Universal Physics Journal
Article VI: Gravitation = Acceleration?

Author: Ethan Skyler
Publication Date: April 26, 2001
Revision Date: January 27, 2004

Purpose

In this article, I intend to answer the question: "Is a gravitational event really the equal of an accelerational event? Concepts at risk include the presumed equality of an accelerating frame of reference to a non-accelerating frame of reference, and the General Theory of Relativity by Albert Einstein.

Article VI

The major premise of Albert Einstein's General Theory of Relativity is the belief that a non-accelerative gravitational event is the equal of a non-gravitational accelerative event. How equal? Well, Albert Einstein thought of these two different events as being perfectly equal with no detectable differences between them. The fact that the value of the mass of a given object's matter determined during a gravitational event can be a precise match with the value of the mass of the same object's matter determined during an accelerational event is cited by Einstein as a fact that stands as proof of the equality of these two very different types of events. But are these two different events really as equal to each other as is claimed by Albert Einstein in support of his General Theory of Relativity which he designed as a forceless replacement for Isaac Newton's forceful Universal Law of Gravitation?

(2) It is important that you and I investigate this equality question thoroughly, for the validity of the General Theory of Relativity depends in part upon there being no testable differences between these two different events. Should we discover testable differences between a gravitational event and a matching accelerational event then these events will lose their equality status. An unavoidable consequence of such a discovery is that any theory that is dependant upon their equality for support will lose all or part of its support.

(3) Now that we have a number of tools in our Force Investigation Toolbox, let us use these tools to compare the forces present during the weighing of an object against Earth in a non-accelerative gravitational event, to the forces present during the weighing of the same object against a cross-hull bulkhead in a rocket-powered non-gravitational accelerative event that takes place in deep space.

The Non-Accelerative Gravitational Event on Earth

(4) To keep upward acceleration/Reaction forces to a minimum, the primary gravitational weighing event will occur in a comfortably warm, circular room, of considerable size, located on the continent of Antarctica at Earth's axis of rotation. The room's glass-surfaced floor forms a flat plane that is level at its center. The scale used in this event is a high-precision compression spring

scale capable of detecting incredibly small differences in the weight-force of objects. This scale directly measures the external contact forces (weight-forces) present between the object above the scale and the floor and Earth below the scale. The "object" to be weighed in this event is composed of the same stack of 4 pavers used during the force events in Article IV. In addition to this gravitational weighing event, I will have you consider the behaviors of two brass plumb bobs and a heavy pendulum suspended from the room's high ceiling, and also the behavior of a long, accurate, aluminum-beam level laid horizontally on the floor. Our purpose here is to identify as many characteristics of the forces present during this gravitational weighing event for later comparison to the forces present during the accelerational weighing event.

(5) After placing the compression scale near the middle of the room, you decide to weigh each paver to make certain that the force of its weight is exactly 1.5 pounds. Here at Earth's South Pole, no portion of the downward-directed action force of the paver's Earth gravitation is being terminated while causing any centripetal acceleration for the paver about Earth's axis, plus the paver is closer to Earth's center of matter since it is not positioned on any portion of Earth's rotationally-cause equatorial bulge, so the force of the paver's weight will register higher here. You adjust each paver's weight to 1.5 lb.force by grinding away a portion of its matter.

(6) Next you pick up Paver 1 by hand, note the feel of its 1.5 lb.force weight, stack Paver 2 on top noting their combined 3 lb.force weight, add Paver 3 and then Paver 4 until you are supporting the full 6 lb.force of their combined Earth gravitational weight. Here you are witness to how the internal Type 2 monopole force of gravitation being generated within each component of each paver's matter is a stacking force that is causing the Type 3 bipole external stacking forces between each subsequent pair of pavers to increase in the direction of your hand. You place the stack of pavers on the scale and note the scale's 6 lb.force reading. Since you already know that if the scale were suddenly to disappear, the stack of pavers would immediately begin accelerating downward toward the floor, you recognize that the internal force of Earth gravitation present within each paver is not only the non-acceleration/Action force responsible for causing the pavers to bear with the downward external contact force of their weight against the scale, but can instantly become the acceleration/Action force that is responsible for causing the sudden downward acceleration for the pavers, should the support force from the scale come to an end.

(7) Thus you conclude that in this gravitational weighing event, the primary action force responsible for the paver's weight is the downward internal Type 2 monopole action force of Earth gravitation being generated within each component of each paver's matter. Recognizing that this downward action force of gravitation is eventually opposed by the equal and opposite primary internal Type 2 monopole action force of paver gravitation being generated within each component of Earth's matter, you further conclude that this non-accelerative gravitational weighing event represents equal and opposite action forces with no reaction forces present.

(8) Next, you turn your attention to the two plumb bobs that are suspended by glass strings from the room's high ceiling. Right away you notice that there is a 360 degree ring finely etched into the room's glass floor and what appears to be a corresponding one etched into the room's glass ceiling. The diameter of each degree ring is plainly marked as 660.00 feet which equals 1/8 mile or 201.16,84 meters. The first plumb bob's string passes up through a hole that is drilled on the

ceiling's degree ring precisely at the 90 degree mark. The second plumb bob's string passes up through a hole that is drilled on the ceiling's degree ring precisely at the 180 degree mark. The body of each plumb bob draws down to a point as sharp as a needle. The needle point of the first bob is suspended just above and directed near the floor's degree ring at the 90 degree mark. On the opposite "side" of the large-diameter circular room, the second bob is suspended just above and directed near the floor's degree ring at the 180 degree mark. Each plumb bob is hanging inside a clear plastic pipe that runs from floor to ceiling, whose apparent purpose is to stabilize the air currents around the bob and its supporting string. There is an opening in one side of each tube at the floor level so that you may closely inspect the location of each bob's needle point relative to the degree ring which is finely etched into the glass floor. You note upon closer examination that the needle points of each plumb bob measures about 1/100 foot or 1/8 inch inward toward the room's center from the degree ring etched into the glass floor.

(9) While you are considering exactly why it is that the needle points of the two plumb bobs are 1/4 inch closer to each other than are the two holes in the ceiling through which the bob's glass strings pass, you walk over to the Foucault Pendulum that is hovering directly over the room's center point that is clearly marked on the floor. Around this center point, a smaller degree ring is also etched into the glass floor. You check your watch which indicates the time to be 3 PM so you decide to draw the pendulum aside from the room's center point in the direction of the 90 degree mark which corresponds to the 3 o'clock position of the hour hand on your pocket watch. When you release the pendulum, you observe its slow acceleration in a horizontal direction across the room's center point in the direction of the small degree ring's 270 degree mark.

