- Séance maintenant présidée par le Pr R. SELLI

4-1% - CORRELATION OF A TRANS-TYRRHENIAN REFLECTION PROFILE WITH DSPD SITE 132

par ZARUDZKI E.F.K.***, WONG H.K.**, MORELLI C.* and FINETTI I.*

*** Laboratorio di Geologia Marina, Via Zamboni 65, Bologna, Italy.
** Northern Illinois University, Dekalb, Il., USA.
* Osservatorio Geofisico Sperimentale, Trieste, Italy.

A 540-km long, continuous seismic reflection profile, MS-1, across the Tyrrhenian sea has been recorded using triple Flexotir, digital instrumentation and 12-fold subsurface coverage.

The profile extends from Calabria Basin westwards into the bathyal plain crossing the Marsili seamount then turns northwestwards traversing the deep central basin and on to the Baronie seamount just east of Sardinia. The Deep Sea Drilling Program's (DSPD) Site 132 (40°15.70'N,11°26.47'E) lies 2.7 km to the SSW of the MS-1 and their representative alignment occurs at the Shotpoint 4140. The Glomar Challenger bottomed the drillhole 223 m below seabed. Finetti et al. (1970) report the preliminary results of seismic studies and show the profile MS-1 and its location.

The compressional wave velocities in the sediments drilled were calculated correlating the observable subbottom reflecting horizons (at the SP 4140) with lithologies of the drilled column. A series of continuous internal reflectors occurs in seismic section at: (1) 0.045, (2) 0.065, (3) 0.085 and (4) 0.100 seconds below the seabed. Each of the levels are correlatable with discrete thin bed of volcanic ash at: (1) 33, (2) 49, (3) 66 and (4) 80 meters'depth respectively. Deeper in the section a strong reflector "M" (Biscaye et al, 1971) occuring at (5) 0.240 seconds below the seabed has been identified with the top the evaporites encountered by drill at (5) 188 meters. The next strongest reflector at (6) 0.265 seconds correlates with the top of solid gypsum drilled at (6) 216 meters. The time-depth plot of those six correlation points yield the compressional were velocities tabulated below:

Depth (m)bel.seabed:	Velocity (km/s) :	Age Material:
0 - 57	1.5	Quat. ; unconsol. oozes
57 - 188	1.6	Plio (from 70 m); unconsol.oozes
188 - 216	2.2	U.Mioc. (Messinian);Horizon "M" evaporites: stiff dolomitic marls

These results agree with velocities of unconsolidated oozes straddling values of 1.6 km/s, measured at other DSDP sites (Schreiber et al, 1972). The dolomitic marls of upper horizon "M" overlie solid gypsum of 4.95 km/s velocity measured in bottom core of Site 132 (Ryan, per. comm.).

The mean interval velocity function was also spot-calculated at 10 km intervals along the MS-1 from the root mean square (RMS) velocity series during the digital processing of seismic data (Finetti et al, 1970). The upper part of the velocity-depth (time) curve at SP 4140, shows baffling highvelocity (3.6 km/s) stringer within the drilled section. The more reliable consistent velocities were computed for depths greater than drilled at SP 4040 where 2.56 km/s (at 4.0 seconds) related to an extensive layer of over 600 m thick upper Miocene (Messinian) evaporites, suggested by Selli (1954).

The sub-division of the seismic profile near the Site 132 into an easily recognisable sequence of Quaternary and Pliocene pelagic oozes with tephra horizons, followed bay the accoustically transparent Pliocene section provides convenient geostratigraphic criteria for interpreting other seismic profiles in the Tyrrhenian. The Pliocene interval changes in thickness much more than does Quaternary. The basic components (other than tephra) of oozes are pelagic calcareous skeletal debris, thus the changes in the species' populations and in the strength and directions of currents may have been greater in Pliocene.

The irregular attitude of the reflector "M", often with a rough upper surface, suggests frequent distortions and displacements of Messinian evaporites resulting perhaps from more active basement and salt tectonics in upper Miocene and Pliocene.

References:

Biscaye, P.E.; Ryan, W.B.F. and Wezel, F., 1971, Age and nature of the Pan-Mediterranean subbottom Reflector M., In Sedimentation in the Mediterranean Sea, D.J. Stanley (Ed.), Smithsonian Press, Washington, D.C. (in press).

Finetti, I.; Morelli, C. and Zarudzki, E., 1970, Reflection seismic study of the Tyrrhenian Sea, Boll.di Geof.Teor.Ed Appl., 12, 48, p. 311-346.

Schreiber, E.; Fox, P.J.; Petson, J.J., 1972, Compressional wave velocities in semi-indurated sediments and basalts, In Initial Reports of the Deep Sea Drilling Project,Vol.XI, U.S. Government Printing Office, Washington D.C. (in press).

Selli, R., 1954, Il bacino del Metauro, In Giornali di Geologia, Bologna, Serie 2, Vol. XXIV, p. 83-93.