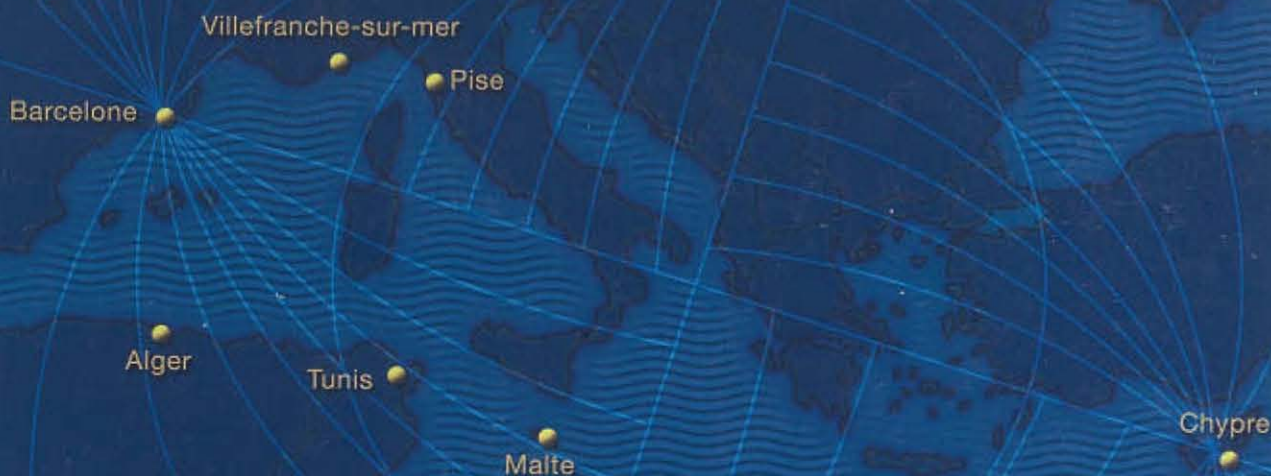


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The Production of Salt in Malta during Early Modern Times¹

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Studies on the history of salt in Malta are extremely few in number. The scarcity of published material on the subject is such that the ideas put forward by Karl Popper in his book *The Poverty of Historicism* come to mind. Popper upbraided the use of history for the projection of the future,² and rebuked the fact that the poverty of historicism leads to a poverty of imagination.³ He attributed this situation to the insufficient survival of documentary material on the history of past successive events. Popper's prognosis deepens if it is projected to those periods in history seriously lacking in copious information regarding past events. The little information that came down on salt history in Malta only permits, if anything, to formulate loose trends.

The aim of this paper is to fill such a void. Undoubtedly, salt in Malta was an ingredient of utmost importance and one which was prized. Then, as now, it was a fundamental ingredient in the kitchen and crucial in the preservation of food, in particular meat, vegetables, fish and cheese. Its use in the preservation of fish, at a time when the rigid religious norms prohibited the eating of meat on designated days of abstinence, was particularly important.⁴ It was daily consumed not only by man, but also by beast of burden and cattle.⁵ Moreover, salt had an important place in the artisans' workshop, in particular among tanners. The making of leather required copious amounts of salt to accelerate the process of drying the animal's skin while preventing it from decomposition.

This importance was reflected even in the local language usage. When one analyses the terminology used for the gathering of salt, one finds that Malta, like other countries applied agrarian jargon to describe the production of salt. For example, in Italian, the gathering of salt is described by the word *raccolta* while English uses the word harvest. Even in

Maltese, the word used for the gathering of salt, *gabra*, carries an agrarian significance. But when one delves deeper into the local situation, one immediately notices that salt was not always considered as a primary ingredient and unlike in many countries, where it was a matter of life and death, there were periods in the history of Malta when it was given less documentary importance. Could it be that as Malta is an island, this product was taken for granted by the population? It must be said that this topic was never popular with local historians who were in the past more preoccupied with the political events rather than with aspects of economic and social history. Even in recent studies on the history of food, salt fails to find proper representation. This vacuum could also be the result of the fact that salt was never considered as a primary product in Malta. Since the population of Malta was small, the inhabitants survived mostly on cereals and pulses. They did not consume great quantities of meat and were therefore perhaps less inclined towards the production of salt. The aim of this paper is to explore these themes as they emerge from both unpublished documents of the modern era and secondary sources and also to explore the different methods in use in the past for salting.