(10) After watching the pendulum's regular, noiseless, and apparently effortless motion, you break free to once again consider why it is that the two plumb bobs, including their supporting strings, are not hanging parallel to each other. Instead, you observe them to be converging toward each other and the center of the room. Then you consider that if the directions the two bobs are pointing were greatly extended, these imaginary lines would eventually reach a point of convergence where they would meet. While thinking of where this point would be, you decide that it would and should be located at Earth's center of matter. Then you remember the teachings of Isaac Newton where in PRINCIPIA he predicts that, on average, the gravitation of a body in space behaves as a point force, as if all of Earth's matter is located at one moving point in space which is approximately 3,950 miles directly below the center point marked on the floor of the moving circular room. This means that each of the plumb bobs is pointing toward this distant central point located deep within the core of Earth. This is why you observe these two bobs as visibly converging toward the center of the room. You decide to calculate how far each bob should actually converge toward the room's center point, given the ceiling's vertical height as 660.00 feet above the floor, given the horizontal distance each bob is suspended from the ceiling's center point as 330.00 feet, and given the vertical distance from the floor down to Earth's center as 3,950 miles.
US units Plumb Bob Distance converged toward room's center point
Room Height = 660 ft.
Earth's Polar Radius = 3,950 miles x 5280 feet per mile = 20,856,000 feet.
Total Distance = Room Height + Earth's Polar Radius = 660 ft + 20,856,000 ft = 20,856,660 feet.

Horizontal Distance converged by extended plumb line over Total Distance = 330 ft
Ratio = Total Distance / Room Height = 20,856,660 ft / 660 ft = 31,601 / 1.
Plumb Bob Distance = Horizontal Distance / Ratio = 330 ft / 31,601 = 0.01 feet.

(11) I will perform the same calculation in SI units.
SI units Plumb Bob Distance converged toward room's center point
Room Height = 201.17 m.
Earth's Polar Radius = 6,356,921.51 m
Total Distance = Room Height + Earth's Polar Radius = 201.17 m + 6,356,921.51 m = 6,357,122.68 m.
Horizontal Distance converged by extended plumb line over Total Distance = 100.58,4 m.
Ratio = Total Distance / Room Height = 6,357,122.68 m / 201.17 m = 31,601 / 1.
Plumb Bob Distance = Horizontal Distance / Ratio = 100.58,4 m / 31,601 = 0.00,318 meters.

(12) Here you have determined the distance along the floor, due to Earth gravitation, that each plumb bob will deflect inward from the degree ring toward the room's center point. At this point, you decide to check on the Foucault Pendulum that has been quietly swinging forth and back across the room's center point. It is no longer following the 90 degree to 270 degree path but instead is closer to 60 degrees to 240 degrees. You check your watch to see that the time is now nearly 5 PM. While you did expected to see the Foucault Pendulum rotate inside the room, you were caught off guard for this observed rotation of the pendulum is counter-clockwise in direction. But then that makes perfect sense to you when you consider that the room is located on Earth's clockwise rotating South Pole, and not its counter-clockwise rotating North Pole. You now realize that it is the room that is rotating clockwise, not the pendulum rotating counter-clockwise. You take a moment to admire how Foucault's pendulum steadfastly refuses to adopt the absolute rotation of the room's frame of reference.

(13) Now you realize that this absolute rotation of Earth, and of the room along with the two brass plumb bobs inside, will cause an acceleration for each bob in the inward direction as it orbits the room's center point. The force causing this acceleration for each plumb bob can only come from an outward shift in the bob's position allowing the now relatively inward displaced attachment point of the bob's string to the ceiling to apply a small inward-directed action force to the bob's matter. The outward shift in the bob's position that provides for the correct inward-directed action force will reduce somewhat the previously calculated amount of inward deflection. You decide to calculate the distance of each bob's outward shift, beginning with the calculations necessary to determine the inward-directed acceleration/Action force that is causing acceleration for each bob as it slowly rotates 360 degrees about the room's center point once every sidereal day with a reported elapsed time of 23 hours, 56 minutes and 4.10 seconds.
US units Horizontal Bob Force causing inward-directed acceleration for each plumb bob.
Bob Mass (including relevant portion of string) = 1 lb.m.
Radius = 330 ft.
Time = 23 hr, 56 min, 4.10 sec = (23 hr x 3600 sec/hr) + (56 min x 60 sec/min) + 4.10 sec = 82,800 sec + 3360 sec + 4.10 sec = 86,164.10 sec.
Circumference = 2 x Pi x Radius = 2 x 3.14159 x 330 ft = 2073.45 feet.
Speed = Circumference / Time = 2073.45 ft / 86,164.10 sec = 0.024 ft/sec.

Instant Velocity = Speed = 0.024 ft/second.
Bob Acceleration = (Instant Velocity)² / Radius = (0.024 ft/sec)² / 330 ft = 0.00,000,175 ft/sec².
(Note: A Poundal is the force required to horizontally accelerate an object with a 1 lb.mass rating in a vacuum at the rate of 1 ft/sec² in Universal System Poundal/ lb.m/ ft units. Poundal = lb.force x 32.17,25 ft/sec² (g) while lb.force = Poundal / 32.17,25 ft/sec² (g).)
Horizontal Bob Force (Poundal) = Bob Mass x Bob Acceleration = 1 lb.m x 0.00,000,175 ft/sec² = 0.00,000,175 Poundal
Horizontal Bob Force (lb.f) = Bob Force (P) / g = 0.00,000,175 P / 32.18 ft/sec² = 0.00,000,005,438 lb.force.

(14) As you might imagine, a 54.38 billionth of a pound of force is a very light force indeed. The SI calculations are below.
SI units Horizontal Bob Force causing inward-directed acceleration for each plumb bob.
Bob Mass (including relevant portion of string) = 0.45,36 kg.
Radius = 100.58,4 m.
Time = 23 hr, 56 min, 4.10 sec = (23 hr x 3600 sec/hr) + (56 min x 60 sec/min) + 4.10 sec = 82,800 sec + 3360 sec + 4.10 sec = 86,164.10 sec.
Circumference = 2 x Pi x Radius = 2 x 3.14159 x 100.58,4 m = 631.99 m.
Speed = Circumference / Time = 631.99 m / 86,164.10 sec = 0.00,733,5 m/s.
Instant Velocity = Speed = 0.00,733,5 m/second.
Bob Acceleration = (Instant Velocity)² / Radius = (0.00,733,5 m/sec)² / 100.58,4 m = 0.00,000,053,5 m/sec².
Horizontal Bob Force = Bob Mass x Bob Acceleration = 0.45,36 kg x 0.00,000,053,5 m/sec² = 0.00,000,024,267,6 Newton.

(15) Next we need to calculate the distance of the outward shift that will occur to each plumb bob in order for this small inward-directed force to occur. The ratio of the distance of the plumb bob's outward shift to the distance from the bob to the ceiling is equal to the ratio of the horizontal component of the force applied by the string to the bob to the vertical component of the force applied by the string to the bob. Since we already know the distance from the point of the bob up to the ceiling to be 660 ft, the solution to the force ratio will yield the horizontal distance of the bob's outward shift.
US units Outward Shift of plumb bob due to its acceleration around the room.
Vertical Bob Force = 1 lb.f.
Vertical Bob Force Vector = 660 ft.
Horizontal Bob Force = 0.00,000,005,438 lb.force.
Horizontal Bob Force Vector = Outward Shift
Horizontal Bob Force Vector = Vertical Bob Force Vector x Horizontal Bob Force / Vertical Bob Force = 660 ft x 0.00,000,005,438 lb.f / 1 lb.f = 0.00,003,589,08 ft.

(16) Here you are relieved to learn that an outward shift of 35.89 millionth of a foot is too small to have any noticeable effect upon the position of the plumb bob and therefore may be ignored. This means that the calculated value for the inward convergence of each plumb bob of 0.01 ft. toward the room's center point agrees with the value of 1/100 foot or 1/8 inch that you measured when you first observed the two plumb bobs.

