Aether, the Mother of All Forces in Nature (I of IV)

—Gravitation—

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Abstract With a down to Earth experiment that everybody can do and verify, this article hopes to introduce a way that can help in principle to solve the mystery how gravitational force is caused. Simply, this experiment shows that two objects submerged in water must intend to move toward each other. This inevitably displays one principle: The fluid pressure between two objects in the fluid is lower than the intrinsic pressure of the fluid at anywhere else outside the volume that circumscribes the two objects.

The act of moving toward each other shown by the two objects can be so easily viewed as a result of "attraction". If the attraction between these two objects in water is so inevitable, we must find no reason to exclude the existence of a special kind of fluid that can also play the same "attractive" role in the space between the Sun and the Earth, indeed, also between the Sun and the other planets, and between all heavenly objects as well. Let's simply call this fluid **Aether**. With the Aether fluid providing such action, the very nature how Newton's gravitational law can be mathematically formulated is revealed. Until then, we dare say that Newton's gravitational equation continues to stay as an empirical equation.

As the article goes on, with the help of the concept of nuclear binding energy, it will soon come to a conclusion that Aether as a fluid has an intrinsic pressure in the order of $\times 10^{12}$ kg/cm^2, an insanely huge pressure. Of course, in so concluding, something must allow us to find that gravitational force and nuclear force share the same nature in each of their own establishment. Indeed, it is the case. Each particle comprising the Aether fluid has extremely small size, far smaller than any electron. Containing the smallest particles in the universe, Aether fills in every space that human can find.

No sealed container that we can imagine would be able to hold a fluid body of such insanely high pressure. This would only further lead us to conclude that for the universe to hold it in bay, **the universe itself must be infinite in dimension.**

The Experiment

The focal points in Fig 01 are the two rectangular Styrofoam boards and the two Styrofoam balls suspending in water. They all are submerged below the water surface so that their suspension is free from the interference of surface tension of the water. (The floating force of the Styrofoam objects is incredibly big. The weight of a sledge hammer is needed to overcome the floating force of the Styrofoam boards. The two cups of marbles also serve as weights which are adjusted, allowing the balls to float with minimum upward force.)

