UPDATING KEPLER'S FIRST AND SECOND LAWS

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ABSTRACT

Although Johans Kepler 1571 – 1630, was one of the most important scientists who began the scientific revolution in the struggle of humanity against the underdevelopment imposed by the Church on all aspects of life, including science, by announcing his three laws of planetary motion, Kepler believed that the sun is the center of the universe such as Copernicus which caused his full inability to recognize the effect of the centripetal force resulting by the gravity of the center of the galaxy which pulls the Sun toward its orbit. and his inability to recognize the cause behind the elliptical shape of the orbits, and then falled in contradiction when drafting the second law, that a straight line between the planet and the Sun sweeps equal areas in equal intervals of time and the planet accelerates as it approaches to the Sun and decelerate as it get far of it, where in this study we proved that the planet in equal intervals of time sweeps unequal areas and that it get faster in apheluin and slower in the perihelion.

KEYWORDS: Orbit, planet, Earth, fall, Vernal, Equinox, Solstices, Area, Arc, Seasons, Elliptical, Circular, Acceleration, Deceleration, Centrifugation

INTRODUCTION

We are about an amazing and unjustifiable delea of almost a century of updating Kepler's first and second laws which should have been done right after Edwin hobble have discovered that the Milky way is not the whole universe in 1923 which opened the door for scientists to discover that the Sun is not the center of the Existence or the Milky way, but no more than a little star that turns around the galactic center (GC) in its proper orbit at about 8 Kpc, where K = 1000, pc= parsec, so 1Kpc = 1000 pc, 1 pc=3light year (ly), so the Sun is about 30000-40000 ly from the galactic center and moves with a speed of 250 km/sec around it, the thing that must have changed all about astronomy, especially these two laws which are based on the legendary beleef, that the Sun is the center of the universe.

Updating Kepler's First Law

The good introduction to the first law in the link from socratica website below:

https://www.youtube.com/watch?v=qDHnWptz5Jo,

Paves the way for talking about the updating of this law. In figure 1, a represents the traditional image of Kepler's first law where the Sun is the invariable fixed center of the Milky way which was representing the whole universe at the age of Kepler, and any planet revolving it in an elliptical orbit.
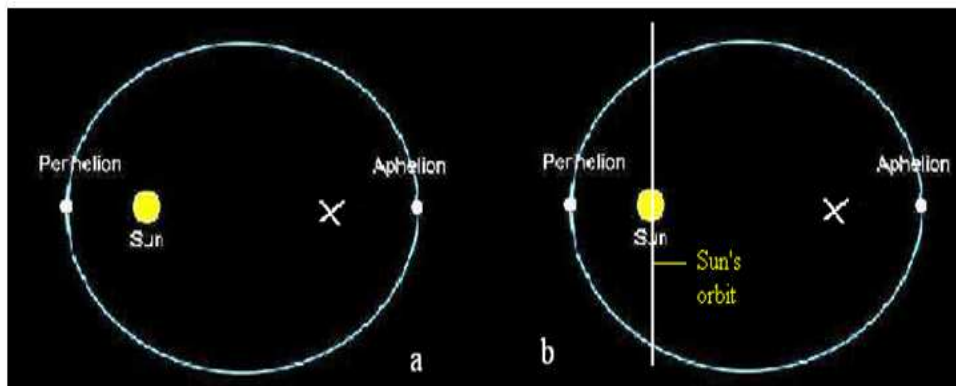
Figure 1a: Known Kepler's First Law   Figure 1b: Kepler's First Law, Updated

In b the law as must be, where the line passing through the center of the Sun represents the orbit of the Sun and the Sun is always located in the focus closest to the galactic center (GC).