(17) I shall perform the ratio calculation above in SI units below.
SI units Outward Shift of plumb bob due to its acceleration around the room.
Vertical Bob Force = 4.44,84 N
Vertical Bob Force Vector = 201.17 m.
Horizontal Bob Force = 0.00,000,024,267,6 N.
Horizontal Bob Force Vector = Outward Shift
Horizontal Bob Force Vector = Vertical Bob Force Vector x Horizontal Bob Force / Vertical Bob Force = 201.17 m x 0.00,000,024,267,6 N / 4.44,84 N = 0.00,001,1 meters.

(18) Feeling comfortable about being able to measure and calculate the convergence caused by a point force such as the paver's force of Earth gravitation, you silently consider another method of revealing that the weighing of the 4 pavers by the compression spring scale is indeed a gravitational weighing event. There is a series of stairs with handrails and landings that wind their way up the circular wall to an opening in the room's high ceiling. You pick up the scale and the 4 pavers and start climbing the stairs to the first landing at the 220 foot elevation. Here you place the scale on the level landing and weigh the stack of pavers. You are undecided whether they weigh the same or less than they did on the room's floor. You climb some more and then weigh the 4 pavers at the 440 foot elevation. Again you are undecided. Finally, you reach the opening in the ceiling where there is a landing at the 660 foot level. For a third time, you weigh the pavers and this time you detect a small reduction in the the scale's indication of the paver's weight-force. You decide to calculate the force of the paver's Earth gravitational weight both at the floor and the ceiling using Newton's formula for determining the mutual forces of gravitation affecting any two objects in space.
US units Weight-force of four 1.5 lb.mass pavers at floor elevation.
Pavers' Mass = 6 lb.mass
Earth's Mass = 1.30,930,196,083,802 E+25 lb.m
Radius of Earth's center to polar sea level = 20,855,454 feet.
Gravitational Constant (G) = 1.06877008179884940237 5e-9 P*ft²/lb.m².
Pavers' Weight (Poundal) = G x Pavers' Mass x Earth's Mass / (Radius)² = 1.06,877,008,179,884,940,237,5e-9 P*ft²/lb.m² x 6 lb.m x 1.30,930,196,083,802 E+25 lb.m / (20,855,454 ft)² = 193.03,500 P.
Pavers' Weight (lb.f) = Poundal / g = 193.03,500 P / 32.17,25 ft/sec² = 6 lb.f.
US units Weight-force of four 1.5 lb.mass pavers at ceiling elevation.
Pavers' Mass = 6 lb.mass
Earth's Mass = 1.30,930,196,083,802 E+25 lb.m
Radius from Earth's center to ceiling = 20,856,114 feet.
Gravitational Constant (G) = 1.06877008179884940237 5e-9 P*ft²/lb.m².
Pavers' Weight-Force (Poundal) = G x Pavers' Mass x Earth's Mass / (Radius)² = 1.06,877,008,179,884,940,237,5e-9 P*ft²/lb.m² x 6 lb.m x 1.30,930,196,083,802 E+25 lb.m / (20,856,114 ft)² = 193.02,278 P.
Pavers' Weight-Force (lb.f) = Poundal / g = 193.02,278 P / 32.17,25 ft/sec² = 5.99,962 lb.f.

(19) While you admit that the pavers' weight-force is not being reduced much by increasing the elevation of the event 660 feet, the effect, though small, is still very much present and therefore a

valid predictor regarding the characteristics of the forces present during the gravitational weighing event. For certain, this reduction of the pavers' weight-force reveals to you that you are moving the scale and the stack of pavers within fields of gravitational influence. The gravitational field that is causing the pavers' weight-force is a field, on average, that is emanating in all directions from Earth's center of matter. Hence Isaac Newton's decision to regard all the matter of Earth as existing at a point some 3,950 miles directly below the room's floor. The portion of Earth's gravitational field of influence that exists here within the room varies in its influence most noticeable from floor to ceiling. This testable variation is a fact you take as proof that you are existing within Earth's gravitational field of influence.

(20) I shall repeat the gravitational calculation above in SI units below.
SI units Weight-force of four 0.68 kg pavers at floor elevation.
Pavers' Mass = 2.72,158 kg.
Earth's Mass = 5.93,895,473,481,82 e+24 kg
Radius of Earth's center to polar sea level = 6,356,755.09 m.
Gravitational Constant (G) = 6.67259 e -11 N x m^2 / kg^2.
Pavers' Weight Force = G x Pavers' Mass x Earth's Mass / $(Radius)^2$ = 6.67259 e -11 N x m^2 / kg^2 x 2.72,158 kg x 5.93,895,473,481,82 e+24 kg / $(6,356,755.09\ m)^2$ = 26.69,037 Newton.

SI units Weight-Force of four 0.68 kg pavers at ceiling elevation.
Pavers' Mass = 2.72,158 kg
Earth's Mass = 1.30,930,196,083,802 E+25 lb.m
Radius from Earth's center to ceiling = 6,356,956.26 m.
Gravitational Constant (G) = 6.67259 e -11 N x m^2 / kg^2.
Pavers' Weight Force = G x Pavers' Mass x Earth's Mass / $(Radius)^2$ = 6.67259 e -11 N x m^2 / kg^2 x 2.72,158 kg x 5.93,895,473,481,82 e+24 kg / $(6,356,956.26\ m)^2$ = 26.68,868 Newton.

(21) During the descent back to the floor, you notice the long scientific version of the carpenter's level that is lying on the floor near the silently hypnotic Foucault Pendulum. The air bubble in the level's super-sensitive liquid vial indicates that at its current central location, the room's glass floor is precisely level. You rotate the level end for end to verify that the room's center is indeed level. Again the level reveals this fact. But the room is so large, you decide to carry the level near to the wall in one direction to see if the floor is level there. Curiously, you find that it is not. So you walk all the way across the room's perfectly flat floor while carrying the level to test the floor near the far wall. Again you learn that the floor is equally out of level near that wall too. After wondering why this obviously flat floor is only level in the middle, you realize that if this flat floor were 20 thousand miles in diameter, it's outer edges would extend almost straight up away from Earth into space. This means that as you walk farther and farther away from the room's center, the flat floor underneath your feet will become steeper and steeper until it is so steep that you can no longer walk up its inclined surface. All the while the floor remains perfectly flat while testing level with Earth only at its center point which happens to be the point of tangency between the flat floor and Earth's curved surface.

(22) With this 20 thousand mile diameter floor a given, you now realize that as you move the Earth gravitational weighing event farther and farther away from the room's center along the flat

floor, the 4 pavers will weigh with less and less force against the scale as not only does their distance from Earth's center of matter increase and their position within Earth's gravitational field of influence shift, but also the point source of their Earth gravitation is no longer directed at a right angle to the floor's surface. This means to you that the scale is only weighing the "normal" component of the force of the 4 pavers' Earth gravitation that is directed at a right angle to the floor. The remaining component of this force is directed parallel to the floor and toward the room's center point. When you move this gravitational weighing event sufficiently far from the room's center point, this sideways component will become so great in magnitude that the pavers will slide sideways off the scale or the scale complete with pavers will begin sliding sideways along the steep flat floor toward the room's center point. Thus you now realize that the pavers will only exhibit their true Earth gravitational weight against the floor when this event takes place at no other place on the floor than at the room's center point.