TOWARDS A HISTORIOGRAPHY OF SALT

The first important publication on salt in Malta is by E.V. Clarke, *Salt Pans in Malta, History, Structure, Operation*,⁶ in which the author discusses the general development of this industry in particular its operations during the early years of the twentieth century. However, a critical look at its content shows that it contains practically no historical information on salt production that goes back prior to the twentieth century. The author's main concern was a study of the place of salt within the wider context of food production.⁷

1) I would like to extend my sincere thanks to Professor Godfrey Wettinger and Mr. Ivan Grech who gave me references concerning salt from the archives of the Order of St. John (AOM) and the Library manuscripts (NLM).

2) K. Popper, *The Poverty of Historicism*, (New York, 2002).

3) *Ibid.*, 120.

4) S. Pira, 'Il Commercio del Sale Sardo nel Settecento dal Mediterraneo all'Atlantico (1700-1760)', *Storia del Commercio del Sale tra Mediterraneo e Atlantico*, S. Pira (ed.), (Cagliari, 1997), 177.

5) M. Balard, 'Il Sale a Genova tra Mare Nero e Mediterraneo Occidentale', *Storia del Commercio del Sale tra Mediterraneo e Atlantico*, S. Pira (ed.), (Cagliari, 1997), 45.

6) E. V. Clarke, *Salt Pans in Malta History, Structure Operation*, reproduced with some modifications from *State Veterinary Journal*, Sept. 1951, Vol. VI, No. 8, 8-11.

7) S. Mercieca, 'L-Istorja ta' l-Ikel fl-Epoka Moderna', *Malta: Esplorazzjoni: Dghajsa Karti*, D. Massa (ed.), (Universita' ta' Malta, 2001), 73-110.

The history of salt also attracted some attention from Professor Godfrey Wettinger. He has given snippets of information on salt in one of his papers⁸ and in his dictionary of Maltese place-names.⁹ Wettinger's main interest in salt was its relation with local Maltese place-names. He furnished an in depth study on medieval surnames whose meaning was related to salt. Finally one finds a dissertation on salt by Pauline Dingli, where among other aspects, she discusses the method of salt production, which in Malta has remained practically unchanged throughout the years.¹⁰ Dingli undertook to study the production of salt in Malta from a geographical perspective and its focus of study was mainly salt production in the twentieth century.

The history of salt has also been looked at through primary sources. For medieval history, one has to rely on published works about the Maltese nomenclature, especially the above-mentioned dictionary by Professor Godfrey Wettinger. The early modern epoch offered worthy of note archival material. The Hospitaller archives at the Valletta National Library were explored in connection with the Hospitaller era (1530-1798). The study of salt in the early modern period was also supported by a careful analysis of different old maps of Malta. Sixteenth and seventeenth century cartography gave primary importance to places which were being used for salt production¹¹. These maps became a primary source and were to prove crucial in the writing of this paper.

Surviving documentation provides insights into the different types of salt-making in Malta which were very similar to those employed in Sardinia, Sicily and Spain. The Mediterranean world had its own characteristic of salt-making which differed from those followed in the rest of the European continent. Unlike the situation in mainland Europe, Mediterranean salt-making enterprises were of marginal character, as they only employed relatively few workers and employment was of a seasonal nature. Despite this fact, salt left a marked impact on trade in the region and became sufficiently integral to systems of commercial exchange¹² to invite comparison with the trading of grain.¹³ The Mediterranean salt-

pans were usually situated along the coast in particular in areas where the lie of the land was flat and where environmental conditions were unfavourable to agrarian use because of the tendency towards aridity.¹⁴

