# Seismic Reflection Study of the Tyrrhenian Sea

*by*

I. FINETTI*, C. MORELLI* and E. ZARUDZKI**

**Osservatorio Geofisico Sperimentale, Trieste (Italie)*

***Woods Hole Oceanographic Institution, U.S.A. (W.H.O.I.)*

**Summary*****

This paper presents the preliminary results of a geophysical study of Tyrrhenian Sea using digital seismic research techniques.

It was conducted jointly in 1969 by the O.G.S. and W.H.O.I.

Recently deep-sea dredging and drilling campains (HEEZEN et *al.*, 1970; RYAN, 1970] showed the Tyrrhenian Sea basin to be a foundered continental crust, the fact speculated on since the end of last century.

Our extensive coverage of very detailed seismic reflection sections confirms this, furthermore our data show the mechanism and the sequence of the subsidence. The effect of the tectonics on the Miocene - Quaternary volcanism is also shown as well as the contemporary sedimentation processes.

The tectonic setting of Tyrrhenian continent (Tirrenide) prior to its collapse in the Post-Miocene time was that of fairly low-lying gently-rolling land mass containing some deeper sedimentary basins located along the present sea margins. A large part of the allochtonous terrains now emplaced in the Apennines Sicily and may have been derived from these basins during their uplifting and tilting in Miocene.

The continental subsidence started at the end of Messinian and continuously lowered the land level creating a deepening sea environment.

Some volcanoes i.e. Marsili and Vavilov, may have existed already at that time as our section show the absence of Miocene-Pliocene horizons near them.

By series of circumtyrrhenian normal faults formed about the same time the central part of the continent was depressed to the present depth of 3500 meters. This may have increased the oceanization of the base of the crust. The subsidence continues in the present time.

With the exception of the circumtyrrhenian basins, all other deep Pliocene to Recent basins show generally a small sediment thickness (200 - 700 m) due to the low deposition rate. Moreover a substantial part of the sediments in bathyal plain is made up of ponded volcanics.

The mechanism by which the terriginous sediments were prevented from reaching the bathyal plain is apparent from the structure of the slope visible on our seismic section. These show the normal and tilted fault blocks forming series of circum tyrrhenian barriers that impeded the descent of terrigenous sediments to the bathyal plain.

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