(23) Summarizing the gravitational event, you recognize the downward internal action forces of the pavers' Earth gravitation, directed toward a common point nearly 4000 miles distant, and resulting from the pavers' position within Earth's gravitational field of influence, are the cause of the pavers's gravitational weight-force against the scale. The fact that each paver initially weighed slightly more in the room, prior to grinding, than it did in an earlier event performed closer to Earth's equator, stands in agreement with your recognition that the room is indeed located closer to one of Earth's poles than to Earth's equator. You also recognize that the Foucault Pendulum is a reliable indicator of Earth's absolute rotation in space and also a good indicator that this test is occurring at or near Earth's South Pole due to the room's clockwise rotation relative to the non-rotating pendulum. The fact that the two brass plumb bobs converge equally inward toward the room's center point from the floor's precise degree ring during the daily rotation of the room tells you that the room is located near to, or directly over, Earth's southern axis of rotation. The fact that the room's flat floor actually tests level only at its center verifies again that this is a gravitational event with the flat surface of the floor at the room's center being the only portion of the floor's surface that is positioned at a right angle to the direction of the Earth gravitational forces being generated within objects inside the room. For this reason, plus the increasing distance factor, you understand that Earth's gravitational field and the resulting pavers's Earth gravitation forces have their greatest effect upon the scale when the weighing event occurs at the room's center point. The fact that an object within the room weighs less at the room's high ceiling than it does at the room's floor again verifies that the object's weight-force is being caused by downward gravitational forces being generated within the object and further that these forces are lessened in a geometrically predictable manner as the distance between Earth's center and the object's center is increased. Finally, you have new confidence in the validity of Isaac Newton's formula for calculating the force of gravitation as it has performed splendidly during this non-accelerative gravitational event in predicting the magnitude of the gravitational forces present based upon knowledge of the mass or quantity attribute of each object's matter and the measure of the distance between their respective material centers.

The Non-Gravitational Accelerative Event in Space

(24) Now you and I are going to travel together in our imaginations a great distance across the space between our home planet Earth and an imaginary science vessel that is located a distance about mid-point between the Sun and a "nearby" star. As we approach the science vessel, it is

hard not to be impressed by its size. It must be at least a mile in length and more than a thousand feet in diameter. Once onboard, we are led, in a weightless state, to a room that is an exact duplicate of the room located at Earth's South Pole where all of your gravitational tests have been performed. As the vessel begins to accelerate gently for safety reasons, we drift against the room's glass lined floor and begin to experience the weight-force of our body's combined "downward" acceleration/Reaction forces reacting in support of "upward" acceleration/Action forces from the floor. Soon we are standing against the floor and then lightly walking around on it to experience our reduced weight-force while inspecting the room. The scale and pavers are strapped to the floor along with the long aluminum level. The two brass plumb bobs and the Foucault Pendulum are tethered in position. We remove the tethers so that these suspended objects may seek their positions of balance.

(25) As the vessel's rate of acceleration increases, you unstrap the scale and the four paving stones and then stack the stones on "top" of the scale. The scale displays a 2 lb.force reading confirming the fact that you feel incredibly light on your feet. As you watch the scale, its force reading is slowly increasing. Meanwhile I have steadied the Foucault Pendulum by positioning it directly over the room's center point. In a matter of minutes, the scale's display has stabilized on an exact 6 lb.force reading of the downward acceleration/Reaction weight-force of the 4 pavers. Our bodies now feel as heavy as they normally do on Earth. It is kind of eerie in this space-bound room for it is just as comfortably warm and sound-free and vibration-free as its twin on Earth's South Pole.

(26) As you set about to repeat your Earthly experiments, you decide to begin by drawing back the Foucault Pendulum along the 90 degree line and set it into an accelerated motion that is directed across the room's center point toward the 270 degree line just as you did to the pendulum back on Earth. Next you walk both ways across the room's flat floor to inspect the two brass plumb bobs. You observe that the needle point of each bob is directed exactly at the degree ring etched into the glass floor. There is no tendency here for either bob to converge in the direction of the room's center indicating to you that here the bobs are responding to a force that is not a point force as is the force of Earth gravitation being generated within the two plumb bobs back on Earth . This lack of convergence comes as no surprise for you recognize that the action force that is the cause of this event is the upward thrust from the science vessel's rockets. The upward exterior head forces of these Type 3 external acceleration/Action forces are causing upward acceleration for every object attached to the the vessel at the same rate and in a direction that is exactly parallel to the direction of acceleration for every other object attached to the vessel. Thus there is no reason for the plumb bobs to converge. This fact alone proves to your satisfaction that no point source gravitational field of influence is having any noticeable influence on the positioning of the plumb bobs in this room.

(27) You again check the scale to find that it is truly displaying a constant 6 lb.force. After picking up the scale and the four pavers, you start climbing the stairs toward the room's ceiling. Stopping for a rest at the 220 ft landing, you weigh the stack of pavers to learn that they appear to weigh exactly as they did on the floor with a 6 lb.force. Later after reaching the 440 ft landing, again the scale indicates the pavers' weight to be a 6 lb.force. As you trudge onward and upward, you can't help but think that it would be nice if the vessel's captain would reduce the rocket's

thrust for a few minutes to make your journey "upward" less strenuous. Upon reaching the landing at the 660 ft ceiling, again the stack of pavers displays a weight of exactly a 6 lb.force. There is no reduction of the pavers' weight-force here for you realize that at every fixed location on the vessel, including this one, the pavers will experience the same magnitude of upward acceleration/Action force causing the same rate of upward acceleration for the pavers as they reactively generate their own supporting downward acceleration/Reaction forces which are, in total, equal in magnitude and opposite in direction to the upward acceleration/Action force that is responsible for their linear acceleration.. Once again, your tests prove that the forces present during this accelerational event are quite different than the forces present during the previous gravitational event back on Earth.

(28) During your descent to the room's floor, you notice that the Foucault Pendulum is continuing to generally follow the 90 degree- 270 degree track that you set as its initial course several Earth hours earlier. You accept this fact as an indication that the science vessel along with the room inside is not rotating during its accelerated motion forward in space. Credit for this lack of rotation must go to the vessel's gyroscopic sensors that are able to detect and correct for even the slightest amount of absolute rotation of the science vessel. Here in deep space, just as at every other location in the Universe, the presence of absolute rotation for an object may be sensibly compared to the state of the same object when it is not experiencing any degree of absolute rotation.

(29) When you reach the floor once more, you place the scale near the room's center point and turn your attention to the long aluminum level. As before on Earth, the level is indicating that the floor near the room's center point is level in the upward accelerating science vessel. But then you wonder if the room's flat floor will test level near the walls. In half an Earth hour, you have your answer. The room's flat floor tests level at all points around the room. This event reveals that the body of the level remains at right angle to the direction of the vessel's upward-directed acceleration/Action force when tested at every point around the room's floor. For this reason, you understand that unlike the test on Earth, if the flat floor of the science vessel's room is expanded to 20 thousand miles in diameter, every portion of this floor will test level and further, every portion will provide the same upward-directed acceleration/Action force that will cause the same rate of upward-directed acceleration for the 4 pavers resulting in the scale displaying the same 6 lb.force as it delivers the upward-directed action force responsible for accelerating the 4 pavers in the upward direction. There will be no sideways component of force here to cause the scale and pavers to weigh less and slide in the direction of the room's center point. For certain no empowering point source gravitational field of influence is present within the room during this enlightening accelerational event.

