

Earth Science Revisited: Expansion-Based Hypothesis for Explaining Global Phenomena

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Abstract

Basic tenets of plate tectonics, like, plunging of a solid plate within solid mantle and the incidence of convection in it causing plate motion are doubtful as scientific explanations. With the help of an expansion-based model of the Earth, which was devoid of oceans, it has been conceived that initially the Earth's mantle was adequately fluid and suitable for expansion owing to association of ocean-forming water. Matching thickness of outer core and extent of expansion reveals that due to expansion-caused by extra-terrestrial gravitational attraction-a void zone, termed outer core was developed between the mantle and the solid iron core. Presence of such a zone in the planet's deep interior would give rise to an additional force of reversely directed gravity in the inner core region where, in consequence, temperature and pressure would be considerably low. Hence, it can be interpreted that the Earth's inner core, from where magnetic lines of force emerge, is a huge dipolar magnet. With opening of the pseudo-fluid zone in the deep interior of the Earth, the inner core remained within it in a suspended condition, giving rise to new magnetic phenomena like pole reversals and polar wandering in response to extra-terrestrial magnetic influences.

Keywords: Earth's expansion; Geospheres; Virtually void or Pseudo-fluid zone; Reverse gravity

Introduction

Despite several breakthrough discoveries, some of the prevalent views on structure and dynamics of the Earth cannot be accepted from scientific point of view. Manifestation of continental drift, plate tectonics, convection currents etc. would essentially require sufficiently fluid state of the mantle which, in contrast, has been confirmed to be rigid and solid by analysis of seismic rays [1]. The parallelism observed between the distantly placed adjacent shores of continents steered Wegener to put forward the idea of continental drift which was vehemently opposed by Harold Jeffreys considering mainly the solid state of the mantle [2,3]. Subsequently it was proved that movement's continents have indeed taken place while Holmes, much before that, postulated occurrence of convection current in the mantle as the driving force for continental drift, despite warning that his ideas were "purely speculative" [4]. Hilgenberg in his concept of Earth's expansion, explained that if the radius of the Earth could be reduced to two-third of its present thickness, all the continents could be appropriately adjusted in the resultant small and ocean-less Earth [5] (Figure 1). In spite of such remarkable fitting of the continents, Earth's expansion too cannot be accepted in view of solid and rigid state of the mantle. The present study, however, points out that since the small Earth-depicted by Hilgenberg-was devoid of oceans, originally the mantle must have been sufficiently fluid owing to association of large quantum of ocean-forming water [6,7].

Prevalent Views on Global Structure

Thickness of the Earth has been determined to be 6371 km whereas, based mainly on analysis of seismic waves and examination of meteorites which are considered to be broken fragments of a pre-existing planetary body, it has been established that the greater part of the planet, occurring below the 33 km thick solid silic crust, can be divided into three thick and distinct geospheres [1]. Amongst these, the top-most 2867 km thick geosphere, composed of solid basaltic rocks, is mantle which is followed downward by a 2080 km thick fluid geosphere, termed outer core. According to the prevalent concept

the fluid outer core-occurring between the mantle and inner-most geosphere of inner core-is composed of iron and nickel. The inner core of the planet, which emanates magnetic lines of force, is a 1391 km thick geosphere, composed mainly of solid iron and nickel.

Expansion-Based Unified Global Tectonics for Elucidating Total Earth System

An outline of salient updated features of the concept of unified global tectonics, which has been suggested by the author, based on Hilgenberg's model of Earth's expansion, is given below explaining the reasons for major changes that took place over the surface and interior of the Earth owing principally to planetary expansion [7,5].



Figure 1: Hilgenberg's OC [5] Model of Earth's expansion.

