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The stability of the earth– forces enabling the balance and stabilization of the earth for a very long period

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Abstract: *The earth was formed about 4.5 billion years ago. At the time of its creation, it underwent many large changes which in time gradually lessened, though have never ended. Today the earth is relatively stable and in order for it to continue existing over a very long period. There are forces that balance and stabilize it, such as:*
The centrifugal force behind the movement of continents; change in the axis of the rotating earth; gravity of the sun that changes the location of the earth's axis on the earth's mantle; the changing location of the earth's core; the influence of the moon.
Key Word*: Centrifugal force; earth's rotation; location of equator; plate tectonics; supercontinents.*

I. INTRODUCTION

There are mechanisms that balance and stabilize the earth enabling it to be relatively stable over a long time. Some of these mechanisms were presented by Y. Greitzer, in the following studies: Greitzer Jun 2020; 10 Sep. 2020; 22 Sep. 2020; Oct. 2020; Feb. 2022. The present article constitutes explanations completing the essence of the articles noted above and adding the relations to the moon, one of the main and important factors stabilizing the earth

II. DISCUSSION

II.I.I THE THEORY ON WHICH THE MOVEMENT OF CONTINENTS IS BASED

The assumption is that over an extended geological period, the axis of the earth's rotation in a pseudo-circular orbit changes its location. A model presented with explanations (Greitzer, Jun. 2020) give the possibility of a change in the axis of the earth's rotation in a peripheral manner by about 90^0 and, in accordance, about a 90^0 change in the equator's location. The actual movement of the continents depends also on many other geological factors.

The movement of continents was first discerned by Wagener (1922; 1966) who in his studies established the basis for the theory of plate tectonics.

In the present work we assume the location of the axis of the earth's rotation in circles of large circumferences changes its position on the globe significantly relative to the mantle of the earth because of cosmic forces - mainly the sun (see details, para. 2.2).

The speed of rotation of the mantle crust of the earth is highest at the equator and gradually decreases towards the north and south poles. Hence the change in location of the equator will cause a significant change in the forces of movement – speed of the rotation – centrifugal force, that act on the continents and will move them. The movements of the continents will be, in accordance, related to the intensity and directions of the new centrifugal forces.

We assume since the creation of earth and its beginning rotations, in the course of the geological eras the change in location of the axis of the earth's rotation had a trend and direction. In the present work I try to reconstruct the

possibility of a change of location of the axis of the earth's rotation, and in accordance, of the change in the location of the equator that relates to the last geological era, approximately the Mesozoic to Recent (around 200 - 250 m.y.). Assumed likewise is that in earlier periods, the earth's rotational axis changed its location by a scope of several rotations on the globe (see details, Greitzer, Feb. 2022 and para. 2.5 below). This was not necessarily done in full circumference circles, but assumedly in large circles.

The movement of every continent is actually determined according to its location relative to the equator, to the speed of its previous movement, to the size of its mass and to its lithologic composition, and also to some parts of other neighboring continents. The size of a continent's mass affects the degree of its acceleration. The degree to which a continent is split depends mainly on its position relative to the equator and to the relations between the speed of the continent's movement and the speed of the movement of the change in location of the equator. In the course of its movement, the continent meets other continents moving at slower speeds or in different directions, and at the point of contact tectonic folds may be created, such as the Alpine fold, or subduction of the frontal part of one continent, slab pull, or mid-ocean ridge, ridge push (gravitational slide) can occur; or other tectonic forms may be created in accordance with the pressure created between the two colliding continents (Seyfert and Sirkin, 1979; Derry, 1980).

There are other explanations regarding the forces moving the continents, among them, the thermal convection current theory known and accepted by many scientists (Holmes A. 1928; 2011, Greitzer June 2021).

II.I.II FORCES OF MOVEMENT ACTING ON CONTINENTS FOLLOWING ABOUT A 90^0 CHANGE IN LOCATION OF THE EQUATOR

In order to explain the forces acting on continents following a change in location of the equator in the past, the possibility is presented of a change in the location of the equator by 90^0 to its present position through six sketches of maps (Greitzer Jun. 2020, Figs. 1-6 see below). These maps illustrate a view of the earth from different directions, whereby four of the sketches focus on the equator (Figs. 1-4) and two on the polar regions, one on the North Pole (Fig. 5) and the other on the South Pole (Fig. 6).

It should be noted that these are estimated locations, and assuming the constant movement of continents with the change in location of the equator, there is no possibility of reconstructing the exact previous places of the equator on the present globe of the earth. There can be a shift of 10^0 -40^0 from the true location, but still the article is aimed to show the principles of the main forces behind the movement of continents.

As an explanation of the model presented, eight main points are marked on the globe which represent the following elements on the sketches (Figs. 1-6):

C-C' is the axis of the earth's rotation 90^0 before its present position where C' was the northern axis and C, the southern one.

A-A' is the present axis of the earth's rotation, where A is the present northern pole and A' is the present southern one.

The state of the former location of the equator 90^0 before its present position is represented by points A-D–A'–E, and its present location of the equator is represented by points C'-D-C-E.

Following the change in the axis of the earth's rotation by 90^0, the previous north pole, C', moved and reached the present north pole, A; accordingly, also the former equator A-D-A'-E moved to past the present equator C'-D-C-E. Marked also in the course of the move is the intermediate station of the equator of 45^0, which is represented by points B-D-B' E.

The points D and E represent the regions in whose realm the equator turned while changing its location by 90^0; and this phenomenon is assumed to be an ongoing process. It is suggested naming each one of these two regions "the region of axis of rotation that changes the location of the equator."

The change in location of the equator according to this assumption should cause the creation of two such regions on both sides of the earth whereby one is more or less opposite the other and they represent the two ends of "the region of axis of rotation that changes the location of the equator. All this assumes that the axis of the earth's rotation changed its location on the crust of the earth on a scope that comes close to the maximum circular circumference of the earth. Point D represents the Bermuda Triangle and point E represents the Dragon Triangle (Figs. 8, 9, 10, see para. 2.3).

The arrows numbered 1, 2 and 3 (Figs. 1-6) indicate the direction of the forces of movement acting also on the movement of continents, and the thickness of the arrows represent, to a certain degree, the intensity of the accumulating forces of movement. Components of the forces of movement that are marked by arrows that are found on the side to which the equator advances (when looking in the direction of the earth's rotation) are termed – "the chief driving force component,"

The surface of the earth is divided into four equal quarters and then into eight equal parts, marked by numbers prefaced by S (Figs. 1-6), S-1, S-1a, S-2, S-2a, S-3, S-3a, S-4, and S-4a.

