



Introduction

SALINAS OF THE MEDITERRANEAN - PAST AND FUTURES

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Dispersed throughout the coasts of the wider Mediterranean, from the Atlantic Ocean to the Black Sea, salinas are very special places for a variety of reasons: because of the salt they produce, and their historical, cultural and ecological values, as well as for their landscape: special, even extreme, at the edge of earth, sea and air.

Although salt today is considered a trivial product, for many centuries it was an extremely important commodity. In fact, salt has always been an essential element for mankind, first because it is one of man's physiological requirements and lack of it leads to *salt hunger*, secondly because it constitutes a major ingredient for seasoning food, and thirdly because of its qualities as a preservative, which have made it a widely used necessity that has influenced all humanity. A fourth reason is because salt has been an indispensable raw material for industry in the 20th century and before. However, to make this substance a series of conditions are required that limit its production to a few areas only, excluding other vast regions. As a result, since the beginning of civilisation, salt production and trade have had a strategic character, comparable to products like gold, silk or spices. In fact, salt has been the *white gold* of history, with a role similar to that of crude oil today.

To obtain salt in the Mediterranean, different peoples used various techniques: most important was solar evaporation of brine obtained from the sea or inland salt-springs, while salt has also been produced through direct mining of rock salt or ebullition of brine (from the sea and salt-springs). Due to the ideal climatic conditions prevailing in the area, with long, warm, and dry summers and favourable *etesian*¹ winds, the Mediterranean basin is a region where salt exploitation through solar evaporation in coastal areas has been extensively practised for many hundreds of years.

Although self-formed salt is easily produced in the Mediterranean area, to actively produce salt in the basin was not an easy business. This is why the first civilisations in the area, like the Greeks, probably never dealt with what is called *salt-making* or *salina cultivation*, being satisfied with the self-formed salt appearing as a natural phenomenon in easily accessible places like seaside rocks, puddles and lagoons. In fact, there are many reasons why the salt-making business was not so easy to carry out in the Mediterranean area: first there has always been a lack of the extensive flat

¹ *Etisiai* (ancient Greek), a term meaning winds blowing once per year, also called *meltémia* (modern Greek), are the local north winds blowing in the Aegean during the summer months from July to September. Such local winds exist all over the eastern Mediterranean.

◀ Salt harvest in the salina of Nin (Croatia)

Photo: Hjalmar Dahm



▲ Sites with coastal salinas in Europe

Map: Hjalmar Dahm

areas needed for the evaporation of sea brine. This was especially true in antiquity, because the wide flat expanses of deltas, where the large salinas are now mostly located, have been formed since then, mainly as an effect of land use and erosion caused by humans. Besides, such alluvial soils are usually sandy and permeable, neither quality being good for the production of salt. Furthermore, due to the absence of tides inside the basin and despite the proximity of the sea, transferring brine required huge quantities of energy. Further, salinas were risky areas to live, because they were vulnerable to malaria and exposed to piracy for long periods. These difficulties, together with the hard labour needed to cultivate a salina under the harsh conditions of summer, made the salt business in the Mediterranean a rather complicated matter!

Despite the difficulties, Mediterranean peoples did exploit flat expanses of land or carved rocks for salt-making. This became a necessity when the Mediterranean population multiplied, especially when big cities were formed, like Rome, and the demand for salt became immense. This is why the Romans were probably the first to have exploited this resource intensely on a large scale. For them, salt production was an agricultural activity that took place in proper solar salinas named *salt-gardens*, probably consisting of a simple evaporation pond.

Salt continued to be an important commodity in the Mediterranean during the dark years of the Middle Ages, both in the West and in the East. Interestingly, it was during this period that major changes in the technique of salt-making gradually modified the method of seasalt production to the benefit of future centuries and peoples. First, from the 5th or 6th century onward the standard practice of harvesting salt was done with the help of special tools. Second, long before the 10th century, the method of *successive evaporation ponds* came into the Mediterranean, probably introduced by the

Arabs through Spain and, very likely, by the Ottomans to Crete. First applied in the salinas of Pag, operating under the control of the Byzantine Diadora, and soon afterwards in many Adriatic salinas (e.g. Chioggia and Cervia), the technique passed to the Aegean a few centuries later. The first illustration of this rather sophisticated method was made by the German scholar Agricola in his *De re metallica* (16th century). By the 17th and 18th centuries almost all major salinas of the Mediterranean operated with the method of *successive evaporation ponds*.

The method is based on the circulation of brine through successive ponds in which different salts precipitate successively according to their solubility. Improvements over the millennia have diversified several techniques depending on the climatic vicissitudes of different geographical areas. For instance, according to the frequency of salt harvesting, salinas may use *continuous crystallisation* (one harvest per season or less) or *periodical (intermittent) crystallisation* (several harvests per season, the frequency varying from a few times to every day). Despite the changes over the last century, such as the mechanisation of the Mediterranean salinas, the basic operating principles remain.

Among the hundreds of salinas operating in the Mediterranean since ancient times, only about 170 are recognisable today. Ninety of them are still working, while the rest are inactive or have been converted. Of the 90 active salinas, 77% are located on the northern, European coast, the rest in Turkey, Tunisia, Algeria, Lebanon, Israel, Egypt and Morocco. Their surface may vary from 1 ha to 12,000 ha, with an annual yield of approximately 7 million tons of salt. Most of the salinas operating in the Mediterranean today have been modernised and transformed into large-scale or *industrial salinas*. Among the few still operating in a fully manual, *traditional* way, we can distinguish *primitive* and *artisanal* salinas, as essential elements of the Mediterranean cultural landscape.

