

## Editor's note

### Points of interest:

- The salt pans of Rio Maior
- The man of salt

### New challenges, new paths

Paths are completed by moving forward. The path of ECOSAL ATLANTIS is half done, looking back we see a gentle slope which we have traversed with ease, looking forward we can see a much steeper slope that we will have to conquer. Although we started this journey alone, we had the ability to attract others, who despite not having our responsibility, have walked with us and share experiences and knowledge, and the common dream of establishing our Route (Traditional Saltmaking – the Atlantic Route).

Although in many regions a certain lethargy persists, there are also some signs of dynamism and interest in the use of resources and salt-producing sites. One of the roles of the ECOSAL project must also be to draw the attention of site managers not to look on these spaces as "derelict" or "facing abandonment," but as areas with potential for the development of new activities or, in the case of salt extraction, with potential to generate complementary activities.

In this area the use of thermal water and hypersaline clays can be considered an especially interesting feature because there is evidence that this use contributes not only to general wellbeing, but also brings therapeutic relief to people suffering from certain dermatological and bone diseases.

This type of thermal resource was widely used in the nineteenth century in different geographical contexts, and some have even survived the "modernization" of therapies and new habits and summer leisure time. Recently, with the marked awareness and increment in spa tourism there has been a renewed interest in salt resources, from hypersaline waters, to clays and algae. This is one of the aspects that ECOSAL ATLANTIS has paid special attention to, for example by preparing a workshop which is organized by the University of Aveiro, because this feature is a new challenge that begs new approaches, that will permit the use of these resources, by restoring and preserving the salt sites and the spaces surrounding them.

On the other hand, society has acknowledged its duty to create the means that will allow all people – including those with any kind of disability – to enjoy public spaces through the creation of adequate resources and support systems. As there are already a reasonable number of visitable salt sites near the Atlantic, it makes sense to create these resources in places like this, so some experiments are taking place under ECOSAL ATLANTIS which will also be addressed in a specific workshop. It's another challenge and another path ...

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## The saltpans of Rio Maior

The Salinas de Rio Maior are located about 3 km from the city centre and fit in a valley in the foothills of the Serra dos Candeeiros mountains, in the Natural Park of Serra de Aire and Candeeiros. They occupy an area of about 22,000 m<sup>2</sup>, have been rated as a cultural heritage monument since December 1997. They are the only active inland salt-site in Portugal.



Figure 1 – Landscape.

The salinas are located in the valley of Fonte da Bica; the valley corresponding to the eroded core of diapir anticline is known as "vale tifónico", where abundant evaporite, salt and gypsum, and marls (Dagorda Formation) are surrounded by clay and limestone. Evaporite rocks are less dense, which, together with the existence of a fault system, allowed their upward movement, known as diapirism.

Formations resulting from these movements are easily eroded, because of their plasticity, permitting some diapirics or salt domes to rise to the surface. This is erosive activity that usually leads to the lowering of the emerging field, with respect to its surrounding, more resistant formations (Serra dos Candeeiros and Serra da Marinha) causing a depression that facilitates the configuration of the river network, creating the valley.

In Portugal, salt rock, and among them, rock salt, were formed at the base of the Jurassic period, in the Hettangian also known as the Dagorda Complex. These occurrences are distributed largely over a strip on the frontier between the mountain range and the western and southern edges. As is the case today in the Dead Sea, seen as an embryo of an ocean opening from rift, we consider that the Portuguese salt formations are related to the lagoon environment which was a precursor to the opening of the North Atlantic, about 200 million years ago.

The existence of these salt rocks shows us that the paleo-environment formation had coastal region features (lagoons and tidal flood plains), in a hot and dry climate, which is very conducive to rapid evaporation. During the Mesozoic, about 200 million years ago, sedimentation occurred in an environment of shallow water in ponds fed by marine waters leading to alternations of salt clay and rock salt. Today it is these clays that separate the mother lode of rock-salt from the surface, thus serving to protect it.