(30) While you are reflecting on the absence of any dominate gravitational field during your tests in the accelerating science vessel, news arrives that the vessel's captain hopes your experiments are complete for the fuel tanks are running low on combustible matter to expel at high rates of downward-directed acceleration. This message makes you realize that the amazingly steady a/R weight-force you are experiencing is quite temporary and about to end. Wanting to avoid drifting about while weightless in such a large room, you and I hurry about tethering the two plumb bobs, the Foucault Pendulum and securing the level, scale and 4 pavers. When our tasks

are complete we both rush to reach the safety of the exit door before the captain makes the decision to switch off the rocket motors. Now that they are complete, it is for certain that here in the science vessel, your tests have clearly revealed many detectable differences in the acceleration/Action and acceleration/Reaction forces present during this non-gravitational accelerative event as compared to the gravitational field non-acceleration/Action forces present during the non-accelerative gravitational event back on Earth.

(31) In summary of this accelerative event, you recognize that the pavers' upward-directed acceleration is being caused by internal Type 2 monopole acceleration/Action forces being generated within and transferred upward from the combustion process within the vessel's rocket motors by the upward-directed exterior head forces of Type 3 bipole external stacking forces. These upward-directed Type 3 exterior head forces cause and thereby find termination against the downward-directed Type 2 monopole acceleration/Reaction support forces being reactively generated within each and every component of matter contained within the science vessel including all of its contents. At the site of the scale, you recognize these upward-directed Type 3 exterior head forces as the acceleration/Action forces that are causing upward-directed acceleration for the stack of 4 pavers. These upward-directed acceleration/Action forces are equally and fully supported against each of the downward-directed acceleration/Reaction forces from each of the components of the pavers's matter. In this manner, the downward-directed exterior head internal Type 2 a/R forces amount to a downward-directed reactionary stacking force that provides effective support for the upward-directed acceleration/Action force as it is reduced to zero by the time it reaches the top surface of the top paver. So instead of two mutually-opposed, non-accelerative, downward and upward directed gravitational action forces at the site of the scale in the Earth gravitational event, here at the scale in the science vessel accelerational event, the acceleration/Action forces are upward-directed action forces that are causing the pavers's acceleration while also causing the reactive generation of their own downward-directed acceleration/Reaction support force.

Conclusion I

(32) After have observed both events, you recognize that very few similarities exist. Admittedly you do "feel" the same during each event, provided that the acceleration/Action force is an external (contact) a/A force impressed at some point of contact against your body, and not an internal acceleration/Action force being generated within each component of your body's matter, such as by gravitation, and further that, during the accelerative event, this upward-directed external acceleration/Action force is adjusted to remain precisely equal at all times to the downward force of your gravitational weight when standing against Earth's south pole. Given these precise conditions, the downward-directed action force of an object's Earth gravitational weight, as displayed by a compression spring scale, will be numerically equal to the downward-directed reaction force of the same object's acceleration/Reaction weight as displayed by the same scale. But even if these conditions are met, as they are at the center point of each large circular room in the two events, your tests reveal so many differences between the non-accelerative gravitational event on Earth and the non-gravitational accelerative event in the science vessel, you conclude that neither event is equal to the other. At best, in a limited case, a gravitational event and an accelerational event being caused by an external acceleration/Action force can cause the generation of identical force readings on a scale.

(33) It is sometimes argued that these two different events must only be compared to each other within the confines of a small room. Why? So their differences are harder to detect? By now you realize the truth. Each difference identified in the large circular rooms of the previous events is present to a lesser degree in a small room. For example, the flat plane floor of a small room on Earth is still truly level only in the middle, the plumb lines of different bobs attached to the ceiling do not hang parallel to each other, and the pavers's weight against the scale is primarily caused by the pavers' downward-directed, internal, non-accelerative, gravitational, action forces toward Earth being mutually opposed by Earth's upward-directed, internal, non-accelerative, gravitational, action forces toward the pavers with no reaction forces present.

(34) Meanwhile, the flat plane floor of the small room accelerating in deep space measures equally level at all points in the room, the plumb lines of different bobs do hang parallel to each other, and the pavers's weight against the scale is the result of the downward-directed, internal, acceleration/Reaction forces being caused by by and reacting in support of the upward-directed, external, acceleration/Action force responsible for the small room's upward-directed acceleration along with that of its contents. Even though the rooms are smaller, all the different effects we have identified are still present.

Ethan Skyler

Epilogue

(35) Now that we recognize that gravitational events are different from accelerational events, and that they are caused by different forces that generally result in somewhat different effects, let us consider how, collectively, this information undermines the foundation of Albert Einstein's General Theory of Relativity which is a complex, forceless theory designed to replace Isaac Newton's recognition of the forceful Law of Universal Gravitation.

(36) When one is faced with learning Einstein's General Theory of Relativity, one is likely to become so apprehensive of the mind-numbing process ahead as to overlook the asking of the question: What problem is this theory designed to solve? Every theory, no matter how complex, has a simple beginning. Do you know the simple beginning of Einstein's General Theory of Relativity? As with any theory, Einstein draws a string of conclusions based upon answers to questions he develops while considering the same kind of Universal events that we consider today. If one's mind is free to question, then one cannot help but wonder if each of Einstein's conclusions moves us closer to, or farther away from that which is real and true.

(37) We already know from our several tests in the two different rooms that no matter how well it is designed and executed, a non-gravitational accelerative event is never the equal of a non-accelerative gravitational event. Since Einstein concluded that these two very different events are equal to each other while predicting that no distinguishing differences exist between them, when, in fact, we have just proved the opposite to be true in that they are not equal to each other and further that many distinguishing differences between them do exist, it is logical to accept this error in Einstein's thought processes as an indication that not one of his conclusions

regarding gravitation, force, acceleration, time or space should be accepted as valid without careful, critical examination. With this thought in mind, let us see if we can locate the initial problem that caused Einstein to begin the arduous task of writing his General Theory of Relativity.

(38) In Albert Einstein's book, Relativity, Part II, The General Theory of Relativity, Chapter 23, Behavior of Clocks and Measuring-Rods on a Rotating Body of Reference, Einstein considers an experiment where the observer is sitting off-center on a flat disk that is rotating at a steady rate, much like an oversized record rotating on an oversized turntable. Einstein tells us that the observer is aware of a force acting upon himself in the outward radial direction. Einstein goes on to tell us that a second observer, who is not on the disk and therefore not participating in the first observer's rotation, interprets the outward-directed force being experienced by the rotating observer as "an effect of inertia (centrifugal force)...".

(39) I will stop here for a moment to point out that we know from Article I that inertia is an early, incorrectly stated recognition of the modern-day acceleration/Reaction force, and further we know from Article IV that the outward-directed force on an object (the first observer above) experiencing inward-directed acceleration is the outward-directed acceleration/Reaction force being reactively generated separately within each component of the object's matter in support for the action force, originally from the turntable, that is causing inward-directed acceleration of that component. By his own words, Einstein reveals here that Newton's misdirected definition of inertia is confusing his mind while preventing him from recognizing the reality of the acceleration/Reaction forces that are present and recognized in his turntable event as "centrifugal force". In effect, Einstein has offered up these two terms, for the reader's consideration, without his having a true understanding of the meaning of either one. This general lack of understanding, on his part, does not bode well for the validity of his forthcoming conclusions. I shall now return to Einstein's rotating turntable event.

