Re-Examination of Newton's First Law

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Trouble with Newton's First Law was found in my original study, but the trouble is not easy to see. In fact, most readers fail to see it. Old ways of thinking stand in their way, and so the purpose of this note is to reexamine Newton's First Law, and to put its trouble in perspective with the state of modern physics.

Introduction

The ultimate goal in physics—to formulate a theory of everything—remains to be found despite all best efforts. String theory has so far been the best shot, but no part of it has been tested, and no one knows how to test it. So where do we go from here? According to Lee Smolin, author of *The Trouble with Physics* [1], "The one thing everyone who cares about fundamental physics seems to agree on is that new ideas are needed. From the most skeptical critics to the most strenuous advocates of string theory, you hear the same thing: We are missing something big."

So where does one search for new ideas, or to find a problem in physics? In a letter to members of the Natural Philosophy Alliance (NPA), ex-president Francisco Müller writes: "I see the catastrophe of Einstein's relativity so irreversible, that unless we go to a deep philosophical reconsideration of the WHOLE enterprise since Newton, Faraday, Maxwell, Ampere, *etc*., *etc*., we will be all going in a circle." And as a minimum consensus, Peter Marquardt recommends the following: "Let us try to focus on the essence of physics: What are the iron principles that never have been found to fail and still leave room for novel discoveries?"

Newton's First Law says that a body in motion tends to move in a straight line, and yet all things in the Universe move about in circular motion. Gravity is thought to be the cause, but the cause itself is a mystery. According to Newton, a body's tendency to move in a straight line is just an act of Nature. The principle has no real cause. And so, does this iron principle leave room for novel discoveries?

Kinematics *vs*. Dynamics

Marquardt delivered the John E. Chappell Memorial Keynote Address at the 2007 yearly conference of the NPA. He discussed how over-estimating a well-established law, formula, or effect might give rise to superficiality. If we dig a little deeper, we might be surprised at an answer that others have overlooked. According to Marquardt, some prominent examples that require a fresh diligent look include kinematics versus dynamics.

Without question, Newton's First Law seems to be valid. Just twirl a ball from a string and you can feel the effect. Then let go of the string. You can see the ball move into a straight line. And so Newton took this principle for granted, and then used the idea of gravity to explain planetary motion. But suppose we start over with a different approach. Instead of straight-line motion, we can postulate circular motion to be the natural thing. The first challenge then becomes to explain how this might be so, and to explain why a ball twirling from a string tends to move in a straight line.

A means by which circular motion is natural and force-free was introduced in my original paper titled, "New Physics Based on Force-Free Circular Motion" [2]. Such motion is defined as the inertial effect of two separate motions, but where one motion carries the other. A body moves in a straight line, but its linear momentum is carried and turned effortlessly by a spin from the body itself. Hence, the body moves about a full circle with each of its own 360° rotations. The roundabout motion is somewhat like that of the Moon's orbit.

The spin involved with force-free circular motion is no ordinary spin—it is strictly an inertial effect. Contrary to principles of contemporary physics, the spin is a rotating inertial frame of reference. For this reason, a body's straight-line motion is sustained but not always seen. It can be seen only if viewed from a frame of reference that turns with the body's spin. But from a fixed point of view, the two motions appear as circular motion. Potential effects of this sort exist with all circular motion. But in the presence of force, the special effect is not realized because force prevents it from happening.

Force-free circular motion may truly exist, but Newton's First Law still comes into play. For example, consider a ball twirling from a string. Many things happen, but some things are caused by inertia, while others are caused by force. Moreover, some effects are stronger than others, and so the final outcome is determined by their magnitude. In reality, force-free circular motion is a potential effect, but the effect is not realized because force prevents it from happening. Thus, Newton's First Law holds true with the application of force.

In order to explain the trouble with Newton's First Law, a ball twirling from a string is to be examined. The string is pulled taut by straight-line motion from the ball. The pulling effect is a fictitious force caused by inertia, while the string pulls back with a true force. The ball then pulls at a right angle to the force of the string. Conceivably, the ball tries to twist and rotate about its connection to the string because the pulling effects are unbalanced. Yet, the twist never happens. The effects of centrifugal force and centripetal force create tension throughout the ball and string. The ball and string are much like a stiff rod, and so the twist of the ball fails to take place. But if a twist actually occurred, it would be an inertial effect, and the effect would carry and turn the ball's linear momentum. But still it never happens. Force keeps the linear momentum of the ball at a right angle to the force itself, and then drags the ball about a circular path. Indeed, the ball tries to move in a straight line, but the effect is not just an act of Nature. It is caused by force.