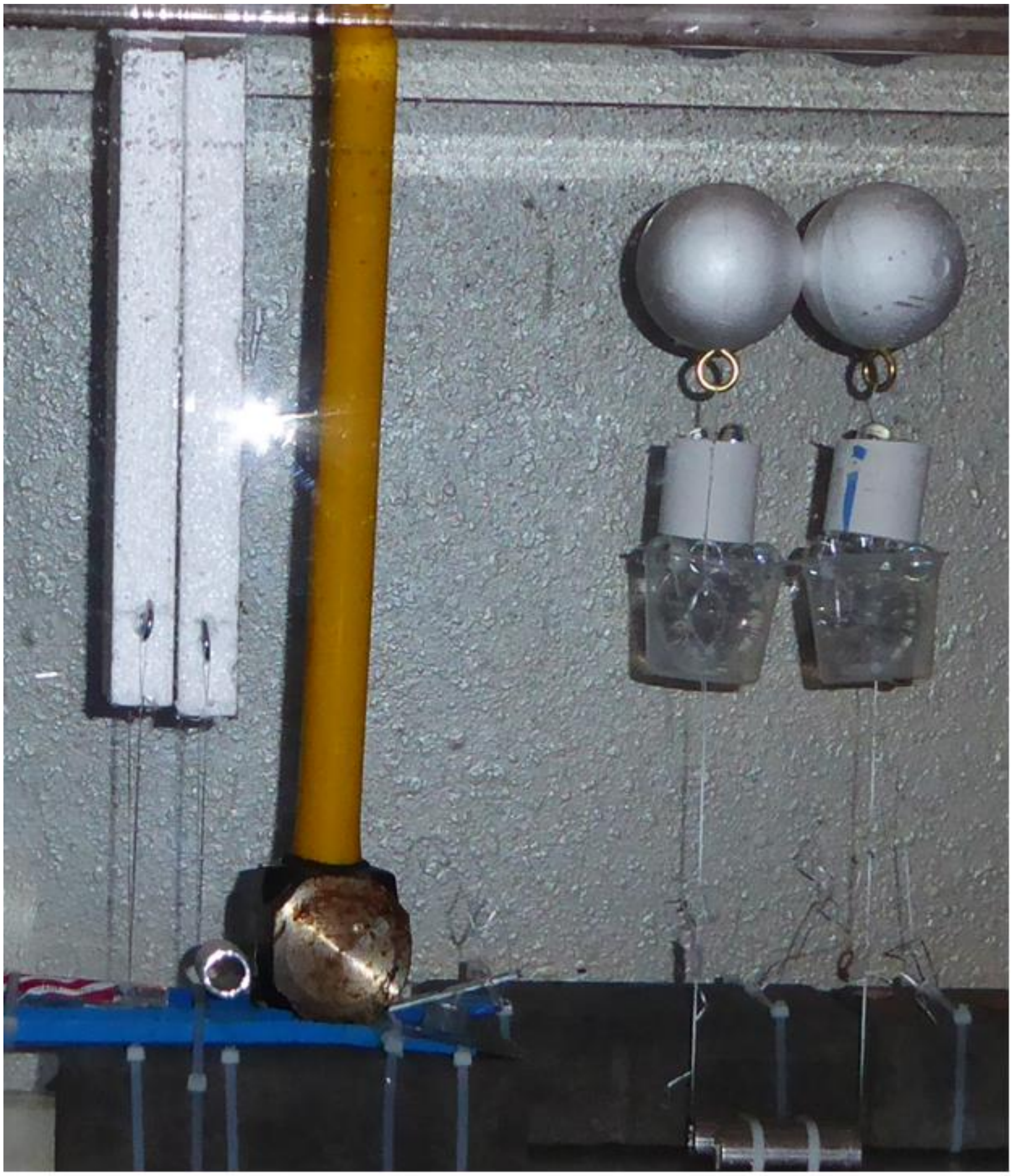

Fig 1 An Experiment That May Help to the Understanding about the Nature of Gravitation

Fig 2 A Closer View of the Two Boards

In Fig 1, we see two rectangular Styrofoam boards very close to each other floating almost vertically. At the top, they touch each other while at the bottom they keep a degree of separation from each other. There is no other object that would keep them touching or separated from each other. The manner in which they float tells us that the liquid pressure between them is smaller than the pressure that is on the outer side of each board. Such a pressure difference must push the two boards to move toward each other. Let's call the pushing force so resulted as F_1. Besides F_1, the two boards are also pushed upward by another force called F_2, which is the water's floating force. We all know that F_2 is proportional to depth, and therefore, at the top portion of the boards, F_2 tends to be zero. Soon in some upcoming text we will realize that F_1 is a force proportional to area. So, for the same size of area but at the bottom of the boards, F_2 can increase by many folds but F_1 cannot. So, as we go lower and lower to the bottom of the boards, we will find that the ever increasing F_2 will make the horizontal force F_1 become less and less pronounced in affecting the boards' suspension inclination. The end result of the force change is that the bottom portion of the boards gets more separated than the top portion. Fig 2 is a close-up of the two boards' distance shown in Fig 1.

Fig 3 shows the dimensions of a Styrofoam ball, and the wrench socket used as the weight at the bottom of the water tank. The dimensions shown in Fig 3 mean that the sum of the radius of two halves of such a ball is smaller than the length of the wrench socket by 1/8". Therefore, if the two balls in Fig 1 can float upward with an absolute vertical direction, the two balls would have a distance of separation of 1/8" between them. However, Fig 1 shows the two balls touching each other, separating themselves with a zero distance. Fig 4 shows a better view of the two floating balls touching each other. If the two Styrofoam balls are pushed apart, they would slowly drift toward each other and finally touch each other again. The reason we need the weight of the marbles is to reduce the floating influence from the water so that the feeble force pushing the two balls toward each other can play a more dominant role in the resultant force. The two floating balls eventually drifting toward each other is another piece of evidence that the fluid pressure between two objects is smaller. In other words, if there is an intrinsic pressure, called P_o, for a fluid body that contains no foreign object, the pressure P_1 found between two objects submerged in such fluid must always follow the relationship $P_1 < P_o$.

The major merit of this experiment is that everyone can do and verify it at dirt cheap cost.

Fig 4 A Closer-up View of the Two Floating Balls (The Strings between the Socket and the Cups in This Picture Are Shortened via Computer Effect for a Better View)

How Aether Formulates the Equation of Newton's Gravitational Law

Let's suppose that, enabled by a certain mechanism, a bubble is to take shape somewhere in a fluid body in a slow and smooth process. Its size is increased from zero to a sphere of radius ***r***. The process is so slow and smooth that energy forming the bubble is only enough for the masses to be pushed out to overcome the resistance from the fluid but they then stay at the immediate neighborhood that covers the surface of the bubble. No extra energy is left to enable any particle to fly away with nonzero momentum. The masses so relocated inevitably displace another batch of masses in the same amount to reside at space a little farther away from the bubble. In other words, in such a space, newcomers invade, and the same amount of "old residents" is made to leave. The same pattern of invading and pushing out continues very gently batch after batch from near to far away, all starting from this bubble.

When a static equilibrium is reached between the outward pushing force and the isotropic resistance from the rest of the fluid, it is only reasonable that any spherical volume of radius R *(>r)* and concentric with the bubble should hold an amount of mass M_R that is contained by this same spherical volume before the bubble appears. For the mass originally contained by the sphere of R, we have

$$M_R = \frac{4}{3}\pi R^3 \rho_0 \qquad (Eq-1)$$

where ρ_0 is the mass density of the sphere before the bubble shows up.

The arrival of the bubble creates a spherical shell of thickness of R-r. The volume V of this spherical shell now holding M_R inside can be calculated as

$$V = \frac{4}{3}\pi(R^3 - r^3) \qquad (Eq-2)$$

The new average mass density σ but inside V should be

$$\sigma = \frac{\frac{4}{3}\pi R^3 \rho_0}{\frac{4}{3}\pi(R^3 - r^3)} = \frac{R^3}{R^3 - r^3}\rho_0 \qquad (Eq-3)$$

Let's assume, as a scenario, that the fluid consists of particles in marble shape that has a radius of *0.001****r***. Immediately bordered with the surface of the bubble, a layer of fluid in the shape of a spherical shell with a thickness of *0.002****r*** would have a mass density of 167 ρ_o. This is a figure disallowed to be achieved by geometrical reality. The impossibility can be visualized by the following reasoning.

