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Continental Drift and Plate Tectonics Vis-a-Vis Earth's Expansion: Probing the Missing Links for Understanding the Total Earth System

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Diverse hypotheses like continental drift, plate tectonics or earth's expansion should not be considered as viable in view of solid and rigid state of mantle which, in contrast, would resist such phenomena. Based on Hilgenberg's model of earth's expansion (1933), the author elucidates that before expansion when the earth was small and devoid of oceans, its mantle must have been sufficiently fluid owing to association of the ocean-forming water. Further, matching thickness of fluid outer core and extent radial expansion of the earth strongly supports that the outer core was opened up as a void geosphere owing to planetary expansion. At the deep interior of the planet, owing to occurrence of a void or pseudo-fluid geosphere separating basaltic mantle and solid iron core, an additional force of reverse gravity would be developed acting in opposite direction of normal inwardly directed force of gravity. This postulation leads us to consider that in the deep interior of the planet an upwardly directed force of gravitational attraction would act in a predominant manner, thereby sustaining sufficiently low temperature and pressure condition and magnetic nature of the inner core which completely agrees with observed features of terrestrial magnetism.

Over the earth's surface due to expansion the basaltic crustal layer was fragmented and through the expansion cracks widespread incidences of magma emission occurred forming rudimentary ocean basins. With further expansion these basins were expanded and simultaneously filled up with water that degassed from the mantle associated with the process of magma emission while owing to desiccation, the mantle itself eventually turned into a rigid body. Before expansion of the planet when the iron core and the mantle were juxtaposed to each other, due to external magnetic influence the magnetic iron core was deflected causing major change in polar and equatorial disposition of the planet. Subsequently in younger geological period when due to expansion a major void geosphere was opened up between the iron core and mantle, external magnetic influences caused the magnetic core to execute smooth revolutions. Such revolutions would give rise to new magnetic phenomena like pole reversal and polar wandering that are precisely documented in the planet's various younger strata. It may be pointed out that while due to expansion, the segregated continental fragments would tend to move away from one another, owing to rotation of the planet along its axis of rotation some continental fragments came closer to each other or even collided forming mountain ranges.

Biography

Subhasis Sen, Date of Birth: 9 March, 1936, M Sc from Jadavpur University in 1960, Ph D from Nagpur university in 1974, from 1961 to 1996 worked in Central Fuel Research Institute under Council of Scientific & Industrial Research as a Scientist, retired in 1996 and since then working on various fundamental problems of earth and planetary sciences, published more than 160 papers and two books entitled 'Earth - The Planet Extraordinary' (Allied Publishers, New Delhi) and 'Decoding the Solar System' (Author House, London), developed a new concept of global tectonics termed 'unified global tectonics' for understanding earth and other planets of the Solar System, recipient of "Bharat Joyti Award" in 2013 instituted by India International Friendship Society, New Delhi.

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