At any rate, a ball that actually twists or turns will have the same kind of pulling actions within the ball itself. Like most any object, a ball is formed and physically bonded together by force. And so when a ball turns, its linear momentum has an unbalanced pull with the force of the ball. Thus, the ball's linear momentum tries to twist itself at each and every point along the radius of its turn, but is held at a right angle to the force, *by the force*, and dragged about a circular path. The pulling actions from within a ball are no different from those of a ball's twist at the end of a tether. The same force that pulls on the ball tends to keep the ball in a straight line of travel. The same thing happens to anything turned by force. It can be external force like a tether on a ball, or it can be force from within a ball itself. Regardless, it is always force that upholds Newton's First Law. You can ponder as you will, but most any object is formed and physically bonded together by force, and so it complies with Newton's First Law. And so when does the law fail?

Based on my original study [2], the effects of gravity are produced by force-free circular motion. Accordingly, gravity is not a true force—it is only a fictitious force. The same notion holds true in general relativity. Einstein himself said that gravity is not a true force. And because celestial bodies are formed and bound together by gravity, they move about in the absence of true force. For this reason, celestial bodies can move in violation to Newton's First Law. Instead, they just move about naturally with force-free circular motion. A body moves in a straight line, but its momentum is carried and turned by a force-free spin from the body itself. Such motion has the same geometry as that of spacetime. In general relativity, a body moves along a straight line (a geodesic) but through curved spacetime. In addition, force-free circular motion creates an imbalance of momentum, and so the motion itself creates a twisting effect. A strong twist will carry and shift the position of a body's orbit so as to produce the effects of gravity. The twisting effect is similar to that of frame dragging. For instance, gravitational effects are produced by the Earth's rotation because the spin is force-free. Each and every particle of the Earth moves about the Earth with force-free circular motion. There really is no action at a distance, or some force of attraction. A stone is carried about with the Earth's rotation by its own force-free circular motion. Granted, a stone is formed and bonded together by force. But any object can have more than just one motion. Elementary particles from within a stone come from creation, and so they have the same basic motion as the entire Universe. This primitive but ongoing motion is completely independent of any secondary motion involving force. Therefore, a stone moves about the Earth with force-free circular motion. An imbalance of momentum creates a twisting effect from the stone itself, and so its frame of reference tends to shift and become eccentric to the Earth. As a result, the circular path of a stone is shifted and directed toward the Earth. The Coriolis force also plays a role in the effect, but the overall perception is that of gravity. And because gravity and inertia are one and the same, the Equivalence Principle holds true. But from an observer's point of view, a body tends to move in a straight line because a body acted upon by force is caused by force to work at maintaining a straight line of travel.

My full report [2] goes on to explain much more, and all is based on force-free circular motion. In short summary, force-free circular motion explains how tides are produced on the Earth with no real influence from the Sun or the Moon. Such motion also explains the constant speed of light, along with the Shapiro effect. Furthermore, the same kind of motion brings about an apparent increase of mass when the speed of an object becomes faster. This will then cause the rate of a clock to slow down. Not just one, but two force-free circular motions by the entire Universe—with one motion perpendicular to the other—would in no doubt produce a multitude of inertial effects that could all be mistaken for gravity. A dual spin like this can explain many things, including a grand explosion at the beginning of creation, a reason for Kepler's Laws, an orbit's perihelion precession, and a conceptual basis for workings of an atom. Indeed, we have been fooled by Mother Nature.

Conclusion

Something new is desperately needed in physics, but old ways of thinking stand in the way. Trouble with Newton's First Law has been found, and with it comes a radical change in physics—the possibility of a rotating inertial frame of reference. By such means, a body's linear momentum is carried and turned by a force-free spin from the body itself. In consideration of Occam's Razor--what could be simpler? Everything just moves about the Universe according to this new understanding of motion, and the whole idea of gravity goes to the wayside. Indeed, this idea can change most everything in physics, and it just might be the change we are looking for. Another point made by Smolin is this: "Good ideas are not taken seriously enough when they come from people of low status in the academic world; conversely, the ideas of high status people are often taken too seriously." And so is it Newton's Law—or Newton's Flaw?

References

[1] Lee Smolin, **The Trouble With Physics** (Haughton Mifflin Company, New York, NY, 2006).

[2] Mitch Emery, "New Physics Based on Force-Free Circular Motion", Proceedings of the Natural Philosophy Alliance Vol. 3, No. 1: 24-36.