Suppose we have a container holding a certain fluid. The dimension of the container is in the order of an astronomical figure. Inside this container, the particles of the fluid have the following pattern of arrangement before the bubble appears: Each particle has exactly a total of 6 point contacts with all its immediate neighbors. This means that all these marbles are having its center occupied by one of the vertexes of a cube in space. In this pattern of arrangement, 52.31% of the cube's space is occupied by mass, while 47.655% of it is empty space or in absolute vacuum. With this kind of particle arrangement, the density of this fluid has no chance to elevate to 167 times of its original density. Conversely, if the fluid has a chance to elevate its density to 167 times of its original figure, each of the particles must have a very large distance from each other. With such distance, pressure cannot be transferred by relying on static body contact between particles but some kind of Brownian motion. In the space of inter galactic dimension where both the temperature and tangible materials in our daily experience are near absolute zero; Brownian movement has zero hope to exist.

Let's suppose another pattern of arrangement in which every marble shape particle has one point of contact with each of 12 neighbors. If the marbles are incompressible, this is the maximum mass that can be packed in space and allowed by geometry, regardless of how high the pressure can be. In this kind of packing arrangement, 88.7% of the space is occupied by the substance of marbles, and 11.3% must be left absolutely empty—a genuine vacuum. With such arrangement, no marble can move with respect to each other, but would have 100% efficiency in pressure transferring relying on static body contact between the marble particles. We are to call the geometrical formation so produced as a 12 point contact aggregate (TPCA), which is actually composed of many tetrahedrons. At each vertex point of the tetrahedron is found the center of the marble.

Comparing between the two arrangements of space packing, if the mass density for the 6-point contact pattern is ρ_1, and for the 12 point-contact pattern is ρ_2, mass density shifting from ρ_1 to ρ_2 can only be up by 0.7 times, reaching $\rho_2 = 1.7\rho_1$. The aforementioned figure of 167 times of increasing in density is impossible to reach from ρ_1 to ρ_2, no matter how pressure would increase.

However, with the particle arrangements of 6-point contact, such a fluid body can hardly transfer pressure from one spot to another, because force from a neighbor can easily make a particle slip off its "duty" location; too much extra space is available for this particle's asylum. So it is more practical to conceive that the fluid able to transfer pressure is a material body in which each particle has far higher compactness than 6-point contacts with its neighbors. Starting with a higher number of contacts between neighboring particles, when further compressed, this fluid needs only to up shift its density by a much lower percentage in reaching the 12-point contact state. So, for our purpose, we choose a figure of 1.1 times in all the upcoming elaborations. We must hereby emphasize that the figure 1.1 times is not a figure that has been confirmed by anything, rather it is just a number proposed to illustrate the following point: A foreign object in a homogeneous fluid of uniform pressure will create imbalance of pressure between locations. We would further emphasize that pressure and force are not used as two interchangeable terms in this article.

That the low percentage in mass density upshifting for a fluid to transfer pressure statically would suggest that this fluid is already in a high pressure state before any further pressure is applied to it. The further pressure may just bring the state of a higher pressure toward the possible state of 12-point contact. Suppose the fluid has an intrinsic pressure P_o as its normal state. Subordinated to this pressure, its normal mass density is ρ_o. If an expanded bubble can push the fluid mass over its surface to a state of 12-point contact, the thickness of the layer of 12-point contact can be obtained as

$$\frac{4}{3}\pi r^3\rho_0 = \frac{4}{3}\pi(R^3 - r^3)\rho_1 \qquad (Eq-4)$$

where r is the radius of the bubble, R is the radius of the volume containing the 12 point packing layer as well as the bubble, and ρ_1 is the mass density of the 12-point contact layer. Given $\rho_1 = 1.1\rho_0$, $(Eq-4)$ leads to $R \cong 1.241r$, or the thickness of the layer is $\Delta R \cong 0.241r$.

In a 12 point contact aggregate (TPCA) formed by the marbles, the very central marble piece always keeps skin contact with 12 neighbor marbles. If squeezing pressure is evenly applied over the entire TPCA formation, this very central marble can be withdrawn but the entire TPCA still stays in shape. Without this central one, the mass of the formation is reduced by 1/13. Nevertheless, the 12-point contact is the most compact particle arrangement regardless of how the external squeezing pressure is to increase. Because of the solidness of the TPCA, a layer of material consisting of numerous 12 point contact aggregates would wrap whatever inside them like an indestructible armor. We would also call the effect such a layer provides armor effect. It is only natural for us to imagine that the armor effect would gradually relax at distance farther and farther away from the bubble.

If the mass density of the fluid is changing with respect to the distance from the bubble, what about its pressure?