In Rio Maior the salt water comes from the great deep vein of rock salt, which is crossed by a stream of fresh ground water originating in the karst system of the Serra dos Candeeiros, which becomes salted through the process of dissolution, ending up in a catchment well in the central part of the salt works.

The salt of Rio Maior was exploited by the Romans, Arabs, and perhaps even by prehistoric peoples. Some of the remains of surviving saltworks at the site are over 800 years old.



Figure 2 – Overview with pulleys.

The sheer density of human occupation in this region since the Upper Palaeolithic period, the Neo-Chalcolithic, Bronze and Iron Ages is in itself a peculiarity in relation to the rest of the country and allows us to identify the exploitation of this natural resource by these communities as the main factor for settlement in the region.



Figure 3 – Using gourds for irrigation.

The first written document mentioning the date of our salt exploitation dates back to 1177 when Templars acquired one fifth of the water withdrawn from the well from the owners Pero de Aragão and Sancha Soares. Later, D. Afonso the firth was the owner of five salt plots besides being the owner of a quarter of the production of the other salt-makers.

Currently these works are completely private and since 1979, 90% of their extension is managed by the Cooperativa Agrícola dos Produtores de Sal de Rio Maior, working on a seasonal basis. There are, however, some independent owners who still explore a few pans. Divided among many owners, there are about 400 pans that are named "talhos" and 70 "esgoteiros" pans which are deeper and that temporarily store water to supply the salt pans. The salt water that feeds them, which was initially ex-

tracted with a pulley and bucket from a central well 9 m deep and 3.75 m in diameter, is now pumped up. In the summer, the salt water is routed into different esgoteiros by means of ditches and from there to the different pans, where evaporation occurs. When all the water has evaporated, pure salt (97.94% sodium chloride) remains in the pans and it is then removed and taken by the salt-workers to the warehouses of the cooperative, or the independent owner, which are built out of wood to avoid corrosion. About 1,500 to 2,000 tons of salt are harvested per year and before it is packaged and marketed throughout Europe, it is selected and graded grain by grain by the workers, to satisfy even the most demanding customers.

This process has been in practice since time immemorial. The channeling of this brine by salt-makers follows traditional practices that have been scrupulously respected since the twelfth century. A litre of water from the well that supplies the salt pans contains on average 220 g of salt (with 97% NaCl), that is 6.3 times saltier than the water of the Atlantic Ocean.

Work on the Salinas de Rio Maior provides a different perception of the formation process and the harvesting of salt. Here we discover the real secret of salt works without the presence of the sea - a subsoil rich in rock salt allowing for the appearance of salt water at the surface and the precipitation of sodium chloride through evaporation of the water, thus bringing about the production of salt. It appears that before salt arrives in our homes, it goes through some processes that are not complex but are drawn out. Due to the historical, social, cultural, economic and geological particularities of these salt works their preservation is extremely important.



Figure 4 – Crystallization.

#### bibliography

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# Character

## The man of salt

In Portuguese, the places where salt is exploited through solar evaporation are called *salinas* or *marinhas*, and it is curious that the word *marinha* may also designate a plot of sandy coast. Or it can have a global meaning, that is better known, and used in association with marine shipping, both merchant or war.

But although the word *marinha* is widespread when referring to salt in Portugal, the name given to men working salt is *marnoto*, or *marnoteiro* or *salineiro*. Only in Rio Maior is the designation *marinheiro* (from *marinha* – navy) used to designate the men who produce salt there. Elsewhere, the word *marinheiro* is restricted to maritime activity.



Figure 2 - The *Marnoteiro de Alcochete*.

However, be they *marnotos*, *marinheiros*, *salineiros*, *salineros* or *paludiers*, these men have something of the gardener and the man of the sea, because they cultivate salt in small plots, they guide the water as if they were watering vegetable patches or gardens and they know, just like sailors, the winds and the phases of the moon and the tides.

