G-III11

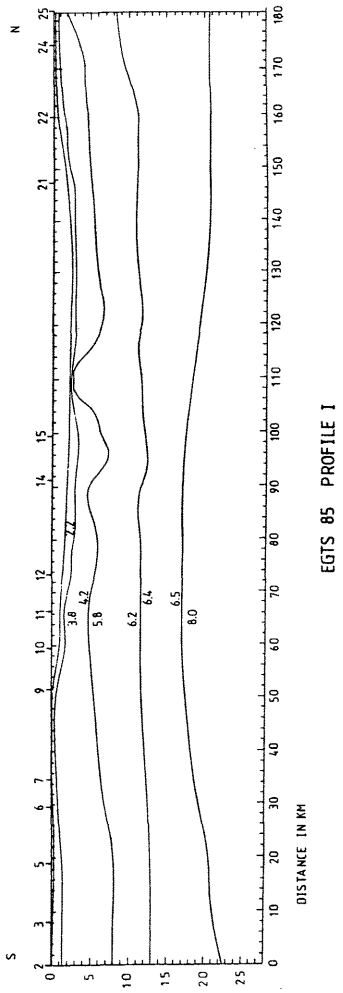
The transition of the Sardinia Channel to the Tyrrhenian Sea

F. EGLOFF*, J. MAKRIS*, C. MORELLI** and R. NICOLICH**

* Institute of Geophysics, Hamburg University, Hamburg (Federal Republic of Germany)
** Istituto di Miniere e Geofisica Applicata, Trieste (Italy)

Seismic and gravity studies along the European Geotraverse, southern segment (EGTS) revield detailed models of the thickness and geometry as well as the nature of the crust and sediments at the Sardinia Channel, Tunisia and the Pelagian Sea. Particularly the seismic observations between Tunisia and Sardinia shawed that the seismic energy generated by the shots fired at optimized deth, propagate from south to north in a very efficient way but not vice-versa. This phenomenon, together with the geometry of the Moho and that of the basement could be explained by the distribution and orientation of a system of faults that limit crustal segments, their orientation and tilt. These structures, also controlled by gravity modelling, could be at best explained by tectonisation due to shearing and rotation of the lithological unites in a NNE direction. The crustal stretching along the Sardinia Channel is therefore a process that has nothing to do with rifting, since also the P_n velocities are normal, but is produced mainly by shearing, observed along Algeria and Tunisia and responsible for many distractive earthquakes along the north african shear zone. This process, together with observations on the development of the volcanic activity and style of deformation of the Tyrrhenian Sea, which was initiated at the west and gradually progressed eastwards to Calabria, permit the conclusion that the opening of the Tyrrhenis and the development of the Calabrian Arc are the direct consequence of the shearing and deformation system observed along the western part of north Africa.

Figure: Model of the Sardinia Channel



G-III12

Marine geology of the Gulf of Trieste (Northern Adriatic). A. Sedimentological properties

B. OGORELEC*, M. MIŠIC* and J. FAGANELI**

* Geological Survey, 61000 Ljubljana (Yugoslavia)
** Marine Biological Station, 66330 Piran (Yugoslavia)

The Gulf of Trieste is the northernmost part of the Adriatic Sea isolated from the res of the Northern Adriatic by a shoal located on the line Grado-Savudrija peninsula (Fig. 1). The Gulf occupies about 500 km^2 and lies at the contact between Istrian carbonate platform and Karst, and the Friuli plain on the west. The Gulf of Trieste is a shallow, nearly level marine basin about 20 - 25 m deep with rather steep shores. The bays of Piran, Koper and Muggia in the SE part of the Gulf are the wide submerged valleys of the small rivers Dragonja, Rižana and Rosandra, respectively. Thre detrital material in the sediments originates from the hinterland (transport by rivers and erosion of the Paleogene flysch). In this paper we present sedimentological data on the central and SE part (Yugoslav) of the Gulf, supplemented by the results on the northern part (Italian) of the Gulf published by various authors (Venzo and Stefanini, 1967, Brambati and Venzo, 1967).

The distribution of suspended sediment in the Gulf of Trieste, represented by Secchi disk transparency, shows the highest contents around the river Isonzo delta, and the lowest in the central and especially at the SW entrance of the Gulf, due to the inflow of the water from the central Adriatic with low suspended matter contents. The E and SE part of the Gulf is characterised by somewhat higher content of suspended sediment. The total concentration of suspended matter in the surface of the central and SE part of the Gulf varries mostly in the range 1.5 - 2.0 mg l^{-1}, of which about 60 % is of minerogenic origin.

According to grain-size distribution and mineral composition the sediment of the Gulf of Trieste could be subdivided into six zones (Fig. 2):

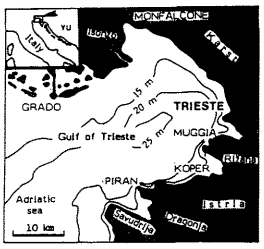


Fig. 1: Bathimetry of the Gulf of Trieste

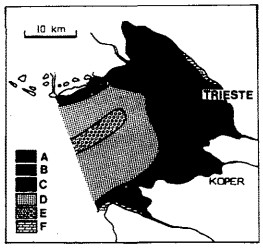


Fig. 2: Grain size distibution of the sediment (our analyses compiled by data of Brambati & Venzo 1967 and Ranke 1976).

A-Sediment close to the coast composed of silt and sandy silt containing a max. of 15 % clay and up to 40 % of a fraction $\geq$ 63 /um, the carbonate content 15-70 % and the median 30-70 /um.

B-Sediment of the interior of the small bays is a dart grey clayey silt containing up to 40 % of clay and 25-40 % of carbonates with a median of 3-6 /um. The biogenic component is composed of foraminifers, ostracods, shells and mollusks; pyrite incrustations of foraminifers.

C-Sediment of the transition zones is composed by grey silt with up to 25 % of clay and a median 5-20 /um, rich in organic skeletons, the carbonate content 40-50 %.

D-Sediment of the open part of the Gulf consists of pure silty sand and sand with up to 10 % of clayey fraction and 50-80 % of carbonates. The mean grain size ranges between 0.2-1 mm. The predominant component are biogenic fragments.

E-Sediment of the central part of the Gulf; medium to coarse sand, carbonate rich (70-90 % of biogenic skeletons), median 100-250 /um.

F-Sediment along the carbonate coast of Savudrija peninsula is composed by silty sand containing up to 80 % of carbonate, formed by erosion of Cretaceous limestone and biogenic production.

In the southern part of the Gulf some seamounds, composed of rhodolites, and hardground appear. The sedimentation rates, measured by radiocarbon and pollen analyses, revealed that the rate is lower than 1 mm y^{-1} in the central part of the Gulf, while it increases towards the inner part of the bays to about 3-5 mm y^{-1}.