

A geological study of the history and of the geodynamic processes during the Late Cenozoic in the Aegean Sea area

by

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Abstract.— The recent geodynamic development of the Aegean Sea area can be divided into 5 main intervals: Early Miocene (Burdigalian, Aquitanian)/ Middle Miocene (Langhian, Serravalhian)/ Late Miocene (Tortonian, Messinian)/ Pliocene and Early Pleistocene/ Late Pleistocene and Holocene. Each interval started with a fundamental palaeogeographic revolution which was probably caused by phenomena in the lower earth crust or the upper mantle.

Résumé.— Le développement géodynamique récent de la région d'Égée peut être divisé en 5 intervalles principaux: Miocène inférieur (Burdigalien, Aquitanien)/ Miocène moyen (Langhien, Serravalhien)/ Miocène supérieur (Tortonien, Messinien)/ Pliocène et Pléistocène inférieur/ Pléistocène supérieur et Holocène. Chaque intervalle a commencé avec une révolution paléogéographique dont l'origine peut être attribuée aux phénomènes de la croûte inférieure ou du manteau supérieur.

1. Early Miocene revolution

With the completion of the main Alpine orogenic folding the Aegean Sea area was raised above sea level and was connected with a European mainland in the north. Increasing uplifting together with compression predominated.

2. Middle Miocene revolution

Continuous rather slow but variable uplifting of the Aegean landmass was accompanied by dilatation and extensive fracturing predominately in N-S and E-W direction. Its center was probably in the Cyclades. Block-raising was accompanied by simultaneous erosion which regionally led to an uplifting of plutonic rocks to the land surface. They are assumed to have been formed at about 10 000 m depth immediately before their uplifting. These differentiated vertical movements formed a basin and range landscape.

3. Late Miocene revolution.

A more or less base-levelled land surface was fractured by fault systems the main directions of which vary regionally. Parts of the Aegean landmass submerged in a "pre-Aegean" trench, which probably connected the Tethys near Crete with the Paratethys north of the Dardanelles and separated a western from an eastern Aegean landmass.

4. Pliocene and Early Pleistocene revolution

Differentiated vertical movements took place along normal and reverse faults and locally caused a folding of recent sediments. Especially within the "pre-Aegean" trench and in its immediate vicinity small blocks subsided so that the sea could advance further.

5. Late Pleistocene and Holocene revolution

The various Aegean blocks were broken up into numerous small and very small blocks by fault systems which were probably produced by a considerable extension of the whole area. Afterwards, a differentiated and partly enormous subsidence took place, so that the sea could invade the major part of the area; this was how the present archipelago was formed.

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