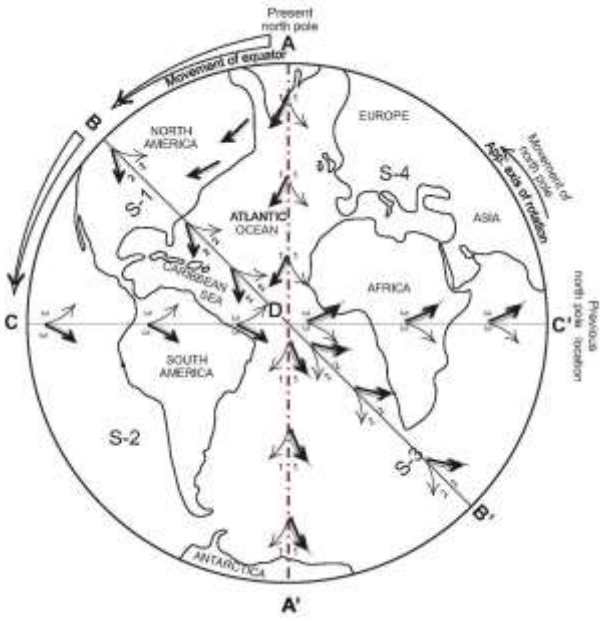

Figure 1. Movement of equator 90^0 from point A to C (movement of pole also 90^0 from point C' to A). View from Atlantic Ocean – Caribbean Sea. By Y. Greitzer (Jun. 2020)

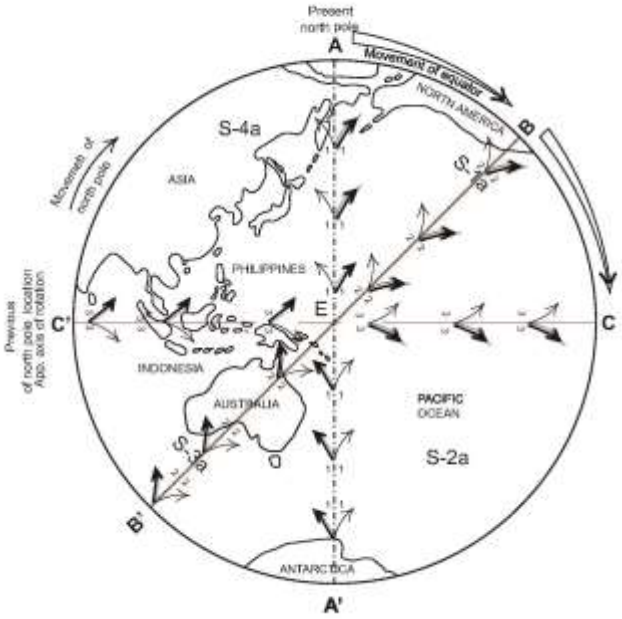

Figure 2. Movement of equator 90^0 from point A to C (movement of pole also 90^0 from point C' to A). View from Pacific Ocean, Philippines – Caribbean Sea. By Y. Greitzer (Jun. 2020).

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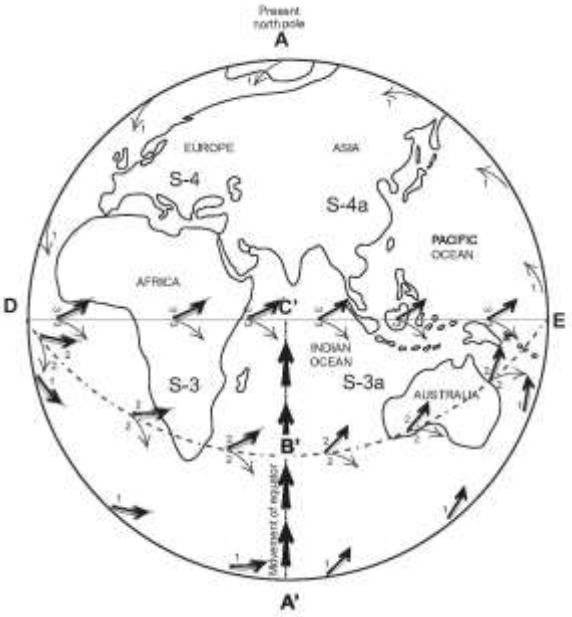

Figure 3. Movement of equator 90^0 from point A' to C' (movement of pole also 90^0 from point C' to A). View from Indian Ocean. By Y. Greitzer (Jun. 2020).

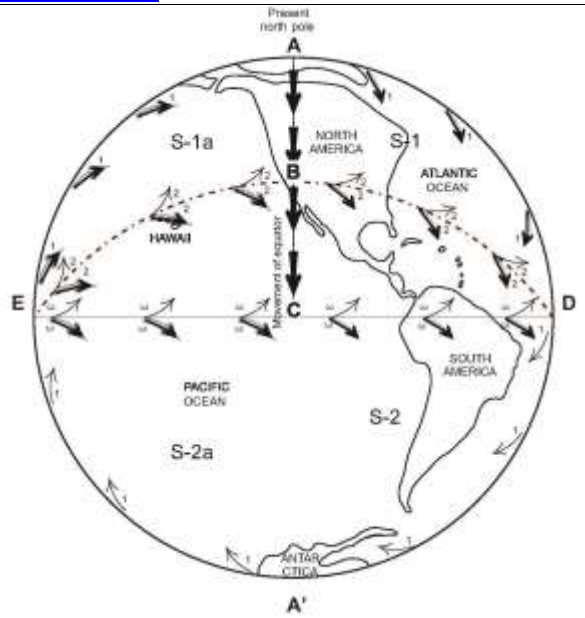

Figure 4. Movement of equator 90^0 from point A to C (movement of pole also 90^0 from point C to A'). View from Pacific Ocean. By Y. Greitzer (Jun. 2020).