Hence the planet (Earth) is turning around a moving Sun, thus the real shape of its orbit is as represented below in figure 2,
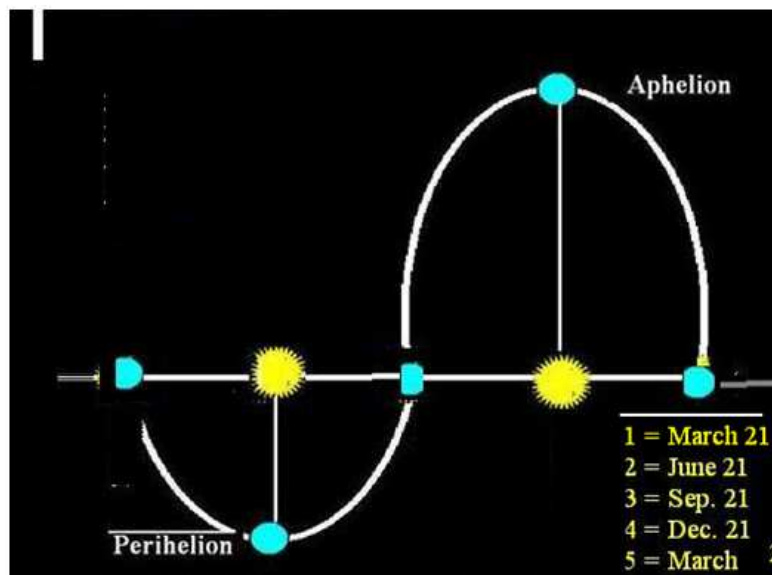

Figure 2: The Real Shape of Elliptical Orbit

As we see, during 1 complete year, the Earth at March 21 vernal equinox is (VE) 147 million Km behind the Sun, in June 21 it is 152 million Km by the right side of the Sun, in the aphelion, at September 21 it is 147 million Km beyond the Sun fall equinox (FE), then at December 21 the Earth is 147 million Km by the left side of the Sun (perihelion) then finally at March 21 VE, the Earth is once again 147 million Km behind the Sun to restart another new year.
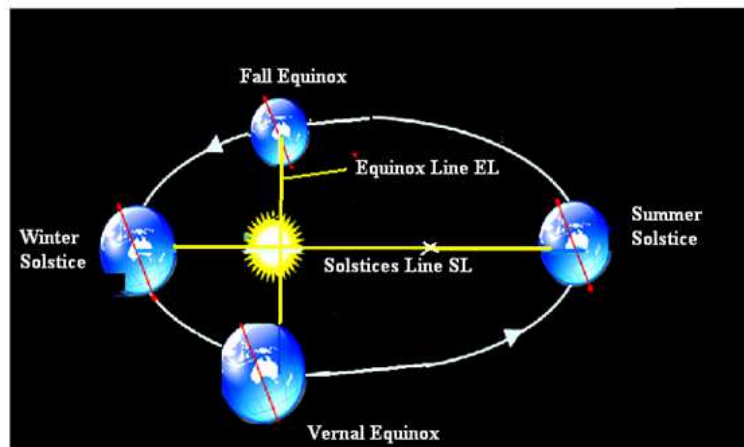
Distribution of Four Seasons on Earth's Orbit

In his first law, Kepler have stated that orbits are all elliptical, and the Sun is located in one focus of the orbit, but because the eccentricity of Earth's orbit is very close to zero (less than 0.02) scientists still dealing with the it as a circular orbit, which explains their acceptance of the wrong traditional image of the four seasons where the Sun appears in orbit's geometrical center figure 3.
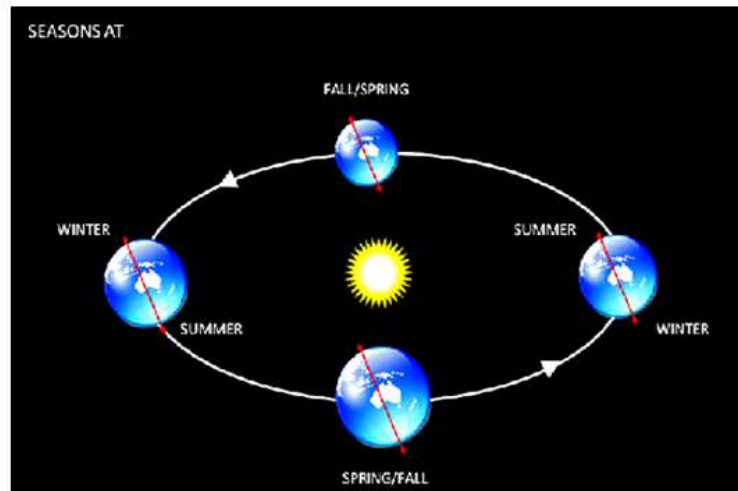
Figure 3: Traditional Image of 4 Seasons where the Sun is in the Center of the Orbit

Notice that the distance between the Sun and the other focus of the orbit is 5 million Km and the diameter of the Sun is around 1.4 million Km as reported in Sun NASA website: ttps://www.nasa.gov/sun, so in any drawing scale the Sun must appear frankly far from the geometrical center of the orbit.

