CRUSTAL EVOLUTION OF THE EASTERN MEDITERRANEAN SEA, DEDUCED FROM GEOPHYSICAL DATA

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By combining gravity, magnetic and deep seismic sounding data, a new crustal thickness map of the eastern Mediterranean sea has been computed. The crustal thickness varies from 18 km below the Herodotus Abyssal Plain to a maximum thickness below the Cyprian arc where it is 30 to 32 km thick. The arc is presently deforming by compression of the Cyprian continental lithosphere and the oceanic lithosphere lying below the Herodotus Abyssal Plain. 3-d modelling revealed that the isostatic balance is achieved only below deep basins and that isostacy is mainly disturbed at the compressional fronts and at the Eratosthenus seamount. All deep basins are floored by oceanic crust and are inversely magnetised. This indicates that they are of Jurassic age. Subsidence has been affecting the area during the last 5 million years resulting in thick sedimentary sequences exceeding 10 km in parts. The area between Crete and Egypt is also under strong compression resulting in crustal thickening. Oceanic lithosphere is being presently subducted below the Hellenic Arc, and the Mediterranean Ridge is developing due to compression. Apart from the Eratosthenes seamount which is a remnant of stretched continental crust 22 km thick, no continental fragments could be encountered outside the Cyprian arc. Seismicity is strongly associated with the compressional processes at the Hellenic and Cyprian arcs, and low heat flow density values which are recorded in the deeper parts of the basins can be explained by fast sedimentation rates that depress the isothermal distribution, and by an oceanic crust and lithosphere of low radioactive content.