Suppose we have two spherical surfaces of R_1 and R_2 in radius and both are concentric with the bubble of radius $\boldsymbol{r}$ so that $\boldsymbol{r} < R_1 < R_2$. If there exists any reason for the sphere of R_2 to exert a contract force, called F_2, toward its center, and therefore directing to sphere R_1, F_2 must encounter a resisting force, called F_1, from sphere R_1. Common sense would leads us to have $F_1 = F_2$ and subsequently $4\pi R_1^2 \cdot P_1 = 4\pi R_2^2 \cdot P_2$, where P_1 is the force per unit area exerted on the surface of the sphere of R_1, and P_2 is the force per unit area exerted on the surface of the sphere of R_2. Immediately, we have

$$\frac{P_2}{P_1} = \frac{R_1^2}{R_2^2} \qquad (Eq-5)$$

Eq-5 tells us that the pressure of the fluid should decrease at distance farther away from the bubble. However, the decrease must reach a limit, which is the intrinsic pressure of the fluid. This intrinsic pressure will be explained later when atomic structure is discussed. However, the aforementioned $F_1 = F_2$, which leads to Eq-5, sets a critically important principle for our further pursuance on the nature of gravitation:

The total contracting force caused by a fluid of certain intrinsic pressure and exerted over a spherical surface is a constant regardless of its radius if this sphere enwraps a concentric bubble inside.

Now, let a bubble of radius $\boldsymbol{r}$ expand from a smaller radius R_1 to a larger radius R_2. The amount of energy ΔE required for the bubble to expand against a constant force F should be

$$\begin{aligned}\Delta E &= \int_{R_1}^{R_2} F dr \\ &= F(R_2 - R_1) \qquad (Eq-6)\end{aligned}$$

Conversely, hinted by Eq-6, if the bubble contracts from R_2 *to* R_1, an amount of energy $-\Delta E$ will be released.

In Fig 5, we found two bubbles of radius r staying at a distance of $8r$ between their centers. With such a distance, these two bubbles create a bubble of radius $5r$ in the sense of geometrical but an incomplete one in the sense of physical presentation, because this physical entity has a certain amount of fluid mass inside it. We call this incomplete bubble KMNLH. If bubble KMNLH ever has a rigid boundary, this rigid boundary must resist any squeezing pressure from the outside part of the fluid and then the mass density at K would show the pattern of 12-point contact. However, the rigid boundary is not there.

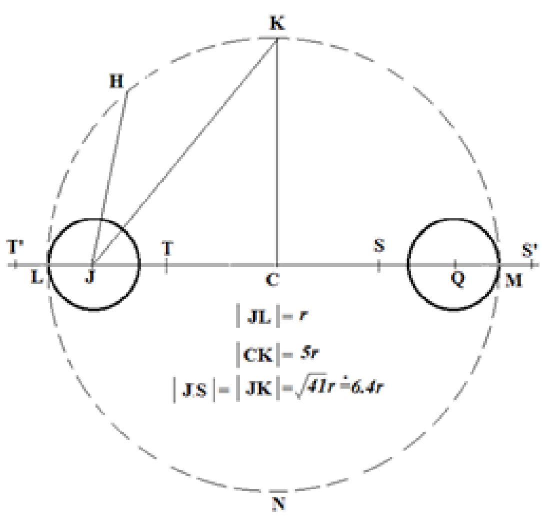

Fig 5 In the Neighborhood of Two Bubbles

With respect to either bubble J or Q , point K is a distance of $6.4r$ from their center, the mass density there must be lower than that is found near S' and T', where 12-point contact is highly more likely. Therefore, across the surface KMNLH, a situation of unequal distribution of mass density is created, with the mass density at M and L being the highest. Under the persistently acting pressure, mass at L will have a tendency to migrate toward H, while the mass originally at H would tend to migrate toward K. The same thing happens at M. Besides, similar to K, point N also provides an identical pit of lower pressure. It is easy to reason that pressure at T is lower than that at T' and at S lower than at S'. The continuous mass filling and replacing must cause the two bubbles to move closer and closer.

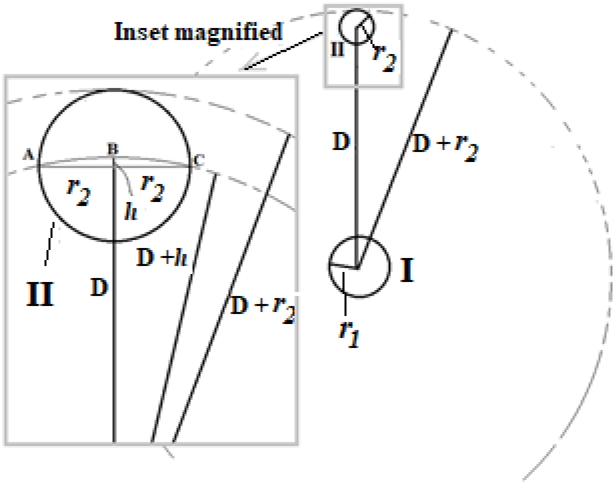

Fig 6 Area Comparison between a Large Circle and a Crown That Is Cut off from Another Sphere