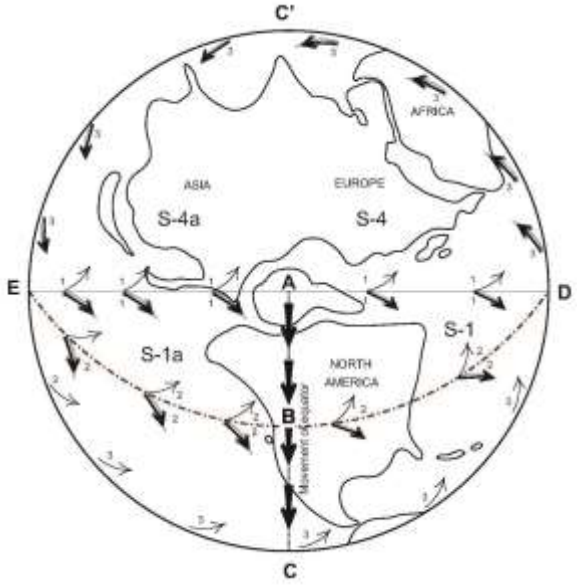

Figure 5. Movement of equator 90^0 from point A to C (movement of pole also 90^0 from point C' to A). View from the present North Pole. By Y. Greitzer (Jun. 2020).

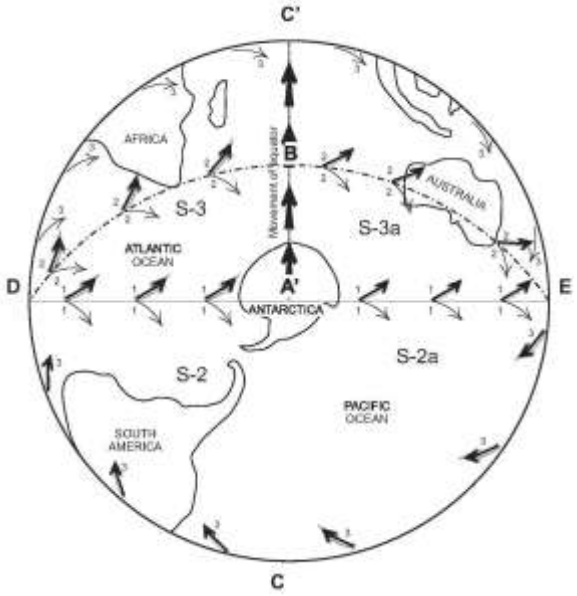

Figure 6. Movement of equator 90^0 from point A' to C' (movement of pole also 90^0 from point C to A'). View from present South Pole. By Y. Greitzer (Jun. 2020).

II.II GRAVITY OF THE SUN, THE MAIN FORCE OPERATING THAT CHANGES THE LOCATION OF THE EARTH'S AXIS OF THE EARTH'S MANTLE AND, ACCORDINGLY, THE LOCATION OF THE EQUATOR (GREITZER 10 SEP. 2020)

The earth completes a full turn around the sun every year. Its axis of rotation is found to be at an angle of around 23.4 degrees towards the ecliptic obliquity of the sun. (earth's obliquity oscillates between 22.1 and 24.5 degrees on a 41,000-year cycle.)

Twice a year, in the spring and the autumn (21 March, 23 September-equinoxes) the gravity of the sun functions mainly in the direction of the earth's equator; and twice a year, in the summer and the winter (21 June, 22 December), the gravity of the sun operates to a great extent in the directions of the north and south poles (the two ends of the earth's rotational axis), as can be seen on Figure 7.

If the earth's rotational axis were also perpendicular to the gravity direction of the sun in the summer and the winter, the gravity would then function on the earth similarly to in the spring and the autumn.

With respect to the present work, an important fact is that the radius of the earth along the equator is greater than the radius towards the north and south poles by about 43 km (with certain changes, depending on which part on the north or south the measurement relates to).

In the spring and the autumn, the sun's gravity on the earth operates perpendicular to the equator and the area encircled between the poles is smaller than that of the bigger circle of the equator (approximately equaling a radius of around 43 km). In this situation there is no influence on the earth's axis of rotation. Against this, in the summer and the winter, the axis of the earth faces the direction of the sun (at about a 23.40 angle), so that a situation is created where a circle of the earth perpendicular to the sun's gravity is larger than that which was perpendicular in the spring and the fall, since it includes parts of the equator's larger circle.

In this phenomenon, when the edges (earth's axis of rotation) face the sun, there is stronger gravity of the sun on the edges and a tendency to straighten the angle of the axis of rotation, and this force of gravity causes a slight shift on the earth's mantle, thereby also causing a change in direction of the earth's axis of rotation on its mantle and not a change in the earth's orbital ecliptic plane.

The sun's gravity on the mantle and on the asthenosphere and the lithosphere acts on its upper solid parts, above the parts in which the material in the mantle is plastic, lubricant, and in which the friction is relatively small, enabling a relatively slight shift of the movement to the relatively upper solid part of the earth.

The angle of rotation of the earth around the sun is determined by a number of factors: the sun, the moon, and the planets turning around the sun, particularly the large ones (Saturn, Uranus, Neptune). It follows that the earth's axis of rotation remains at the same angle towards the ecliptic obliquity around the sun (around 23.50), however shifting of its axis of rotation slightly relates to the mantle of the earth. The amount of this shift on the earth's mantle is estimated to be a few centimeters a year, about 2 cm in the summer and about 2 cm in the winter, a total of about 4 cm a year.

This slight shift of the earth's rotational axis on its mantle also causes a shift of the equator on its mantle, which is perpendicular to the earth's axis of rotation.

It is assumed that the equator changes its location through relatively constant slow motion on the mantle of the earth at an average rate of 4-5 cm/yr during about 200-250 million years at a total distance of 90^0 of the surfaces of the globe, from the Mesozoic to the Present. (Greitzer Jun. 2020, para. 2.1).

It should be noted that there are very many articles on a marked number of forces operating on the earth that change the face of the earth, including on the effect of the moon's gravity on the earth (see para. 2.6). It is possible that some of these different forces may also have an effect on the change in location of the earth's rotation axis, but their effect seems secondary to the action of the main force of the sun's gravity on the earth in summer and in winter. Likewise, in the study made regarding the change in axis of the earth's rotation and in accord with the change in location of the equator (see para. 2.1, Figs 1, 2), it was found that the change in location of the earth's axis was continuous throughout a long geological period and is continuous (para. 2.5).