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1. Since the primordial small Earth was devoid of oceans, the entire amount of ocean-forming water, therefore, must have originally been associated with the mantle, thereby rendering that geosphere considerable fluid or semi-fluid and suitable for phenomena like planetary expansion, fragmentation of super-continent and continental drift. The view is based on the results of experimental studies of Roy and Tuttle [8] that confirmed depression of melting point of silicate rocks under hydrothermal and high pressure condition.
2. Originally the small Earth was entirely covered with a solid super-continent composed of granitic crust and, at that stage, oceans were not developed. Due to tidal bulging of the semi-fluid mantle-caused by the Moon's gravitational attraction-the geosphere was bulged causing fragmentation of the solid sialic crust into a number of continental fragments. Through these expansion cracks basic magma started to emit which, with further bulging or expansion of the planet, continued to spread on both sides of the gap developed between the segregated continental fragments. In this manner formation of ocean basins took place while owing to further expansion the cracks eventually turned into mid-oceanic ridges.
3. Eruption of widespread molten magma through the expansion cracks or mid-oceanic ridges was continuously accompanied by extensive emission of volatiles consisting chiefly of water which filled up the ocean basins. While the early Earth grew bigger due to bulging of the original semi-fluid mantle, emission of moisture-enriched volatiles caused dehydration of the mantle, eventually turning that geosphere solid, when further expansion of the planet was ceased. In Figure 2 between the two solid geospheres of mantle and inner core (solid iron core) there is a thick fluid geosphere, termed outer core, precise nature of which is not known before expansion the Earth was devoid of oceans and the fragmented continents were joined together forming a super-continent while in the planet's interior, its inner core and mantle were juxtaposed to each other. At that stage, due to incorporation of ocean-forming water the mantle was considerably fluid and suitable for expansion. Further, since the thickness of the outer core matches with the extent of expansion, this geosphere can be considered as newly opened up and virtually void zone in between mantle and inner core. This sort of disposition, where mantle and inner core are separated by a void outer core-that subsequently turned fluid-like or pseudo-fluid geosphere due to influx of particles-both the geospheres of mantle and inner core would exert gravitational attraction on each other. Accordingly, a reversely directed force of gravitational attraction in the deep interior of the planet would be generated. Hence, in the deep interior of the planet, in addition to normal inwardly directed force of gravitational pull, an upwardly directed force of reverse gravity would manifest, thereby generating low pressure and low temperature condition around the inner core which tallies with observed features. The present study, therefore, conceives the iron core, from where magnetic lines of force emanates, as a huge dipolar magnet (Figure not to scale).
4. Primordial small Earth's two-third of radial expansion amounts to about 2124 km, while thickness of the fluid outer core of the Earth is of the order 2080 km. Since the thickness of the fluid outer core and extent of expansion matches, it would be rational to consider that the so called outer core is virtually a void zone or void-like zone opened up owing to expansion of the planet. Therefore, during pre-expansion stage of the planet when the fluid zone of outer core, occurring in between mantle and inner core, was not developed, the solid inner core and the mantle were juxtaposed to each other.

It has been pointed out that after commencement of expansion; the Earth's internal features were considerably modified. Owing to such modification, especially due to development of a virtually void zone between the two geospheres of basaltic mantle and solid iron core, both the mantle together with the crust and the solid iron core would exert gravitational attraction on each other (Figure 2). In consequence of such incidence of both geospheres gravitationally attracting each other-depending upon the magnitude of the forces-an oppositely directed force of gravitational attraction or reverse gravity would occur at the deep interior of the Earth, including the inner core. Following the Newtonian principles at great depth and the inner core region, therefore, manifestation of reversely directed force of gravitational attraction or reverse gravity would prevail, in addition to the normal inwardly directed force of gravity. Hence, low temperature and low pressure condition would prevail at the inner core and adjoining regions of the Earth, evidenced by solid nature of iron core and its magnetic characteristics and corroborated by occurrence of cond rules and minerals with water in rocky meteorites, considered to represent the deeper parts of mantle of a pre-existing planet. The supposition of pro rata increase of temperature and pressure with depth is unacceptable because the inner core is solid and emanates magnetic lines of force. The view of high temperature and pressure at the core has been conjectured on the basis of increase of temperature and pressure with depth, observed in the upper part of the planet. The popular view of prevalence of very high temperature and pressure in and around the core has been based on speculation which cannot be proved. On the contrary, solid nature of the inner core, considered to be made of iron, and emanation of magnetic lines of force from it-as if it is a huge bar magnet-are evidences of considerably low temperature and low pressure of the inner core which, therefore, can be explained to be a huge dipolar magnet.