In Fig 6, bubble I and bubble II are separated by a distance D from center to center. The large circle AC of bubble II (see the inset) has a diameter of $2r_2$. Naturally, the area Q of this large circle is $Q = \pi r_2^2$. The area T of the crown ABC from a sphere of radius D+h but encircled by the circumference of the large circle AC can be calculated in the following:

$$
\begin{aligned}
T &= 2\pi(D+h)h \\
&= \pi(2Dh + 2h^2) \\
&= \pi(D^2 + 2Dh + h^2 - D^2 + h^2) \\
&= \pi[(D+h)^2 - D^2 + h^2] \\
&= \pi[r_2^2 + h^2] \\
&= Q + \pi h^2 \qquad (Eq-7)
\end{aligned}
$$

If the ratio $D/_{r_2}$ is reasonably large, such as 50, Q and T can be regarded as equal. As a matter of fact, for example, with $D/_{r_2}$ =50, we will have $\pi h^2 = 0.0003142 r_2^2$ while $Q = 3.1416 r_2^2$ or T=$3.1419 r_2^2$.

If bubble II had not existed, let's have the pressure at the surface of bubble I to be P_{r_1} . At the surface of the sphere of radius of D+r_2, Eq-5 will lead us to have the pressure $P_{(D+r_2)}$ there to be

$$P_{(D+r_2)} = \frac{r_1^2 P_{r_1}}{(D+r_2)^2} \qquad (Eq-8)$$

We can also get the pressure $P_{(D+h)}$ at the surface of the sphere of radius of D+h as

$$P_{(D+h)} = \frac{r_1^2 P_{r_1}}{(D+h)^2} \qquad (Eq-9)$$

Now, bubble II comes in to the picture and cuts a hole on spherical surface of radius of D+h , and such a hole is the crown shown as ABC in the picture. The total force $F_{(D+h)}$ with which this sphere can resist the squeezing force from the sphere of $D + r_2$ must be weakened due to the surface loss represented by the crown. When the ratio *D/r* is reasonably large, the surface area of crown ABC and the area of the large circle AC of bubble II are practically the same. So we have

$$F_{(D+h)} = 4\pi(D+h)^2 P_{(D+h)} - \pi r_2^2 P_{(D+h)}$$
$$= 4\pi r_1^2 P_{r_1} - \pi r_2^2 \frac{r_1^2 P_{r_1}}{(D+h)^2} \qquad (Eq-10)$$

Any sphere with a radius between D-r_2 and D+r_2 concentric to bubble I will create a small circle cut across bubble II and thus leave a hole on the corresponding sphere. Only the sphere of radius D will create a large circle. However, mathematically, the area loss due to the large circle can be accurately used as the mean value to represent the average area loss caused by all these small circles. Using the large circle as the mean value for the loss of areas, h in Eq-10 will no longer come to the picture and leaves Eq-10 read as

$$F_{(D+h)} = 4\pi(D+h)^2 P_{(D+h)} - \pi r_2^2 P_{(D+h)}$$
$$= 4\pi r_1^2 P_{r_1} - \pi r_2^2 \frac{r_1^2 P_{r_1}}{D^2} \qquad (Eq-11)$$

Since the squeezing force $F_{(D+r_2)}$ from the sphere of radius D+r_2 is also $4\pi r_1^2 P_{r_1}$, Eq-11 thus enables us to have

$$F_{(D+r_2)} - F_{(D+h)} = \pi r_2^2 \frac{r_1^2 P_{r_1}}{D^2} \qquad (Eq-12)$$

In Eq-12, $r_1^2 P_{r_1}$ is always a constant if r_1 remaining constant. If r_2 is also constant, the only variable we have in Eq-12 is D, which is the distance between the two bubbles. Obviously, $F_{(D+r_2)} - F_{(D+h)}$ is a net force resulted by squeezing or pushing action other than attraction. Let's replace $F_{(D+r_2)} - F_{(D+h)}$ with *F*. Then we have

$$F = \pi r_2^2 \frac{r_1^2 P_{r_1}}{D^2} \qquad (Eq-13)$$

All the above analysis enables us to conclude that it is the size of a bubble, but not its material nature, that determines the magnitude of *F*. Suppose the aforementioned bubbles are replaced with some homogeneous material of mass density *d* and in volume equal to bubble I and II respectively. Then mass M_1 of bubble I is $M_1 = ({}^4\!/_3)\pi r_1^3 \cdot d$, and M_2 of bubble II is $M_2 = ({}^4\!/_3)\pi r_2^3 \cdot d$. Then, Eq-13 can be rewritten as

$$F = \frac{\left({}^{4}\!/_{3}\right)\pi r_2^3 \cdot d}{\left({}^{4}\!/_{3}\right) r_2 \cdot d} \cdot \frac{\left({}^{4}\!/_{3}\right)\pi r_1^3 \cdot d}{\left({}^{4}\!/_{3}\right)\pi r_1 \cdot d} \cdot \frac{P_{r_1}}{D^2}$$
$$= \frac{0.5625}{\pi r_1 r_2 d^2} \cdot P_{r_1} \cdot \frac{M_1 M_2}{D^2} \qquad (Eq-14)$$

Eq-14 matches well in form with Newton's gravitational force equation. If so the coefficient term $\frac{0.5625}{\pi r^2 d^2} \cdot P_{r_1}$ should be taking the role of the gravitational coefficient. This equation now gives us confidence to believe that a pushing force other than an attracting force is more to the point in explaining the true nature of the gravitational law. Conversely, if attraction is excluded, the gravitational force being a result of pushing force is a powerful evidence to support the existence of an omnipresent fluid called Aether in the space, which is one of the physical elements of our universe.