At least six types of different salt-making can be identified. In continental Europe, salt mines were the main source of salts. Those countries lacking in salt mines, such as the Netherlands, resorted to importation or to the burning of soil for the extraction of salt.¹⁵ These two methods of salt extraction were however not feasible along the Mediterranean littoral. A similar method to the one used in the Netherlands was operated in the Mediterranean basin and consisted in the boiling of brackish water until salt residues were extracted by evaporation. Unfortunately, no written documentation has yet been encountered about the use of this method in Malta. Instead, people in Malta, as in the rest of the region, resorted to other methods, which all produced what is known as solar salt. The greater availability of sunshine and daylight hours along the Mediterranean permits the natural production of salt through the formation of salt marshes in holes and crevices in the rock. These are formed once seawater gathers in the crevices, and after evaporation, the residues form salt marshes. The human intervention also played a role and salt-pans were created since the late medieval times at different parts of the Mediterranean coast. These salt gardens, as they are also known, can be of two types. The first are those which could nowadays be regarded as proto-industrial plants as a result of their big size. These were extremely labour intensive. The next type of salt-pans were those developed in the fashion of honeycombs on different parts of the coast, where the rock bed was characterised by soft stone which could be easily worked to produce square, shallow compartments. These salt-pans were run on a family basis. In the case of Malta, as I shall be explaining below, these last three examples were the main methods used in the production of salt. Here, I would also like to point out that the word salt-pan will be specifically used in this paper for the making of salt through human endeavour, that is for those salt-pans which were dug by men and where

8) G. Wettinger, 'L-Inhawri tal-Mellieha fiz-Zmien Nofsani', *Il-Mellieha mal-Milja taz-Zmien*, ed J. Catania, (Malta, 2002), 41-48.

9) G. Wettinger, *Place-names of the Maltese Islands ca 1300-1800* (Malta, PEC, 2000).

10) P. Dingli, *A Resource from the Sea: a Spatial Study of Salt-pans around the Maltese Islands*, Unpublished B.A. Hons dissertation, University of Malta, 2000.

11) A. Canado, 'Il-Mellieha f'Mapep mis-Sekli Sittax sa Dsatax', *Il-Mellieha mal-Milja taz-Zmien*, J. Catania (ed.), (Malta, 2002), 49-58.

12) V. D'Artenzo, 'Le Fonti di Approvvigionamento del Regno di Napoli e il Sale Sardo tra Medioevo ed Età Moderna', *Storia del Commercio del Sale tra Mediterraneo e Atlantico*, S. Pira (ed.) (Sardinia, 1997), 131.

13) L. Palermo, *Meranti del grano a Roma tra Medioevo e Rinascimento. Il mercato distrettuale del grano in età comunale*, vol. 1, (Roma 1990), 20-1.

14) M. Mollat Du Jourdin, 'Sel Méditerranéen, Sel Atlantique: Profits et Servitudes (Proposition pour une réflexion Comparative)', *Storia del Commercio del Sale tra Mediterraneo e Atlantico*, S. Pira (ed.) (Cagliari, 1997), 11.

15) A.R. Michell, 'La Pesca in Europa agli Inizi dell'Età Moderna', *Storia Economica Cambridge*, E.E. Rich, C.H. Wilson (ed.), vol. 5, Torino 1978, 213.

the whole process of salt-making, including the filling of the saltpans with water, was also made by man. On the other hand, the term salt marshes is used to denote the formation of salt out of a natural environmental process. In these instances human intervention was minimal, though of course this would not exclude localised or enhancing measures, such as in the deepening of the stone cubicles for a better salt formation. What is most important in this context is that the salt in this last process is practically naturally formed, and that this process was the principal the late medieval period.



The saltpans of Qbajar in Gozo. These type of saltpans dug in honeycomb fashion became fashionable in the eighteenth century.

THE LATE MEDIEVAL PERIOD

The recent publication of the minutes of the Maltese Medieval town council, or *Università*, confirms the paradoxical situation Malta was in during this period in terms of salt production. Despite the fact that Malta is an island and therefore ideally placed to a labour intensive production of salt, the latter lacked any economic relevance at the time. The minutes of the *Universita'* for the period between 1450-1499 contain no reference to salt.¹⁶ On the other hand, if one were to consider topo-nomastic evidence, one encounters very few place-names which can be taken to unambiguously denote sites for the production of salt. At the same time one has to note that there is no independent historical information which confirms the relationship of these few place-names with the production of salt. Thus, if one were to take one of the medieval place-names, Mellieha, which is the name of a village situated at the Northern part of the island, one could justifiably conclude that it stands for the Semitic word < ملاحه > which stands for a saltpan. This relationship of the place name with salt can be also confirmed from the maps published in the sixteenth century, as they indicated in Italian the word *saline* (or saltpans) next to the village of Mellieha, but there is no other known written evidence that confirms that salt was being produced in this area during the fifteenth century.

