Coves and «Calas»
The Essence of the Limestone Cove

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In the Mediterranean, the term *cala*, namely *cove*, abounds to denote all and any inlet in a rocky shoreline. But in the strict sense, the coves dealt with in this monograph are defined by their calcareous component. In our country this requirement is met only by the coves in southern Menorca and Sa Marina in Mallorca.

Straight lines are not conducive to interchange. Land-dwelling men enter the sea wherever the waters pierce the shore, sailors seeking shelter for their boats, disembark and unload. Long beaches are hostile to commercial shipping: we must adapt estuaries or lagoon inlets –harbours– to trade requirements. On rocky shores, every inlet, bay, creek or nook can be called a *cove*. There are coves in Provence, on the Costa Brava, Cap de Creus, in southern Sicily, Malta, the Ionian, the Red Sea (*sherm*). So too are the *Ingressionsbuchten*, formed by the rise in sea level, the Galician *rias*, the Breton *abers*, Scottish *fiirths* or even Scandinavian fjords.

Our civilization hails from a well-defined shoreline, the Greek coast. Homer’s Ionia was a handful of cities scattered along a coast trimmed by bays and coves: Miletus, the birthplace of Thales, Anaximander and Anaximenes, had four harbours in four bays, now silted up by sediment. Indeed it was from Phocis harbour that they set sail to establish the colonies of Ampurias and Marseille. Ulysses was to dock the boat in the small port of Ithaca.

**GENERIC AND SPECIFIC**

Apart from an absence of tides –almost immaterial– making us unique in the Mediterranean, our coastlines are shaped by lithology; the chemical composition –acidic or basic rock– does not react in the same way to the onslaught of mesoform and microform sculptors. Shorelines can be high, steep or low beaches, often combined with wetlands and dunes. An overwhelming proportion of world’s beaches are siliciclastic, that is, often formed by silica-bearing sand. Most arguments made by geomorphologists take this premise for granted. The indentations or inlets in high coastal lands may be of tectonic or fluvial origin (or both combined), but in the case of calcareous shores, the river’s role is emphasised by carstic dissolution.

Bioclasts usually oppose siliciclasts, but in the Mediterranean realm we could easily substitute bioclasts for calcareoclasts, the reason lying in the unprecedented dominance of calcareous rock along our coastlines. This is not because we have mostly carbonate sands –also existing in the Canary Islands where it is found next to exclusively volcanic rock– but the abundance of calcareous rock lining our shore arose from the skeletons and shells of millions of animals (corals, for example), long-dead creatures that thrived in sunny coastal warm waters. Experts, taphonomists, call them *assemblages*, a special kind of cemetery, and much of our coastal waste forms platforms, where the remains of calcareous carbonate synthesisers ended up.

**OUR CIVILISATION HAILS FROM A WELL-DEFINED SHORELINE, THE GREEK COAST. HOMER’S IONIA WAS A HANDFUL OF CITIES SCATTERED ALONG A COAST TRIMMED BY BAYS AND COVES**

*On the left, Rosa Torres. «The Enchanted Cove» series, 2012. Oil on canvas, 65 x 80 cm.*
CALA GENTIL, CALA D’OR, MARSASCALA, CALA CORNUDA, CALA PORTALS AND CALAPORTAL

I have purposely chosen a mixture of names, two were invented by a poet and a visionary planner, one is from Malta, another from southern Valencia, one from Mallorca (well known by the jet set who do not know the name means “high port”) and a final word that has nothing to do with the sea, meaning “bump” or “confusion” ... Thus, the word cala harbours a host of diverse coastal landforms varying in importance and nature. Without going into underlying processes or raw materials, ranging from gently curving bays to deep incursions in the coastline. A (confusion) calaportal of many shapes and meanings!

Oriol Riba’s Diccionari de geologia (Dictionary of Geology) defines cala as an «inlet that turns the sea into a rugged coast». Both Tavellera cove and Jóncolcs cove (Cap de Creus massif) open up between schists, slates and phyllites, metamorphosed in the permocarboniferous period, framing the turquoise waters in black. The role played by gullies is small, what count are earth’s structural features or tectonics. The coves at Giverola and Salionç (La Selva), cradled between
Permian and Carboniferous granite and granodiorite, retain a geomorphically archaic air. Cala Sa Tuna and Aiguafreda cove (Begur massif) arise from a sudden tectonic clash between limestone and slate, both from the Cambrian.

On the Valencian coast, the northernmost coves are modest indentations scattered along the great quaternary coastal strip, often coinciding with paleo-channels, like Saldonar and Foradada coves for example. To the south, in the Nao promontory, the Granadella cove (1,250 metres wide and 500 long) splays open where Cretaceous limestone meets Oligocene flysch; its ravine can be monitored from the castle and from Descobridor isle; this cove is too large and structurally complex to fit the category. Further south, Cala Cornuda, and the coves known as Rincon, and Trabajos (Vega Baja) are tiny pleats in the precipice of the quaternary mantle, once a shelter to fishermen. Across the border we can even find linguistic fossils: Calblanque and Calnegre, testimony that the fishermen’s semiology did not coincide with ours.

**CALA SENSU ERECTU: NECESSARILY OF CALCAREOUS ROCK**

To begin with, specifying that the sea inlet should be longer than it is wide, we can find three factors interwoven to form its genesis: fluvial modelling, tectonics and karst processes. If we consider past wetter epochs, relatively effective erosion of a stream does not require a very large basin, and features of certain coves—often referred to as box canyons, which may be small rias—accentuate their personality. This is the result of a potential imbalance, becoming steeper towards the end. Certain coves, which are angled or branched, show a strong structural or tectonic component, with the transformation of minor lines crossing the rock, coinciding or not with the fluvial path.

The nature of these benchmark coves, however, corresponds to the dissolution and washing away of limestone slabs, which are assailed by rain water or the somewhat aggressive groundwater. Also, at the freshwater-saltwater interface, karst phenomena play a decisive role. Notwithstanding, the marine factor is clearly fundamental and this gouging out effect is almost always due to marine invasion caused by a general increase in the ocean level in the last 10,000 years, at least.

All of these requirements—or at least three out of the four—are met by the bays and inlets in Malta and southern Sicily, the sherum of the Red Sea, some spots in Ionia, certain inlets in Provence and, above all, the eponymous calas of Migdia in Menorca and Sa Marina in Mallorca.

**BIBLIOGRAPHY**


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