"The Fractural Pattern of the Aegean Basin"

Bernd MEISSNER[x], Volker JACOBSHAGEN[x] and Peter KRONBERG[xx]

x) Institut für Geologie der Freien Universität Berlin, Altenstein-Str. 34A, D-1000 Berlin 33

xx) Institut für Geologie und Paläontologie der Technischen Universität Clausthal, Leibniz-Str. 10, D-3392, Clausthal-Zellerfeld 1, Western Germany.

Résumé : Dans la région égéenne des fractures en directions NW, NNW, NE et ENE, localement aussi E/W et N/S, sont prédominantes. Des accidents majeurs sont alignés en plusieurs "arcs fracturaux" parallèles à l'arc insulaire Hellénique. Ils témoignent d'une compression laterale en alternance avec les mouvements d'extension prédominants dans le Cénozoique supérieur. Ce résultat pourrait correspondre à l'hypothèse des "arcs induits" proposée par BRUNN (1976).

The fractural pattern of the central and southern parts of the Aegean region was analysed by different methods:

- For the continental and island areas, a map of satellite lineations drawn by KRONBERG & GÜNTHER was locally completed and checked by the interpretation of aerial photographs in selected areas. Both evaluations were controlled in the field. The results of these 3-level investigations are complementary and partially overlapping.
- For the sea floor, only the major faults could be deduced from submarine morphology recorded in nautical isobath maps: Abrupt linear steepings in the submarine

relief were interpreted to be caused by active faults. The morphological analysis was complemented by the reflection seismic results of JONGSMA et al. (1977) and STANLEY & PERISSORATIS (1977).

In the whole region,two rectangular systems of fractures predominate: NW/SE and NE/SW on one hand and NNW/SSE and ENE/WSW on the other. Both are due to supraregional stress fields. Additionally, E/W fractures and locally N/S elements occur. Within the pattern of the major faults, the diagonal systems interfere with large "fractural arcs" parallel to the Hellenic island arc, the bordering faults of which do not prolongate into the limitations of the West Anatolian grabens, but meet them with a sudden change of their directions. These configurations as well as the narrow curvature of the arcs may be due to a lateral shortening of the crust which probably alternated with the predominant processes of distraction during the Upper Cenozoic. BRUNN's hypothesis of induced orogenic arcs may possibly serve for a geodynamic interpretation.

The uprisal of the south Aegean mantle dome did not produce a significant radial pattern of fractures. Probably, older fractures were revived by this process.

The centers of the South Aegean volcanic arc are situated on crossings of young fractures.

References

JONGSMA, D.; WISSMANN, G.; HINZ, K. & GARDÈ, S. (1977): Seismic studies in the Cretan Sea 2. The southern Aegean sea: an extensional marginal basin without sea floor spreading? - "Meteor" Forsch. Ergebnisse (C), 27:3-30.

STANLEY, D.J. & PERISSORATIS, C. (1977): Aegean Sea ridge barrier and basin sedimentation patterns.- Marine Geol., 24:97-107.