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Dynamic Aether Theory of Gravity

The Cause and Mechanism of Contractile and Divergent Gravitation

Conrad Ranzan[1]
[1] DSSU Research, Niagara Falls, Canada
Email: DSSUresearch4@aol.com

Abstract: The three dominant theories of gravity are Newton's gravitational force, Einstein's spacetime curvature, and the Aether model (based on flowing-accelerating aether). All three make wrong predictions. Newton's theory predicts test objects will accelerate towards where the gravitational force is strongest, which, as any physicist will testify, is always at the body's surface, at for instance Earth's surface. Accordingly, objects placed at the bottom of a deep mine shaft should gravitationally rise to the surface —but they do not. Einstein's version predicts acceleration towards greatest spacetime curvature, which for Earth is at its surface. Objects at the bottom of a mine shaft should rise to the surface —but, again, they do not. Lastly, aether gravity theory predicts test objects will tend towards where inward acceleration of the universal space medium (aether) is most intense, which occurs at Earth's surface. Yet again, objects deep below the surface do not rise —sunken ships do not rise to the sea's surface. Presented is the Principle of gravity, the proposition that unambiguously solves the problem, aligns aether gravity's prediction with reality. Presented is essentially the missing component in the causal mechanism of gravity, both mathematically and mechanistically, without action at a distance.

Keywords: Gravity; Inertia; Aether dynamics; Acceleration; Ontology of matter; Gravity Principle; Interior of mass gravity; Aether self-dissipation; DSSU

1. Introduction

In order to understand the mechanism of gravity, we need to appropriate the universal medium —the subquantum space-permeating fluid commonly called aether— and carefully deduce its nature.

We already know that gravity involves mass (and anything possessing mass equivalence, such as energy particles). Gravity also involves the ethereal medium, the *aether* we have just appropriated. Those two knowns we link together by adopting a straightforward, yet deeply profound, assumption.

1.1. Key assumption

The assumption is this: All matter —all mass and energy particles, anything physical, without exception— absorbs and consumes aether. The very existence of matter depends on a continuous replacement supply of aether. This is an axiomatic process and, as such, requires no proof. (If justification is to be sought, it will be found with the engendered explanatory success.)

From this simple assumption, it follows that matter particles and mass bodies require a symmetrical inflow of aether. See **Figure 1.**

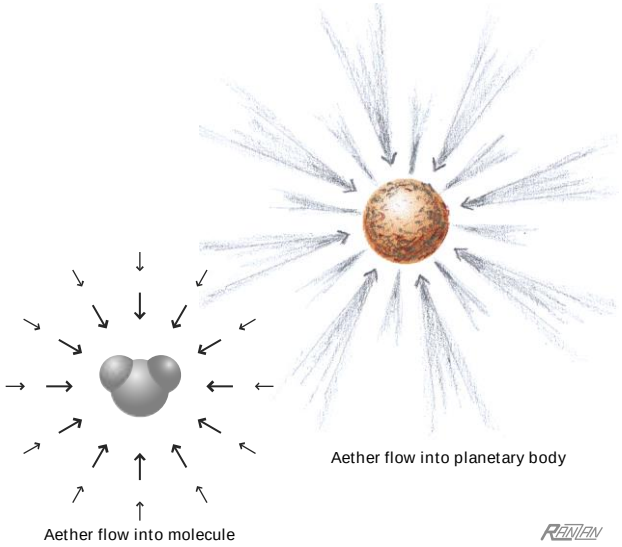

Figure 1. Mass, acting as a sink, is surrounded by a continuous inflow of aether. This symmetrical motion of aether serves three functions. (1) The inflowing aether sustains the existence of matter particles and mass bodies. (2) The flow field is responsible for bestowing the property of inertia, the resistance of mass to a change in motion or state of rest. (3) The flow field is the particle's (or object's) self-gravitation attribute —its ability to attract, and be attracted to, other matter.

1.2. The connection with gravity

The connection of *flow* to the gravity effect. Material objects are dependent on the aether and in a sense are locked into the medium; and thus, are subject to any *change* in the motion of the medium. The motion of the aether is its velocity, and the change in its motion is simply the acceleration of the aether. And therein lies the connection with gravity. The essential point is, the motion of the aether (its acceleration) is what influences the motion of material objects. By means of its self-inflow field an object 'senses' the aether acceleration of other flow fields and responds in a manner we recognize as a gravitational influence.

Delving deeper. Aether flows, therefore it is a fluid. The question then is, *What kind of fluid*?

2. Aether Cannot be an Ideal Fluid

2.1. Aether flow comparison for point-like mass

Let us assume, for the moment, we are dealing with an ideal unalterable fluid.

A comparison can be made between gravity generated by an ideal-type fluid (a suppositional aether treated as a non-compressible, no-loss fluid) and ordinary Newtonian contractile gravity. And in order to avoid dealing with what happens in the interior of the gravitating mass, we examine a situation in which the surface inflow rate is precisely known (in the sense of being a definitional value).

Consider an Earth-like body at rest with respect to the aether medium (or just comoving with the medium somewhere out in deep space). It can be treated as a point-like mass —or as an *almost* point-like mass. The mathematical approach for doing this is to use the Schwarzschild sphere, with an equivalent amount of mass. This Schwarzschild sphere has the mass of the original Earth (5.98×10^{24} *kg*) and a greatly reduced radius of only 0.885 centimeter. This treatment is entirely within the domain of standard astrophysics. The surface of this small sphere, by definition, has an inflow (a '*space*' inflow by the conventional view, an *aether* inflow by the mechanical view) equal to the speed of light.

2.2. Comparing accelerations, 'ideal' fluid versus Newtonian-compatible fluid

Now to test the external flow field. We compare the acceleration predicted for the idealized fluid, on the one hand, with the actual acceleration obtained under the Newtonian paradigm, on the other.

The Newtonian acceleration expression, as found in any physics textbook, is $a_{grav} = \dfrac{GM}{r^2}$. It is defined as the acceleration of freefall of a test mass located at a distance *r* from the center-point of a gravitating body. It works equally well in specifying the acceleration of the ethereal medium.

The acceleration equation for modeling the ideal non-compressible aether, as derived in the Appendix, is

$$a_{\sup}(r) = -2\left(\upsilon_S R^2\right)^2 \frac{1}{r^5}, \quad \text{where } r \geq R. \qquad (1)$$

Substituting known values, into the two equations, allows us to make a graphical comparison. Replace *G*, the gravity constant, with $6.673\times10^{-11}\ N\cdot m^2/kg^2$; *M*, the body's mass with 5.98×10^{24} *kg*; *R*, the Schwarzschild radius, with 0.88528×10^{-2} *m*; and υ_s, the surface inflow, with $c = 3.0\times10^8$ *m/s*.

The gravitational acceleration, then, for the Schwarzschild earth is

$$a_{Sch}(r) = \frac{-\left(6.67\times10^{-11}\,N\cdot m^2/kg^2\right)\left(5.98\times10^{24}\,kg\right)}{r^2}, \quad \text{where } r \geq 0.885\times10^{-2}\ m. \qquad (2)$$

And the gravitational acceleration based on the suppositional fluid is

$$a_{\sup}(r) = \frac{-2\left(\left(3.0\times10^8\,m/s\right)\left(0.885\times10^{-2}\,m\right)^2\right)^2}{r^5}, \quad \text{where } r \geq 0.885\times10^{-2}\ m. \qquad (3)$$

The corresponding graphs are shown below (**Figure 2**). Notice how the acceleration value (9.8 m/s^2) at the *r*-distance 6378 *km* agrees precisely with the acceleration at the Earth's actual surface (whose physical radius is 6378 *km*). The difference in the gravitational intensity between the two versions, the extraordinarily wide range of values, made it necessary to use a log scale on the vertical axis.