Figure 4: Our Seasons with the Sun in One f Two Ocuses of the Ellips, According to Kepler's First Law

In figure 4 above, the correct distribution of four seasons on the orbit of the Earth, where due to that during both equinoxes Ve and FE is vertical to the equator, the line linking VE and FE or equinoxes line (EL) must pass by the center of the Sun because the Sun during both equinoxes is orthogonal to the equator, and this guides us where to locate the two equinoxes. Notice that the center of the Sun is located in the mid distance of the line linking the two equinoxes, EL, and notice also how this line in king the two solstices or Solstices Line or (SL), passes by the center of the Sun in a way that both, EL and SL intersect at the center of the Sun. Now pay attention to that the SL devise the orbit and the year in two identical longitudinal halves while the EL devise only the year in two equal halves where each half is 6 months, but as you can see it is not devising the orbit into two identical areas as the SL do.

Updating Kepler's Second Law

In his second law of equal areas, Kepler has declared that "a straight line between the planet and the Sun sweeps equal areas in equal intervals of time, so the planet must accelerate when getting closer to the Sun and decelerate when

getting far from it", mean that the speed of the planet is highest in the perihelion and lowest in the aphelion.

In this chapter we will prove how this is not true and even contradictive, through the following examples:

In the Clip, Kepler's Second Law, from Big Bang Physics

The speaker in this clip like all others in all other clips that explain and prove Kepler's second law by focusing his speech on the motion of planet (Earth) around the Sun between the perihelion and the aphelion, where the two Solstices are located, which, as we have mentioned above, devises the orbit and the year into two identical longitudinal halves, but the speaker ignores that to prove a law we should examine what we find in a side if it goes in the other sides, because the SL, used in the clip is not the only that devises the year into two halves, we have another five other devising lines like those linking January and July, February and August, April and October, May and November and finally the equinoxes line EL which links March 21 and September21, but however, the SL used in the clip is the only one of all that devise both year and orbit in two identical longitudinal halves, where as in the clip, the Earth sweeps from Dec. 21 to June 21 which the interval of time equal to six months the same area during the second half of the year from June 21 to Dec. 21. In returnee, if we took the line linking both equinoxes EL, we will see that it devises the year into two halves of six months for each, but this EL devise the orbit into two unequal areas, where the Earth travels from fall equinox FE to vernal equinox VE in six months and from VE to FE also in six months but, the area it sweesp from FE to VE is frankly smaller than that it sweeps from VE to FE, means the Earth sweeps unequal areas in equal intervals of time, contrary to Kepler's second law.

The Diagram in Figure 5, Below,
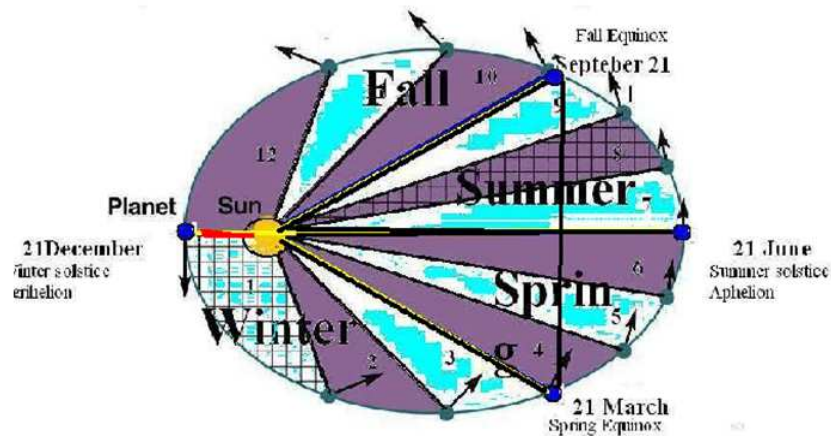
Figure 5: The Sun is Vertical to the Earth in Both Solstices, but it is Acute in Both Eqonoxes, Notice the Equinoxes Line el, How It Is not Passing by the Centre of the Sun and How Much it is Far From it

Demonstrates how Kepler was imagining the division of Earth's orbit into 12 equal areas, equivalent to area swept out during each month.

