with a planetary sized body. But if we accept the impact origin of moons, then have all the other impacts been just right so as to ensure that essentially all the other major moons remain prograde and in nearly the same plane as the solar system?*

The tilt of Uranus requires a special explanation in any theory, and impact is as good an explanation as any. I envision a large impactor that gets absorbed into Uranus much like a lunar mascon, and slowly sinks and dissolves over many millennia. This would induce gradual axis tilt. As long as the tilt is slow compared to the precession period of the satellite orbits, they will be forced to follow the tilt and remain low inclination to the equator at all times. This model is described in my book "Dark Matter, Missing Planets and New Comets", along with plausible origin models for all the planets, moons, asteroids, comets, and meteoroids in the solar system. I agree that only

one model should be needed for the origin of the system. But IMO the last 4.5 billion years have seen a rich and varied set of events that have changed each body in the solar system as much as Earth has changed since its origin. It has not been just a lot of monotonous, uneventful orbiting.

- > [McCarthy]: *Is there anything in current physics that forbids the*
- > *natural occurrence of a moon in a polar orbit? Yet it never happens --*
- > *even when a planet has been knocked on its side. Why?*

Leaving aside the stability issue (which prevents long-term survival in a polar orbit), origin conditions in both solar nebula and fission models mandate near-equatorial formation of planets and satellites.

- > [McCarthy]: *Finally, the similarities between our Jovian planetary*
- > *systems and the encompassing solar system are too numerous to count.*
- > *In fact, in many mainstream treatments on the subject, Jupiter is*
- > *described as a miniature solar system. Our solar system and the*
- > *Jupiter system both rotate in the same direction, near the same plane.*
- > *Both have orbiting terrestrial bodies and rings. It is particularly*
- > *unparsimonious, to put it mildly, to use two completely different*
- > *explanations for the formation of these two systems – and leave their*
- > *obvious resemblance to chance.*

Agreed. But again, neither competing theory, solar nebula or fission, does that. The motivations you have mentioned are explained well by these models. So no third theory is needed on that account.

But from what little I know, even if no existing theory explained anything, the vortex sink model would not be viable. Dennis, I know you understand angular momentum. So what about the vortex model interests you? It strikes me as a non-solution looking for a non-problem. –[Tom]–

Tom Van Flandern – Washington, DC – see our web site on replacement astronomy research at <http://metaresearch.org>