CONTINENTAL ENDOGENOUS REGIMES By V. V. Beloussov, Translated from the Russian by V. Agranat and Yu. Prizov. Mir Publishers, Moscow (1981) 295 pages, 82 figs., price not quoted.

In this short treatise on endogenous regimes of continents, Beloussov follows the conventional tectonic classification of basins attempted by Hall, Dana, Haug, Argand, Stille, Van Bemmelen, Kay, Aubouin and others. In his detailed analysis of the endogenous regimes of the continent he has clearly shown his preference for fixist concept as opposed to 'plate tectonics'. The discussion is restricted to the characteristics of continental endogenous regimes. It would have been better if continental margins had also been included since the rocks and structures on land extend into shelf beneath the sea.

In this book, Beloussov has proposed a classification of continental endogenous regimes based on different combinations of tectonic, igneous and metamorphic processes. He has distinguished geosynclinal, platform, orogenic, and rift regimes of magmatic platformal activization. These classes in turn are subdivided into fourteen regimes. In these, the eugeosynclinal and miogeosynclinal regimes show distinct stages of development termed preinversion, inversion and postinversion. All the regimes display definite rate and amplitude of oscillatory movements, well-defined relationship between subsidence and uplift, characteristic sedimentary facies, magmatism and metamorphism. The author also points out to a remarkable correlation between the properties of the regime and its associated heatflow, and to the variation in the energy of deepseated processes in the course of geological time.

The main geosynclinal regime of Beloussov comprises eugeosynclinal, miogeosynclinal, parageosynclinal and medium mass regimes. He identifies a lower molasse, mainly marine, forming part of the postinversion stage of eugeosynclinal and miogeosynclinal regimes as distinct from a separate upper molasse which forms part of orogenic and rift regimes representing continental facies.

The rise of mantle-derived basic and ultrabasic rocks is related to thermal excitation of the upper mantle at the preinversion stage of the eugeosynclinal regime. At the inversion stage of the eugeosynclinal and miogeosynclinal regimes all excitation is transferred into the crust with the development of high temperature metamorphism and anatexis. Beloussov is in favour of accepting Stille's idea that ultrabasic magmatism is only a particular case of initial magmatism which includes, in addition, basic, intermediate and acid magmas in the preinversion stage of eugeosyclinal development. This magmatic parameter of eugeosyncline is in contrast to the ophiolitic sequence in the plate tectonic model where it represents an oceanic crust with a definite sequential order.

The author discusses the history of various geosynclines drawing examples from all over the world.

Beloussov divides platform regime into protoplatforms, ancient and young platforms. The protoplatforms of the northern continents represent relatively small masses of the early epi-Archaean consolidation, occurring as 'insets' in the ancient platform basement where age is generally estimated to be epi-middle Proterozoic. In the Indian platform, Beloussov considers the volcano-sedimentary complexes of the Cuddapah and the Vindhyans (these names are wrongly spelt in the book) as Protoplatform covers. Shallow-water marine, continental and volcanogenic rocks, block tectonics and Diaschistic-metamorphic rejuvenation are some of the characteristics of Protoplatform stages.

Magmatic activization of platforms has occurred in pure forms not connected with major tectonic events on the surface. There are two independent regimes of magmatic activization of platforms. The plateau basalt or trap regime is characterised by outpourings of great amounts of very uniform tholeiite basalts with outpourings proceeding steadily through fissures and basaltic flows spreading over vast territories. The Deccan Basalt of India belongs to this category.

The other regime belongs to 'Central intrusions and explosion pipes' characterised by intrusives of various composition from ultrabasic and alkaline to acid and kimberlitic explosive pipes. It has a short span of magmatic activity and is restricted to ancient platforms with source in the deeper roots of volcanoes.

There is a close interrelationship among various endogenous regimes in time and space. Permobile, unstable protogeosynclinal and stable geosynclinal – platform are the three major stages. The end of Archaean era witnessed the division of the continental crust into an unstable arrangement of protogeosynclinal and protoplatforms, the former retaining the permobile conditions of the preceding stage. A transition from the unstable protogeosynclinal stage to the stable geosynclinal platform was marked by a division of the continental crust into ancient platforms and geosynclinal belts.

In the final chapter, the author deals with deep sources of endogenous regimes which are governed by heat conditions existing in the upper mantle and the crust. Beloussov's scheme of ophiolite development invokes a sequence starting with high heat excitation of the mantle, vigorous circulation of basaltic flows in the asthenosphere which entrain the blocks of the residual peridotite and carry them upward where peridotite after being cooled undergoes serpentinization with sharp fall in density and increase in volume and plasticity. The situation thus created leads to diapir-like deformations. The ophiolites tectonically intrude along faults and are liable to be compressed and squeezed between more compact and hard crustal blocks. He also tries to explain the mechanism of folding by tectonic uplifts, spreading of uplifted crustal blocks and deep diapirism.

In conclusion, Beloussov criticises plate tectonics as 'antihistorical and based on accidental combinations of movements of separate crustal blocks, which at the investigator's will may meet, unite and separate . . . .'. This comment is rather harsh as we all know 'plate tectonics' is also based on regular events with definite schemes supported by geophysical and geodynamic evidences. There are, however, many rather fundamental observations and interpretations in Beloussov's endogenous regimes which can be recognised in plate tectonics and this calls for an attempt at integration. His obsessive insistence on vertical tectonics masks many of his useful ideas.

The book represents interesting reading despite straightforward translation and hard presentation. It is recommended for gaining knowledge of the 'other view'.

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