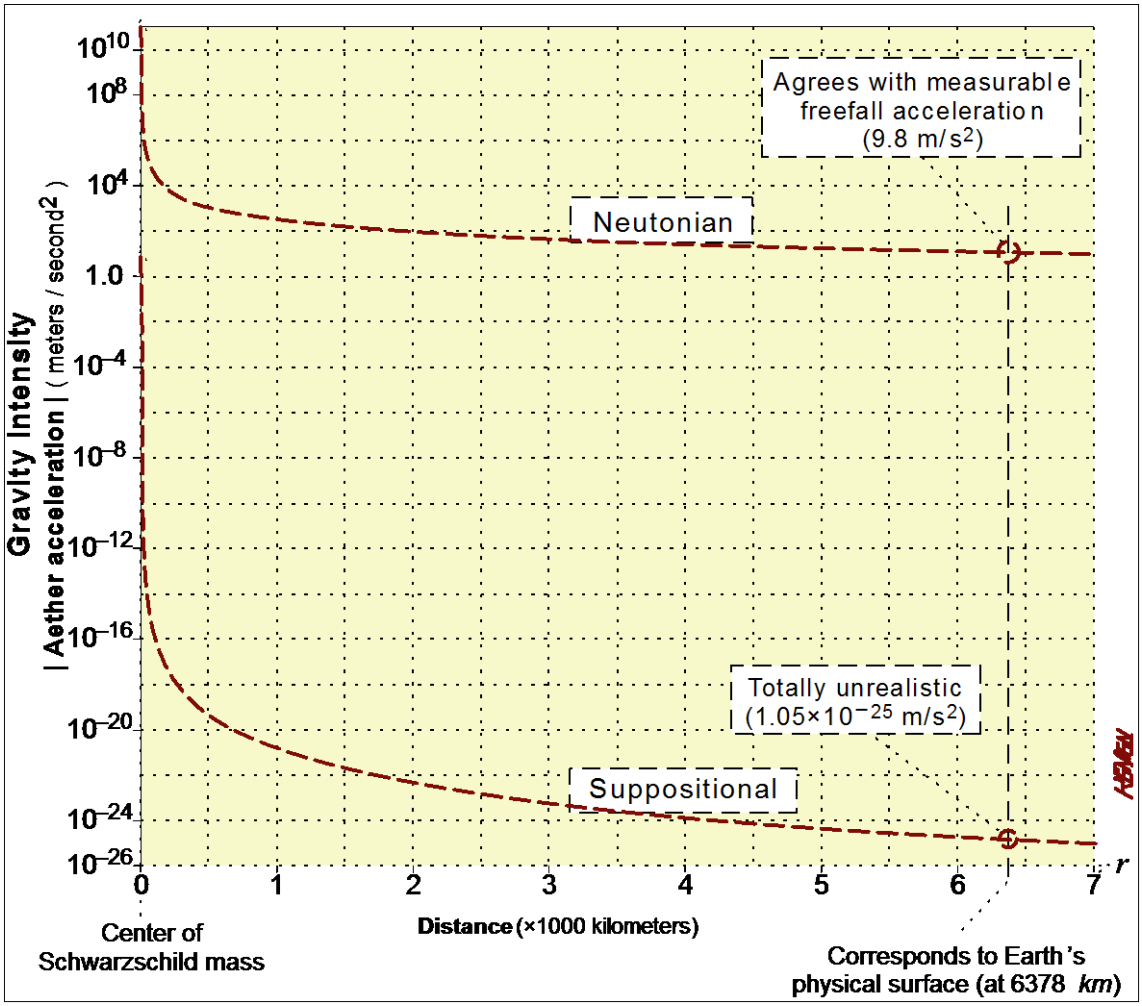

Figure 2. Graphical comparison of Newtonian gravity, on the one hand, with gravity generated by a suppositional-type aether, on the other. The mass involved is a Schwarzschild spherical Earth. Presented is essentially a comparison between the aether that causes Newtonian gravity (solid curve) and a suppositional noncompressible aether that causes a vastly weaker gravity (dashed curve). Gravitational intensity is determined by the accelerating inflow of each type of aether. The indicated point (6378 *km*, 9.8 m/s^2) serves as an accuracy check. The use of the *y*-axis log scale was necessary in order to fit both curves onto a single graph; use of a log scale also means expressing the acceleration as absolute values.

It is quite evident from the graph that an idealized fluid cannot function as a realistic mediator of gravity.

Why is it that one fluid is so weak and the other so potent? Mathematically, the weakness of the ideal fluid is coded in its functional ratio (a 5^{th}-*power-inverse* ratio). But what is it about the actual aether, as opposed to the suppositional version, that makes it such an effective intensifier of the gravity effect?

To see what is going on here, and uncover the nature of the Newtonian-compatible aether, it helps to look specifically at the velocity of the fluid flow.

3. Velocity of the Inflow of the De Facto Medium

A closer look at the motion of aether —its velocity and volumetric transfer— is in order. Determining the speed of the inflowing aether is a relatively simple exercise. Start with the fluid's known acceleration of 9.8 m/s^2 at the radial distance of 6378 *km* (as found in **Figure 2**).

Next, place a test mass *m* there and keep it stationary by applying an external force. The upward force on the test object is, by definition, its mass times its acceleration; the countering force is the

equal-and-opposite Newtonian gravity ($-GM_{\text{Earth}}m/r^2$, where G is the conventional gravitational constant).

Expressing the situation mathematically:

$$m_{\text{test}}a = -G\frac{Mm_{\text{test}}}{r^2}; \qquad (4)$$

Cancel out the test mass and replace acceleration a with its definition $d\upsilon/dt$ (the time rate of change of velocity) and apply the chain rule:

$$\frac{d\upsilon}{dt} = \frac{d\upsilon}{dr}\frac{dr}{dt} = -\frac{GM}{r^2}. \qquad (5)$$

Then replace dr/dt with its identity, velocity υ, rearrange terms, integrate, and solve for the velocity:

$$\int \upsilon d\upsilon = -\int \frac{GM}{r^2}dr; \qquad (6)$$

$$\frac{\upsilon^2}{2} = -\frac{GM}{-r} + C. \qquad (7)$$

Now, since the test mass is stationary, located as it is at a fixed distance to the center of gravity, there can be only one interpretation. The velocity in the equation must be with respect to the aether. The aether is streaming *downward* past the test mass; one could also justifiably say, the small mass is travelling *upward* through the aether. Both interpretations are embedded in the equation (and are made explicit in the next set of equations). The integration constant C is a placeholder in case there is a background flow component present. An absence of any background flow as a condition has been assumed throughout this article, so that C equals zero. The velocity expression then is,

$$\upsilon^2 = \frac{2GM}{r}. \qquad (8)$$

And expressed as a function of radial distance from the center of mass M:

$$\upsilon(r) = \pm\sqrt{2GM/r}, \qquad (9)$$

where G is the gravitational constant (whose experimentally determined value is 6.673×10^{-11} N·m^2/kg). Mass M refers specifically to the mass contained within a sphere of radius r. In other words, if a radial position of interest is selected which happens to be INSIDE the gravitating body, then only the *inner mass* (with respect to r) enters into the equation. The positive solution expresses the upward motion of the test mass *through* the aether (in the positive radial direction). The negative solution represents the *aether flow velocity* (in the negative radial direction) streaming past the test mass.

The negative solution represents a spherically symmetrical inflow field —giving the speed of *inflowing aether* at any radial location specified by r.

A plot of the aether inflow, based on equation (9), for the Schwarzschild 'Earth' is shown in **Figure 3**.

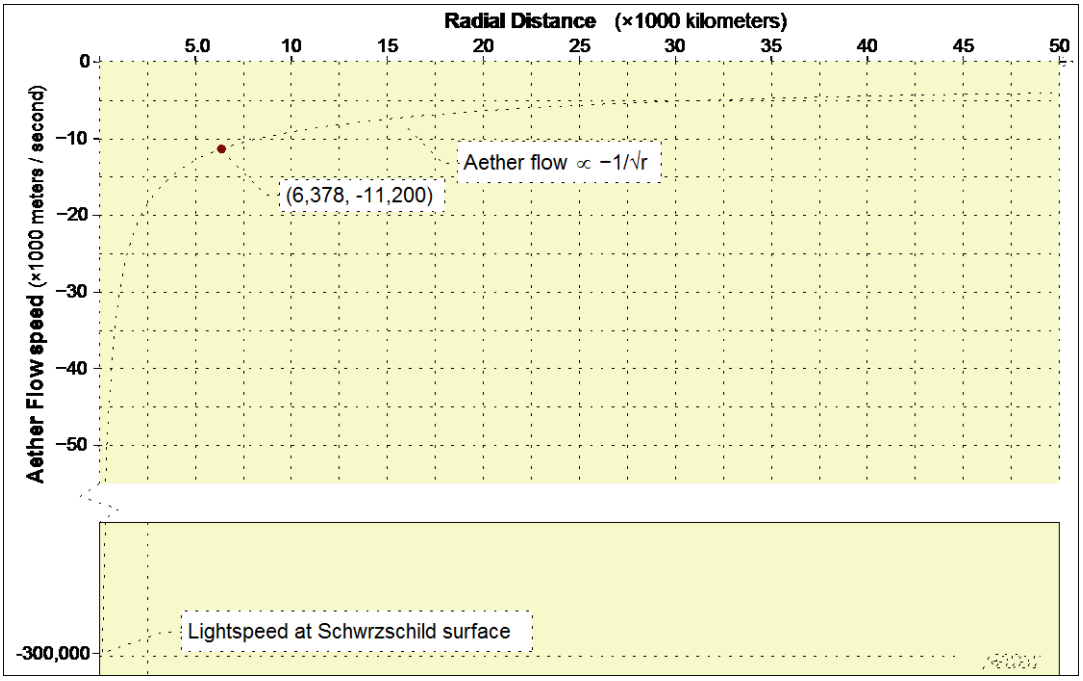

Figure 3. Graph of the aether flow surrounding a Schwarzschild 'Earth'. The curve is a representation of equation (9) presented in the text. The point (6378, −11,200) marked on the graph corresponds to the distance where the normal-sized Earth would have its surface. And the velocity at that location is as one would expect it to be, −11,200 *m/s*. At the Schwarzschild surface, the speed of inflow is the speed of light; this is true regardless of how the ethereal medium itself is defined. (The velocity flow for the unalterable-type aether is far too insignificant to be discernible within the scale of this graph.)

Although the flow speed of the 'ideal' (non-deformable) fluid is much too small to show up on the **Figure 3** graph, some calculated values allow for a side by side comparison with the *de facto* medium.

Table 1. A comparison of some calculated inflow velocities for Suppositional (unalterable) fluid *versus* Newtonian-compatible *de facto* aether near the point-like Earth mass.

Test point (radius)	Suppositional fluid	De Facto aether
Schwarzschild surface	velocity = $-c$	velocity = $-c$
0.10 *km*	−2.35 *m/s*	-2.82×10^{6} *m/s*
0.50 *km*	−1.0 *m/s*	-1.26×10^{6} *m/s*
1.0 *km*	-2.35×10^{-2} *m/s*	-8.92×10^{5} *m/s*
500 *km*	-9.4×10^{-8} *m/s*	-4.0×10^{4} *m/s*
1000 *km*	-2.35×10^{-8} *m/s*	-2.82×10^{4} *m/s*
6378 *km*	-1.1×10^{-15} *m/s*	**-11.2×10^{3} *m/s***

Based on the information available from the graph in **Figure 3**, here is the situation: Each and every second 5.735×10^{18} cubic meters of aether enters the spherical 'surface' at radius 6378 kilometers; while simultaneously only 2.95×10^{5} cubic meters enters the surface of the Schwarzschild mass. Obviously there is a truly prodigious volume reduction occurring —an ongoing shrinkage or loss of the universal medium amounting to thirteen orders of magnitude!

Before investigating the mechanism behind the volume loss, it may be useful to first find its mathematical expression.