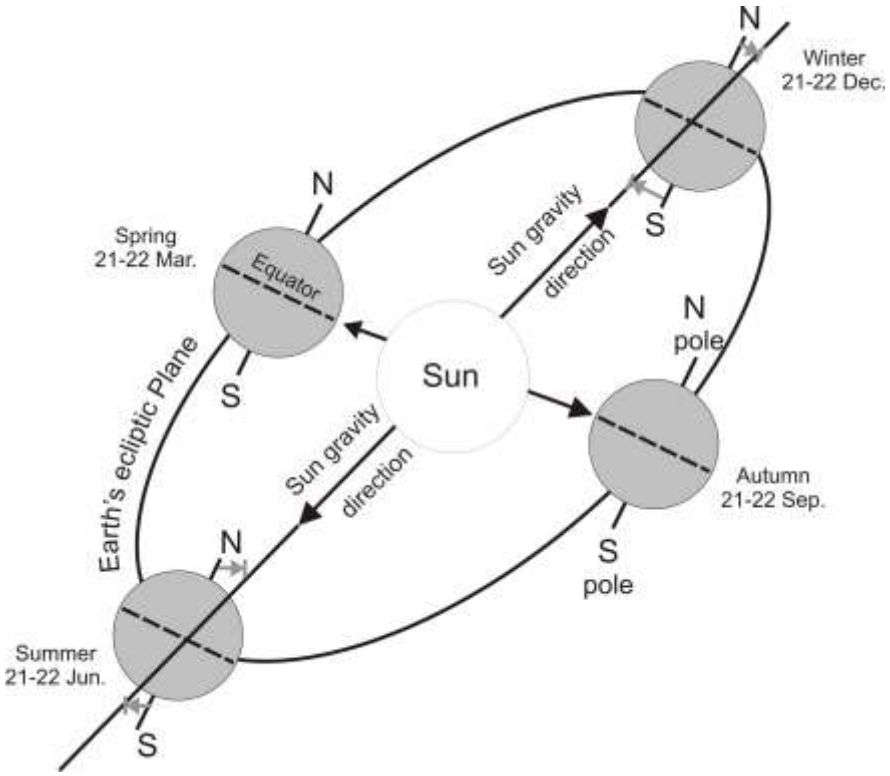

Figure 7. The force of gravity of the sun on the earth (Y. Greitzer, 10 Sep. 2020).

II.III SPECIFIC FORMATION OF THE BERMUDA AND DRAGON TRIANGLES AS A RESULT OF A CHANGE IN THE AXIS OF THE EARTH'S ROTATION (GREITZER, 22 SEP. 2020)

II.III.I THE BERMUDA AND DRAGON TRIANGLES AND THEIR SPECIAL PHYSICAL GEOLOGICAL AND TECTONICS CHARACTERISTICS

Both the Bermuda and the Dragon triangles are found on both sides of the earth, in the areas relatively close to the equator. The boundaries of the two triangles are not defined officially and they are sometimes called by other names.

The Bermuda Triangle is located in the archipelago area between North America and South America and the Dragon Triangle is located in the archipelago area in Southeast Asia (Fig. 8).

Bermuda Triangle Area:

According to Bateman and McLean (1985):

The Caribbean basin marks the boundary between the North and South American plates. The mountainous and volcanic nature of Central America testifies to the tremendous pressures that underlie the entire Caribbean plate. On the west, the Cocos plate is subducted at the Middle-American trench, also toward the center of the Caribbean plate. Deep below, pressurized mantle material from these subductions give rise to frequent earthquakes, volcanism and buckling of the crust on the entire plate. In the Caribbean and Central America, earthquake epicenters occur all along the subducting plate (Fig. 9).

The Dragon Triangle Area:

According to Bateman and McLean (1985):

The Philippine plate is bounded by trenches. To the east, the Pacific plate subducts at the Mariana trench, where depth of the ocean is greatest. The Philippine plate subducts below the Eurasian plate at the Ryukyu, Luzon, and Mindanao thrusts (Philippine trench), throwing up a string of volcanic island archipelagos stretching from Okinawa to the Celebes in the south. (Fig. 10).

The areas of these triangles are unique relative to other areas on earth. The intention in this article is not to discuss the various theories describing the influence on the different means of transportation, the ships and planes and the disasters they endured in these triangles, whether true or not, nor to add another theory. The intention is to explain the creation of these two areas from a geological and tectonic aspect as the result of a change in the location of the axis of the earth's rotation and, in accordance, a change in the location of the equator.

II.III.II THE THEORY ON WHICH THE BERMUDA AND DRAGON TRIANGLE AREAS WERE FORMED BASED ON THE CHANGE OF THE AXIS OF THE EARTH'S ROTATION AND, ACCORDINGLY, THE CHANGE IN LOCATION OF THE EQUATOR

As reported in the research Greitzer Jun 2020, para. 2.1), located in the realm of or proximity to the two areas, the Bermuda and Dragon triangles, is "the region of axis of rotation that changes the location of the equator." Area's points D and E. Therefore, the movements of continents in this area have a very small circular rotation relative to the other continents on earth. As a result, in this area there are small continents in whose margins are deep trenches and strong tectonic pressure, whereby one of them either slides on top of the other or subducts beneath it, thus creating strong seismic activity, volcanoes, and earthquakes, as explained in the previous section.

II.III.III FORCES OF MOVEMENT ACTING ON CONTINENTS FOLLOWING ABOUT A 90^0 CHANGE IN LOCATION OF THE EQUATOR

In order to explain the forces acting on continents following a change in location of the equator in the past, the possibility is presented of a change in the location of the equator by 90^0 to its present position through two sketches of maps (Figs. 1, 2 in para. 2.1).

The points D and E represent the regions in whose realm the equator turned while changing its location by 90^0; and this phenomenon is assumed to be an ongoing process. It is suggested naming each one of these two regions "the region of axis of rotation that changes the location of the equator." extending at least from the Mesozoic era until today, an estimated period of ~200-250 m.y.

The change in location of the equator according to this assumption should cause the creation of two such regions on both sides of the earth whereby one is more or less opposite the other and they represent the two ends of "the region of axis of rotation that changes the location of the equator." These two areas (regions) are marked by points D and E.

Located in the two regions D and E are the Bermuda and Dragon triangles: the Bermuda Triangle is located in the region of point D, the Caribbean Sea area, and the Dragon Triangle in the region of point E, the Philippines sea area (see para. 2.1.3).

The movement changes radically on the continents found in these two areas. Likewise, the forces operate in a rotational direction in a relatively small radius. These phenomena and the closeness of the continents to the equator over a long period caused significant intense tectonic phenomena. Such tectonic phenomena are found west of the two points, the D and E areas (Fig.8). West north west of point D at a distance of about 30^0 -40^0, in the area that includes the Bermuda Triangle (Figs. 1, 9), and north west of point E at a distance of about 10^0 - 20^0, in the area that includes the Dragon Triangle (Figs 2, 10).The move from points D and E could be explained as a result of drafting lacking for the explanation, and/or the lack of the possibility of reconstructing exactly the true phenomena that operated over time on the present globe following the actual movement of the continents.