The error here is that the Sun is not vertical to the equator in both equinoxes, but it is even acute and the straight line between fall and vernal equinoxes don't pass by the center of the Sun but very far of it, which empties the scientific definition f equinoxes of its meaning. In fact it impossible to devise Earth's orbit into twelve equal areas and respecting in the same time the correct position of the equinoxes and the EL passes by the center of the Sun.

In Figure 6,
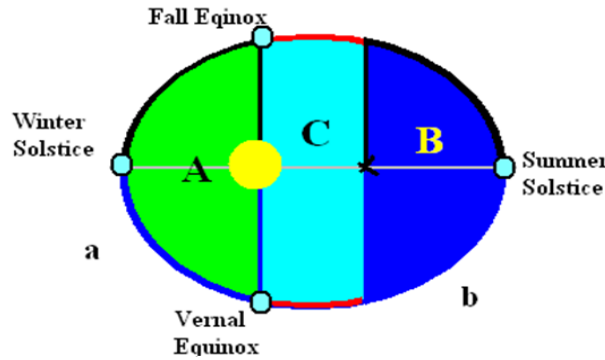
**Figure 6: Moreover the Earth Sweeps Form Fall Equinox to Vernal Equnox the Area
A Smaller Then B+ C, It Travels 10 Million Km in Are b More Then in Are a**

at perihelion the Earth is 147 million km far from the Sun and at aphelion it is 152 million km far from it, and the inter focal distance is 5 million km, the EL passes by the center of the Sun devising the year (12 months) in two equal intervals of time, each = 6 moths, and devise the orbit into two unequal arcs and two unequal areas. We have the short arc a, and a long arc b. another straight line passing by the second focus parallel to EL and isolates the area B, and both lines are parallel, hence the distance between the Sun in the first focus and the perihelion equal the distance between the second focus and the aphelion, thus, area A equal area B. It rest the area C which is a thin rectangle, its length equal twice the distance between the Sun and the perihelion and its width is the inter focal distance = 5 million Km, the width in the top and in the bottom (red colored) of this rectangle are parts of the arc b.

The thing that allows us to say that the distance the Earth cross in arc b, from VE to FE is 10 million km longer than that it cross in arc a, from FE to VE.

How could we believe that the Earth can cross the longer distance in a same time by deceleration; without violating all mathematics? Knowing that the Earth needs more than four days to cross the additional10 million Km, mean the Earth is 4 days faster during its travel from Ve to FE than from FE to VE.

For the planet Mars, when it is at perihelion it is 206,655,215 km from the Sun and at the aphelion it is 249,232,432 km so the inter focal distance is 42.577.217 km, means that arcb is twice the distance (85.154.434 km) longer than arc a, and this confirms the results above.

Kepler and Deception of Sight

Hence he was believing that the Sun is the fixed center of his micro universe made of the Milky way, which mean that the distance between it and the GC and its speed around it equals zero, thus it was impossible for him to conclude the real speed of Earth and other planets, because he was unaware that the whole solar system travels with the Sun with its speed of 250 Km/sec around the GC. If we took the Earth as example we ck now that it like all other planets turns around the Sun in anticlockwise, like the Sun which turns around the GC in anticlockwise also, and this mean that the Earth at aphelion goes with the Sun but at perihelion it goes backward. T Hence the speed of the Sun is 250 Km/sec and the speed of the Earth around it is 30 Km/sec, thus, when the Earth moves with the sun in the aphelion its true speed = 250 + 30 = 280 Km/sec, and in perihelion it = 250 – 30 = 220 Km/sec, but Kepler wasn't aware that the Sun moves with 250 Km/sec, for this reason he fell in the deception of sight while measuring the speed of the Earth relative to fixed Sun, like when we

are running with 100 km/h and another car is bypassing us with 120 Km/h, the riders in both cars will see that the other car is moving with only 20 km/h, but I when the other car goes in the opposite direction of our car, the riders in both cars will see that the other one is running with the total speed of the two cars = 100 + 120 = 220 Km/h, so at the aphelion Kepler was measuring a virtual speed of 30 Km/sec while the real speed is 280 Km/sec, and at the perihelion he was measuring the speed of 280 Km/sec while in reality it is 220Km/sec.