In Mellieha, salt was naturally formed close to the

sandy beach, which was and is still known as I-Ghadira. The Ghadira Bay is an extended area of about 3 km². It is surrounded by cliffs on two sides which permit this bay to receive fresh water. At the same time, this small lake is flanked by two bays, which force seawater to infiltrate into the hinterland. Fresh water from the cliffs mixes with seawater that enters this bay gradually

in winter, creating puddles of brackish water. When one looks at the bay's representation in sixteenth- and seventeenth-century maps, one notices that the illustration of the saltpans was never shown in the form of grid compartments. This means that the area had not been used during this period for a man-made salt production. Instead, in this region, salt was being produced in a natural way, through the formation of salt marshes that were formed once the brackish water dried up in summer. The above-described hydrological factors were assisting this natural process. One has to remember that salt produced by a natural process is considered to be of superior quality to the one produced in man-made saltpans. It has been graded to be almost similar to table salt¹⁷ that although coarse in nature, is digestible and at the same time even ideal to be employed by craftsmen for their local production, as was the case with the tanners.

Malta has other late medieval toponomastic evidence with direct reference to salt. There were, at least, two other places which can be linked to the production of salt. These are il-Mellieha ta' Benghisa at the south of Malta and il-Mellieha taz-Zonqor also at the southern tip. Up to some time ago, these two places were still producing salt. The latter area of iz-Zonqor at Marsascala, is still being used for the production of salt. Archival documentation exists which shows that il-Mellieha taz-Zonqor¹⁸ was associated with salt production before the arrival of the Knights of St. John of Jerusalem. This place has similar characteristics to Mellieha Bay, that is, a confined catchment area for fresh water which after mixing with salt water, turns brackish. These factors make this habitat ideal for salt production.

Yet, despite this salt production at different points in

16) *Acta Iuratorum et Consilii Civitatis et Insulae Melitae*, G. Wettinger (ed.) and translated by P. Carrao (Palermo, 1993).

17) Dingli, 28-31.

18) National Library of Malta, Univ. 206. f.261. II-vii-1509.

Malta, this product was never discussed in the Town Council meetings at least during the period 1450-1499. This means that salt did not fall under the Town's Council jurisdiction. The Town Council was neither importing nor exporting salt. This situation leads to a second observation. The Town Council was authorised to impose taxes on the consumption of certain products in Malta

that fell under its jurisdiction.¹⁹ One has to keep in mind that a salt tax was common all over Europe, especially in Catalonia, in the Kingdom of Castile,²⁰ and in France. Judging from existing documentation, a similar tax does not seem to have existed in fifteenth-century Malta. On the other hand, other products of alimentary nature were being taxed, in particular wine and cereals. The latter were constituted by wheat, rye and bran. Therefore, medieval Malta either had no salt taxation or else, if it existed, salt fell under the jurisdiction of the Royal Domain, that is, the Sicilian Regno. In the Constitution of Melfi (1231), Frederick II made the gathering of salt a prerogative of the Sicilian crown.²¹ From the time of the enactment of this constitution in 1231 until the fifteenth century and later, no information has been divulged attesting the existence of any form of salt tax in Malta.

The fact that as far as can be ascertained there was no *gabelle* tax in Malta, does not mean that salt was not being considered as a primary product. The population of Malta was very small during this period and perhaps the amount of salt that was being gathered from Mellieha and the two other places in Malta was enough to meet the local demand. If one had to put the local situation in an European context, one finds that the countries that were taxing this product were those that needed it most, despite the fact that they had a very high local production as was the case with Castile and France. Due to climate and above



A general plan of the area of the so-called Old Saline of Burmarrad.

all the size of the population, the production was never enough and therefore France and other northern countries had to turn to its importation. The cold winters of Northern Europe constrained these countries to stock meat and fish and for this reason they needed large quantities of salt. One has to remember that at this period, the imposition of taxes was not considered

a protective sanction but a source of revenue. Therefore, taxes were mostly levied on those goods that were consumed in considerable quantities or else on luxury products.²²

