

## THE EARTH'S DEGASSING, ROTATION AND EXPANSION AS SOURCES OF GLOBAL TECTONICS

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**Abstract.** Several specific structural features are typical for the Earth. Like other planets it is divided into two hemispheres with different relief: the Pacific hemisphere with the lowered relief and thin oceanic crust, and the continental hemisphere with a raised relief and a thick continental crust. This division is outlined by the Benioff zone ring around the Pacific Ocean. Another regularity is a system of the oceanic ridges forming a ring around Antarctica with regular sprigs of mid-oceanic ridges. The origin of these regular structures contradicts to chaotic movement of the lithosphere plates but it may be explained by the fluids-rotation concept proposed by the author. The conception supposes two main energy sources of the global tectonics: the degasification of the Earth (the fluids advection) and the Earth's rotation. Three basic stages of the tectonosphere formation are distinguished by the conception. Judging by the paleomagnetic data in Archean-Proterozoic several continents were formed in the southern hemisphere. The geochemical studies show that the thick continental tectonosphere (continental roots) was formed in from the mantle matter with a high content of fluids and it means that the intensive deep fluid flow has been at that time in the southern hemisphere. The formation of the thick tectonosphere has led to asymmetry of the planet and to the relative displacement of the mass centers of the Earth's spheres. That resulted in mantle turning around the core in Paleozoic with the movement of the continental hemisphere to the north. The mantle rotation around the core created a new nonequilibrium system. Therefore in Mesozoic era an expansion of the southern hemisphere began. Such expansion resulted in the regular system of the mid-oceanic ridges symmetrical to the Antarctica.

**Key words:** *Earth rotation, fluids, geospheres, continents, oceans, geodynamics.*

### Introduction

The plate tectonics concept is still the most popular concept. It explains the geological processes as the paleomagnetic pole mobility, the formation of the orogens and rift systems by the large scale drift of the lithosphere plates. The ocean formation is explained by the spreading of the lithosphere in the regions of mid-ocean ridges and its subduction beneath the active margins of the continents. But the concept can not explain why the subduction is observed only within the Pacific Ring, and how the observed ancient subcontinental crust was formed in the oceans. Many other contradictions between the plate tectonics concept and the experimental data are widely discussed in many articles (Meyerhoff and Meyerhoff, 1974; Beloussov, 1979; Grant, 1980; Barto-Kyriakidis, 1990; Dickins et al., 1992; Meyerhoff et al., 1992; Dickins, 1994; Storetvedt, 1997; 2003; Pavlenkova, 1995, 1998; Pran, 2000; Shalpo, 2002) and in the special international journal *New Concepts in Global Tectonics Newsletter*. The main conclusion of all these publications is that the plate tectonics cannot be used as the basic tenets of the global geodynamics, and other models should be developed to explain the observed geological and geophysical data.

There are some other concepts of the global tectonics, but they consider most often some limited amount of data or individual events, without linking them in with each other. The most of them do not consider the sources of the global processes and their origins. Thus, the hypothesis of the expanding Earth (Scalera and Jacob, 2003) explains the formation of the oceans by the rupture and spreading of the continents without the subduction. But the expansion sources are not clarified. There are also not enough foundations of such large expansion possibility during the short period of time (from the late Paleozoic). The endogenous regime concept (Beloussov, 1990) on the contrary considers mainly the processes within the continents without touching the problems of the oceans. The wrench theory by Storetvedt (1997 and 2003) overcomes many weak points of the plate tectonics and describes in detail the results of the continent rotations but the origin and the scale of this rotation are problematic. The concept of the plume tectonics considers only some abnormal tectonic activity in the local regions and does not address other problems. In many concepts the observed tectonic evidences are rarely considered with the common energy sources and a little

# New Concepts In Global Tectonics

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## **Table of Contents New Concepts In Global Tectonics**

1. Understanding the eBook New Concepts In Global Tectonics
  - The Rise of Digital Reading New Concepts In Global Tectonics
  - Advantages of eBooks Over Traditional Books
2. Identifying New Concepts In Global Tectonics
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an New Concepts In Global Tectonics
  - User-Friendly Interface
4. Exploring eBook Recommendations from New Concepts In Global Tectonics
  - Personalized Recommendations
  - New Concepts In Global Tectonics User Reviews and Ratings
  - New Concepts In Global Tectonics and Bestseller Lists
5. Accessing New Concepts In Global Tectonics Free and Paid eBooks
  - New Concepts In Global Tectonics Public Domain eBooks
  - New Concepts In Global Tectonics eBook Subscription Services

- New Concepts In Global Tectonics Budget-Friendly Options
- 6. Navigating New Concepts In Global Tectonics eBook Formats
  - ePub, PDF, MOBI, and More
  - New Concepts In Global Tectonics Compatibility with Devices
  - New Concepts In Global Tectonics Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of New Concepts In Global Tectonics
  - Highlighting and Note-Taking New Concepts In Global Tectonics
  - Interactive Elements New Concepts In Global Tectonics
- 8. Staying Engaged with New Concepts In Global Tectonics
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers New Concepts In Global Tectonics
- 9. Balancing eBooks and Physical Books New Concepts In Global Tectonics
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection New Concepts In Global Tectonics
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine New Concepts In Global Tectonics
  - Setting Reading Goals New Concepts In Global Tectonics
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of New Concepts In Global Tectonics
  - Fact-Checking eBook Content of New Concepts In Global Tectonics
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
- 14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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