4. Quantifying Aether Volume Reduction/Loss

It has been established, above, that the space medium undergoes contraction —somehow. To find how this

comes about, we pursue a mathematical approach. A function of the volume reduction/loss can be constructed as follows.

Start with a thin spherical shell exterior to and enclosing a concentric gravitating mass *M*. Aether flows into the shell with speed v.

(Shell's aether Volume loss) = (Flow into shell) − (Flow out of shell);

(Volume loss rate @r) = ($\text{Area}_{(r+\Delta r)} \times \text{vel}_{(r+\Delta r)}$) − ($\text{Area}_{(r)} \times \text{vel}_{(r)}$);

$$\Delta V = (4\pi(r+\Delta r)^2 \times \text{vel}_{(r+\Delta r)}) - (\text{Area}_{(r)} \times \text{vel}_{(r)}); \qquad (10)$$

$$\begin{aligned}\Delta V &= \left(4\pi\left(r+\Delta r\right)^2\left(-\sqrt{\tfrac{2GM}{r+\Delta r}}\right)\right)-\left(4\pi r^2\left(-\sqrt{\tfrac{2GM}{r}}\right)\right);\\ &= 4\pi\sqrt{2GM}\left(\left(r+\Delta r\right)^2\left(-\left(r+\Delta r\right)^{-1/2}\right)+r^2 r^{-1/2}\right);\\ &= 4\pi\sqrt{2GM}\left(-\left(r+\Delta r\right)^{3/2}+r^{3/2}\right). \quad (\text{where } \Delta r/r << 1) \qquad (11)\end{aligned}$$

Apply the binomial theorem by replacing $\left(r+\Delta r\right)^{3/2}$ with $r^{3/2}\left(1+\tfrac{3}{2}\tfrac{\Delta r}{r}\right)$;

$$\begin{aligned}\Delta V &\approx 4\pi\sqrt{2GM}\left(-r^{3/2}\left(1+\tfrac{3}{2}\tfrac{\Delta r}{r}\right)+r^{3/2}\right);\\ &\approx 4\pi\sqrt{2GM}\left(-r^{3/2}-\tfrac{3}{2}r^{1/2}\Delta r+r^{3/2}\right);\\ &\approx -4\pi\tfrac{3}{2}\sqrt{2GM}\left(r^{1/2}\right)\Delta r\,. \qquad (12)\end{aligned}$$

By setting Δr to equal 1 meter, we obtain the function for aether shrinkage/loss rate for any *r*-radius exterior shell.

$$\Delta V_{\text{loss}}(r) = -6\pi(2GM)^{1/2}(r^{1/2})(1.0\text{meter}), \quad (\text{units: } m^3/\text{s}) \qquad (13)$$

where *M* is the mass *inside* radius *r*.

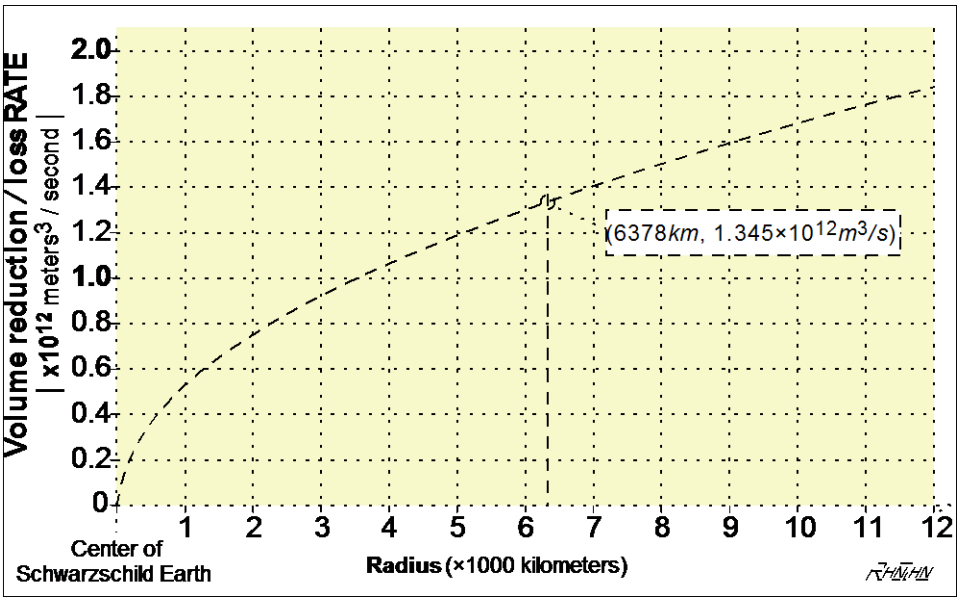

Figure 4. Rate of aether contraction, or loss, within concentric thin shells (with thickness of 1 meter each) as a function of radius —the radial distance from the Schwarzschild Earth. The point indicated gives the volume reduction/loss rate for a shell coinciding with where the Earth's surface would normally be.

So, within each incremental shell (1 meter thick) there is a certain amount of aether lost (in terms of volume). The graph in **Figure 4** traces the rate of volume contraction with respect to radial distance[a] from

[a] Note: Because the binomial approximation was used in the derivation, the loss equations will not be accurate at very small radial distances.

the center of gravity. The larger the shell (1-meter-thin shell), the greater is the rate of reduction.

A more general expression, one that applies to thick shells or an entire sphere, can be obtained by first taking equation (12) to the differential limit.

$$dV_{(r)} = -4\pi \tfrac{3}{2}\sqrt{2GM}\cdot r^{1/2}dr\,, \qquad (14)$$

where the negative indicates a loss of aether volume. And then integrating over the domain r_1 to r_2,

$$\int dV_{\text{loss}} = -4\pi \tfrac{3}{2}\sqrt{2GM}\int_{r_1}^{r_2} r^{1/2}dr\,; \qquad (15)$$

$$V_{\text{loss}} = -4\pi(2GM)^{1/2}\left((r_2)^{3/2} - (r_1)^{3/2}\right), \qquad (16)$$

which gives the loss rate within any specified external shell.

Setting r_1 equal to zero gives us a function for the TOTAL volume-loss rate within a concentric sphere of radius r. (In this case, the mass need not be point-like, as long as M refers to the mass portion *inside* radius r.)

$$V_{(r)} = -4\pi\sqrt{2GM}\cdot r^{3/2}\,. \qquad (17)$$

The graphical representation of equation (17), still using the point-like Schwarzschild Earth, is shown in **Figure 5**.

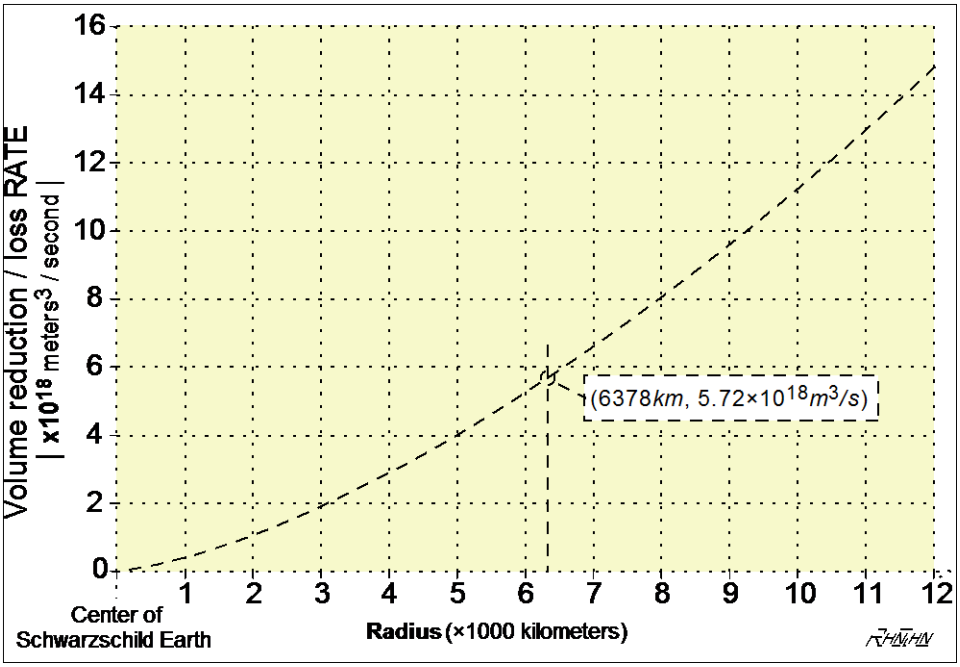

Figure 5. Rate of aether contraction, or loss, within a sphere of radius r —the distance from the Schwarzschild Earth. The y-axis gives the TOTAL volume loss rate (in cubic meters per second) for the region inside r.

What the graphs and the equations tell us is that the quantitative loss or volumetric shrinkage is truly staggering. For example, aether is flowing inward at the radius 10,000 kilometers at the rate of $11\times10^{18}\ m^3/s$ (see **Figure 5**) while only $2.95\times10^5\ m^3/s$ reaches the central Schwarzschild Earth mass —a difference of 14 magnitudes!

The cause of conventional gravity, the driver impelling objects to accelerate towards the center of mass, is rooted in the dynamic nature of aether. But what is the mechanism underlying the dynamism? ... It has been established that the universal medium undergoes volume contraction —this is its dynamic aspect. The question is, *How is the change in volume accomplished*?

5. How the volume loss is accomplished

We are confronted with the undeniable fact, demonstrated above, of volume loss. There are basically two ways to account for the medium's loss. (i) Allow it to be compressible, or (ii) Allow it to self-dissipate. ... In other words the choice is between allowing aether to increase in density OR letting a portion to simply vanish. (This vanishment is deemed to be independent of matter's direct absorption/consumption/vanishment of aether.)