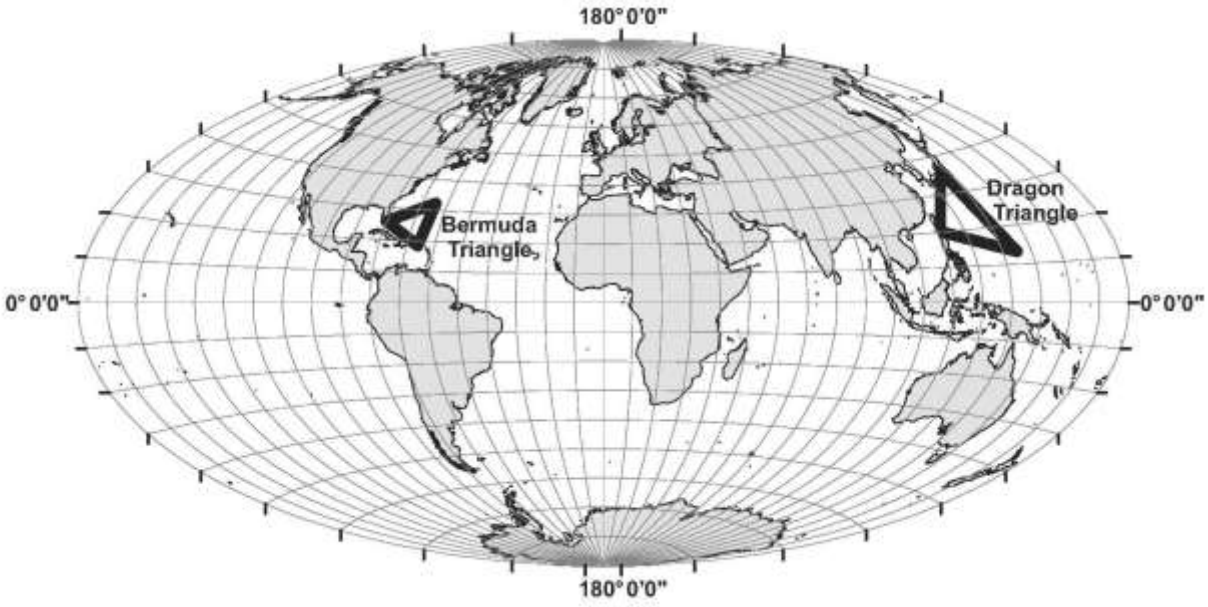

Figure 8. Approx. location of Bermuda and Dragon Triangles (Y. Greitzer, 22.9.2020).

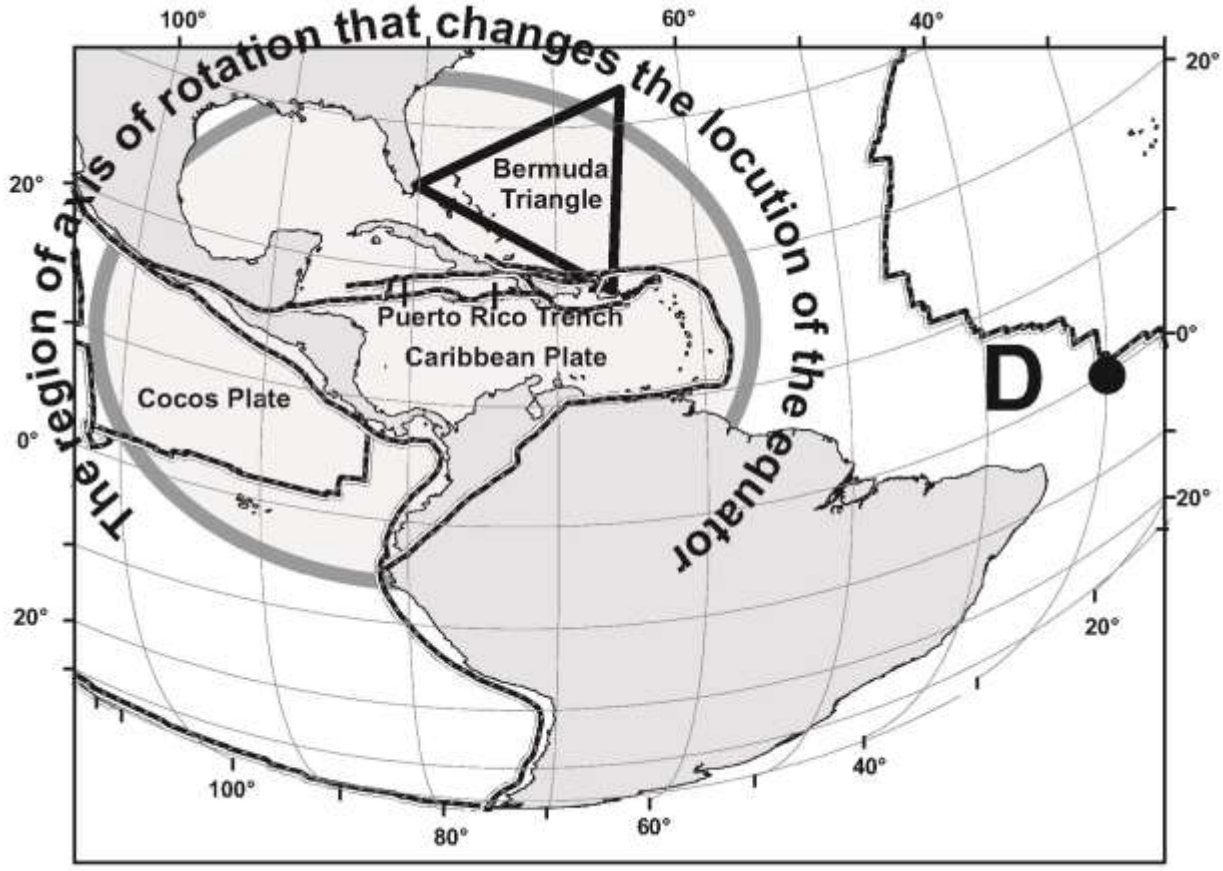

Figure 9. The area of the big circle represents "the region of axis of rotation that changes the location of the equator." In its western end (side). Point D. - Point that according to the model represents "the region of axis of rotation that changes the location of the equator" By 90 degrees (see Fig. 1).

