

Geochronological Data on Granitic Rocks of the Aegean Sea
Preliminary Results

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Abstract. New radiometric age determinations on granitic rocks of the Attic-Cycladic Crystalline Complex are recorded. It is demonstrated that a Paleogene high-pressure metamorphism became overprinted by high-temperature metamorphism and related plutonism in Miocene times. A model for the geodynamic evolution of the area is suggested.

Résumé. Des datations récentes K-Ar et Rb-Sr de granites du complex cristallin des Cyclades ont toutes donné des âges correspondants au Miocène. La signification géologique de ces dates est le thème de la discussion. - Une métamorphose à haute pression a eu lieu pendant le paléogène; une plutonisme acide lié à une métamorphose à haute degré a atteint son apogée au miocène. - On donne un modèle pour le développement géodynamique du centre de la mer Egée pendant le tertiaire.

Most of the granitic intrusives outcropping in the central Aegean area are part of the Attic-Cycladic Crystalline Complex (e.g. the granites of Laurium, Seriphos, Tinos, Paros, Naxos, Mykonos, Ikaria, Keros). The question of their age is closely related to the question of the age of their metamorphic country rocks. South

of this crystalline area some granitic rocks can be found which intruded into higher tectonic units (e.g. the granites of Hermion, Anaphi, Kos). These granites may be allochthonous (part of the nappes) or they may be intruded after emplacement of the nappes. Rb-Sr and K-Ar determinations on whole-rocks and on minerals of granites from Seriphos, Tinos, Mykonos, Ikaria, and Kos exclusively yielded Upper Miocene dates. These dates are in agreement with the results of ANDRIESEN et al. (1976) on Naxos, with the age of the granodiorite of Laurium, reported by MARINOS (1971), and with geological data for Keros (DÜRR, pers. communication). Barrowian metamorphism and related plutonism in the central Aegean Sea are therefore believed to have a climax in Upper Miocene times, partly overprinting a Paleogene high-pressure metamorphism (ALTHERR et al., this volume).

Petrographic analyses of the (contact) metamorphic mineral assemblages indicate, that Barrowian metamorphism, migmatization, and intrusion of granitoid magmas took place at a depth up to 20 km (SCHUILLING, 1973; ALTHERR et al., 1976).

Subsequent uplift and erosion of the whole area amounted to 10-20 km and must have happened in a very limited time span, still within the Upper Miocene, as indicated by radiometric dating on minerals and overlying autochthonous Neogene (BESENECKER and OTTE, in prep.; ROESLER, in prep.). Uplift and erosion were immediately followed by the nappe like emplacement of non-metamorphic rocks (e.g. on Naxos, Mykonos, Kos).

References:

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- ALTHERR, KELLER and KOTT: Bull. Soc. géol. France (7), 18, 403-412, 1976.