(40) At this point, Albert Einstein tells us that "on the basis of the general principle of relativity" the accelerating (orbiting) observer may validly regard the rotating turntable as being at "rest" and from his turntable at "rest" the first observer validly sees the second observer and every other object in the Universe beyond the turntable as participating in a steady circular orbit about the axis of the non-rotating turntable. He continues on with this train of thought by telling us that the first observer on the turntable at "rest" may regard the outward-directed force acting upon himself as the "effect of a gravitational field" with characteristics that are of a kind not possible according to Isaac Newton's theory of gravitation.[1] He summarizes this portion of his turntable event by telling us that "since the observer believes in the general theory of relativity,"..."he is quite in the right when he believes that a general law of gravitation can be formulated -- a law which not only explains the motion of the stars correctly, but also the field of force experienced by himself ." (on the rotating turntable which the rotating observer mistakenly considers to be non-rotating).

(41) " [1] The field disappears at the centre of the disc and increases proportionally to the distance from the centre as we proceed outwards."

(42) In this event, Albert Einstein clearly recognized the outward-directed "(centrifugal)" a/R forces being experienced by the first observer sitting off-center on the rotating turntable yet he did not understand that the turntable's absolute rotation is the cause of the absolute inward-directed action force that is the cause of the observer's absolute inward-directed acceleration which, in turn, is the true cause of the reactive generation of the observer's absolute outward-directed acceleration/Reaction forces. Instead, he thought it valid to consider the turntable to be at "rest" and everything beyond in rotation, in the same manner as previously theorized by Ernst Mach. In this new non-rotating perspective of the turntable event, Albert Einstein figured that the observer's outward-directed a/R force would continue at full strength despite the turntable's lack of acceleration associated with absolute rotation. He thought this to be true because, like Ernst Mach, he thought the observer's outward-directed force was due to "the effect of a gravitational field" of a type unknown to Newton, as being the outward-directed "field of force experienced" by the non-rotating turntable's observer. Ernst Mach referred to this theorized field as the result of a "dynamic gravitation" that he believed would be caused by the rotation of the stars and other matter of the Universe about a central non-rotating object.

(43) I wonder if either Albert Einstein or Ernst Mach spent much time considering by what mechanism it could be possible that the outward-directed force resulting from their predicted "gravitational effect" on an object positioned on a non-rotating turntable with the entire Universe whirling about, could change to an equal force in the opposite direction should the observer walks just a few feet to the same radial distance on the other side of the non-rotating turntable's center? Did they overlook the fact that the zone at the center of any massive object, such as Earth, whirling or not, is a zone of gravitational equilibrium or weightlessness, not a zone where one may be said to experience the sensible force of weight in one particular direction when one is but a few feet to one side of the zone's exact center?

(44) Instead of trying to relate this outward-directed "gravitational" effect to the whirling matter of the Universe at tens, hundreds, thousands, millions, or billions of light-years of distance from this event, why did it not seem reasonable and logical to Mach and later on to Einstein to recognize this outward-directed force present within the object as being the object's reaction force that is naturally and reactively generated whenever an object is experiencing an action force that is the cause of linear or centripetal acceleration for the object? Did they not understand that an inward-directed action force is present and being applied to the off-center object in the ever-changing direction of the turntable's center when the turntable is rotating? Did they not understand Newton's LAW III wherein he tried to teach them that this simple inward-directed acceleration/Action force is the cause of the existence of its own outward-directed reactionary support force in the form of the object's acceleration/Reaction forces which Isaac Newton, on more than one occasion, referred to as the outward-directed "forces of receding from the axis of circular motion"?

(45) I think Mach and Einstein understood that by accepting Newton's recognition of the mutuality of acceleration/Action and acceleration/Reaction forces as true, they would have had to accept that the rotation of any object was an absolute event, and not a relative event. Newton clearly demonstrated his recognition of the absolute nature of the rotation of an object when he rotated a bucket half-filled with water while suspended from a long wound-up cord and observed

that the water's surface was concave when the water was rotating, and flat when it was not rotating, regardless of whether the bucket was rotating along with the water or suddenly stopped from rotating. When Newton suddenly stopped the bucket from rotating by grasping the rotating bucket with both hands, he observed that as long as the water continued on with its own rotation, its surface continued to form a concave shape. Only when the water had ceased all rotation did its surface once again become visually flat.

(46) From Newton's Bucket experiment, he concluded that rotation is an absolute event since the inward-directed and outward-directed forces present during a rotational event "are greater or less according to the quantity of the (circular) motion." [1] Clearly it was of paramount importance to the survival of the relative theories of Mach and of Einstein that Newton's recognition of the absolute nature of rotation and the absolute nature of the forces present during rotation be set aside. By employing imaginative thoughts of fantasy, Mach and later Einstein proposed the whirling of the entire Universe around Newtons' Bucket in an attempt to convince others that the outward-directed acceleration/Reaction forces present within the water were not being caused by the reaction of the water to the inward-directed acceleration/Action forces provided by the bucket's walls but instead were being caused by an outward-directed "gravitational" effect unknown to Newton.

(47) Is the simple problem that prompted Einstein to begin assembling the string of conclusions that forms his General Theory of Relativity clear to you now? In question form, the problem he began with is "What is the acceleration/Reaction force of matter?" By mistaking this common, event-supporting, acceleration/Reaction force for an imaginary event-causing acceleration/Action force supposedly caused by "the effect of a gravitational field" of a type unknown to Newton, Einstein got off to a misdirected beginning in formulating his General Theory of Relativity.

(48) Historically, recognizing and understanding the acceleration/Reaction force has proven to be a vexing problem for scientists. Einstein inherited little from his mentors. Newton noted the a/R force as "the forces receding from the axis of circular motion.", but since Newton attributed many of the characteristics of this a/R force to his misdefined version of inertia, he left little more than this description for the rest of us, including Mach and Einstein, to consider. More than anything else, Einstein knew that Newton's recognition of the absolute nature of rotation had to be set aside in order for Einstein's relative version of rotational events to prevail. The trouble with Einstein's effort is that setting aside the truth is never of any long-term benefit to a science.