5. As evidenced by tidal pull of the Moon, it is rational to consider that the probable reason for the Earth's expansion is gravitational pull exerted by the former, causing uniform bulging of semi-fluid primordial mantle [6]. It appears that the Moon-was originally a distantly placed object which, in course of its gradual approach towards the Earth, was eventually captured by the later and since then it started to revolve around the bigger object Earth as the

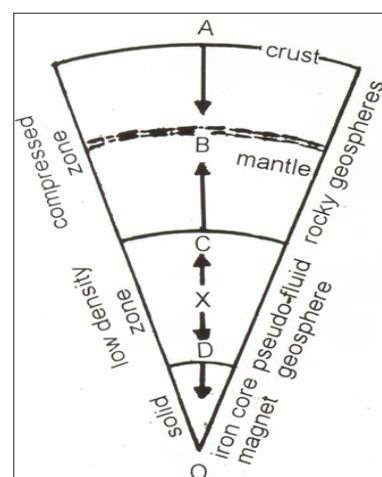


Figure 2: Expansion of the Earth.

planet's solitary satellite. Since the Earth is rotating around its axis of rotation and the Moon too is revolving around it as a satellite, the planet experienced gravitational pull in a uniform manner, more or less preserving its basic global shape.

6. The phenomenon of shifting of continental fragments or plates relative to one another was caused by two forces. The first force, caused by bulging of the semi-fluid mantle due to the Moon's gravitational pull, initiated planetary expansion. The expansion, thus, was accomplished by lifting of the broken continents that were embedded over the semi-fluid mantle upwardly along with the mantle medium. With further expansion, the gap between the adjacent fragments on both sides of the expansion crack or mid-oceanic ridge steadily increased which was continuously filled up with molten magma, thereby enhancing the ocean dimension and increasing the distance between the segregated continents due to uplifting of continents along with the mantle.
7. The second force, caused by rotation of the planet along its axis of rotation, was principally responsible for horizontal or flat movement of the broken continents or plates over the planet's surface. This redoubtable force caused by rotation of the planet along its axis of rotation, is maximum around the equator and minimum near the poles. In case of expansion, the continental fragments would tend to move away from one another thereby expanding the ocean basins and, consequently, one continental block colliding with another cannot take place. A number of evidences, nevertheless, confirm that such incidences of collision of one continental fragment with another indeed occurred, especially during the relatively younger geological periods. It may, however, be noted that mainly owing to rotation of the planet along its axis of rotation, certain broken fragments or continents came closer or even collided with each other forming lofty mountain ranges.
8. Before expansion of the planet, the solid iron core and semi-fluid mantle were juxtaposed to each other as shown in Figure 3a. Under such circumstance, if a magnetic planetary body with its north magnetic pole facing the Earth's north magnetic pole approached the latter, disposition of both the planetary objects in space would experience major alteration. Remarkable changes of the Earth's geographical orientation, such as, polar region showing characteristics of warmer environment in the past geological era and equatorial or warmer regions depicting signatures of cold environment, can be explained to be caused by deflection of the Earth in response to magnetic influence of an external planetary body when the Earth's core magnet was firmly attached with the mantle [6,7].
9. Due to expansion, the Earth's original core-mantle conjunction was ruptured and along the ruptured surface a void zone was developed which gradually grew into a pseudo-fluid geosphere, i.e., the Earth's fluid outer core as shown in (Figures 2 and 3b,c). Such disposition of the planet would give rise to the phenomenon of reverse gravity in its deep interior generating low temperature and low pressure zones in the Earth's inner core and deeper regions. After development of a broad pseudo-fluid or virtually void geosphere, the iron-core would remain within it in a suspended condition (Figure 3d). Hence, at this stage, in response to extra-terrestrial magnetic influences new phenomena, like, polar wandering, pole reversal could take place, as documented over the global surface.
10. The present thesis considers that interaction of gravitational

