SEISMIC PROFILES ACROSS HELLENIC TRENCHES

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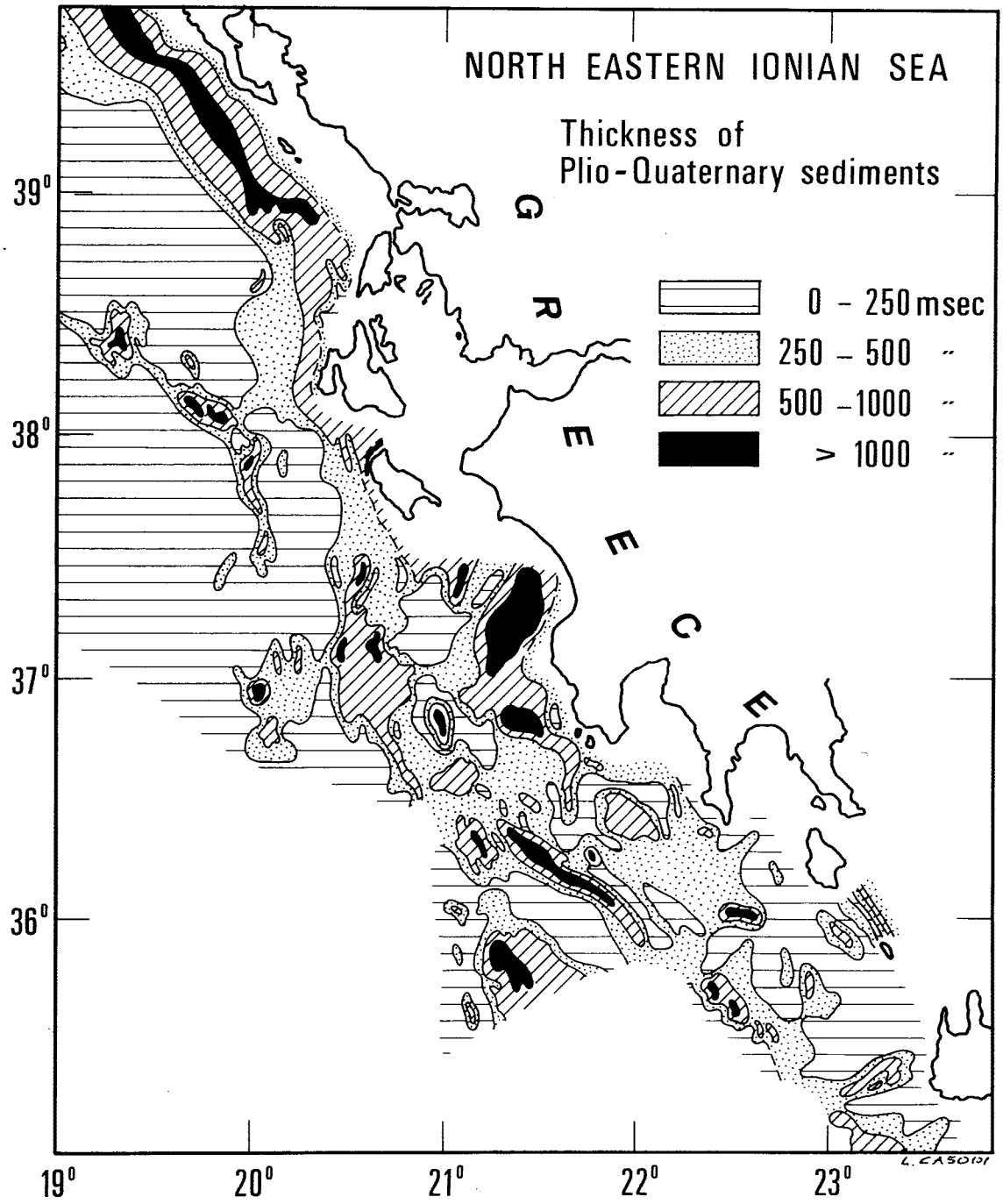
SUMMARY. A physiographic map was set up on the basis of continuous seismic reflection profiles (sparker 30 kJ) carried out in the North Eastern Ionian Sea (mainly in the Hellenic Trough). A detailed map also shows the thickness of P-Q sediments. The flat regional magnetic field confirm that none of the seamounts are volcanoes. On this basis, a tectonic sketch map has been constructed to interpretate tentatively the evolution of the area from Upper Miocene.