5.1. Traditional approach

Newton's aether with density variation: Isaac Newton is known to have speculated on two possible mechanistic causes of gravity —one hydrodynamic, the other hydrostatic. In a letter to Robert Boyle (in 1679)[1], Newton had suggested that if gravity were to be constructed as a more truly mechanical theory, then it would be a *hydrostatic* theory depending on *variations in aether density* (somewhat like an earlier theory of French mathematician Gilles Personne de Roberval). Gravity did not depend on the motion or consumption of aether, but rather on its density. The problem is, how can a static fluid (irrespective of any density variation) lacking in motion possibly model what is in fact dynamic?

The compressibility option was also explored by Leonhard Euler (1707-1783) for his aether theory of gravity. The density of his mechanical-but-nonmaterial particles increases as one moves away from the Earth's surface. Greater density supposedly manifests as an increase in pressure. Any object in this aether 'field' experiences a greater pressure from above than below; hence, it falls downward towards Earth. In his attempt to solve the riddle of gravity, Euler struggled with density variation and pressure differentials of a particulate aether. What mechanism could possible explain such an odd density-pressure pattern? —Not to mention the fundamental question of how *nonmaterial particles* are able to generate a pressure force!

Aether density variation played a role in an otherwise purely mathematical theory proposed by M. F. Podlaha in 1980. Quoting, "Gravitation is caused by the inhomogeneities of the aether. The gravitation tensor is derivable from the distribution of the aether density. Material bodies are pulled in the direction of the greater aether density."[2] The specifics of the mechanism, of how a density gradient causes gravity, were never explained.

The tradition continued into the 21st century with the work of French physicist Mayeul Arminjon. His aether theory of gravitation was yet another failed attempt to exploit density changeability. Gravity is interpreted as the gradient of aether density; it is, like Euler's medium, "characterized by a *decrease* in the aether density, not an increase, towards the attracting bodies." Oddly, aether is treated as a continuum (not as a composition of discrete entities): "it must be continuous at any scale."[3][4] If the universal fluid is a continuum, how then is it possible to increase its density!? And since Arminjon's aether is strictly conserved, there is no chance for vanishment.

An old idea with the same old problems. Researcher Nadeem Haque proposed that the density of aether particles increases with proximity to Earth's surface, but, as he explained, "an immediate serious problem arose:" If the density decreased with greater altitude, then there would be more aether particles colliding *underneath* an object in the 'fluid field', than *above* (the effect being analogous to a buoyancy upward push or Archimedes Thrust). Under such density increase, in the absence of any other factors, objects would rise up instead of fall down.[5]

A recent example. Researcher Henry H. Lindner has suggested that space consists of physical cells, which, as a consequence of convergent flow forcing them into smaller volumes, become compressed laterally. If they lose volume (the cells become smaller), which means their density increases. If they do not lose volume, they undergo a deformation and become quite elongated through a process of 'spaghettification' —in which case the density necessarily remains unchanged. Overlooking the sagacity of employing a *physical* space medium able to impart and sustain lateral pressure, problems arise when trying to explain what goes on in the interior of mass bodies.[6]

There were, of course, some who believed aether could do neither —could neither be compressed nor lost. René Descartes (1596-1650), for instance, "believed in a continuous aether that completely fills the

space not occupied by solid bodies and mediates their interactions by means of a system of vortices. His aether was a continuous indestructible fluid."[7] In the 1870s, the Norwegian physicist Carl A. Bjerknes developed a hydrodynamic gravity model based on an infinite and incompressible fluid. Bjerknes's work was revived in 1898 by the German Arthur Korn at the University of Munich, for the development of his fluid-dynamic theory of gravitation [8].

5.2. Revolutionary approach

To the best of my knowledge, there are only two well-developed theories that embrace the concept of aether vanishment —Reginald T. Cahill's Process Physics[9] and C. Ranzan's DSSU[b] model[10].

The revolutionary approach is to acknowledge that the universal space medium is a unique type of compressible fluid —one that responds to compressive stress not by any change in density, but rather by simply self-dissipating. The implications are profound.

For one thing, the medium's spatial density necessarily remains constant (within some narrow range).

A medium that is compressible, yet does not undergo a change in density, has to be particulate. Stated another way, if aether undergoes variable degrees of vanishment, then it cannot be a continuum. A continuum has the connotation of being a single extended entity, not something that can be discretized. Aether must, therefore, be a particulate-type fluid. Logically, it must consist of discreet units.

And then there is a most unexpected implication. If aether's discreet units are to have the ability to vanish (as a reaction to compressive stress) and simultaneously comply with Nature's conservation laws, then it follows that such 'particles' must be nonmaterial. This means the *de facto* aether units possess no mass and no energy. The inherent benefits for the advancement of gravity theory and cosmology are unprecedented.

Table 2. Two ways of reducing the volume of the aether fluid. In an effort to achieve acceleration proportionality to the inverse square of the distance from the center of mass, some theorists advance the notion of a variable-density medium (middle column). Whether the density change refers to inherent particulate nature or to the energy content, the method is a pitfall. With DSSU aether (right-hand column), the volume reduction is achieved through the unique process of self-dissipation —a reaction to the stress of convergent flow and its axiomatic constant density.

How to effect volume reduction		
	Popular approach (pitfall)	Revolutionary approach
Key property:	Density VARIES	Spacing density remains CONSTANT
Method:	Volume is reduced as an increase in DENSITY (and/or compression deformation)	Volume is reduced as a loss of aether (SELF-DISSIPATION)
Test:	Can be made to work math-wise but fails reality	Conforms to reality

A summary of the two ways of reducing the volume of the aether fluid is shown in **Table 2**. One is a classic pitfall, the other turns out to be remarkably successful. With DSSU aether (right-hand column), the volume reduction is achieved through the unique process of self-dissipation —a reaction to the stress of convergent flow and its constant-density[c] attribute. It is this vanishment property that makes aether dynamic —and gravitational.

[b] DSSU is the acronym for *the Dynamic Steady State Universe* —the cosmology theory that holds that the space medium is the ultimate substrate of Nature, and that the space medium expands and contracts ***regionally and equally*** resulting in a cosmic-scale cellularly-structured universe. It is a model based on the premise that all things are processes.

[c] To be clear, this is not a normal type of density, rather, a constant spatial density of discrete aether units.

6. Aether's Essential Properties and The Gravity Principle

6.1 Defining properties

The four essential properties of the universal medium are described as follows.

● **Uniquely compressible**. The universal space medium is a unique compressible fluid. It responds to compressive stress without a change of density. It accomplishes this seeming magic by *self-vanishing*.

● **Discretized.** Aether undergoes variable degrees of vanishment. Consequently, it cannot be a continuum, something usually thought of as being a single extended entity, something often pictured as a continuous fabric or a deformable rubber sheet. The only alternative is for aether to be a particulate-type fluid.

● **Constant spatial density.** An essential property of aether is its constant spatial density. This aspect follows from the historical and contemporary failure of using the opposite property, that being the lack of success with a variable medium.

● **Nonphysical.** There is an inviolate law that Nature enforces —the law of conservation of mass/energy. It means the aether's individual units simply cannot possess mass or energy. The conclusion is as unavoidable as it is profound; the aether that permeates all space and generates all guises of gravity is *nonphysical*.

Notice, and notice well, we started by assuming nothing regarding the properties of the universal medium. The only assumption was that matter —all mass and energy particles— depended on the medium for its existence. The aether's essential properties just followed logically.

6.2. Gravity Principle

The general rule (encompassing both convergent and divergent kinds) is that the gravity effect is conveyed by the acceleration of aether. However, there is a deeper causative level, as expressed in the following principle:

The natural tendency of any particle/object is: (1) to move in the direction of greatest aether loss —the direction in which the rate of aether self-vanishment is most pronounced; and (2) to move *away* from the direction of greater aether gain, within regions of aether emergence. The second part of the Principle is relevant to the great Voids. (The situation there, where divergent gravity operates, is explained in Section 7.)

The proportional vanishment (and emergence) of aether is equally important, if not more so, to the causal mechanism than simply citing the acceleration of aether.

Some important points to consider, along with some related incidental ones:

● The *root cause* of the contractile gravity effect is the absorption/consumption of aether by matter.

● Aether acceleration can occur only if there is converging or diverging flow. Such patterns are not always obvious because there can be an overlapping of many multiple flow fields.

● Any more-or-less-constant background flow is not important to the aether theory of gravity.

● Here's what was previously missing from gravity theory: Specifically, it was the two-step linkage in the mechanism of *contractile gravity*: (1) The convergence of the acceleration of aether is the direct cause of stress and, hence, of the associated self-vanishment. And (2) self-vanishment, then, is the direct cause of conventional contractile gravity.

● A clarification on the role of space-medium acceleration. Aether acceleration acts as the nominal cause of normal gravity when the acceleration is in the direction of convergence (as it is for a body's exterior). But this cannot be said of the interior of a mass body. There, the flow *decelerates*. This means that in the interior of a mass body it is solely the aether volume-loss gradient that acts as the cause.

● The accelerating flow induces stress, which is intensified by the flow's convergence as it descends a gravity well. The resulting strain in the aether 'manifests' (for lack of a more appropriate word) as a

quantitative loss by way of self-dissipation.

● A clarification on the compressive stress that induces vanishment: It is not pressure in the proper sense of a force being exerted, but rather a mechanical imposition. Since the aether in nonphysical, conventional pressure is meaningless. And since it consists of discrete units, it *is* mechanical. Theory allows for a certain degree of tolerance, giving aether the ability to conduct wave-like disturbances and withstand a small amount of compressive and tensile stresses.

● Concluding point: Acceleration of aether is *not the direct cause of gravity; it is only the intermediary cause*!

6.3. Definition of the gravity effect

What is called *the gravity effect* is the observable manifestation of gravity. It may be defined as the tendency a body, object, or particle —in the absence of any force acting on same— to accelerate relative to a mass body or, on the cosmic scale, relative to the nearest Node galaxy cluster[d]. For example, the Milky Way galaxy is accelerating towards the Virgo Node cluster (with M87 at its center).