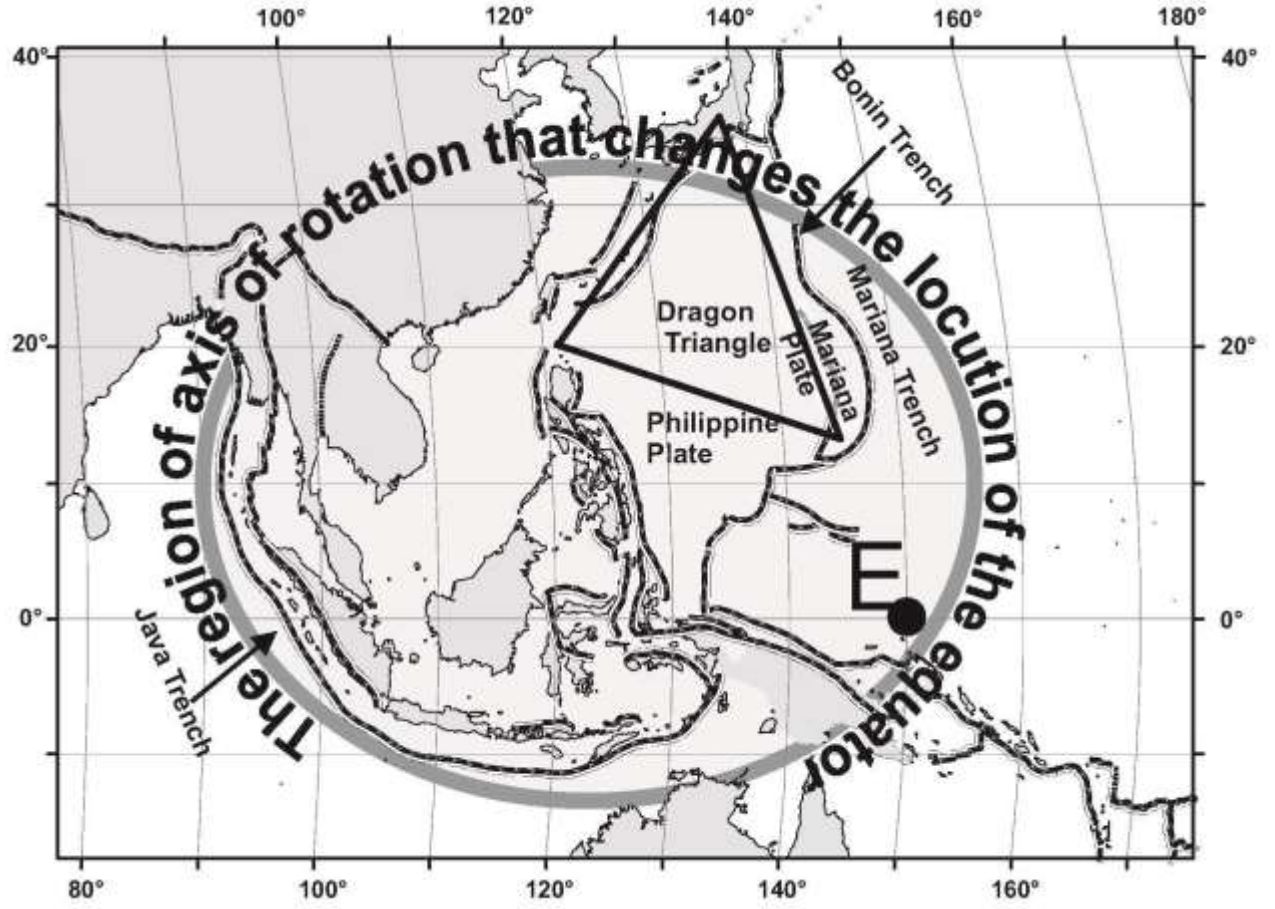

Figure 10. The area of the big circle represents "the region of axis of rotation that changes the location of the equator." In its eastern end (side,). Point E. - Point that according to the model represents "the region of axis of rotation that changes the location of the equator" by 90 degrees (See Fig. 2).

II.IV CHANGING THE LOCATION OF THE EARTH'S CORE, THE MAIN FORCE OPERATING THAT CHANGES THE MAGNETIC FIELD OF THE EARTHS (GREITZER, OCT. 2020)

According to the accepted assumption, in the earth core's mantle a magnetic phenomenon is created that acts as a dynamo. The central part of the earth's core is solid and its mantle is in a viscose state (Herndon, J. M., 1996-01-23).

The magnetic field of the earth changes from the north pole to the south pole in an extreme form in a changing space of time between 0.1 and 50 million years.

Flexibility of the earth's core and changes in the earth's axis of rotation in a continuous manner exist since the beginnings of Earth's crystallization (Greitzer, Jun. 2020; 10 Sep 2020, para. 2.1, 2.2) and relating to the law of isostatics, is one of the main reasons for the stability and of the earth remaining in the form of a relatively round ball (Geoid). As a result of the core's intermittent fluctuation (its center of gravity) to the northern and southern parts of the earth, the magnetic field intermittently changes from north to south.

Since the mantle of the core is built of fluid - viscose material (Jordan, 1979), this matter enables balancing the phenomena of changes and pressures in the geological layers of the earth's mantle and crust. The core can be pressured in order to balance changes in the earth. It is mainly pressured towards the northern half of the earth in the direction of the north pole or towards the southern half in the direction of the south pole in order to balance the equilibrium of the earth, in accord with the law of isostatics.

Due to the flexibility of the core, it has the capability to respond relatively rapidly to the significant changes occurring on top of the earth's crust or mantle, opposite the locations that change the general equilibrium in relation to the center of the earth. This phenomenon also causes a change in the magnetic field of the earth. The assumption is that this movement has been ongoing in a continuous form since the stage of the globe's creation in a relatively rounded shape (Geoid). Since the direction of the earth's rotation is perpendicular to the earth's axis, and moves from west to east, it is estimated that the change in the location of the core, or part of the core's mantle changes in its movement in order to balance the equilibrium of the earth mainly perpendicularly in the direction of the rotation of the earth, towards the north and south poles.