In contrast, medieval Malta did not need salt importation and the small size of the island spared Malta the problems of internal food exportation. On the other hand, the rise of corsairing and piratical activities in the fifteenth century made the production of salt very difficult. It was very unsafe to live or work next to the coast. The risk of these people to become a prey of corsairing raids was high. In fact, during this period, Malta was increasingly becoming the target of pirate attacks, as well as it suffered from a number of Muslim razzias. Professor Wettinger notices a process of depopulation in all the villages situated next to the coast along the fifteenth century.²³ Lack of security brought the abandonment of these villages to the benefit of those situated in the hinterland. Villagers started to seek the safety of the internal villages. Before such a situation, salt production, which was an industry concentrated around the coast, must have suffered a severe setback. It could explain why no proper salt production was undertaken and the people preferred to rely on the natural process of salt production for their daily needs. However, this impasse was not the sole factor that hindered the importation of salt in the late medieval period. Salt does not seem to have been considered an important commodity at the time, with the result

19) On the other hand, if there was a salt tax, this was never changed or it was a royal tax. In this context, one has to keep in mind, that the royal taxes also existed in Malta that were separate from the ones imposed by the municipality. According to Brian Blouet, the manufacture of salt in Sicily was a royal monopoly that had its origin in the Norman epoch. This monopoly, Blouet continues, was handed over to the Order of St. John. However, one has to say that the principal region where salt was produced that is, Ghadira Bay in Mellieha, was not part of the Royal Domain. B. Blouet, *The Changing Landscape of Malta during the Rule of the Order of St. John of Jerusalem 1530-1798*, (Unpublished Ph.D Dissertation, Hull, 1963), 272.

20) Balard, 53.

21) I owe this information to Mr. Charles Dall.

22) J. Hadzioussif, « Salines et Grand Commerce en Méditerranée au Xve Siècle », *Storia del Commercio del Sale tra Mediterraneo e Atlantico*, S. Pira (ed.), (Cagliari, 1997), 60, cfr. 76-80.

23) G. Wettinger, 'Lost Villages and Hamlets', *Medieval Malta*, A. Luttrell (ed.), (Rome, 1975) 181-216.

that no measures were taken to counterbalance any local shortages, which such a situation may have provoked with the importation of salt from other areas.

In other words, salt production during late medieval times in Malta was condemned to stagnation. Gauging from cartographic evidence and the lack of other written or archaeological sources, the only scenario possible is one in which salt production simply could not expand and if an industry had existed, it was a localized affair with the result that salt had a very limited consumption. The industry could only function on as a small family-run enterprise. Perhaps, the production of salt was left to a natural process of production, as some areas of the coast produced natural salt crystals every year. Then, it was up to the locals to go to these places producing salt to gather these crystals.

With the population of Malta during the fifteenth century being around ten to fifteen thousand, a small operation in the production of salt would have been enough to sustain the entire population. Above all, there is no doubt that meat was not a primary product during this period. The majority of the population was poor and depended on cereals and vegetables. Only small amounts of meat were consumed in Malta at the time, and as the rest of Europe, meat was mostly eaten on special occasions and important religious feasts.²⁴ Malta imported small amount of meat and fish but the amounts imported reached our shores either as livestock or else as stocks of meat preserved in salt. In such a scenario, the local production of salt was probably not directed at a culinary purpose. It would appear that salt was primarily needed in Malta for the production of leather which was a well-established industry during this period. Moreover, as the archaeological evidence shows no saltpans dating to the late Middle Ages, one can hold to the statement made above that salt was being produced during this period through a natural process.

The confirmation that medieval Malta had no man-made saltpans can also be confirmed from the first cartographic evidence on the island of Malta that dates to the sixteenth century. Unlike late sixteenth-century maps, if one looks at the Piri Reis map of Malta of 1522 there is no reference of a toponomastic reference to this product. The same can be said about

a second important map of Malta that was published in Lyons, France. In 1533, Jean Quintin d'Autun published the first description of Malta and a map of the island. Neither the map nor the description gave any information about the production of salt on the island. Such a missing reference to a saltpan toponym can be taken as evidence of the minor importance that salt production had in Malta at the time.

