A large-scale tectonic model of the Tyrrhenian Sea

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Dans la mer Tyrrhénienne, il est possible de suivre la chaine alpine de la Corse à la Calabre à travers les seamounts centro-tyrrhéniens, où affleurent des métamorphites très semblables à celles de la Corse et de la Calabre. Les Alpes Tyrrhéniennes sont découpées et déplacées par des failles transformantes orientées E-O.

According to the geological and geophysical availabe data tree main tectonic units can be recognized in the Tyrrhenian Sea:

I) Corsica-Sardinia- W Tyrrhenian (or better W Mediterranean) microplate. Hercinian rocks (granite, gneiss, micaschists, etc.) are outcropping on Sardinian slope, Baronie and Cornaglia Seamounts. This substratum, quite similar to that of Sardinia, probably extends eastward till to the bathial plain covered by Neogene and Quaternary sediments.

2) Tyrrhenian Alps. On Cassinis, Secchi, Farfalla, de Marchi, Flavio Gioia and Issel Seamounts low grade metamorphites are outcropping (slates, phyllites, carbonaceous quarzphyllites, chloritic schists, calcschists, etc.) very similar to the alpine rocks of Corsica and Calabria. On Cassinis and Secchi Seamounts granitic rocks show analogies with those of Calabria. In all these Seamounts the vergence is to W as the alpine Corsica and Calabria. At the base of the more western Sicilian slope and among the xenolhits of Eolian volcances, high grade metamorphites are present (biotite and sillimanite schists and migmatitic paragneiss); the metamorphism of these rocks, like those of central Calabria, is 97 My old (Savelli 1979), that is Upper Cretaceous.

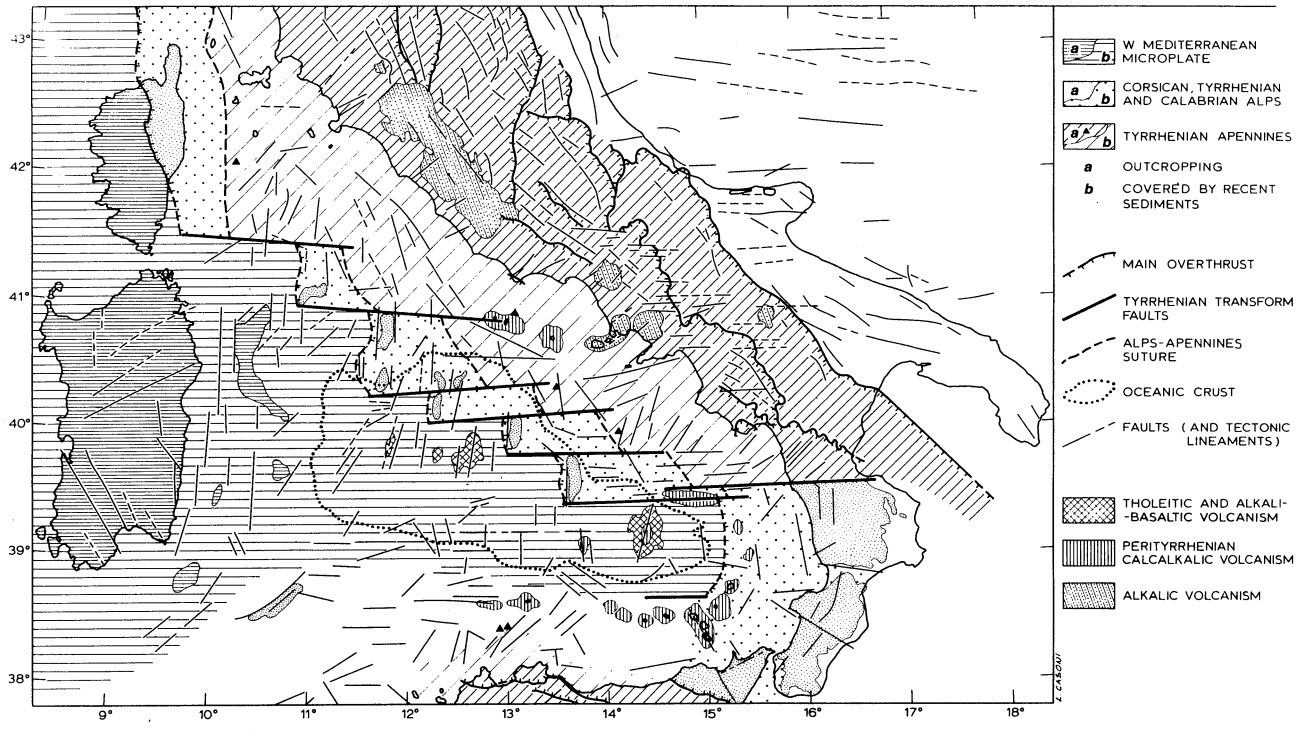
3) Tyrrhenian Apennines. From the slope of Latium, Campania and Sicily rocks of apenninic units (Tuscan sequence, mesozoic carbonate nappe, north Sicily autochtonous and nappes,etc.) have been dredged; their age ranges from upper Trias to Paleogene.

The boundaries among these large units are inferred from seismic and morphological data and from orientation of tectonic lineaments. The suture between Alps and Apennines continues northwards in the Voltri line. The N-S continuity of the units, is interrupted by E-W sinistral compressional transform faults, as demonstrated by the rows of volcanos and magnetic anomalies. E-W faults are very widespread also in southern Tyrrhenian Sea, northern Sicily, southern Italy south of 42° parallel, southern Adriatic Sea till to Dalmatia (Selli 1974).

The Tyrrhenian Alps have been originated by the drift of W Mediterranean microplate toward NE and E from middle Cretaceous to Oligocene; the Apennines by the drift of Adria microplate toward SW and W during the Neogene. On land movements along the **E-W** faults took place from Upper Tortonian up to the present as demonstrated by the seismicity of S Italy; in the sea probably these displacements were even older.

During the Neogene and Quaternary (probably during the last IOMy) the preexistent centraltyrrhenian continental crust underwent a thinning, changing into semioceanic or oceanic crust. The event, due to a mantle stoping or diapir, affected all three main tectonic units and was accompanied by tholeitic volcanism, high heat flow, little spreading of the Tyrrhenian area in E-W and ESE-WNW directions and by a isostatic foundering.

Obviously, in reality the boundaries among the three main units and their fragments are not so sharp and rectilinear as in the Fig.; but this is only a preliminary model. A better contouring will be the task of future researches.



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