# 4-10. - SOME PRINCIPAL SEAFLOOR FEATURES IN THE STRAIT OF SICILY

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The Strait of Sicily (SoS) is a submerged part of the african continent joining the North Africa to Sicily. Morphologically, the SoS is divided into a) the sicilian and african continental shelves; b) the continental slopes which are broken up into platforms and basins, and c) the subaerial and submarine volcanoes.

Three distinct tectonic provinces can be discerned in the SoS.

The Skerki Bank forms a NE extension of the Tunisian Atlas range. The gently-arched bank is formed by series of small anticlines, in echelon, their major axes aligned towards ENE and continuing as far as the south tyrrhenian E-W tectonic trends. The anticlines are broken-up by numerous transverse faults into small blocks of varied vertical displacements.

The Narrows - a tightly compressed zone between NE Tunisia and W Sicily, resembles a mosaic of small tectonic blocks, smaller than 5 km square. The blocks were subjected to strong vertical displacements, frequently more than 1 km, forming deep, closed sedimentary basins and elevated horsts. The predominant tectonic trend runs WNW-ESE. Some blocks have sunk along this trend, creating a deep channel interconnecting the isolated basins. The sediments filling the rugged-floored basins exceed 1 km of thickness in many places. At least two unconformable patterns of sedimentation can be seen. The hinterlands of the Narrows on the sicilian and african sides are large plateaus levelled by erosion, dissected by less numerous faults.

The Main Province, about 200 km wide, is the largest in the SoS. Its structure resembles the Sahel Depression in east Tunisia. The province is made up of large plateaus and deep sedimentary basins (Pantelleria, Linosa and Malta trenches). The trenches are filled with more than 2 km of sediments which show remarkably quiet deposition patterns in their upper part. The underlying older sediments are frequently distorted by the sinking of the rugged trench floors. The floor depth, often acoustically invisible, may lie over 4.5 km below sea level. The flanks of the trenches are built of down-stepping, outwardtilted fault blocks their combined throws exceeding 3 km. The intervening plateaus are gentle synclines formed by consolidated sedimentary rocks, thinly clad with sediments. The trenches lying close to present continental margins are nearly sedimentfilled.

An overall tectonic scheme of the Main Province is a series of older gentle pressure folds which were later tension-or shear-faulted particularly in the anticlines. The direction of the folds and of fault planes were both approximately WNW-ESE. The subsidence may have started in Pliocene and continued until today, as shown by distortion of the most recent sediments. The tensional forces appear to have predominated. A large number of volcanoes active in Quaternary, either subaerial (Pantelleria and Linosa) or submarine, populate the flanks of trenches along the faulting trending WNW-ESE. The magnetic and gravity

anomaly trends support the assumption that the surface faulting is related to deep-lying causes. All trenches have their associated volcanoes. Volcanism in the SoS continued until recently (1891). The low-frequency magnetic anomalies here are directly related to the volcanism and show, that the magma intrusions may exist below the heavily-faulted main trenches. Numerous small but intense (over 1000 gamma) high-frequency anomalies testify to a widespread shallow volcanic activity.

The Free Air gravity anomaly confirms deep sediment fill of the three main trenches and other basins, i.e. Gela Basin, already suggested by the reflection profiles. The positive Bouguer anomalies, up to 90 mgals, coincide with the trenches, revealing the presence of denser rocks below their floors.