Thus, one can conclude that the Malta of the 1530s did not have any significant salt production. However, this does not exclude the existence of salt production at a domestic level. In fact, most probably salt production during the Middle Ages was derived from a natural process, through the formation of salt marshes.

THE PRODUCTION OF SALT IN THE SIXTEENTH CENTURY

The appointed official historian of the Hospitaller Order, Giacomo Bosio, confirms the existence of salt marshes in Mellieha in 1533. He described these salt marches as being « *saline assai vicino del Freo* », or the channel between Malta and Gozo.²⁵ At the same time, the notarial archives began to make references to saltpans. In a contract compiled in front of the notary Brandanu Caxaro in 1541, there is reference to a plot of land called *tal-mellieh*.²⁶ This land was in a village called Hal Kbir, in a locality called *Benarrad* (Burmarrad). Incidentally, in this locality, there were extensive marshes that contained brackish water. The same plot of land was mentioned again in another contract three years later.²⁷ Then, in 1557 in another notarial contract, one finds the name of another locality suggestive of salt production; this was known as *il-Mellieha ta' Ben Ghisa*²⁸ in the south of Malta. Geologically, this region was full of pools of brackish water; the rock formation of this region, with its numerous fissures had been consequential for the production of salt marshes. Water got trapped in the ruts, stagnated and formed salt crystals.

It was during this period, that is, towards the middle of the sixteenth century that there is the first direct reference to the production of salt in a published map of the Maltese Islands. The map of Antonio Lafreri entitled « *Melita Insula, quam hodie Maltam uocant...* » and published in Rome in 1551,

24) K. Gambin and N. Buttigieg, *Storja tal-Kultura ta' l-Ikel f' Malta*, (Malta, 2003) 81-88.

25) G. Bosio, *Istoria della Sacra Religione*, Vol. III, (1676), 128.

26) NAV R 175/8, Not. Br. De Caxaro, 24-xi-1541, f. 96.

27) NAV R 196/4, Not. Cierolamo Cumbo, 10-ii-1544, f. 1v.

28) NAV R 175/54, Not. Br. De Caxario, 9-viii-1557, f. 1078v.

made reference to the saltpans of Ghadira. The term *saline* was placed exactly next to Marfa, in an area known as ix-Xilep. At this point, the reader should note that these saltpans were not represented on the map as having a grid structure. This fact reinforces the previous observation that the salt marshes in this region probably produced salt through a natural process. The most important fact in this map was that after Lafreri, this reference to the existence of saltpans in Ghadira started to be repeated in other maps like those of Cirni, Ab. Hortelius, Bertius, Megiserus, and Ogilby.²⁹

The pictorial element of the salt marshes re-emerges in the map by Giovanni Francesco Camocio and published in 1560. Camocio's map includes new features. He puts the word « *salini* » next to the geographical location of Marfa, but then showed I-Ghadira in the form of a delta and depicted the saltpans as a patch on the eastern cliffs of Marfa. In other words, the cartographer was foregrounding the relationship that existed between the water and the production of salt. This same element was repeated in the maps by Andre' Thevet (1502?-1590) and Giovanni Battista Rondinellus (1588) but Rondinellus introduced a further element. He called the salt marshes of Mellieha as « *Saline vecchie* ». This reference implies the existence of new saltpans but failed to indicate where the new saltpans were situated.

Seventeenth- and eighteenth-century maps were more exact in the location of the saltpans, in particular when representing the old saltpans of Mellieha. Francesco Valegio's map was published after 1615. He depicts the Mellieha saltpans in the inland water of Ghadira. The same location is repeated in another map of 1735 made by the parish priest of Naxxar, Fr. Fiteni, under whose jurisdiction the entire region of Mellieha was included. Fiteni depicts the *saline vecchie* exactly where the Ghadira bay is situated today.