(49) Why has the a/R force been so hard for Galileo, Newton, Einstein, and all those who have followed in their footsteps, to recognize and understand? Of these three men, only Galileo associated the a/A and a/R forces with manual events such as hammering. All of them were college professors. College professors are particularly noted for their mental abilities and not particularly for their physical abilities. I wonder if any of these men spent time digging in the dirt using a pick and shovel or chopping firewood or hammering nails or shaping bricks and paving stones with a hammer and chisel or shaping red-hot steel using an hammer and anvil or driving wooden or metal stakes in the ground or shaping thin copper or bronze sheets by hammering or playing ball sports by batting a baseball or kicking a football or striking a croquet ball with a mallet? I wonder as to their level of experience in these matters regarding event-causing

acceleration/Action and event supporting acceleration/Reaction forces. I have no doubt that any one of them was capable of recognizing the event-causing acceleration/Action force that mutually causes sudden acceleration in opposite directions for two objects in possession of different velocities of rest-motion upon their sudden contact with each other. Once the active role of the mutual acceleration/Action force is recognized, it is but a short step to recognizing that this event-causing action force is also the cause of its own support force in the form of each object's acceleration/Reaction forces that exist in the opposite direction to that object's accelerational event solely to provide the required support for the event-causing acceleration/Action forces present. I think it would have helped their recognition of the reality of these action and reaction forces present in such common everyday events had they spent months or years performing repetitive tasks that employ the active acceleration/Action forces that cause what we see as negative acceleration for the hammer's head along with positive acceleration for the portion of the object being struck. A mutual acceleration/Action force is responsible for both accelerations as the differing rest-motions of each object come into disagreement as to which object will occupy the space currently occupied by the other. Since each object is solid and therefore not offering easy passage for the other, a collision results. As one external head force of the bipole Type 3 bipole stacking action force present at the point of contact causes a change in the rest-motion of one object (negative acceleration of the hammer), the opposite external head force present at the same point of contact causes a change in the rest-motion of the other object (positive acceleration for the nail). Each acceleration-causing external head force causes the reactive generation, deep within the components of the accelerating object, of its own Newton LAW III required acceleration/Reaction forces serving solely to provide support and termination for the action force so this action force can even exist to act as the cause of each object's acceleration. Regardless of their reasons or inexperience in laborious events , at the end, each of these great thinkers had no particular success in understanding the simple, common, ordinary, everyday acceleration/Reaction force that every object exhibits in support to every form of acceleration the object may experience. Of the three, Einstein stands alone as being the one who became totally lost and confused while trying to figure out the reactive nature of the a/R force.

(50) Now that we recognize the differences between a non-accelerative gravitational event and a non-gravitational accelerative event, I would like us to take a closer look at the test physicists use to determine the amount of matter contained within an object. There are two basic methods of determining the numerical quantity attribute (mass) of an object's matter, the gravitational method and the accelerational method. Both of these methods depend upon force for making their determination of an object's mass. The gravitational method is by far the simplest method where here on Earth, the mutual forces due to mutual gravitation between the object and Earth are directly measured by placing the object on a calibrated spring scale, at a standard elevation above Earth's core (sea level), at a location on Earth (North or South Pole) where the distortion of Earth's shape is least affected by the termination of a portion of each Earth object's weight-force due to the centripetal accelerations caused by Earth's absolute rate of rotation about its own axis.

(51) Since an object's weight-force is proportional to its quantity of matter, the numerical measurement of the object's gravitational weight-force is proportional to the numerical measurement of the object's quantity of matter (mass). All that is left to be done is to set one standard for force and then reduce an object in size until it precisely generates, in a gravitational

manner, this standard unit for force, with the end result being that the object becomes a standard object whose weight-force of gravitation is useful for comparison with the weight-force of the gravitation of another object. Once a standard object has been so determined, an equal-arm balance beam scale can be used to compare the weight-forces of two objects, one being the standard object and the other being a test object. When the balance beam scale indicates that the weight forces of these two objects are equal, then the scale has done its job. Adaptations of the equal-arm balance beam scale commonly include scales with unequal length arms so that using the laws of leverage, a less massive standard object suspended from the long arm of a beam will generate sufficient weight-force to balance the more massive test object suspended from the beam's short arm. Regardless of their design, in every balance beam scale, it is the weight-force of one object that is being compared to the weight-force of a second object. Understand that this type of scale does not "measure" these weight-forces, it only compares one weight-force to the other. For this reason, the comparison of weight-forces by a balance beam scale is equally valid against the Moon where one object's weight-force is greatly reduced from its value against Earth yet precisely equal to the greatly reduced weight-force of the other object of equal mass. Since the balance beam scale is powered by force, it is completely useless in a weightless environment for neither object to be compared is generating the required weight-force needed for a valid comparison to occur.

(52) The accelerational method for determining an object's quantity of matter is a far more complicated test involving precise measurements of elapsed time, distance and force along with calculations to determine velocity, acceleration, and finally mass. The test may be performed horizontally on Earth, horizontally on the Moon, or in a weightless environment in space. The accelerational test is based upon the relationship between Force, mass and acceleration. Basically, an object's mass has been found to be equal to the acceleration/Action Force applied to the object divided by the rate of acceleration that subsequently occurs to the object. Friction is the enemy of this test for any portion of the measured Force impressed against the object, that is spent in a non-accelerative manner opposing friction the object may be experiencing against a supporting surface or against the surrounding air, is a portion of the measured Force that is not assisting in causing acceleration for the object. Thus, with friction present, the proper computation of mass = Force / acceleration will produce an erroneous result for mass since the magnitude of the acceleration/Action force is being overestimated. (Here force must be measured in absolute units for force, such as the US Poundal or SI Newton.)

(53) Assuming that friction is properly absent, the forces of gravitation have no accelerative effect on the test object, and the elapsed time of the acceleration is precisely measured along with the object's starting velocity, its ending velocity, and the precise distance over which the acceleration occurs, then the object's numerical quantity attribute for matter (mass) may be precisely calculated. Understand here that this accelerational method of determining an object's mass is as dependant upon the direct measurement of force as is the gravitational method. The standard we set for force in the gravitational method above must be divided by the acceleration rate of Earth gravitation to reach an absolute unit for Force since an absolute unit is the one unit of Force that will cause an object containing matter equal to one unit for mass to accelerate at the continuing rate of one unit for distance per one unit for time for each subsequent unit for the time of the continuing acceleration.

(54) If the standard we set for force is a 1 lb.force, then the standard we set for mass is a 1 lb.mass object that exhibits a 1 lb.force of Earth gravitational weight at sea level near one of Earth's poles. The reason why a 1 lb.force is not an absolute unit for force becomes clear when you consider that if the 1 lb.m standard object is suddenly denied the support of the scale as such a weighing, and is instead allowed to accelerate in a frictionless environment down a vertical vacuum well, 100% of the standard 1 lb.mass object's Earth gravitational weight-force will become the acceleration/Action force responsible for causing acceleration of the standard 1 lb.m object toward Earth's core at the initial rate of g or approximately 32.17,25 ft /second for each second of the standard object's fall. Thus the standard object's 1 lb.force of weight is 32.17,25 times greater than the absolute force required to cause an acceleration rate of just 1 ft/sec for each second of the standard object's fall. The term for the correct absolute unit for force in US units is a Poundal. In a purely accelerative event, a force of 1 Poundal will cause an acceleration rate for a 1 lb.mass standard object of 1 ft/sec for each second of acceleration. This acceleration rate is written as 1 ft/sec/sec or 1 ft/sec^2. Converting back to pounds force, 32.17,25 Poundal equals a 1 lb.force.

