CYPRUS ARC: STRUCTURE AND EVOLUTION

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Abstract:The Cyprus Arc system is a well defined,presently active, plate boundary and the Cyprus Trench displays ample evidence of nortwards underthrusting.The model of anticlockwise rotation of the Cyprus block satisfactorily explains the observed shallow structure.

Résumé: Le système de l'Arc de Chypre est un "plate boundary" bien défini et actuellement actif; le fossé donne plusieurs preuves de la subduction suivant la direction nord. Le modèle de bloc de Chypre, qui suit une rotation inverse à celle des aiguilles d'une montre, explique de manière satisfaisante la structure peu profonde de la région.

The Cyprus Arc system is a well defined,presently active plate boundary and a critical area for the evolution of the Eastern Mediterranean Sea.The present study utilizes available seismic reflection profiles in order to establish the main tectonic features of the arc. The Cyprus block is bounded to the south by the Cyprus-Pytheus Trenches and to the north by the Misis-Kyrenia-Gulf of Antalya fault zone.To the east it is truncated by the northern segment of the Dead Sea Transform system and to the west by the Cape Gelidonya-Anaximander Mountains strike-slip fault line.The Cyprus Trench displays ample evidence of nortwards underthrusting and development of a rudimentary subduction complex,with small accretionary and perched basins on the inner wall.Subduction appears to have been activated first in the eastern sector of the Cyprus Trench around the Middle Miocene; this sector now appears to be less active than the rest of the Cyprus Trench.The Cyprus Trench appears to have established a tectonic connection with the Dead Sea Rift system via a right-lateral,mainly transtensional fault system which passes eastwards into the Hatay-Baer Bassit overthrust zone in Syria.To the West,the Cyprus Trench

is intersected by the Pytheus Trench which is presently not very active and is tentatively associated with a mainly transtensional right-lateral strike-slip zone.However,a more transpressional regime appears to exist near the NW and SE ends of the Pytheus Trench,as manifested by the drastic uplift of the Anaximander Mountains and the SE end of the Florence Rise.The Cape Gelidonya-Anaximander Mountains fault line,appears to involve right-lateral strike-slip movement.This fault line divides the Anaximander Mountains into WNW and ESE domains,the latter having undergone dip-slip displacement that is significantly greater than its strike-slip displacement,suggesting that rotational mechanisms also may be involved.

The difference of movement between the sinistral Strabo and the dextral Pytheus Trench sectors appears to be accomodated at the junction of the two Trenches by the northward thrusting of the Mediterranean Ridge over the southern margin of the Rhodes Basin and by the transpressional regime evident in the WNW Anaximander Mountains domain, as well as in the ESE domain,which may be locally overthrust southwards over the Pytheus Trench.

The model of anticlockwise rotation of the Cyprus block(Robertson and Woodcock,1980) satisfactorily accounts for the observed shallow structural deformation of the post Middle-Miocene sediments.The balance of evidence suggests that this rotation was initiated around the Middle Miocene and that the major movement of the Cyprus block took place along the Misis-Kyrenia-Antalya Gulf sinistral zone. During rotation of the wedge-shaped Cyprus block a trench complex (Pytheus-Cyprus Trenches) formed along its leading edge and the subduction of the fossil oceanic crust of the easternmost Mediterranean sea was initiated.

REFERENCES

Robertson,A.H.F. and Woodcock,N.H.,1980. Tectonic setting of the Troodos massif in the east Mediterranean.In"Ophiolites",Proceedings Internatinal Symposium Cyprus 1979,Cyprus Geological Survey Dept., pp. 36-49.