

Rifting, geotectonic cyclicity and pulsations of the Earth

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Rifting is the process of horizontal crust extension concentrated in the narrow linear zones, expressed in development of faults, wrench faults and gaps and formation of graben-like depressions (rift zones) and their systems. The full break up of crust leads to transformation of rifting into spreading. More or less typical rifting took place beginning from early Proterozoic, i.e. during last 2,6 billion y. It was manifested interruptedly in time, in the form of separate impulses - rifting phases. The spreading increased during them. With the global phases of rifting and spreading there were connected the phases of basaltic volcanism activation, tectonoeustatic ocean level rises, peneplanation of continents and (in any case in Mesocenozoic) - decrease in geomagnetic inversions frequency etc. These phases alternated with global phases of the crust compression and contraction intensification - folding phases, controlled by multiorder geotectonic cyclicity. The hierarchic system of tectonic cycles includes the supercycles (1-1,3 billion y.), megacycles (300-500 mln y.), cycles of 1. order, or Bertrand cycles (50-200 mln y.), cycles of 2. order, or Stille cycles (2-20 mln y.) and cycles of higher orders (up to 10-20 years).

The existence of multiorder geotectonic cyclicity represented in the superposition of cycles which begin with the activation of the crust extension processes (rifting, spreading etc.) and complete with the same of contractional ones there is impossible to adjust with the postulate on the Earth volume constancy laying in the base of plate tectonic concept, but it is in the consent with the idea on the Earth pulsations of different ranks, scale and duration. Such pulsations are peculiar not only for Earth, but for many cosmic bodies including Sun. In so far as geopulsations are well correlating with the changes in the geomagnetic reversals frequency, we believe that they are controlled by cyclic processes proceeding in the Earth liquid upper core and near its boundary with lower mantle.