A peculiar situation arises within the great Voids, the regions where aether is emerging (expanding). Here it is possible to have mass structures moving away from each other, yet at the same time have all accelerating towards the very same Node cluster of galaxies. All remain in compliance with the definition.

7. Divergent Gravity

Two factors are responsible for divergent gravity: the bulk acceleration of aether and a gradient in aether's emergence/expansion. (As a side note, the emergence/expansion of aether has two causes: First, it is a fundamental axiomatic process. Second, it is a reaction to the cosmic tension that exists across any great Void.)

The domain of what is being called the *divergent gravity effect* is found within the great cosmic Voids. Objects located there respond to two dynamical properties of aether: its accelerating motion and its self-emergence or self-expansion.

A test body, if held in place at some distance from a Void center and then released, will accelerate outward. As shown in **Figure 6**, the test mass would 'sense' greater aether acceleration on one side and thus gravitate in that direction. In addition, there is a gradient in emergence/expansion of new aether —an extremely gentle gradient such that the greater the distance from the Void center the lower is the rate of new aether emerging. (Remember, the medium is nonmaterial and has no energy and, so, the process does not violate any conservation law.)

[d] *Node cluster* refers to the mass concentrations at the nodes of the dodecahedral tessellation of the DSSU.

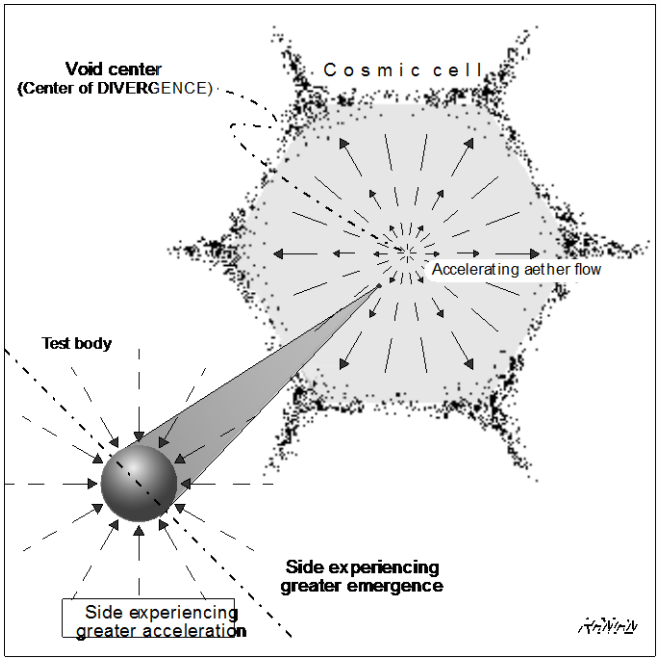

Figure 6: Divergent gravity. A test object within the cosmic Void responds to two dynamics of aether: Its emergence/expansion and its acceleration. In accordance with the aether-gravity Principle, the mass moves *in* the direction of greater acceleration and *away from* the direction of greater aether emergence/expansion. (Cosmic cells, according to astronomical evidence, are 300 to 350 million lightyears in diameter.)

8. Interior Gravity

The problem that had plagued previous aether gravity models was that the aether streaming inside a mass body is actually decelerating. Technically, by virtue of the fact that the flow is slowing down (and reaches zero at the center of mass), it means the aether is accelerating radially outward/upward. According to a strict interpretation of having aether acceleration as the sole cause of gravity, it could then be argued that interior test objects should gravitate towards the planet's surface. This of course does not happen.

In order to uncover the *direct* cause of gravity (of which aether acceleration is the intermediary cause) we need to analyze the flow. We will do this for an Earth-like body (for which there is no background flow).

8.1. Internal inflow velocity

In order to construct a velocity function for the interior, we first need a mass function. And *that*, in turn, requires a density function. As a reasonable approximation, we use a linear variation in density as shown in **Figure 7**.

$$\rho(r) = \left(\frac{\rho_{\text{sur}} - \rho_{\text{cor}}}{R} \right) r + \rho_{\text{cor}} \,. \qquad (18)$$

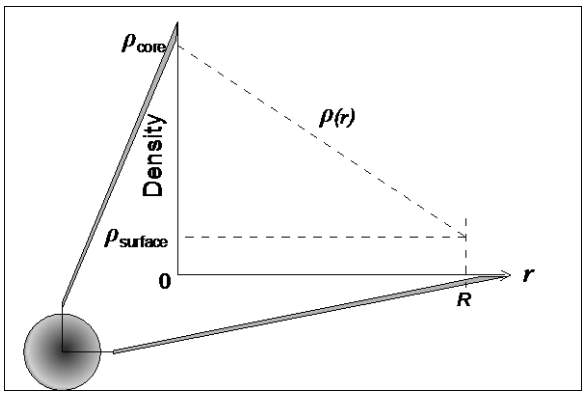

Figure 7. A linear gradient is being used to model Earth's density profile —represented by the sloping line whose equation is $\rho(r) = ((\rho_{sur}-\rho_{cor})/R)r+\rho_{cor}$.

The mass inside a thin concentric shell of radius *r* is simply the shell's density multiplied by its volume, that is,

$$\Delta M(r) = \rho(r)\times\Delta V_{\text{ShellVol@(r)}} \ . \qquad (19)$$

Substituting the expressions for density and shell volume, gives

$$\Delta M(r) = \left(\frac{\rho_{sur}-\rho_{cor}}{R}r+\rho_{cor}\right)\times\left(4\pi r^2\Delta r\right);$$

$$= 4\pi\left(\frac{\rho_{sur}-\rho_{cor}}{R}r^3+\rho_{cor}r^2\right)\Delta r \ . \quad r\le R \quad (20)$$

Take the differential limit and then integrate (and note, the constants of integration are not relevant here and have been omitted):

$$\int dM = 4\pi\int\left(\frac{\rho_{sur}-\rho_{cor}}{R}r^3+\rho_{cor}r^2\right)dr\,; \qquad (21)$$

$$M(r) = 4\pi\left(\left(\frac{\rho_{sur}-\rho_{cor}}{R}\right)\frac{r^4}{4}+\frac{\rho_{cor}r^3}{3}\right). \quad r\le R \qquad (22)$$

The Earth's density ranges from 2340 kg/m^3 at the surface all the way to 15,000 kg/m^3 at the core's center[11]. Inserting these values, including Earth's radius *R* ($6378\times10^3 m$), gives the mass of Earth as a function of radius.

The Earth-applicable function of the total mass *inside* any specified radius *r* is:

$$M_{Earth}(r) = 4\pi\left(\left(\frac{2340-15,000}{6378\times10^3}\right)\frac{r^4}{4}+\frac{15,000r^3}{3}\right). \qquad (23)$$

Its corresponding graph is shown in **Figure 8**.

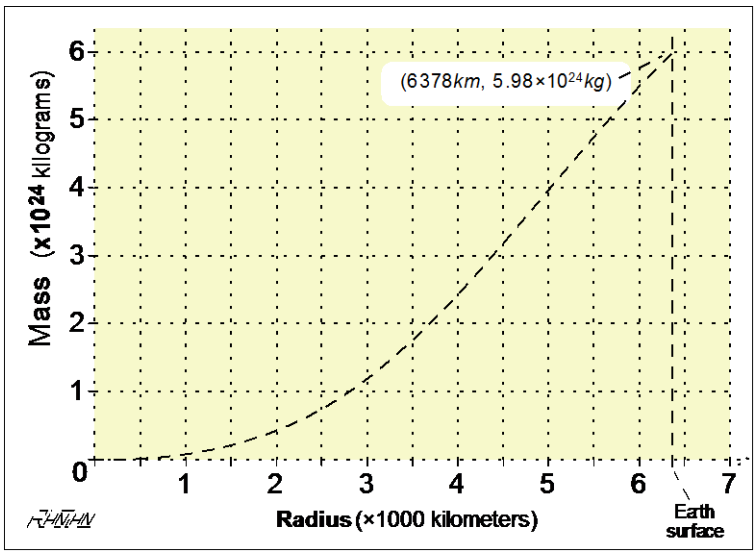

Figure 8. Graph of Earth's interior-mass function. The function gives the total mass inside a radius specified by the variable *r*. Notice that the distance corresponding to the Earth's surface gives an ordinate that agrees with the official whole-Earth mass value of 5.98×10^{24} *kg*; and thus, serves as a check on the general correctness of the density function.

We can now construct an aether velocity equation for a mass body with linearly varying density.

Start with the basic aether flow expression. (The usual assumption stands; there is no background aether flow or it has been mathematically removed.)

$$\upsilon(r) = -\sqrt{\frac{2GM(r)}{r}}\,; \qquad (24)$$

Combine equations (22) and (24) and apply some algebra as follows,

$$\upsilon(r) = -\sqrt{\frac{2G}{r}\,4\pi\left(\left(\frac{\rho_{sur}-\rho_{cor}}{R}\right)\frac{r^4}{4}+\tfrac{1}{3}\rho_{cor}r^3\right)}\,;$$

$$\upsilon(r) = -\sqrt{2\pi G\left(\left(\frac{\rho_{sur}-\rho_{cor}}{R}\right)r^3+\tfrac{4}{3}\rho_{cor}r^2\right)}\,; \quad r \le R \qquad (25)$$

$$\upsilon(r) = -\sqrt{2\pi G\left(P_{slo}r^3+\tfrac{4}{3}\rho_{cor}r^2\right)}\,; \qquad (26)$$

where P_{slo} is the **slope-of-density parameter** and replaces the division term (relating to the slope in **Figure 7**). The appropriate evaluation for Earth is: (2340-15,000)/(6,378,000) = −0.001985 *kg/m*^{4}.

Replacing the parameters with their respective values (as specified above) results in the expression for Earth's interior aether velocity at radius *r*. The graph is given in **Figure 9** (along with a portion of the external flow).

