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STRUCTURE, STRATIGRAPHY AND EVOLUTION OF CENTRAL MEDITERRANEAN

Summary. The purpose of this paper is to outline the regional structure, stratigraphy and evolution of the Pelagian and Ionian Seas. Information, descriptions, remarks, ideas and conclusions here reported are based on a great amount of new geological, geophysical and drilling exploration data, and on the numerous most informative published scientific papers.

The studied area has been schematically subdivided into geological provinces according to their relevant regional characters. Every province is described in a synthetic manner regarding stratigraphy, structural setting, main geodynamical phases, which have occurred and associated regional volcanic activities.

Four principal extensional phases are recognized from Permo-Triassic to Quaternary. The first one, active during Middle-Upper Triassic, produced a continental rifting with prominent effects in the Gabes-Tripoli-Misurata basin, Steppenosa Trough (Sicily-Malta platform area), Sicily-Malta-Medina Mounts and Medina Bank areas, and in the Ionian Sea. The second extensional phase occurred in Middle-Jurassic and opened the Ionian Sea. The Sicily-Malta escarpment is affected by an extensional mega-fault system that connects the thick continental crust of the Pelagian Sea to the paleo-oceanic crust of the Ionian abyssal basin.

The Pelagian Sea and Sirte rise (excluding the Upper Sirte Slope, where sedimentation commenced in the Upper Cretaceous), are constituted by a more or less thick sedimentary sequence that includes depositions from Triassic to Quaternary. The Sirte Rise, as well as other geological provinces of the studied area, was greatly stretched during the third extensional phase of the Middle Upper Cretaceous.

The Ionian abyssal basin is interpreted as a paleo-oceanic crust which has been continuously covered by deep water sediments from the Middle Jurassic to Quaternary. In the central part of the Ionian, where there exists the maximum Bouguer anomaly of the Mediterranean, the sedimentary sequence as well as the lower crust, are considerably thinner.

The last main extensional phase occurred from the Middle-Upper Miocene to Quaternary and affected the greater part of the Pelagian and Ionian Seas, but in particular the areas of Malta-Pantelleria-Linosa, Medina Grabens and the Ionian Sea. Malta Islands are structurally an horst which emerged in the Pelagian Sea during late Miocene-Lower Pliocene. The rifting process of the Pelagian Sea involves the entire median area known as the Sicily Channel with numerous extensional faults, block collapsing, tilting and widespread volcanic activity.

Received August 1, 1982

I. Introduction

After more than two decades of intense geological and geophysical exploration activities, remarkable progress has been made in the knowledge of structure and stratigraphy of the Mediterranean. This does not mean that all aspects of the basin are now fully understood. But it is today possible to propose schemes of geodynamical evolution supported by more data. In addition to the scientific investigation, a consistent contribution has been made also by the oil exploration activity on the