

Expansion-Oriented View On Origin of Oceans

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Abstract

Both the concepts of plate tectonics and continental drift conceive that the planet earth's dimension, associated with its oceans, has remained unchanged throughout the past geological periods. In contrast, Hilgenberg's model of earth expansion endorses that initially the planet was considerably small and devoid of oceans [1]. Based on earth expansion theory the author has pointed out that since the primordial condensed or small earth was devoid of oceans, initially the ocean-forming water must have been associated with the mantle, thereby turning that geosphere considerably fluid and pre-eminently suitable for planetary expansion. Expansion of the planet appears to have been caused owing to swelling up of the semi-fluid mantle in response to an external gravitational pull caused by an extra-terrestrial planetary body, probably the Moon. The primordial earth was completely covered with a relatively thin granitic crust, which, due to swelling up of the mantle developed a number of long and sinuous expansion cracks. Through these expansion cracks widespread eruption of molten magma took place spreading on both sides of the cracks to form rudimentary oceans basins. With continued expansion, the dimension of the oceans was broadened while the expansion cracks turned in to mid-oceanic ridges. Associated with expulsion of molten lava, large quantum of volatiles, chiefly constituted of water was released from the mantle that formed the ocean water while due to desiccation of the mantle, the process of expansion was eventually stopped.

Introduction

Compared to the 29% of total land surface over the earth's crust, ocean and other major bodies containing water counts amazingly high figure of nearly 71%. For understanding the planet earth, therefore, origin of its predominant surface feature should play a significant role. In consideration of topography from continental shore to ocean prevalent concepts consider occurrence of several distinct zones with in oceans which are Continental Shelf, Continental Slope, Continental Rise, Abyssal Plain and, usually situated far away from the coastal zone, Oceanic Ridge. Besides these there are a few other types of topographically distinguishable zones with distinct features, such as, Submarine Canyon, Abyssal Hill, Guyot, Trenches, Island Arc, and Volcanic Arc etc. Apart from this division, the present popular concept of plate tectonics which is currently reigning geological sciences, reckons presence of a few more oceanic topographical features.

Diverse Views on Origin of Oceans

There are diverse views on origin of oceans, including certain bizarre ideas which strictly on the parameter of scientific investigation fail to explain the earth's surface dichotomy with overwhelmingly vast expanse of ocean bodies. One of the earliest views on origin of ocean was put forward by George H. Darwin – son of Charles Darwin of evolution of species – who in 1882 considered that it was due to a chunk of matter that was thrown out of earth,

the planet's satellite Moon was formed while the void that was thus produced over the terrestrial surface resulted in formation of the Pacific Ocean [2]. Obviously from the scientific standpoint George Darwin's concept as well as a few other bizarre concepts were rejected [3]. Yet, much confusion still prevails on origin of oceans as well as origin of water on global surface. Amongst the diverse opinions some consider that oceans were there on earth's surface along with the continents from the beginning while some consider that oceans were opened up during relatively younger geological period. Yet there is another opinion that water came to earth's surface from extra-terrestrial bodies like meteorites. In the present paper based on earth expansion theory the author has tried to explain that water surfaced over the terrestrial crust from the planet's own internal source triggered by planetary expansion.

Discussion

Alfred Wegener's concept of continental drift, though gained popularity, could not explain several crucial features on origin of oceans, especially, as his view was based on rigid state of the mantle [4]. The suitable condition of the mantle for expansion can rationally be explained only with the help of earth expansion theory since this theory conceives the original small earth to be devoid of oceans. In that case the ocean-forming water, at the pre-expansion stage of the planet, must have been associated with the mantle – a condition that would impart considerable fluid characteristics to

the geosphere. The most serious constraint on substratum of crustal layer of the earth, namely, the rigid condition of mantle would resist continental drift while the radial expansion of the ocean-less planet with semi-fluid mantle would support earth's expansion.

Author's concept of unified global tectonics has been developed based principally on the concept of earth expansion theory as deuced by Hilgenberg of Germany in 1933 [5, 6]. The concept of earth's expansion has been supported by various scientists [7]. Hilgenberg conceived that if the radius of the earth could be reduced to two-third of its present thickness, all the continental fragments would be perfectly adjusted in the resultant small globe which would be devoid of oceans. The present author considers that under such a set up the ocean-forming water would be associated with the mantle, thereby turning that geosphere semi-fluid in nature and, hence, suitable for expansion or similar mobilistic phenomena. An outline of the concept of unified global tectonics pointing out the major changes that took place over the surface as well as interior of the primordial ocean-less earth, especially outlining origin of oceans, continental fragmentation and drift has been given below.

The view of semi-fluid primordial mantle has been based on the results of experimental studies conducted by Roy and Tuttle confirming depression of melting point of silicate rocks under hydrothermal and high-pressure condition [8]. It may be presumed that the reason of earth's expansion is the gravitational pull exerted by the Moon causing periodical bulging of the semi-fluid mantle. However, with progress of the process due to escape of volatiles consisting chiefly of water, the ocean basins would be filled up with water, simultaneously reducing the fluidity of the mantle which would eventually turn into a rigid geosphere.

It appears that the Moon was originally an independent small planet which was captured by the earth when it was approaching the latter. Eventually the former turned into the solitary satellite of the

earth. Due to tidal bulging of semi-fluid mantle, the solid sialic crust was cracked forming a number of continental fragments of sialic composition. Through these expansion cracks basic and ultra-basic magma emitted which with further bulging or expansion of the planet continued to spread over the gap developed between the segregated continental fragments. In this manner ocean formation took place while the expansion cracks eventually turned into mid-oceanic ridges [9].

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