RESUME'. On met en évidence les caractéristiques de la physiographie de la zone de fosses Helleniques (35°-40°Lat.N;19°-24°Long.E) obtenues par de nombreux profiles sismiques à réflexion (sparker 30 kJ). Ces enregistrements ont permis de construire en détail une carte de la distribution des épaisseurs des sédiments Plio-Quaternaires. Les données magnétometriques ont permis d'observer qu'il n'y a pas des anomalies régionales très fortes. On peut donc conclure que toutes les montagnes ne sont pas de volcans. Sur cette base on présente une mappe qui est un tentative d'expliquer l'evolution de la zone à partir du Miocène Supérieur.

Since 1975,numerous continuous seismic reflection (sparker 30 kJ) and magnetometric profiles were carried out by R/V Bannock,in the North Eastern Ionian Sea between 35°-40°Lat.N and 19°-24°Long.E. A map shows the boundaries of the detailed morphological features and regional settings.A second map shows a distribution of the thickness of P-Q sediments. It shows the largest thickness (> 1 sec) near the Hellenic coasts (terrigenous sediments?):the terraces and the basins and/or the trenches,on the middle part of the continental slope,are covered by P-Q sediments.A great number of slumping phaenomena is also present in this zone.On the contrary,moving away from the coast,the sedimentation decreases:the Hellenic Trough shows a generally scarce P-Q sedimentation (< 0.5 sec);sometime trenches and basins have a very small thickness of sediments.Generally the thickness of sediments decreases approaching the Southern depression zone of the area. A tentative structural sketch map from the Upper Miocene on was made. The foundering of the "Orogenic belt complex" may well be caused by the compressional motions of thrusting of the different structural units. Vertical components leading to differential sinking of the external areas may result as a shallow response to the deep thrusting.Both compressional and vertical motions have been mostly active


