Cross-folding on West Aegean Islands and the Problem of the Connections between the Alpine Mountain Belts of Greece and Turkey

by

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The Hellenide orogenic system connects the alpine chains of the Balkan Peninsula with the mountain belt of Anatolia. For the Hellenides, a zonal division on the basis of stratigraphy, facies, and tectonic history has been created by C. RENZ and worked out mainly by French authors. The external Ionian miogeosynclinal zone may be compared with the deepest nappes of the Western Taurides [KUSS & THORBECKE 1974], and the Menderes Massif is surely a prolongation of the Cyclades Massif of the Pelagonian Zone at least to Turkey. Other parallels of Hellenide and Anatolian elements are more tentative or wrong. The Vardar Zone e.g. cannot be clearly persued to Turkey.

Giving special attention to orogenic connections between Greece and Turkey the authors investigated the stratigraphy and the tectonic style of the Northern Sporades and Psara. They found a sedimentary passage between the weakly metamorphized Mesozoic sediments of the Pelagonian Zone and the Almopias Zone (western part of the Vardar Zone) on the island of Skopelos, which is also based on the stratigraphical data of PAPASTAMATIOU [1963] and KELEPERTSIS [1973]. This transition is exposed south of the North Anatolian Fault — in the North Aegean Sea the southern border of the Saros Graben — which runs into the huge fault bordering the Vardar Zone to the W.

The predominant tectonic phenomenon of the western and central islands is a crossing between two systems of folds with NNW- and NE-striking axes. The first one has deformed a bedding-parallel schistosity whereas the second is accompanied by a second axial-plane schistosity and in consequence it must be younger. Both fold-systems and schistosities are younger than the Upper Cretaceous-Palaeogene flysch. On the eastern and southern North Sporades as well as in the autochthonous parts of Psara and Chios and on the island of Lesbos, only one NE-striking fold system with one conjugate schistosity could be observed.

The cross-folded area belongs to a large region of cross-folding within the very interior of a narrow fold arc coming from Anatolia between the Rhodope and the Menderes Massifs which crosses the inner zones of the Hellenides before it swings into the NNE strike of the Hellenides in Central Greece and on the northeastern Peloponnesus. The cross-Folding is probably due to extreme lateral shortening of the crust within this Central Aegean Arc which is of late Palaeogene age. This arc is independent of the probably younger Crete Arc since they have different andesitic zones.

With respect to recent transcurrent movements along the North Anatolian Fault and the western border of the Vardar Zone (according to Ritsema), it may be supposed that the Rhodope Block is escaping this narrow bending Central Aegean Arc from the Middle Tertiary to recent times.

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