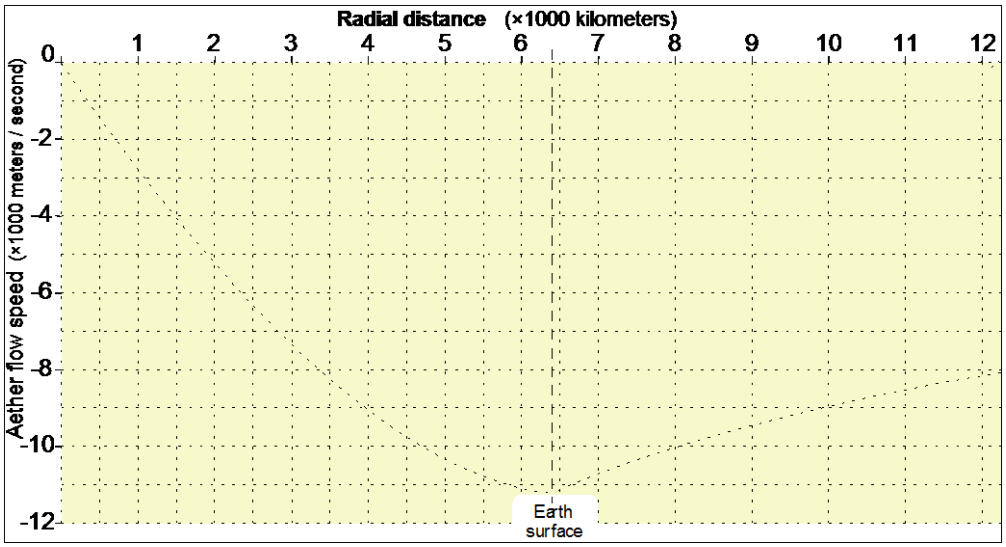

Figure 9. Velocity graph of the aether surrounding Earth (whose density varies linearly from 2340 *kg/m*^{3} at the surface to 15,000 *kg/m*^{3} at the core's center). The focus is on interior aether flow's variance with radius *r*. Interior curve is based on in-text equation (26). (Any more-or-less constant background aether flow, to which the real Earth may be subjected, is being ignored. Such background flow has negligible effect on gravity intensity; and does not affect gravity theory.)

We are now in a position to determine the rate of aether volume loss within the interior of the Earth.

8.2. Volume loss determination

The volume loss rate (of the quantity of aether consumed *and* self-dissipated in Earth's interior) within an arbitrary thin mass shell is found as follows.

Start with a thin spherical shell of the Earth's interior. Aether flows into the shell with a certain speed υ, which depends on the distance from Earth's center point (as shown in **Figure 9**). A certain amount is lost during passage through the thickness of the shell, and the rest flows out through the inner surface. The volume loss within the shell is simply the difference between the inflow and the outflow.

(Volume loss rate @r) = $(\text{Area}_{(r+\Delta r)} \times \text{vel}_{(r+\Delta r)}) - (\text{Area}_{(r)} \times \text{vel}_{(r)})$;

$$\Delta V(r) = \big(4\pi(r+\Delta r)^2\big)\upsilon_{(r+\Delta r)} - (4\pi r^2)\upsilon_{(r)}; \qquad (27)$$

Replace the two velocity-function placeholders with full expressions using equation (26) and work through the basic algebra:

$$\Delta V(r) = \big(4\pi(r+\Delta r)^2\big)\big\{-(2\pi G)^{1/2}\big(P_{slo}(r+\Delta r)^3 + {}^4\!/_3\,\rho_{cor}(r+\Delta r)^2\big)^{1/2}\big\} - (4\pi r^2)\big\{-(2\pi G)^{1/2}\big(P_{slo}\,r^3 + {}^4\!/_3\,\rho_{cor}\,r^2\big)^{1/2}\big\}; \qquad (28)$$

$$= -(2\pi G)^{1/2}\Big[(4\pi(r+\Delta r)^2)\big\{\big(P_{slo}(r+\Delta r)^3 + {}^4\!/_3\,\rho_{cor}(r+\Delta r)^2\big)^{1/2}\big\} - (4\pi r^2)\big\{\big(P_{slo}\,r^3 + {}^4\!/_3\,\rho_{cor}\,r^2\big)^{1/2}\big\}\Big];$$

$$= -(2\pi G)^{1/2}\,(4\pi)\Big[\big\{\big(P_{slo}(r+\Delta r)^7 + {}^4\!/_3\,\rho_{cor}(r+\Delta r)^6\big)^{1/2}\big\} - \big\{\big(P_{slo}\,r^7 + {}^4\!/_3\,\rho_{cor}\,r^6\big)^{1/2}\big\}\Big]. \qquad (29)$$

To evaluate the volume loss rate for a **one-meter-thick mass-shell**, set Δr equal to 1.0 *m* and plug in the values, $G = 6.673\times10^{-11}$; density-slope parameter $P_{slo} = -0.001985$ *kg/m*^{4}; and density $\rho_{cor} = 15{,}000$ *kg/m*^{3}. Discard the negative sign, since we are calling it a *loss function* and plotting it on the plus side of the *x*-axis.

This, then, is the **volume loss** (per second) within a single such shell at *r* meters from Earth's center:

$$\Delta V(r) = (2\pi\cdot6.673\times10^{-11})^{1/2}\,(4\pi)\Big[\big\{\big(-0.001985\,(r+1)^7 + {}^4\!/_3\,15000(r+1)^6\big)^{1/2}\big\} - \big\{\big(-0.001985\,r^7 + {}^4\!/_3\,15000\,r^6\big)^{1/2}\big\}\Big]. \qquad (30)$$

The graph appears in **Figure 10**.

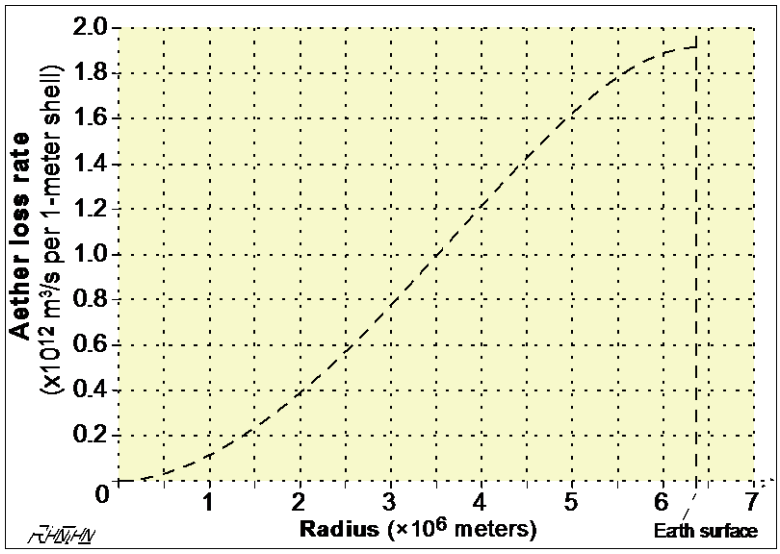

Figure 10. Graph of the aether loss (per second) within a mass shell one meter in thickness and having radius *r*. Think of the Earth layered like an onion, each layer one meter thick. The 'loss' represents the aether directly absorbed/consumed by mass *and* an amount lost by self-dissipation. The curve is based on equation (30).

The loss-per-shell graph does not really tell us very much. Self-evidently, the smaller the shell, the lower is the volume loss. Not very useful in itself, but it is vitally important to the final step in this study of interior gravity.

8.3. Aether loss (per background cubic meter) increases

The really important question is, *Is there an increase in the aether loss per unit volume*? —specifically, *per cubic meter of background space*? The viability of the aether theory of gravity hinges on the answer.

The volume loss rate per cubic meter of background Euclidean space can be determined by dividing the

loss-per-mass-shell expression (ΔV derived above) by the shell volume. Recall, the mass shells are one meter thick.

Unit volume loss rate: $v_{(r)} = \Delta V(r)$ / (Shell vol.);

$$= \Delta V(r) \,/\, \left((4\pi/3)\,(3r^2 + 3r + 1)\right). \quad (31)$$

The loss rate can be expressed as $m^3/s \,/\, m^3$ OR simply as the fractional loss of aether per second. Under the intuitive interpretation, numeric values represent cubic meters of aether lost per second within each cubic meter of Euclidian space (space as a conceptual container). The graph of equation (31), giving the aether loss per unit volume, is presented in **Figure 11**.

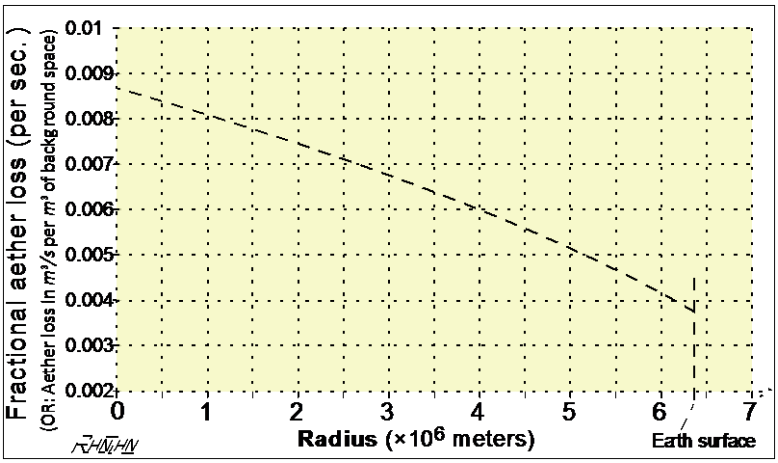

Figure 11. Graph of the fractional quantity of aether *consumed and self-dissipated* in Earth's interior, as a function of distance to the center. This graph shows, on a per unit volume basis, that aether loss is increasing with depth. In other words, aether loss is *accelerating* during decent in Earth's interior. It is exactly what is required by the gravity Principle —and is the immediate driver of the contractile-gravity effect.