If D is extremely large compared to r, such as the distance between the Sun and the Earth, we can easily accept that 2 or 3 more bubbles of the same quality staying in the same neighborhood of the lonely bubble I in Fig 6 will double or triple the strength of F to $2F$ or $3F$. By the same reasoning, a collection of w times of bubble I will increase F to wF. Likewise, a collection of u times of bubble II in the same neighborhood near II, together with the w times of bubble I in a huge distance away, will lead us to have a total force as shown below:

$$\sum F_{wu} = \frac{0.5625}{\pi r^2 d^2} \cdot P_{r_1} \cdot \frac{(wM_1)(uM_2)}{D^2} = wuF \qquad (Eq-15)$$

In the macroscopic world, any individual object that can be seen by our naked eye can actually be a huge collection of bubbles that we mention in our above analysis. As far as we know, no proton has been able to be divided by any method. Therefore, we can regard each one of them as one of the numerous bubbles that comprise any heavenly body. In most of the case, neutrons act like protons if electrical charge is not a concern. So, any neutron is also one of the countless bubbles. Of course, in a huge material collection like the Sun, electrons are some basic bubbles in its formation, too. This is to say that the sizes and mass density of the nucleons and electrons are playing a role in determining the gravitational constant. Fig 7 suggests that the gravitational force between two heavenly bodies is actually the sum of gravitational force of two

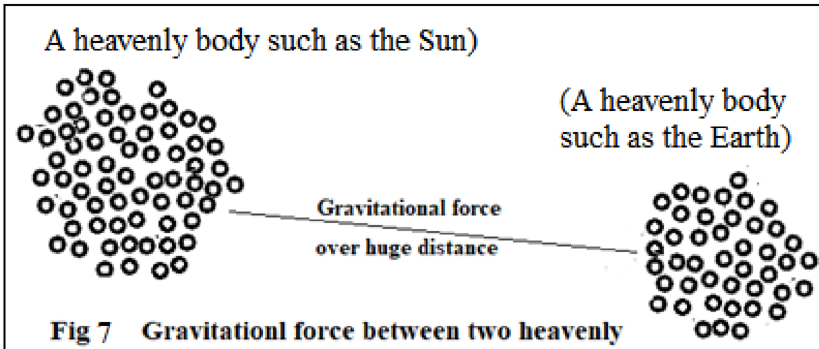

Fig 7 Gravitationl force between two heavenly bodies is a collection of tiny forces of the same nature

collections of bubbles over a huge distance. In each of such bubbles the most likely resident may just be a nucleon, or an electron, or positron. We will go into more details about that in some later text.

Now, in Eq-15, the only quantity remains in mystery is P_{r_1}, which should be related to the intrinsic pressure of the fluid body. All previous reasoning has given us confidence that the closer some bubbles come together, the higher the squeezing force these bubbles must experience from each other. Of course, the higher the squeezing force would result in a more stable gathering of the bubbles.

In nuclear physics, it is commonly accepted that the value of binding energy for an α particle is 28.3 MeV (Fig 8) [1]. This means that to disintegrate the particle into 4 separate nucleons, 28.3 MeV of energy is needed. The radius of an alpha particle is 3.6 x 10^{-14} m [2]. On the other hand, however, to create a bubble from zero to a size of 3.6 x 10^{-14} m in radius in a medium that has pressure P_{r_1}, a work equivalent to the binding energy must have been done. According to Eq-6, the energy required for the work so done is $\Delta E = F(R_2 - R_1)$, where F is always a constant. If we take $R_1 = 0$ from which the bubbles starts to take shape, and $R_2 =$ 3.6 x 10^{-14} m, given $\Delta E = 28.3\ MeV$, we have

$$\Delta E = [P_{r_1} 4\pi (3.6 \times 10^{-15} 4m)^2] \cdot \left(3.6 \times 10^{-14}\ m\right) \qquad (Eq-16)$$

Then

$$P_{r_1} = \frac{28.3 \times 10^6\ (1.6 \times 10^{-19})\ Joule}{4\pi \left(3.6 \times 10^{-14}\ m\right)^2 \cdot \left(3.6 \times 10^{-14}\ m\right)}$$
$$= 7.72 \times 10^{27} \frac{N}{m^2} \qquad (Eq-17)$$