The movement north and south is not equal in consecutive time periods (Fig. 11) due to different phenomena existing in the earth, such as the tectonic activity in the creation of mountains and shifting of continents (plate tectonics), where one overlaps the other, and/or a change in the location of the axis of the earth's rotation (para. 2.1, 2.2), etc. These phenomena balance each other in part of the earth's crust or mantle in accordance with the isostatic law, but mainly with the help of the core, due to its sensitivity and flexibility its influence is fast and efficient. The assumption is that the center of the earth to which the isostatic law relates is found in the core's center opposite the equator. When the core's center moves north of the equator the magnetic field also moves north (or to the opposite direction); or reversely, when the core's center moves south of the equator, the magnetic field also moves south (or to the opposite direction).

A change in direction in the course 5.28 million years of the magnetic field of the earth in the late Cenozoic was studied (Tauxe 1998). What Greitzer (Oct. 2020) found was that the time of the change that accumulated between the magnetic field in the direction of the present northern axis and that of the magnetic field oriented in the opposite direction was equal. Thus for 2.62 million years the magnetic field has been oriented in the direction of the present north axis, and for 2.66 million years the magnetic field was oriented in the opposite direction, in the direction of the present southern axis (Fig. 11). The relatively small difference between the two evidently stems from a section that was measured arbitrarily and does not exactly represent the beginning of the section measured that was determined 5.28 million years ago.

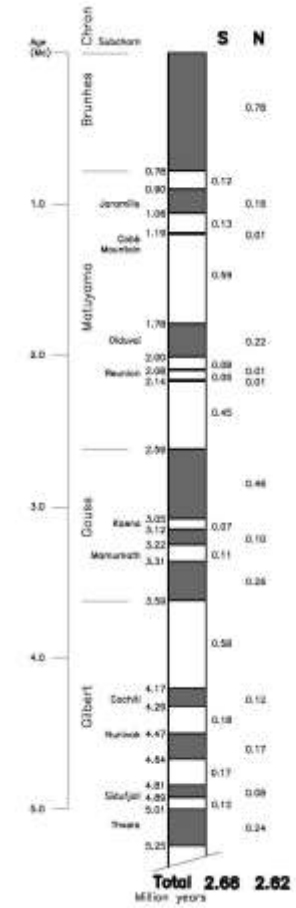

Figure 11. Geomagnetic polarity during the late Cenozoic Era in the course of 5.28 million years. Dark areas denote periods where the polarity matches today's polarity, light areas denote periods where that polarity is reversed. (By Greitzer, Oct. 2020. according to Tauxe 1998).

II.V CREATION OF GLOBAL SUPERCONTINENTS BY FORCE OF THE ROTATION EARTH'S CHANGING AXIS (GREITZER FEB. 2022)

In the course of the creation of the earth, continents formed that united, became supercontinents, and in continuation split into small continents which again united, again creating supercontinents. This cycle of phenomena probably was ongoing in the course of the earth's entire existence.

There are different theories regarding the forces that caused the supercontinents to separate, to come together again, and to again create a supercontinent. It should be noted that evidently a combined activity existed of several of the forces that create the supercontinents that are mentioned in the literature.

However, the main force causing the movement of the continents and mainly the direction of their movement, in my opinion, are the centrifugal forces of the globe, and due to the changing location of the earth's rotation axis (changing the TPW), a change accordingly in the location of the equator (see para. 2.1, 2.2).

The direction of the changes and movement of the continents from the Mesozoic period to the present day is about 200- 250 million years and is presented in the present study in chapter 2.1 and in Figures 1, 2.

Presented are four figures that represent the direction of the movement of the continents following the change in location of the earth's axis. Three- 1, 12 and 13, represent their movement from a view of the Atlantic Ocean on the Caribbean Sea area – the Bermuda Triangle, point D. This point represents one of the ends of "the region of axis of rotation that changes the location of the equator" (Fig.1). The other end of this region, is in the opposite side of the earth, in the Philippines – Dragon Triangle, point E (Greitzer Jun. 2020 para. 2.1, Fig. 2).

Figure 1 represents a change of the equator on the mantle of 90 degrees. Figure 12 represents the change of 180 degrees of the equator on the mantle, and Figure 13 represents the change in the equator on the mantle of 360 degrees. The continents move in the direction indicated by the arrows in accord with the direction of the change of the equator: change of location of the equator by 90 degrees (Fig.1), in which the movement of the continents are represented by arrow nos. 1, 2, 3; in continuation of the change of the equator's location to 180 degrees (Fig. 12), the movements of the continents are represented by arrow nos. 3, 4. One already sees that towards the end of the continents' move of 180 degrees, in accord with arrows no. 5, the continents move in an opposite direction of the initial move of the continents, arrows no.1.

In continuation of the move of the equator's location to 360 degrees (Fig 13), arrow nos. 6,7,8, all represent the continents that move in the direction opposite to that of arrow nos. 2,3,4,5. Whereas arrow no. 9 is in the direction of arrow no. 1, which starts the cycle from the beginning.

The inference from this is that in the course of their movement the continents spilt, as presented in Figure 1. And in splitting, they enlarged and expanded from magma rising from the mantle and material from volcanic eruptions and also from layers of sediment that sunk into the oceans and rose up through tectonic activities. Afterwards the continents could move in different directions, including movement in opposite directions, and in different periods join and produce supercontinents or parts of supercontinents.

As estimated, in the ongoing process of the creation of the earth and of the first continent, the rotating earth's axis changes. In order to estimate the number of its rotations made since the creation of the first continent, it is estimated that in about 250 million years the equator changed on the mantle by 90- degrees (para. 2.1), Assuming that the rotation of the earth moves at a speed equal in time to that at its inception (the speed at the beginning of its creation was faster) thus, if we think according to different estimations in the literature that the first supercontinent Vaalbara existed 3.6 billion years ago, the axis of the rotating earth can be estimated that the rotation of its axis and in accord the change in location of the equator, within the realm of four rotations in large circumferences they changed their location on the earth's mantle. It should be noted that the rotations were not in complete circumferences though in large ones since point D must represent an area of a certain size of the earth's rotational axis. It is estimated the location of this area today and since 250 million years ago, on one side of the earth, is the Bermuda Triangle, point D, and on the opposite side of the earth, is the area of the Dragon Triangle, point E (para. 2.1). Likewise, it should be noted that the areas represented by point D (Fig. 1) and point E (Fig. 2) also moved in the course of years since the creation of the earth.