As aether flows inward, its unit-volume loss rate increases from 0.37% at the surface to 0.87% within 60 kilometers of the core.

Conclusion. The *unit-volume-loss-rate* graph reveals that the loss rate *increases* as aether flows inward through the interior mass. This progressive rate-rise is critically important. It fulfills the requirements of the *DSSU gravity Principle*. It solves a problem for which Newton's force-gravity and Einstein's geometrodynamic-gravity have no resolution.

The broader conclusion is this: Within any contractile gravity well, aether loss (per background cubic meter) increases with depth into the well. For gravitating mass bodies, it is true externally and internally.

9. Interaction Mechanism

9.1. Object-Aether interaction

Let us examine how a particle or object interacts with a converging aether flow. Every particle/object possesses its own small gravity domain —its surrounding aether inflow field. With this acceleration field the object 'grabs' into the surrounding aether, so to speak. But the aether it is grabbing into has a loss gradient —an aether-loss gradient induced by the stress of the converging-and-accelerating aether streaming into a gravitating body. By way of its own field, the object 'senses' the loss differential. As shown in **Figure 12**, since the convergence is downward, the lower half of the object's gravity domain 'senses' a greater loss of aether vanishment than does the upper half. (And of course the lower half of the domain is closer to the mass than is the upper half.) This imbalance in aether loss causes the test object to move (or attempt to move if held at rest) towards the direction of greater loss.

In accordance with the gravity Principle, the object will move (accelerate) in the direction which its own field senses to have the largest rate of aether self-vanishment within the dominant contractile region.

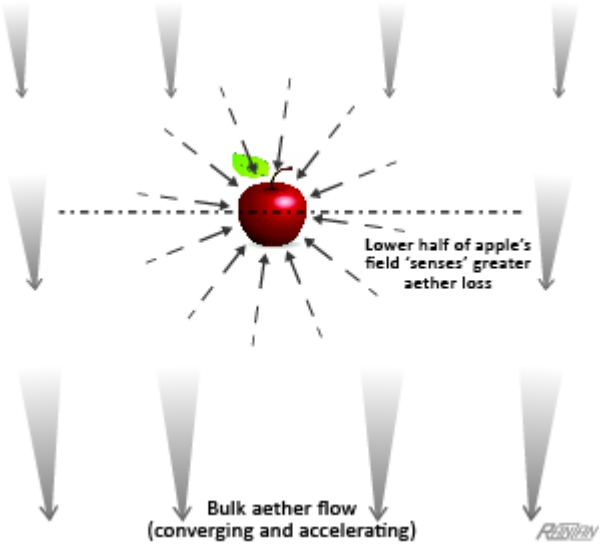

Figure 12. Object interacting with converging and accelerating aether. Every particle/object is surrounded by its own small gravity field —the object's mechanism through which it 'grabs' into the ambient space medium. The lower half of the apple's acceleration domain/field 'experiences' a greater loss of aether vanishment *occurring in the bulk flow* than that 'experienced' by the upper half. Picture it this way, the apple is sucking in aether that is vanishing faster on the lower side than on the upper side. In an effort to maintain its necessary supply of aether, the apple *pulls* itself downward.

9.2. Object-Object interaction

When two comparable masses gravitationally attract each other (meaning they tend to accelerate towards each other) they do so because within the in-between region their inflow fields overlap and compete. They compete for their existence-sustaining supply of aether. The result is a region of greater aether vanishment. Once more invoking the gravity Principle, each mass will move in the direction of greatest aether loss and that direction is along the line joining the two masses.

It is the vanishment that is of critical importance —vanishment caused by, as always, the mechanical stress of aether's converging motion.

The resulting mutual acceleration of the masses has historically been interpreted as a force. Newton formulated this force, a force between two masses, as GM_1M_2/r^2. But under the aether gravity paradigm, M_1 and M_2 also represent the strengths of respective aether-acceleration fields.

10. Discussion

Historical note. Over the past few centuries there were a number of attempts to explain gravity by having material bodies function as aether sinks. As physicist Carl Frederich Krafft described the efforts, "All aether sink theories of gravitation, however, are confronted by the difficulty of explaining not only what causes such inward flow of aether, but also what happens to the aether after it is absorbed." Krafft acknowledges, "There are only two possible answers —either the aether accumulates in them, or it disappears in the same." Aether accumulation, unquestionably, requires some kind of density increase. Almost all theorists of the past opted for accumulation and densification. But there was one, the only one, the German mathematician G. F. Bernard Riemann (1826-1866), we are told, who did not. He, instead, favored the concept of *vanishment*.[12]

Three processes are involved in generating the gravity effect. All three contribute to the acceleration of external aether flow.

(1) The direct absorption/consumption of aether by matter. This process generates a localized convergence of aether flow —a converging flow of accelerating aether.

(2) Self-dissipation, or stress-induced vanishment. The flow convergence imposes a compression-like stress which leads to a proportional self-dissipation of aether. It is this quantitative loss of the universal medium that we recognize as contractile-type gravity. The ontological meaning underlying the normal gravity effect involves aether vanishment.

(3) The emergence/expansion of aether. This is the process associated with the great Voids. It is a quantitative 'growth' of aether and generates the divergent gravity effect (often called antigravity). It also bestows an essential equilibrium to the Universe —the essential balancing source supply of new aether. In this *harmony of opposites* of emergence and vanishment, the fresh supply balances what is continuously being absorbed/consumed by all physical matter and lost by self-dissipation in the contractile zones.

An important caveat: While it may be tempting to say that the cause of gravity is the acceleration of aether, it is not entirely true. It must be understood that the *direct* cause is the quantitative change of the aether medium —its vanishment (or its emergence, as the case may be).

Importance of convergence. Hypothetically, what would happen if the bulk flow were parallel, if convergence were absent?

Consider a thick mass slab of nominally infinite extent. We know there would be no gravity effect *above* or *below* such a thought-experiment structure (this is also true in Einstein's gravity theory). As can be easily imagined, the aether inflow is constant for the region external to the upper and lower surfaces (and diminishes to zero in the interior at the mid-plane). There is no vanishment differential, no proportional loss gradient. Therefore, no gravity effect would manifest on the slab's exterior. Without radial convergence, clearly there can be no contractile gravity effect.

However, for the slab's interior things are not so simple. In the interior of the slab, there definitely would be a proportional consumption gradient and speed gradient; resulting in aether deceleration towards the mid-plane (equivalent to acceleration away from the mid-plane). What would happen inside a hole bored into the slab's interior is subject to debate. It is probable, in the context of a thought experiment, that an object comoving (with the aether) into a borehole would suddenly experience an outward acceleration acting as a breaking effect. But an object held at-rest inside the borehole would 'experience' no gravity. There is neither an aether loss gradient nor convergent aether flow —the two gravity-producing essentials. (There is a velocity gradient, but this in itself *does not produce a gravitational effect*.)

How an at-rest particle or object 'senses' its gravitational acceleration. Understand that any object, as explained earlier, manifests its inertia[e] by 'grabbing' into the surrounding aether (regardless of what the aether is doing). If on one side, aether is slipping away —self-vanishing— more than on the other side, then the object will strive to move/accelerate in that direction. Think of it like this, the object is gripping into aether much of which is slipping away into nothingness. The object must then grab onto the remaining aether; and this remaining aether is itself streaming downward (i.e., towards the center of mass).

Whether it is held at rest 100 kilometers up above by some external propulsion force, or resting on a planetary surface, or lying at the bottom of the deepest mineshaft; a test object's self-gravity field 'senses' the aether dynamics (acceleration and self-dissipation) of its surroundings. In accordance with the Principle, it is pulled, and pulls itself, in the radial direction of greater aether loss.

Freefalling objects. An object accelerating under freefall, accelerates *only until it is comoving with the*

[e] Inertia is the object's inherent property making it oppose any force that would cause it to change its motion or state of rest.

aether flow (as usual, for the sake of simplicity, it is assumed there is no background flow or it is negligible). This rule also applies to acceleration within the great Voids.

Aether dynamics versus *space* dynamics: The DSSU theory of gravity is based on *aether* being dynamic, while the 20th-century theory of gravity is founded on '*space*' being dynamic. The reason they are both deemed to be 'dynamic' is simply that they both involve expansion and contraction. The question then is *What's the difference*? ... One is a mechanical medium, the other is a mathematical continuum. With the DSSU dynamic aether, one knows clearly what is going on; it expands through a process of emergence, it accelerates away from Void centers and towards mega-mass centers, and it contracts via convergence-induced self-dissipation. With Einstein's *space* dynamics on the other hand, one is left groping in a mathematical realm for meaning —for the meaning behind *space* expansion, *space* contraction, and *spacetime* curvature. Another mathematical scheme (used in attempts to understand gravity), quantum theory, just deepens the level of abstraction. Not to be forgotten is the fact "that quantum mechanics does not really describe what kind of dynamical phenomena are actually going on."[13] Moreover, quantum theory has long been viewed as an incomplete field theory in which phenomena actually arise from a deeper level of dynamics —underlying dynamics having the nature of classical mechanics. In other words, what is now being recognized as underlying all reality is the existence of a mechanical medium. It makes all the difference. The revolutionary difference is that *aether dynamics* leads to a deep-level understanding of gravity, *space dynamics* does not.

Overview of how the universal space medium was employed to produce a successful mechanical theory of gravity. There are four main types of aether. They are, as shown in **Figure 13**: energy particulate, mass particulate, continuous nonparticulate, and nonphysical particulate.