When chemical elements in liquid or solid state, the shortest distance between atoms is usually in the order of $\times 10^{-10}$ m. At standard temperature and pressure, the average shortest distance between atoms or molecules is in the order of $\times 10^{-9}$ m. These figures typically tell us that at distance in the order of $\times 10^{-8}$ m and beyond, the intrinsic pressure of the fluid embracing all these atoms or molecules will not have higher value to motivate their close clustering. So, for the pressure p_o of the fluid at a distance of $10^{-8}\ m$ away from the α particle, Eq-5 should lead us to have

$$p_0 4\pi (1 \times 10^{-8} m)^2 = 7.72 \times 10^{27} \frac{N}{m^2} \cdot 4\pi \left(3.6 \times 10^{-14}\ m\right)^2$$
$$p_0 = 1.0 \times 10^{17} \frac{N}{m^2}$$
$$\cong 1.0 \times 10^{12} \frac{kg}{cm^2} \qquad (Eq-18)$$

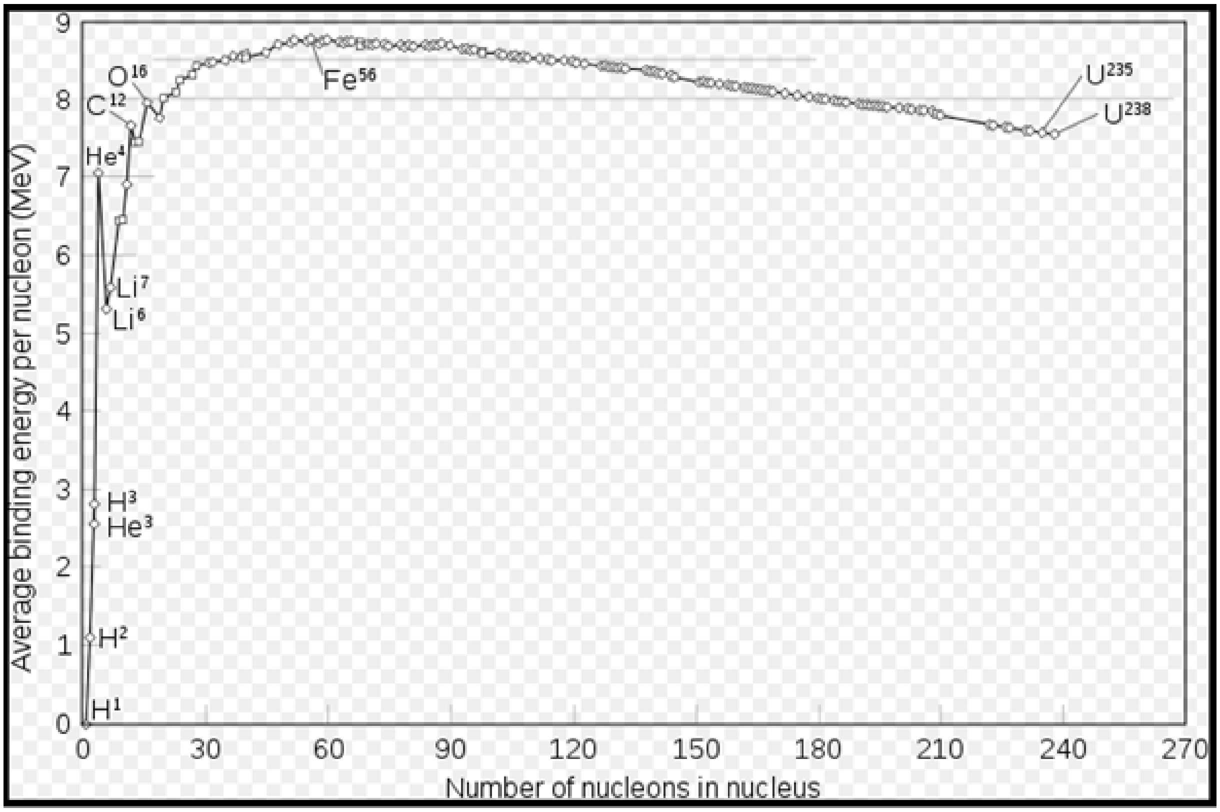

Fig. 8 Nuclear Binding Energy

Soure of credit: https://en.wikipedia.org/wiki/Nuclear_fission

The figure $1.0 \times 10^{12} \frac{kg}{cm^2}$ for pressure shown in Eq-18 is certainly insanely high if judged by our daily experience. But don't we already have experiences that thermonuclear energy is insanely enormous compared to any chemical or mechanical energy that we know of? This article later will come to a point to discuss that it is the insanely high intrinsic pressure of Aether that makes the insanely enormous thermonuclear energy possible. On the other hand, we can also imagine that if the intrinsic pressure takes a lower and lower figure, it would be more and more impossible for small particles to hold each other to produce any compact gathering. For example, going to extreme, what if $p_o=0$? Therefore, we have reason to believe $p_0 = 1.0 \times 10^{12} \frac{kg}{cm^2}$ (before nuclear energy is further investigated) should be a universal intrinsic pressure for the Aether at wherever gravitational phenomenon is found. Of course, then, the omnipresent phenomena of gravitation would necessarily and sufficiently imply that this word "wherever" entitles the entire universe. A fluid with such an insanely high pressure must defy being inside of any container of a solid wall. To continue its existence, logic gives Aether only one possibility: it can find no exit to escape, and no extra space for it to bleed its high pressure. This would happen only if the fluid's container is boundless and thus infinite. **This is a direct acclamation that our universe is infinite!**

A fluid of an insanely high pressure demands the existence of an infinite universe, and gravitational force demands the existence of a fluid of high pressure for it to display.

