

Ideas concerning the integration of the Romanian territory into the plate-tectonics concept

by

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The numerous geophysical data, have not been used up to now to develop a plate-tectonics concept of the territories of Romania. The presence of Benioff (one along the Eastern Carpathians, another, parallel to the first, in the Apuseni Mountains (SOCODESCU *et al.*, 1964) presence of a subduction process in the Vrancea region, which intersects the crust and affects the upper mantle under an angle of 55-60° in the NW direction (defined on the basis of the Vrancea earthquake foci distribution [CONSTANTINESCU *et al.*]; the crustal fracture system inscribed on the map of the deep geological structure of Romania [GAVAT *et al.*], of which the Dobrudja appears to be integrated in a probable plan of transformation faults of Prejurassic age, and, the synthesis of the geodynamics of the Carpathian-Balkan-Dinaric area in which subcrustal convection currents are admitted as causal factors of the "Meridional wrenchfault".

Up to the present two geological patterns were parallelly developed regarding the plate-tectonics concept, and which, are lacking geophysical arguments.

One [6, 7] is based on the presence of two linear zones in the Carpathian area with almost parallel bands of basic rocks of intermediate composition and of volcanic (Neogene) rocks. The age of the eruptive rock sequence permits to presume the presence of two intracontinental basins with ocean-type floor, active from the Triassic to the Cretaceous. It is assumed that the intracontinental basins (an outer one, on the Eastern Carpathians' area; an inner one in the Apuseni Mountains) were formed through the splitting of the southern edge of the Euroasian plate and that the westwards subduction of the oceanic-type crust beneath the continental blocks has generated the intermediate-composition igneous rocks. Rebuilding the geological evolution of both basins, the authors admit that the essential elements of the present geological structures do not contradict by their hypothesis, although the sedimentation areas have evolved on an oceanic-type crust.

The second geological pattern [8] considers the evolution of the Carpathian territory before and after the Miocene, to have occurred in a series of structural zones, closely identified with the present island arc regions. There were distinguished : an more or less active outer trench; a frontal folded mountain arc; a Tertiary magmatic arc and Transcarpathian retroarc basins (Pannonian and Transylvanian, the latter as interarc). The K_2O/SiO_2 ratio of the rocks in the Tertiary magmatic arc permitted establish a perfect similitude with the calc-alkaline magmas in the island arcs.

In agreement with the authors' appreciations, both the geological patterns are liable to essential improvements, which we see achieved only by a sensible integration of all the geophysical existing and potentially elements.

References

- [1] SOCOLESCU (M.), POPOVICI (D.), VISARION (M.), ROȘCA (V.), 1964. — Structure of the Earth crust in Romania as based on the gravimetric data. *Rev. roum. géol., géophys., géogr., Sér. Géophys.*, **8**, 3, p. 13.

Rapp. Comm. int. Mer Médit., **23**, 4a, pp. 167-168 (1975).

- [2] CONSTANTINESCU (L.), CORNEA (I.) & LĂZĂRESCU (V.), 1973. — An approach to the seismotectonics of the Romanian Eastern Carpathians. *Rev. roum. géol., géophys., géogr., Sér. Géophys.*, **17**, 2, p. 133.
- [3] GAVĂT (I.), AIRINEI (ȘT.), BOTEZATU (R.), SOCOLESCU (M.), STOENESCU (S.C.) & VENCOV (I.), 1965. — Contributions de la gravimétrie et de la magnétométrie à l'étude de la structure profonde du territoire de la R.P. Roumaine. *Rev. roum. géol., géophys., géogr.*, **9**, 1, p. 81.
- [4] AIRINEI (ȘT.), 1973. — L'appartenance de quatre dislocations crustales dobrogéennes à un probable système de failles de transformation d'âge préjurassique. *Rapp. Comm. int. Mer Médit.*, **22**, 2a, p. 158.
- [5] CIOCĂRDEL (R.) & SOCOLESCU (M.) (1972). — Aspects of the Carpathian — Balkanic — Dinaric and Central Mediterranean areas geodinamics. *Rev. roum. géol., géophys., géogr., Sér. Géophys.*, **16**, 2, p. 179.
- [6] RĂDULESCU (P.D.) & SĂNDULESCU (M.), 1973. — The plate-tectonics concept and the geological structure of the Carpathian. *Tectonophysics*, **16**, p. 155.
- [7] RĂDULESCU (P.D.), 1973. — Plate-tectonics in Tertiary volcanic areas. An example : The Carpathians (preprint). *International Symposium on Volcanism and Associated Metallogenesis*, 3-8 September 1973, Bucarest.
- [8] BLEAHU (M.), BOCALETTI (M.), MANETTI (P.) & PELTZ (S.), 1973. — Neogene Carpathian Arc : A continental arc displaying the features of an 'Island Arc'. *Jour. Geophys. Res.*, **78**, 23, pp. 5025.