Socially, they may have different origins and statutes: owners, tenants, or employees. Out of the salt season they can have multiple activities, whether in agriculture, fishing or even in building or temporary factory work. They were almost always a hidden class, virtually invisible, appeared only exceptionally, like in 1957 in Alcochete (salt works of the Tejo) during the so-called rebellion of the salt, motivated by low wages and poor working conditions, or in street demonstrations in Nantes in the 1970s, against the destruction of traditional salt-producing activity in western France.

Much has changed since those times, starting in the number of *marnotos*, *marinheiros*, *salineiros*, *salineros* or *paludiers* who are still active. However, in some regions, the social reality of these workers has also changed substantially, with people coming from other sectors and activities and who have had a higher school education and in some cases (as in Guérande) have modernized and revitalized the industry, allowing, in the case of France, for the establishment of regular training courses, programs and curricula that are perfectly

established and approved by the competent authorities.

Occasionally, in Spain and Portugal, there has also been some training that attempts to embody a new man of the salt, who may be both a guardian of the landscape and the ecosystem and a tour guide who provides information for visitors on the techniques and the salt landscapes. The entire future of traditional salt exploitation depends on the engendering of these new salt-workers and, as in many other sectors, it is often women who respond better to changing paradigms and are better able to adapt to new opportunities. So the man of the salt is already the woman of the salt as well - and this will increasingly be so.

Here's to the new *marinheiras*!



Figure 1 - The *Marinheiro de Rio Maior*.



Figure 3 - The *Marnotos de Aveiro*.

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## Events

### Workshop on good interpretation practices

**Vitoria-Gasteiz, 9 and 10 June 2011**

The Diputación Foral de Alava organized a workshop on good interpretation practices mainly for guides on the traditional salt works of the partners on this project, on 9 and 10 June, in Vitoria-Gasteiz. The workshop was attended by twelve professionals from Spain and Portugal, as well as specialists in heritage interpretation and visitor support: Isabel and David Canales Boj.

The aim of this workshop was to provide knowledge and exchange experience among tour guides of the traditional salt works of the Atlantic. The conclusions of the meeting were recorded in a "white book" of best practices, translated into the four languages of the project.

Diputación Foral de Alava



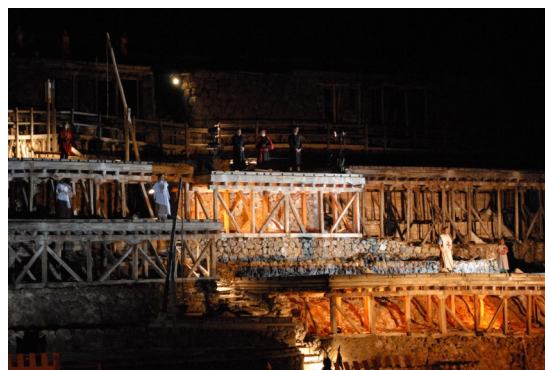
### Salt Fair – Valle Salado de Salinas de Añana

**Añana – 9 and 10 July 2011**

On 9 and 10 July the Salt Fair organised by the Fundación Valle Salado Salinas de Añana, the association of Gatzagak salt-makers and the Ayuntamiento de Añana was held in the Salinas de Añana (Álava).

On the evening of July 9, there was a light and sound show "La Memoria del Valle Salado" in which the inhabitants of this town dramatized, for the public, the rich history of the Vale Salgado since before the time of the Roman Empire, through the granting of the status of royal town of Salinas de Añana, by Alfonso I (the Warrior) in the twelfth century, up to its decline, in the 1970s and ending with the recovery of the Valley.

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### Photography Exhibition SAL q.b (to taste)

**On show in the Núcleo Museológico do Sal until 14 August 2011**

SAL q.b. is a product of the different visions of various authors from photography contests that the Photographic Archive of the Municipality has been promoting over the past 10 years.

Here you can see salt to taste the human harvest, the wrinkles of this weary earth producing centuries of fleur de sel in these enchanted gardens of Salt.

Câmara Municipal da Figueira da Foz