NORTH EASTERN IONIAN SEA
Thickness of
Plio-Quaternary sediments
0 - 250 msec
250 - 500 "
500 -1000 "
> 1000 "
GREECE
39°
38°
37°
36°
19°
20°
21°
22°
23°
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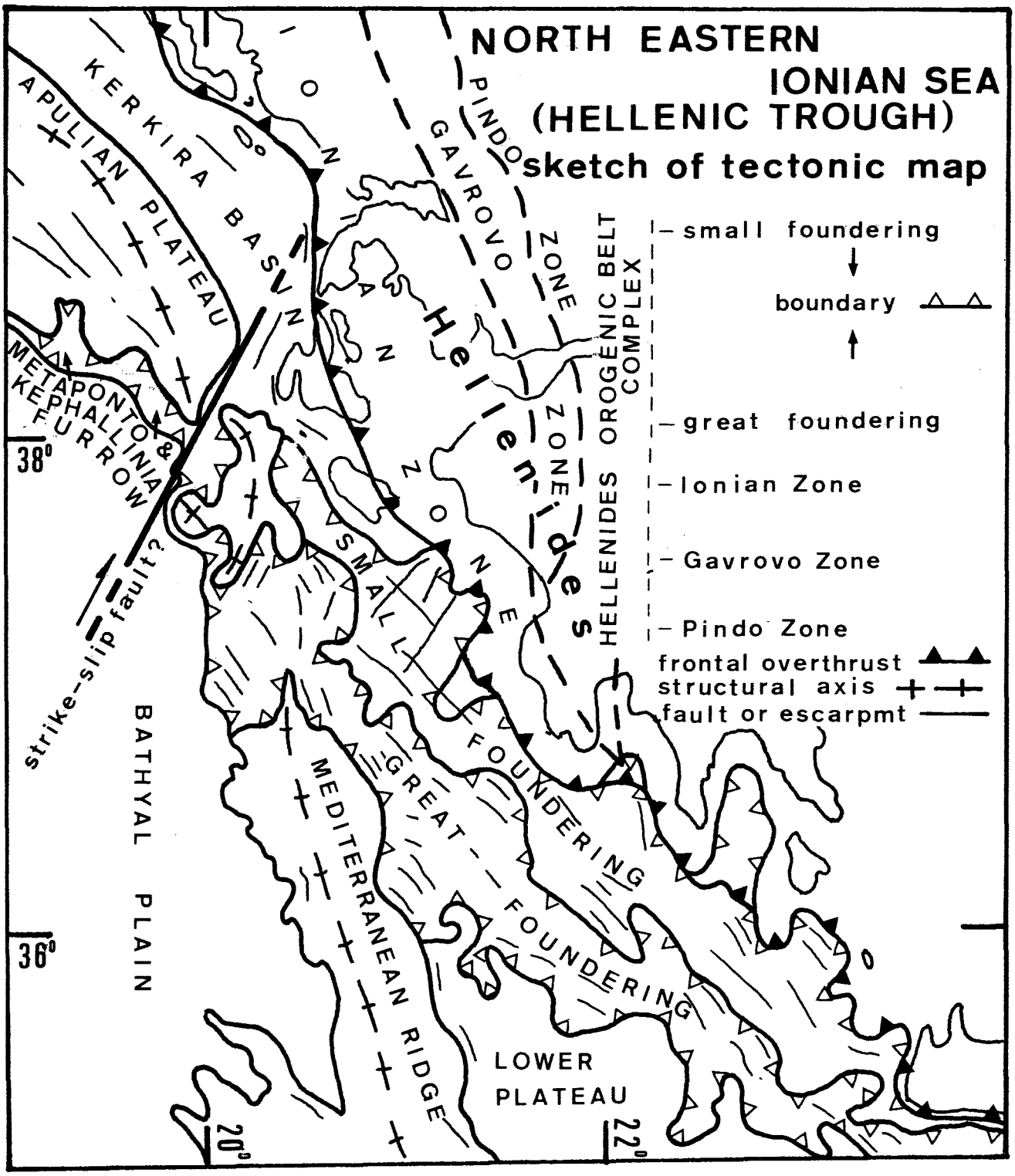
till the end of the Lower Pliocene.This is shown anyhow by the faults and by the extreme tectonization of the Upper Miocene and the lower part of the Pliocene terrains.We believe that the foundering,shown by the faulting not always affecting sub-horizontal recent sediments, probably decreased its intensity after the Mio-Pliocenic phase,in the belt nearer to the Hellenic frontal overthrusting ("Small Foundering) especially in the southern part of this zone;while it is still active in the central belt of the orogenic complex("Great Foundering"). Here the trenches reach the greatest depths of the Mediterranean Sea (tectonized and inclines P-Q sediments). The depression zones of Great and Small Foundering have a SE-NW direction axes, as main faults, and are separated either by seamounts or by the base of the continental slope. The boundaries of these two zones of the orogenic belt complex: to the N they stop against the Apulian Plateau,to the NW they seem to continue in the Metaponto-Kephallinia Furrow,to the E they stop mostly in the frontal Hellenic overthrusting,to the W in the Mediterranean Ridge,in the Bathyal Plain and in the Lower Plateau. The foundering continued S of Crete toward SE.

Finally one remark seem very important:the seismic evidence of the Apulian Plateau and the large seamount,situated W of Zante and Kephallinia,shows that they are formed by the same terrains;a big fault,oriented SSW-NNE,divides them. It probably is a strike-slip fault (about 22° azimouth) with the western side pushing northwards.


NORTH EASTERN
IONIAN SEA
(HELLENIC TROUGH)
sketch of tectonic map
small foundering
boundary
great foundering
Ionian Zone
Gavrovo Zone
Pindo Zone
frontal overthrust
structural axis
fault or escarpmt
HELLENIDES OROGENIC BELT COMPLEX
PINDO ZONE
GAVROVO ZONE
IONIAN ZONE
SMALL FOUNDERING
GREAT FOUNDERING
KERKIRA BASIN
APULIAN PLATEAU
METAPONTO & KEPHALLINIA FURROW
strike-slip fault?
BATHYAL PLAIN
MEDITERRANEAN RIDGE
LOWER PLATEAU
38°
36°
20°
22°