Structure of the Eastern part of the Cyprus Arc

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During the first "Training through Research" cruise (*R/V "Gelendzhik"*, 1991) the eastern part of the Cyprus Arc was investigated by gravity and magnetic survey, as well as high resolution seismics. Two- and three dimensional gravity modelling of the intensive ΔG_B anomaly over Cyprus has been fulfilled on the base of data already available and newly obtained. The modelling allowed to define a position of the main density boundaries in the Earth's crust and geometry of the anomaly-forming body. The results of gravity modelling, justified by accompanying magnetic modelling, show that a large ophiolite body has been emplaced here into continental crust. The lower body boundary is situated at the depth of about 10 km, the upper boundary rises from east to west from 9.5 km depth and outcrops as the Troodos Massif in Cyprus. West of Cyprus this ophiolite body is cut by a deep fault.

The modern southern boundary of the Turkish Plate in the studied area passes between Cyprus and Eratosthenes Rise, along the Hecataeus Ridge south flank and its eastern continuation, the West Tartus Ridge, that has been traced till the Syrian upper continental slope. A pattern of gravity field, thickness and composition of the Earth's crust and mode of sedimentary cover deformation change sharply across this plate boundary.

No signs of subduction of the African lithosphere have been recorded along the West Tartus Ridge. The ridge was interpreted as a large steeply south- and southeastward thrusted sheet likely to be made up of the Palaeogene sedimentary rocks (Fig. 1). The Messinian evaporites pinch out against the ridge slopes. The similar but not so extensive thrust structures were found to the North, between the West Tartus Ridge and underwater prolongation of the Kyrenia Ridge. This system of southward thrusts orlginated possibly in the Oligocene-middle Miocene time, when the convergence of the African and European Plates was northwest directed (LETOUZEY, TREMOLIERES, 1980; RICOU, 1980; LIMONOV *et al.*, 1992). Since the late Miocene time, when the convergence direction became northeasterly, the thrust sheets suffered a lateral displacement along the wrench fault system stretching from Cyprus (BAGNALL, 1964) to Syria to form step-like configurations of their coastlines. All shear sheets are moving in general to the west, the value of westward displacement decreasing gradually from the southern sheet to northern one. Small pull-apart basins were formed inside some sheets due to latitudinal separate ophiolite bodies, rest on the deep fault (possibly deep dextral wrench fault) traced approximately from the Nile Delta into the Antalya Gulf. As a result of such kinematics the lateral crust shortering and ophiolite piling take place, reflected in intensive gravity high over Cyprus.

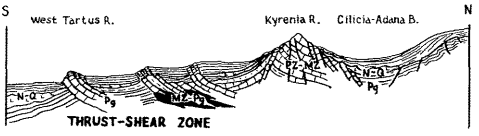

Fig. 1.- Schematic geological cross-section of the Cyprus Arc along 34°40'E.

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