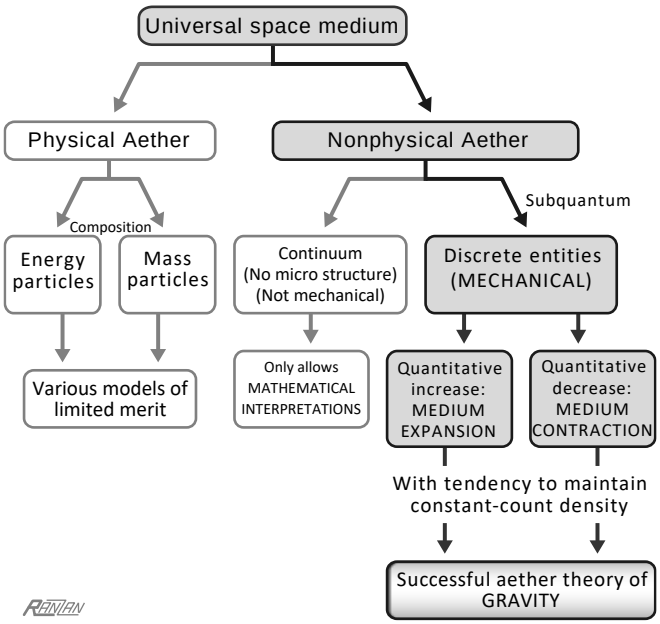

Figure 13: Universal space medium is invoked in the conceptual development of a successful mechanical theory of gravity. Of the four main types of aether only the *nonphysical mechanical* type leads to a successful aether theory of gravity. The aether's tendency to maintain a constant spatial density is responsible for emergence/expansion when the medium is under tension and responsible for vanishment/contraction when compressively stressed.

A unique component. The aether that emerges from the conceptual analysis and from empirical studies is absolutely unique. With its unparalleled explanatory power, it is unlike any other to be found in the

scientific literature prior to its use in the development and validation of DSSU theory[14]. This narrowly-defined component is responsible for the outstanding success of the cosmology known as the Dynamic Steady State Universe —success in terms of its predictions of large-scale structural patterns that have long mystified astronomers and its resolutions of a number of long-standing problems in astrophysics as well as certain ontological issues. (See Press Releases [15, 16, 17, 18, 19, 20, 21])

The DSSU aether plays the key role in generating the various known gravity effects, as detailed in the open-access article *The Nature of Gravity –How one factor unifies gravity's convergent, divergent, vortex, and wave effects*[22].

A most extraordinary ability. Aether has the extraordinary capability, under appropriate conditions, to simply vanish, or self-dissipate. Although it may strike one as something incredible, this feature is supported by a number of arguments.

● Theoretical argument: This has to do with the ontological nature of aether. Understand that if aether were physical in the sense of consisting of mass or energy particles, then the notion of vanishment would undeniably be impossible. Conservation laws would preclude it. But aether is not something physical. Although it is mechanical, that, in itself, does not make it material. We are dealing with a fluid that is not a substance; the fluid's discrete entities possess no mass and no energy. They have a borderline existential function, in the sense of delineating the realm of existence from nonexistence. This allows our universal medium to circumvent the normal laws of physics. With the imposition of some threshold degree of stress (mechanical in nature) aether units/entities can be pushed into a state of nonexistence. They can literally be extinguished.

● Empirical argument: The key aspect here is the acceleration in the flow of aether. Mass acts as the sink drawing into itself a flow that sustains its very existence; this applies to mass particles and mass bodies, even energy particles such as photons and neutrinos.

The observational evidence is unambiguous. Aether surrounding a mass body accelerates towards the body in proportion to $1/r^2$. Since the defined aether (as presented in **Figure 13**) maintains a constant spatial density and is not compressible like an ordinary gas, compliance to this empirical proportionality factor is only possible if some of the aether undergoes self-dissipation. There is no plausible alternative.

If the self-dissipation did not occur as was shown earlier, the acceleration would have to be proportional to $1/r^5$, which represents an extremely weak and unrealistic form of gravity. Something not observed.

● Pragmatic argument: If not self-dissipation, then the only other way to account for the demonstrable volume loss (**Figure 4** and **Figure 5**) would be some sort of change in the medium's density. Such an approach has consistently run into problems of one kind or another and has, historically, failed; whereas the outright loss approach fits perfectly into the broader body of knowledge of DSSU theory.

● Ontological argument: A space medium having the ability to be 'compressed' out of existence solves some basic metaphysical problems, including the nature of existence itself and the deep ontological meaning of energy[23].

11. Conclusion

The present study has revealed that mass (particles, objects, etc.) accelerates in the direction of greatest aether loss (in accordance with the Principle, Section 6.2) regardless of the cause of the loss —whether by direct absorption/consumption or by self-dissipation. For the interior of large bodies, the loss is attributed to the direct action of matter *and* to the stress-induced strain associated with converging flow. It is the combined loss that is important. In order to achieve this vital aether-loss gradient, it was necessary to have a corresponding density gradient in the gravitating mass body. Mass density must increase with depth.

Aether gravity versus general relativity. Einstein's general relativity has three serious problems. ONE. It is incomplete; it has no explanation for gravity's root cause. TWO. It is unable to explain *internal* gravity, why objects fall downward, say inside a deep mineshaft, instead of upward toward the surface *where spacetime curvature is greatest*. THREE. It is embarrassingly unable to explain the fact that light

undergoes redshifting on passing through (i.e., crossing) a gravity well. As most astrophysicists are aware, general relativity fails to recognize that light becomes redshifted during descending and during ascending a gravity field [24]. A practical instance of this is the *Pioneer 10 & 11 anomaly*; another is the *Taurus A experiment* [25].

Aether theory, with its gravity Principle involving acceleration and self-dissipation, solves the causal question. It also resolves the internal-region gravity paradox. As for the third of the mentioned problems, the DSSU aether model provides an unambiguous solution, which also made possible the proper interpretation of the cosmic redshift (and thereby completely discrediting the expansion interpretation and in effect disproving universe-wide expansion) [26].

Einstein's theory of gravity, aside from missing a causal explanation, has two fatal flaws. There is the contradiction between prediction and actuality when his theory is applied within the interior of a mass body. Another such contradiction applies to radiation traversing a gravity field.

The DSSU aether theory of gravity, on the other hand, elucidate the causal mechanism, solves the 'internal' gravity problem (Section 8), and correctly predicts the redshift associated with radiation transiting a gravity well (the redshift occurring on inbound *and* outbound propagation) [26]. Moreover, the theory requires no lines of force, no gravity waves, and no gravitons. All is accomplished by employing a dynamic fluid unlike any other previously proposed, historically or contemporaneously.

In its ability to correspond to reality, the theory remains singularly unequaled.

Appendix

Flow equations for non-compressible, non-alterable fluid

Picture a gravitating mass surrounded by a concentric sphere —an imaginary outer surface having some radius *r*, as shown in **Figure A1**. In order for the aether to reach the mass body, it must pass through this 'surface.' Let the radially inward flow-speed, at the instant of entry, be υ. Where the flow enters the body's surface at radius *R*, the velocity is designated as υ_s. The idea is to compare the flow passing through the concentric 'surface' at arbitrary radius *r*, and the flow passing into the body's physical surface. To formulate this, all that is needed is an apt version of the standard fluid-flow continuity equation:

$$\left[\begin{array}{c}\text{area of concentric}\\ \text{external sphere}\end{array}\right]\times\left[\begin{array}{c}\text{flow velocity at}\\ \text{external sphere}\end{array}\right]\times\left[\begin{array}{c}\text{fluid density at}\\ \text{external sphere}\end{array}\right]$$
$$=\left[\begin{array}{c}\text{area of body's}\\ \text{surface}\end{array}\right]\times\left[\begin{array}{c}\text{flow velocity}\\ \text{at surface}\end{array}\right]\times\left[\begin{array}{c}\text{fluid density}\\ \text{at surface}\end{array}\right] \qquad \text{(A1)}$$

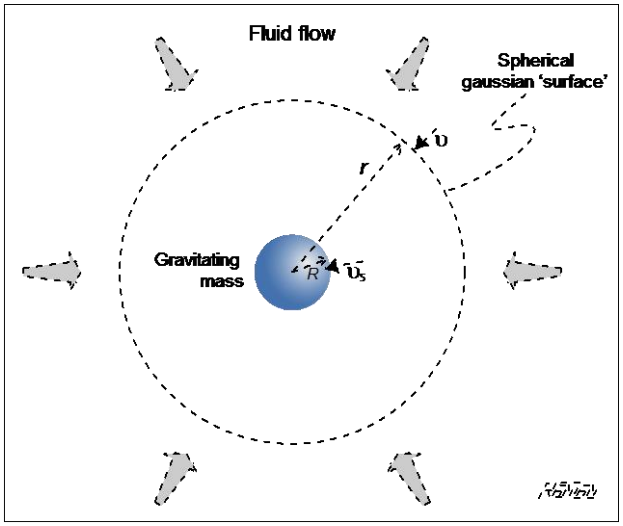

Figure A1. Diagram for formulating the convergent flow of *non-compressible* aether. The central mass acts as a sink, an absorber/consumer of aether.

The two density terms immediately cancel, since this is an *idealized non-compressible* fluid. Then, substituting the parameters from the diagram gives

$$\left(4\pi r^2\right)\upsilon = \left(4\pi R^2\right)\upsilon_S ; \qquad \text{(A2)}$$

The velocity of the flow, as a function of radial position, then is,

$$\upsilon(r) = \upsilon_S R^2 \frac{1}{r^2} ; \qquad \text{where } r \geq R. \qquad \text{(A3)}$$

This says that the aether flow is proportional to the inverse square of the radial position.

Now, in order to make the connection to gravity, all we need is the acceleration of this flow. By taking the *time* derivative of the above expression, the acceleration, and hence the *suppositional gravity* intensity, is found to be

$$a_{sup}(r) = -2\left(\upsilon_S R^2\right)^2 \frac{1}{r^5}, \qquad \text{(A4)}$$

where $r \geq R$, and a_{sup} is the suppositional acceleration.

This is the gravitational acceleration an object would 'experience,' if the aether were as described —non-compressible and unalterable. With a proportionality that *varies inversely with the fifth power*, this would make for an astonishingly weak form of gravity! Hence, such an aether is untenable.

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