(55) In SI units, the unit for force does not represent an object's gravitational weight-force against Earth at sea level at one of Earth's poles but instead represents the absolute force of 1 Newton that will accelerate a standard object of 1 kilogram mass at the rate of 1 meter per second for each second of acceleration in a frictionless environment. The Newton, like the Poundal, has the advantage of needing no conversion when used in calculations involving acceleration. But it also carries the disadvantage, as with the Poundal, of not being numerically equal to an object's mass attribute when weighed at sea level. So while a US standard 1 lb.mass object has a 1 lb.force of Earth weight at sea level at one of Earth's poles (if properly measured) , a SI standard 1 kg mass object does not have a 1 Newton force of Earth weight at sea level at one of Earth's poles. Instead, it has an Earth weight of about 9.80,69 Newton of force. Thus if you want to know the weight-force of a 120 kg mass object, an inconvenient and counterintuitive conversion to Newton units is required. While it is true that a 1 lb.mass object will generate a smaller weight-force in mile-high Denver, Colorado than it will at Fisherman's Wharf in San Francisco, the reduction in weight-force due to Denver's elevation is only 0.00,05 lb.force or 5/10,000th of a pound which is a difference too small to be noticed on most scales.

(56) An example of this miniscule difference is if you first purchase 10,000 grains of wheat, with a given weight-force in San Francisco, then travel up to Denver while maintaining the wheat's current level of humidity, upon arriving at Denver, you will find that the addition of 5 extra grains of wheat will be necessary in order to increase the now lighter weight-force of the 10,000 grains in Denver up to match the heavier weight-force previously recorded in San Francisco.

(57) As a suggestion to the SI community, I think the addition of a gram.force unit will solve their force dilemma quite nicely. Then 1 kilogram.mass will have an Earth weight-force at sea level at one of Earth's poles of 1 kilogram.force. Considering how widespread the practice of ignoring the Newton (force) while directly comparing the SI kilogram (mass) to the US pound.force is today, I think this suggestion should be taken seriously. It is for certain we would be severely hampered with the US standard if we were limited to calculating all forces in our unit

for absolute force, the Poundal. For example, a person with a weight of 125 lb.force would have to accept her weight-force as being 4,052 Poundal! A Class C tractor-trailer with a gross vehicle weight-force of 80,000 pounds would instead have to carry a sign on the side indicating the truck's weight-force limit as 2,593,315 Poundal.

(58) When the accelerational method of determining an object's mass is properly performed, the results yield an accurate value for the numerical quantity of the object's matter. One might wonder how the results of the accelerational method compare to those of the gravitational method. Do both tests return the same mass determination for the same object? Or does one method always indicate an object to be somewhat more massive than is indicated by the other method? Questions such as these have bothered physicists endlessly. Many comparison tests using both methods have been made. To my knowledge, no difference between the results returned by these two very different methods of determining the numerical quantity of an object's matter (mass) has ever been found. But this news should come as no surprise. After some thought, I wonder how these two different methods, if correctly performed, could possibly yield different results. Let me explain.

(59) Do you remember when we first set the US standard for force as a 1 lb.force and then used it to set the US standard object for mass as having a 1 lb.m by adjusting the standard object's quantity of matter until the object generated exactly a 1 lb.force at sea level at one of Earth's poles? Well, consider that while this standard 1 lb.mass object is in rest-motion against the scale, it is generating a downward 1 lb. Earth gravitational action force against the scale as indicated by the scale's 1 lb.force display. Due to the presence of this preloaded 1 lb.force of gravitation, this standard object is poised to begin accelerating at the initial rate of 32.1725 ft/sec² toward Earth's core. All that is required for this non-accelerative weighing event to become a weightless accelerative event is if the support by the scale is suddenly removed. If this sudden removal does occurs, immediately the standard object will begin accelerating toward Earth's core at the initial rate of 32.17,25 ft/sec² with this acceleration being driven by the continuing 1 lb.force of the standard object's gravitation toward Earth. For this accelerational event, a 32.17,25 Poundal absolute force (1 lb.force) divided by an acceleration rate of 32.17,25 ft/sec² yields a 1 lb.m for the standard object, verifying the formula Force / acceleration = mass. For the gravitational event, prior to acceleration, a 32.17,25 Poundal absolute force (1 lb.force) against the scale divided by the potential acceleration rate of 32.17,25 ft/sec² this absolute force will cause for the standard object at this location on Earth should the standard object no longer be supported by the scale, again yields a 1 lb.mass for the standard object being weighed. Force / acceleration = mass. In these two different events, with the same values plugged into the same formula, is it any surprise that the determination of the standard object's mass is also the same value?

(60) Perhaps you think that the previous example is unfair in that the accelerational event should be caused by an external contact force and not an internally generated gravitational action force of equal magnitude. Then let us suppose that the standard object is poised to be accelerated in a frictionless manner along a horizontal vacuum tube by an external action force of 32.17,25 Poundal (1 lb.f). The mechanical stop that is preventing the standard object from accelerating along the tube will also be experiencing an external contact force of 32.17,25 Poundal (1 lb.f). While this force against the stop does not represent the standard object's weight-force for the

standard object is not "freely" bearing with this force against the stop, it nevertheless is a verification of the magnitude of the action force that has the potential for causing acceleration for the standard object should the stop be removed. This verification is the same as the verification offered by the scale during the gravitational event where the scale displays the gravitational force that has the potential for causing acceleration for the standard object should the scale be removed. (In practice, additional force against the stop is required to accommodate for the acceleration of the device that is causing the acceleration of the standard object.)

(61) When the stop is finally removed and the continuing 32.17,25 Poundal force (1 lb.f) begins causing acceleration for the standard object in a frictionless manner inside the horizontal vacuum tube, the acceleration rate will be equal to 32.17,25 ft/sec² which is the same acceleration rate the same magnitude of force will cause for the same object once the scale is removed in the gravitational event. Again, a 32.17,25 Poundal absolute force (1 lb.f) divided by an acceleration rate of 32.17,25 ft/sec² will yield a 1 lb.m for the standard object. Force / acceleration = mass. Once again, the same values for force and acceleration plugged into the same formula yield the same results for mass. There is no mystery here. All we are really accomplishing is using two different methods to verify the same formula F = ma made famous by Isaac Newton's work of more than 300 years in the past.

Conclusion II

(62) While not perfect, the work of Isaac Newton continues to stand firm against the test of time as a monument to human achievement regarding the advancement of our understanding of the natural laws that govern the formation and operation of the Universe. The General Theory of Relativity, designed by Albert Einstein to lead us away from the truth of Newton's Law of Universal Gravitation, is a theory herein shown to be without basis and therefore a theory that needs to be set aside.

Ethan Skyler

References

[1] Sir Isaac Newton, 1686, 1729, Mathematical Principles of Natural Philosophy and His System of the World, 1934, 1962, PRINCIPIA, University of California Press, Berkeley, Los Angeles, London, pages 10 - 12.

Author's Commentary

Are you wondering why Einstein's forceless version of gravitation has been with us for so long if it is truly without merit? The answer is that his theory makes certain predictions regarding the behavior of expanding energy emissions and planetary motion. Scientists have traditionally focused on attempts to prove or disprove these predictions of the final theory. I know of no effort to prove or disprove his theory that has focused, as I have herein, upon checking the validity of the very foundation upon which his theory is constructed. Without the support from a valid foundation, the predictions of Albert Einstein's theory are without meaning.

Just as the acceptance of Newton's misdefined and misleading concept of inertia as fact has made it difficult, if not impossible, for scientists to recognize the truth of the a/R force, the

acceptance as fact of Einstein's imaginary General Theory of Relativity has made it difficult, if not impossible, for scientists to recognize the real and true solutions to the expanding energy emission events they are investigating.

Ethan Skyler