Traditional, as opposed to *modern*, salt is produced in non-modernised salinas, which may in fact be large-scale ones like those operating in Greece, Italy and Spain at the beginning of the 20th century. As a general rule, the borderline between traditional and modern in the Mediterranean is just after the Second World War, while in a few countries, like Greece, it may extend as late as the 1960s. Today there are only remnants of this traditional operation, found in a few salinas continuing to operate below capacity in a state of generalised decline and uncertainty. Such salinas are those of Nin and Ston on the Dalmatian coast of Croatia, and to some extent those in Ulcinj, Montenegro.

In addition to its time significance, the term *traditional* is often used instead of, and even confused with, *artisanal*. Artisanal is a term related to art, *manual work* and *craftsmanship*, concerning the way of working, as opposed to industrial and *mechanised*. Artisanal salinas can only be small-scale ones, operated manually by one salter at all stages of production. Typical examples of such salinas still operating in the wider Mediterranean are the salinas of Guérande in Brittany, those of Slovenia and Portugal, the municipal salina of Pomorie (Bulgaria), the partly working salinas of Koukouri in Mani (Greece), and Cervia and Marsala (Italy), as well as those in Malta. *Artisanal salinas* share the same basic operating principles as traditional salinas as well as *industrial*

salinas: seawater circulates through successive compartments, from ponds to crystallisers, to an increasing concentration of sodium chloride, releasing along its course the undesirable elements from the brine (e.g. gypsum). The difference between these salina types lies in their shape, size and mode of exploitation.

Primitive salinas, formed of a simple pond carved in rock (coastal or inland) and filled with brine during storms or simply by man in summer, are the salinas of remote islands and isolated communities. Their self-formed salt is harvested according to local needs, using very primitive tools such as spoons, or, most frequently, collected only with the fingers. Almost all the islands in the Aegean had or, in many cases, still employ saline *gournes* or *alatógourres* of different degrees of primitiveness, in parallel to those of Malta or the Canarian Bañaderos carved in the rocks or simply built in the rocky soil. Among all the Greek *alatógournes*, those of the island of Kythira are the most numerous and systematically exploited up to the present.

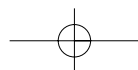
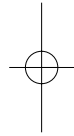
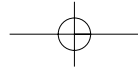
Artisanal salinas differ substantially with geography. The Atlantic typology, common from Cadiz (Spain) and northwards, where the large tidal range plays an important role, is significantly different from the Mediterranean type corresponding to several specific typologies, all conditioned by a limited tidal range. All these salinas share the same characteristics: small dimension, almost no mechanisation, thus, use of soft energy for brine transfer, intense manual work, the need for a human presence, and several harvests per season. Industrial salinas, either occupying former traditional salinas or newly constructed on favourable grounds, have large dimensions, powerful pumps for transferring brine, and carry out mechanised harvests once per season. In the extreme case of the immense salina of Margherita di Savoia (south-eastern Italy) the salt is harvested even less frequently: once every 4 to 5 years.

Due to changes in social values and economic stresses the salinas of the Mediterranean basin today face many pressures and threats. Their fragile socio-economic balance is linked to a market that is subject to tough competition from cheaper salt (produced terrestrially or in immense salinas in the south or outside the Mediterranean) and world trade. Faced with the need to be economically viable, Mediterranean salinas are confronted with the choice of closing, industrialising their production, or finding a niche market for quality salt that gives higher market returns. Where salinas close, this leads to an immediate loss of their biodiversity, as continual circulation of water is essential to maintain these values. In the cases of conversion to other farming use (rice, fish, and other types of aqua culture), salinas permanently lose their ecological value. The current trend to cease or consolidate salt production in many parts of the Mediterranean has created many inactive and intermittently exploited salinas with buildings and hydrological infrastructures falling into ruin. This is exacerbated by competition for space along the Mediterranean coastline for urbanisation, industry, and tourism, especially on the northern edge where there is the largest number of dormant salinas.

Today salinas constitute a threatened landscape in the Mediterranean and in Europe. This is more pronounced for artisanal salinas, because of the small size and manual operation that makes them much less profitable compared to industrial salinas. And as there is no commercial differentiation between industrial and traditional salt, artisanal salinas, with much higher operating costs, have been gradually abandoned during recent decades, with only a few still in operation.

In many parts of the greater Mediterranean region, the clock has been ticking for the re-opening of disused salinas. These rehabilitated salinas are frequently used as demonstration salinas for their past technology and know-how. However, the future of Mediterranean salinas needs more than the mere passion for salinas of the past. In fact, as Mediterranean salinas are limited in size and productivity, they are in practice unable to keep up with the world industrialisation process and to compete with the ongoing globalisation of the salt business. Under these circumstances, and on the assumption that salinas represent more than strictly economic values, the only solution is to preserve their operation by applying an alternative type of protectionism: depending on the salina type, to consider the salt produced there exclusively for consumption or/and to regard it as a “wetland”, therefore as a “green product”; finally to “certify” salinas, the salt-making process and the salt in order to market it under “special labels”.

Looking closer and analysing the situation of today’s Mediterranean salinas, characterised by a high degree of uncertainty even in the case of the large ones, we conclude that it is high time for action. Besides individual salt and salina lovers in the Mediterranean and the Canaries, sometimes united to confront the difficulties of the salt business, as with ALAS, there are important international bodies with an awakening interest in salinas and their product, like the Ramsar Convention, MedWet, Unesco, and the European Commission. With their contributions, all the above aims will be certainly easier, and may be feasible.



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