Some new aspects of the evolution of marginal seas deduced from observations in the Aegean region.

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It is shown that essential criteria defining an island arc are fulfilled in the Aegean region. Differences compared with most other island arcs are: Small dimensions of the arc. Thick, predominantly sialic crust and shallow water depth in the back arc sea. No typical oceanic crust and a huge sedimentary chain in front of the trench. A dominating nonvolcanic frontal arc. A poorly developed volcanic arc. A field of sialic islands behind the volcanic arc. A seismically well established low subcrustal velocity. Earthquake foci not deeper than 2oo km. As a unique case several alpidic orogenic belts can be traced all through the Aegean from the Dinarides to the Taurides. These differences are more of gradual than of principal character. According to Karig's classification the Aegean region is a young inactive island arc with high heat flow in a somewhat hampered state of development.

The frontal arc as well as the back arc islands have fully participated in the alpine orogeny with outward transport of nappes, flysh and molasse deposits and a deeply denudated cristalline massiv. It is postulated that a mountain range similar to the Dinarides existed in the Aegean at the end of the alpine orogeny. Since Tortonian erosion and subsidence with simultaneous widening and raising of the frontal arc took place. An already existing mountain range became desintegrated and destroyed. Why just here and not somewhere else in the Alpidic belt? The answer is that in course of the collision between the African and European plate this part of the Alpine chain became bordered at one side by a pseudooceanic crust, perhaps the remainder of a Thetyan ocean basin.

It can be shown that a mountain range, even in isostatic equilibrium, exerts strong horizontal stresses in the order of the weight of its topographic relief. It will flow apart if its internal strength is insufficient and if no counterforce is provided by adjacent large continental blocks. Low

strength is expected inside of a young mountain body with elevated temperature. This gravity induced disintegration is regarded the primary cause for the initiation of the island arc and marginal sea development. The eastern Mediterranean crust was first passively overridden. Subsequently the downgoing plate became actively pulling because of density increase by phase transformation. The rate of subduction is governed by the relative motion of Africa, Europe, and Anatolia and by the expansion of the Aegean sea. This expansion, in turn, is reinforced by upwelling mantle material displaced by the volume of the intruding downgoing lithosphere. In case of a preexisting gravity instability in the mantle an asthenospheric diapir iniciated by the disturbances in the lithosphere may rise and contributed as a third agent to the expansion of the Aegean. In principle this process may continue until equilibrium is achieved with the crust of the adjacent oceanic area. Because of the anomaleously thick crust in the eastern Mediterranean the expansion in the Aegean is limited and no true seafloor spreading occured.

Comparing the situation in the Aegean with other true marginal seas it becomes evident that in all cases the frontal island arc, even if only preserved in rudiments, merges continously into continental orogenic belts of Tertiary age. Therefore, it might be allowed to apply the evolution model of the Aegean Sea also to other marginal seas.