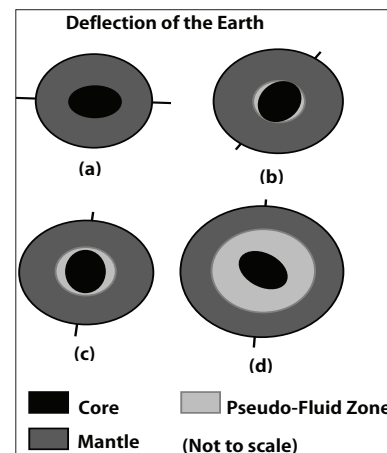


Figure 3: (a) Before expansion of the planet, the solid iron core and semi-fluid mantle were juxtaposed to each other. (b) Due to expansion the original core-mantle conjunction was ruptured and along the ruptured surface a void zone was developed which gradually grew into a pseudo-fluid geosphere, i.e., the Earth's fluid outer core. (c) This view supports that due to occurrence of two geospheres of rocky and metallic composition, separated by a non-solid and virtually void zone, the phenomenon of reverse gravity in the planet's deep interior and core would develop generating low temperature and low pressure condition in the Earth's, magnetic iron core and deeper parts. (d) After development of the broad pseudo-fluid geosphere the iron-core would remain within it in a suspended condition when in response to extra-terrestrial magnetic influences, new geomagnetic phenomena, like, polar wandering and pole reversal would take place.

forces from upper and lower parts of the mantle would generate a compressed zone towards the middle part of this geosphere which, due to interaction with the Moon's gravitational attraction, would be periodically disturbed thereby generating frictional heat or the perennial energy of the Earth (Figure 2).

Conclusion

Based on the expansion-based global tectonics it has been concluded that the Earth is an expanded planet which was originally small and devoid of oceans. Hence, at the primordial stage when the planet was small and ocean-less, owing to association of ocean-forming water its mantle was considerable fluid. It was due to gravitational pull from an external source the planet Earth was expanded causing rupture of the original core-mantle conjunction, along which gradually a void or pseudo fluid geosphere was opened up. Because of the new setup of occurrence of thick and virtually void zone between basaltic mantle and inner core, in addition to inwardly directed normal gravitational force, the phenomenon of upwardly directed reverse gravity would develop in the Earth's deep interior, in consequence of which, temperature and pressure condition at inner core region would be sufficiently low. Thus, inner core can be considered to be a huge magnet which due to opening up of a virtually void or pseudo-fluid geosphere, remained within it in suspended condition and in response to external magnetic influences started new magnetic phenomena of polar wandering and pole reversal. Over the crustal surface of the Earth, owing to expansion several cracks were formed through which extensive discharge of basaltic magma took place forming a number of ocean basins. With further expansion of the planet caused by bulging of the mantle, molten magma continued to erupt associated with emission of water-rich volatiles. While the magma spread on both sides of the expansion cracks or mid-oceanic ridges causing enlargement of ocean basins, the water-rich volatiles on condensation filled up the ocean basins. While the early Earth grew

bigger due to bulging of the original semi-fluid mantle, moisture-enriched volatiles that emitted accompanied by widespread disgorge of molten magma, on condensation as water filled up the ocean basins. The process simultaneously caused dehydration of the mantle, which eventually turned into a solid body when further expansion of the planet was ceased.”

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