Why Orbits Are All Elliptical

Despite Kepler has discovered that all orbit are elliptical, he was not able to know the reason behind its shape or to explain why they are not circular. I have worked hard to get an answer to this question, but I didn't get a convincing thing. I have asked an elite group of astronomy experts, but, moreover their answers were weak and very different, all of them were turning around one incoherent idea about a natural phenomenon, and that pushed me to conclude that this question has no scientific coherent answer, the thing that let me imagine that scientists in astronomy are dealing with the solar system as if it is not a part of a galactic system, and nothing in the universe has any influence on it. After while I found that Kepler himself, wasn't aware that the Sun and its planets rotates around the GC, and this rotation, will generate a reactive centrifugal force RCF, in addition to the centripetal force CF made by the gravity between the GC and the Sun.

Let us imagine the galaxy as a great cevtrifugator and the solar system is rotating in this huge device. The (CF) between the Sun and the (GC), tends to pull it from the center of the solar system to stay in its orbit around the GC, in return the reaction called reactive centrifugal force RCF tends to push the solar system outward, the thing

That makes the Sun coser to December and farther from June, which transform a circular orbit to and elliptical, and give the chance to the perihelion-aphelion phenomenon to appear.

The major aspect of the centripetal force CF resulting from gravity and the RC F, is that they are opposite to each other, where the gavity or CF is inversely proportional with cubic distance according to Newton's general law of gravity, and the RC F is directly proportional with this distance. As a consequence, the CF of GC has all its impact on the Sun only, without any direct influence on planets, but the RC F has its impact on these planets and can push them away from the GC, knowing that the gravity between each planet and the Sun is elastic so that they can get cliser to the Sun (in perihelion) as they can get far of it (in aphelion). This encourages us to accuse the interaction of the CF and RCF to be behind the elliptical shape of orbits.

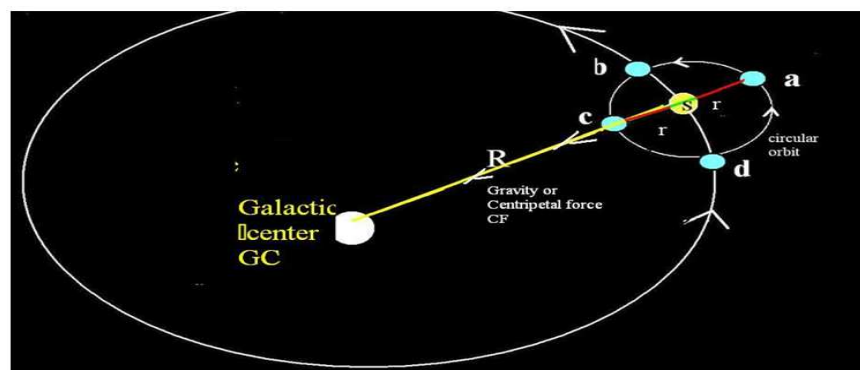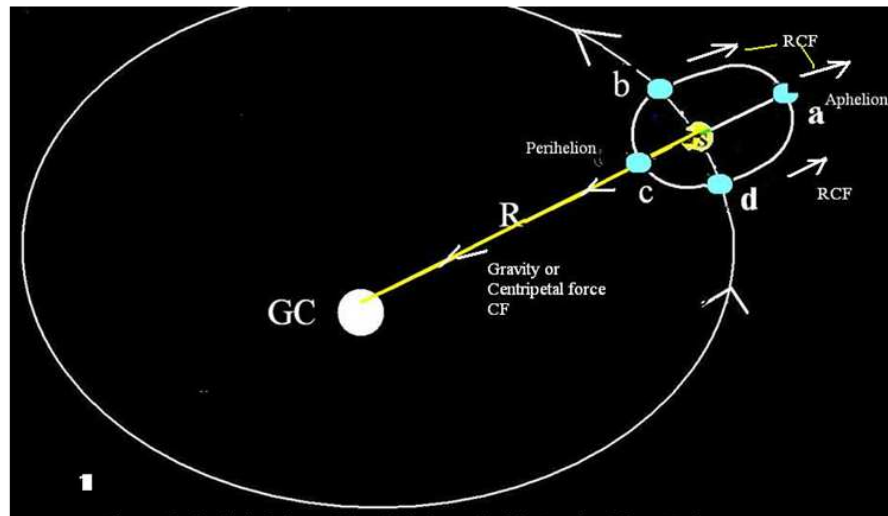In figure 7 a, suppose the Earth revolves around the Sun in a "circular" orbit,

