

NEW FINDINGS OF MINOAN HOMOGENITES IN THE IONIAN SEA

M.B. CITA(1), A. CAMERLENGHI(1), K.A. KASTENS(2) ET AL

(1) Dip. Scienze della Terra, Univ. - Milano - Italy

(2) Lamont - Doherty Geological Obs., Columbia Univ. - Palisades -
- N.Y. - U.S.A.

RE'SUME' - Des homogénites d'âge holocène comparables à celles décrites dans la Dorsale Calabraise et dans la partie ouest de la Dorsale Méditerranéenne et interprétées comme dérivant de l'accumulation au fond de bassins de sédiments pélagiques mis en suspension par le tsunami originé par le collapse de la caldère de Santorin (eruption minoïque) ont été découverts dans deux domaines distant environ 600 et environ 450 Km de Santorin, dans la Mer Ionienne.

During the exploration of two areas of the abyssal Mediterranean sea characterized by the so-called "cobblestone topography", a Holocene depositional event that is different in character and size from usual pelagic turbidites and from debris-flows was discovered. A several-meters thick single bed essentially consisting of homogeneous, structureless mud (homogenite) with a sharp basal contact and a rapidly fining upward basal foraminiferal sand layer was recorded in eleven different cores. All the homogenite-bearing cores were located at the bottom of flat-lying ponded basins, whereas this type of sediment was conspicuously absent on elevated settings (plateaus) and on basin slopes.

Triggering mechanism was considered the tsunami induced by the collapse of the Santorini caldera about 3500 y BP (Minoan eruption).

Order of magnitude calculations show that the near bottom oscillatory currents were strong enough to stir into suspension the pelagic drape of the flanks of the ponded basins, at sites distant 800 and 450 Km from the tsunami source area. Also, pressure pulse was sufficient to cause liquefaction of the sediment.

The tsunami depositional model is strongly supported by new findings of Holocene homogenites during the exploration of the Mediterranean Ridge with R/V BANNOCK in 1981 and 1982, as follows:

- 1) Minoan homogenites comparable in character and stratigraphic position to those previously mentioned were recovered in three deep-sea cores from a transect crossing the deformation front of the Me

diterranean Ridge east of the Messina abyssal plain and Victor Hensen Seahill (distance approximately 600 Km from Santorini).

- 2) Minoan homogenites as above were recorded in three cores located in three discrete ponded basins lying at the bottom of a deep cleft in the Mediterranean Ridge west of Crete (distance approximately 450 Km from Santorini).
- 3) No Minoan homogenites and in general no Holocene turbidite were recorded in any core from a transect of nine deep sea cores crossing the deformation front of the Mediterranean Ridge in the Herodotus abyssal plain (distance approximately 450 Km from Santorini, in SE direction).

The absence of tsunami deposits in the Levantine basin was predicted by the model because the basin morphology resulted in a lesser velocity of the tsunami waves. Indeed, the Santorini caldera collapsed south-westwards, so that a disproportionate amount of tsunami energy was directed towards the Ionian basin.