It can be estimated that the supercontinents were formed in cycles of about 500 million years (assumedly between 400 and 600 million years) and in the combined cycles of all of them ~ 1 billion years (assumedly between 0.8 to 1.1 billion years). Everything said is a general estimation – is in order of magnitude.

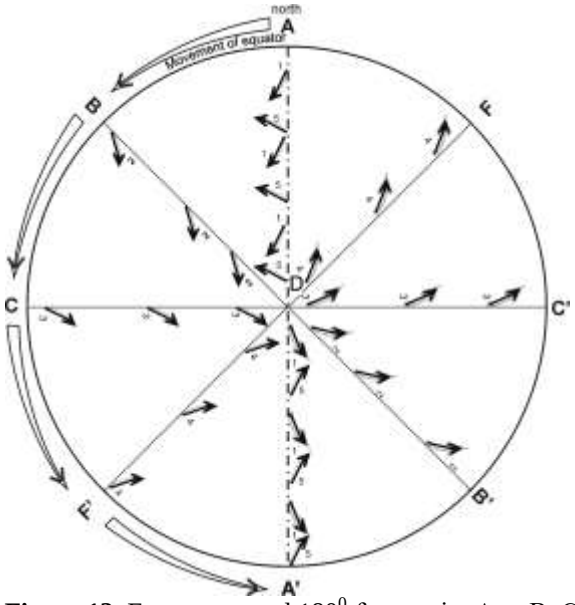

Figure 12. Equator moved 180^0 from point A to B, C, F', A' (movement of pole also 180^0 from point C' to F, A, B, C). View from point D, the Atlantic Ocean – Caribbean Sea. Continents moved in the direction of the Arrows. By Y. Greitzer (Feb. 2020).

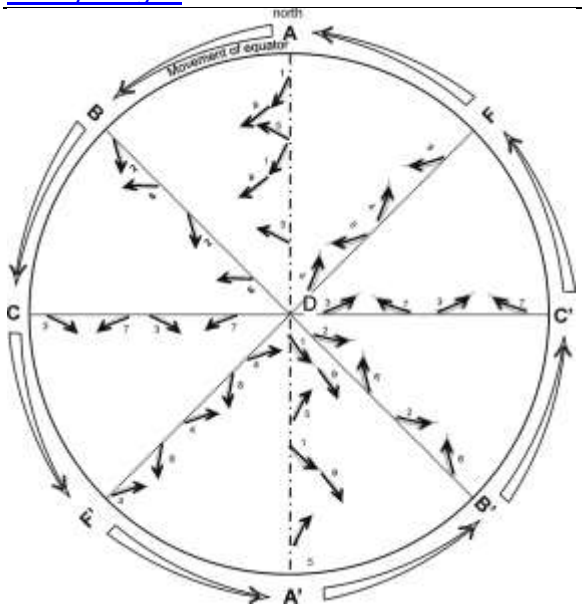

Figure 13. Equator moved 360^0 from point A to B, C, F', A', B', C', F, A (movement of pole also 360^0 from point C' to F, A, B, C, F', A', B', C'). View from point D, the Atlantic Ocean – Caribbean Sea. Continents moved in the direction of the Arrows. By Y. Greitzer (Feb. 2020).

II.VI THE MOON, ONE OF THE MAIN IMPORTANT FACTORS IN STABILIZING THE EARTH.

One of the main factors creating balance and stabilizing the earth is the moon, which circles the earth. This of course is known and understood and there are several hypotheses regarding the creation of the moon that encircles the earth. Following is a discussion of one of the main hypotheses regarding the way the moon was created.

According to the description in Wikipedia, one of the theories (the binary theory) is that the moon separated from the earth in the stage of the earth's crystallization from the Nebula. This happened when the material that created the earth (including the moon) rotated rapidly around the sun that had already been created a little while before, or in the process of its creation. The beginning form of the crystallization of the earth was an elongated narrow disc, with high centrifugal energy, power of gravitation that caused the crystallization of the earth in the central part of the disc and gradually weakened towards its outer part. The speed of the turn of the disc was higher than the pull of the gravitation, whereby the heavy parts of the earth's core already accumulated in the course of the crystallization and are as they are today and the lighter parts of the outer material are as they appear today in the outer mantle of the earth. Because of this speed, the outer part of the disc was separated and this part constitutes the material of the moon. And as assumed, the moon is mainly composed of material similar to the outer material of the earth, the mantle of the earth.

There is an argument that the assumption of the above theory does not explain the difference in the geological age between the ancient rocks in the crust of the moon (4.3 billion year) and that of the ancient rocks in the crust of the earth (3.9 billion years).

I think there is an explanation in the following: The moon was created from material that detached from the Nebula that was in the form of a narrow, elongated disc, and from the outer part and crystallized faster and formed the moon structure, and the earth that was larger and took more time to crystallize and to create the differentiation of the different paths, the core and the mantle. Therefore, the crust of the moon is older than that of the earth by 300 million years (all that assuming that determination of the ages of the earth and the moon is exact).

In addition to the fact that the moon serves as an important factor in the stabilization and balance of the earth, the researchers Hofmeister, R Criss, E Criss (2022/5/) wrote that the Combined forces of the sun and the moon on the earth cause the movement of continents as quoted from the following studies:

Lateral accelerations require lateral forces. We propose that force imbalances in the unique Earth-Moon-Sun system cause large-scale, cooperative tectonic motions. The solar gravitational pull on the Moon, being 2.2× terrestrial pull, causes lunar drift, orbital elongation, and an~ 1000 km radial monthly excursion of the Earth-Moon barycenter inside Earth's mantle. Earth's spin superimposes an approximately longitudinal 24 h circuit of the barycenter... …."

Other researchers: F Riguzzi, G Panza, P and Varga, C Doglioni 2010/3/19- Carcaterra, write that the moon influences the movement of the continents.

III. CONCLUSION

The earth is relatively stable compared to the other planets circling the sun because of the balance of the existing efficient mechanisms of the forces balancing and stabilizing it as against the changes occurring in its realm. It is important that the mechanisms acting to balance it anew after all the changes in its realm, such as continents moving, will be flexible, efficient and fast relative to the extent of changes occurring in the earth.

Noted and detailed are several main and important forces operating to stabilize and balance the earth, such as:

The centrifugal force behind the movement of continents, change in the axis of the rotating earth; gravity of the sun that changes the location of the earth's axis on the earth's mantle; changing the location of the earth's core; and the influence of the moon.

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