**Figure 7a: The Elliptical Orbit is it Rsuit of the Impact of Gravity
CF and RCF on a Supposed Circular Orbit**

In order to find out how the RC F transform the supposed "circular" orbit into elliptical as in the coming figure 7b,

Figure 7b: The Elliptical Shape of the Orbit is the Result of the Centripetal Force CF that Pull the Sun to its Orbit and the Reactive Centrifugal Force RCF that Pushes the Planits Outward

we will study the impact of the RCF on Earth when it is at the four sites a, b, c, d of its orbit as illustrated in figure 7a, notice that at site a, R = the radius of the orbit of the Sun linking the GC to the Sun, and when the Earth is at a, it turns with the Sun around the GC, so the distance between the GC and the Earth = R + r (radius of Earth's circular orbit), it is the longest distance of all other sites, so the RCF has the strongest impact on Earth at site a, which pushes the Earth outward to have the aphelion.

When the Earth is at site b, it is moving toward the Sun opposing the RCf, so it is forced to slow down, from where its deceleration from a (aphelion) tord c (perihelion). When the Earth is at site c, notice that c is the closest the GC and the distance between the GC and Earth = R, so degenerated RCF which is smaller than at a, its impact is able to push the Earth toward the Sun allowing the perihelion to appear. When the Earth is at site d, it will behave inverse to its behavior at site b, it moves from c (perihelion to a (aphelion), means, in the direction of RCF, which tend to push it with an additional force, rom where its acceleration from c (perihelion) toward a (aphelion). Hence the RCF is the only detected element able to have a real influence on Earth and all planets, we can declare it as the only cause behind the elliptical shape of the orbit.

Newton and Kepler's Second Law

Newton, like Kepler, wasn't aware that the Sun is about 6 to 7 parsecs distant from the galactic center and orbiting it with a velocity of 250 km/sec, he was believing that the distance between the Sun and the galactic center = 0.0 km and its velocity around the galactic center = 0.0 km/s Do you believe he will not inter in his account the calculation of centripetal force CF which tend to pull the Sun toward its orbit and its reactive centrifugal force RCF which tend to push the planets to the outer periphery causing the elliptical shape of all orbits? Could he agree that the energy consumed by a planet in a circular orbit is the same energy it consumes in the elliptical orbit?

In the end of this study it remains to confirm that we do not question Newton's laws of movement and gravity, but at the same time we emphasize he lacks eligibility of his support of Kepler's second law Because he knows nothing about the movement of the sun and the planets more than Kepler Because he knows nothing about the movement of the sun and

the planets more than Kepler.

End

ABBREVIATIONS

- **FX:** Fall equinox

- **VE:** Vernal equinox

- **EL:** Equinoxes line (the straight line that links both equinoxes)

- **SL:** Solstices line (straight line linking both solstices)

RESULTS

The discovery of the orbit of the Sun is the greatest since Kepler and it must have changed everything in astronomy especially Kepler's first and second laws the Sun is always located in the focus where its orbit pass by it all the planets of the solar system have their perihelion's inside the orbit of the Sun and aimed toward the center of the galaxy and have all their aphelion in the outside of it.

The elliptical shape of the orbits is the result of the centripetal force that pull the Sun from the center of the solar system toward its orbit to be closer to December and far from June causing the elliptical shape of the orbit only in circular orbit, the straight line between the planet and the Sun sweeps equal areas in equal intervals of time.

CONCLUSIONS

The famous traditional image of four seasons where the Sun appears in the center of the orbit is wrong and to be replaced a one that accords Kepler's first law

Kepler's second law is wrong because the Earth sweeps from fall equinox to vernal equinox an area much smaller than that it sweep from vernal to fall equinox.

Kepler's first law is wrong because the Earth travels from vernal equinox to fall equinox an ar distance 10 million Km longer than the arc distance it travels corm fall.

Kepler's second law is wrong because the planet (Earth) at the aphelion is faster than at perihelion

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