In comparison, the normal atmospheric pressure is about $1kg/cm^2$. It is this little pressure (compared to P_o) that has held our flesh body in whole, preventing our guts from being turned inside out. On the other hand, it is the huge pressure of Aether that has held all molecules of our body together, forcing one molecule to follow the movement of another molecule at no time. That is why, when a cheetah runs at its full speed, its head and tail never disintegrate into different parts moving at different speeds.

[To be continued: **Aether, the Mother of All Forces in Nature (II of IV) —**Electromagnetism—]

Glossary, Abbreviation, Acronym

(The content in this section is shared by all 4 papers of this series **Aether, the Mother of All Forces in Nature**)

Aether drag It is a fluid resistance presented by Aether against the movement of any particle.

Aether particle A physical combination of one negoff and one posoff, electrically neutral. It is the most fundamental component of the Aether fluid.

Aether sub-particle Either the negoff or posoff . For convenience of illustration, this particle only present these two sub-particles as the major components of the Aether fluid. However, nothing in this article would suggest that these two are the only material components of the Aether fluid. As least, in the section Certainty and Possibility, this article leaves a big room for neutrino to stand out as another major component of the Aether fluid.

Armor layer A layer of Aether fluid enveloping a nucleon or a nucleus. In such a layer, a dominant portion of the Aether particles coexist with neighboring particles by forming unit after unit that looks like a pyramid in spatial structure. If each Aether particle has a shape like a perfectly spherical marble, the pyramid can be regarded as a tetrahedron, with its vertex at the center of each marble. No other spatial structure consisted of round balls can be constructed to produce higher density arrangement than a tetrahedron. If a force is evenly applied to squeeze over the tetrahedron, regardless of what magnitude of the squeezing force is, the tetrahedron will not yield in shape and its density will not increase. If such a layer is to be laid on an absolutely flat surface, any marble can be found to form a tetrahedron with three neighboring marbles, and also have totally 12 point of contacts with all its immediate neighbors. Unyielding in shape, once formed, such a layer is indestructible withstanding any outside crushing effort. Besides calling this layer as an armor layer, this article sometimes also calls it a layer of 12 point contact aggregate (TPCA). The layer can be in any thickness, depending on actual situation.

Condensive force The collective term of gravitational force and nuclear force. Both forces are raised due to the same nature of the Aether's intrinsic pressure.

Horizontal movement (or sliding movement, or gliding movement) The movement of an electron in an atom tangential to the nucleus.

Irreversible thread When a screw rod is aligned end to end with another screw rod and if the screw threads on both rods look different, the screw threads carried by both rods are irreversible threads. Reversing the direction of one of the rods will not make the screw threads between the two rods look the same.

Negoff one of the two components forming an Aether particle. It is particularly sensitive to any negative charge in the way of showing repellence to each other. The word is put together as an abbreviation of neg(ative charge)-off

Posoff one of the two components forming an Aether particle. It is particularly sensitive to any positive charge in the way of showing repellence to each other. The word is put together as an abbreviation of pos(itive charge)-off

Reversible thread When a screw rod is aligned end to end with another screw rod and if the screw threads on both rods look the same, the screw threads carried by both rods are reversible threads. Reversing the direction of one of the rods will not make the screw threads between the two rods look different.

Vertical movement (or penetrating movement) The movement of an electron in an atom toward the nucleus.

Quantized pit In elaborating the Armor layer above, an impeccable and consistent formation of continuous layer formed by some uniform tetrahedrons is said to be laid on an absolutely flat plane. If the plane is not flat but curving, the formation can no longer maintain its uniformity all over, but some spots where the tetrahedron formation is interrupted must show up somewhere. At where such interruption shows up, some empty space larger than what a compact tetrahedron allows would appear. we hereby call the interrupting space the pit. The pits resulted by such an interruption is an inevitable result of geometry: No smaller balls can perfectly cover the surface of a larger ball with absolute evenness. Placing another layer of the smaller balls over the first layer would not change the outcome. The distance between various pits and their inconsistent sizes between each other should follow some mathematical rule that this author is unable to tackle. Adding to this geometrical rule, if the covering is done with the Aether particles covering the nucleons, the pits would be further determined to appear by the influence of Aether's intrinsic pressure, electrical charge magnitude, magnetic moment, atomic number, layer distribution of nucleons in a nucleus... When an electron moves in the vicinity of the nuclei, these pits would prevent it from completing each trip with smooth and continuous acceleration or deceleration. Instead, their trip distance and their traveling momentum must manifest themselves with discrete quantities. For this reason, the pits are further called quantized pits in this particle.

TPCA Twelve point contact aggregate. Refer to "armor layer" for more details.

Bibliography

[1] Nuclear binding energy http://en.wikipedia.org/wiki/Nuclear_binding_energy

[2] Radius of an alpha particle Atoms— the inside story; How Big Is the Nucleus?

http://resources.schoolscience.co.uk/ PPARC/16plus/partich1pg3.html