At this stage one should ask why the cartographer Rondinellus made such a difference between the old and new saltpans and why do the old saltpans appear in the location of Mellieha? Perhaps the answer can be found in the fact that when the lithographer and the publisher of the map were making their design, they were following other maps, which contained reference to both the old and new saltpans. As these maps were not locally produced, the cartographer had executed his map at the same period when the first saltpans had been constructed with

the result that he had little knowledge of the exact geographical position of these saltpans. This could explain why he had failed to give their exact indication on his maps. Perhaps the new saltpans were still under construction when the first reference to the old pans was made. This means that the new saltpans would have been made in the last quarter of the sixteenth century and most probably the source of this new information was the map of Malta being on one of the walls of the Grandmaster's palace, by Matteo Perez d'Aleccio. The Italian painter Matteo Perez d'Aleccio was commissioned by Grand Master Jean Levesque de Cassiere to depict scenes of the Great Siege of Malta of 1565.³⁰ Among the scenes depicted by Perez d'Aleccio, there was a full map of Malta. It is in this map that the painter makes reference to the new saltpans. He depicted grid-structured saltpans in the region known today as *is-Salini*, in the limits of Burmarrad.

Perez d'Aleccio's map represents Malta in the time of the Great Siege of 1565. On the basis of this map, one can conclude that saltpans at Burmarrad were already in existence around 1565. However, on a second reading, it is more probable, on the basis that the first reference to the *vecchie saline* dates to just after 1565, that they were constructed around the time when this map was executed, that is in the period between 1570-1580. The designer thus included in his scene the new project launched by the Knights Hospitaller for the production of salt in Malta. Moreover, it was in this map that a difference was registered between the saltpans of Ghadira and the new ones, or *le Saline Nove* (sic), of Burmarrad.

The building of new saltpans is to be approached within the general sense of security instilled by the Knights. Once it became clear that the Knights were going to remain in Malta, they intensified their capital investments on the Island through the construction of a fortified city and the introduction of coastal towers. In this context, the production of salt could make a leap forward. Salt was not only produced through a natural process since new production techniques were introduced. The new sense of security encouraged individuals to work in this new enterprise, despite the fact that during this period alerts over corsairing raids were frequent. Judging from Perez d'Aleccio's map, these new saltpans were state of art, in terms of the method used. Perez d'Aleccio depicted a complex system of saltpans laid out in grid form structure; such a structure reflects

29) M. Agius-Vadala and A. Ganado, 'The Pre-Siege Maps of Malta', *Annual Report and Accounts, 30th September 1986 of Investment Finance Bank Ltd. Malta*, 1-17.
30) A. Ganado and M. Agius-Vadala, *A Study in Depth of 143 Maps Representing the Great Siege of Malta of 1565*. (Malta, 1994), 462-477.

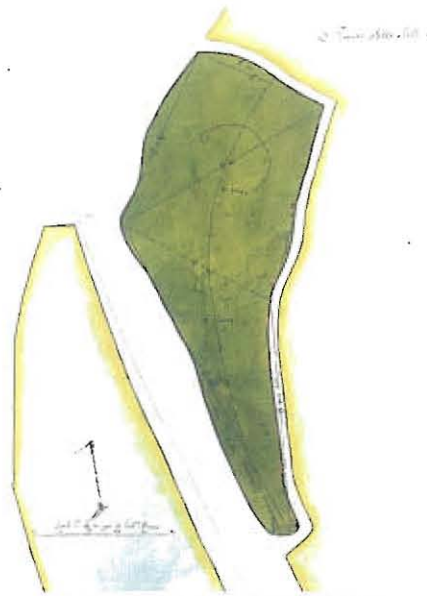
the professionalism that the Hospitallers sought to instil in the production of salt.

This locality was not the only area given over to the production of salt. New places started to be developed for this purpose. The Burmarrad model was copied by local craftsmen through the construction of flat cubicles in the rock at various points of the coastline, which had the upper rock made of globigerina limestone. Current owners of some of these salt pans confirmed to students undertaking research on the subject that some of these salt pans are indeed very old. Both the surviving oral tradition and the structure of some of the salt pans³¹ suggest eighteenth-century origins. Moreover, there are some who even speculate, perhaps exaggeratedly, that some of these rock-cut salt pans date back to the seventeenth century³².

THE PRODUCTION OF SALT IN THE SEVENTEENTH CENTURY

Toponymic information in maps about places related to the production of salt increased in the seventeenth century, with the most important addition being the salt pans of Burmarrad. In the early seventeenth century, the cartographer Francesco Valeggio (1611-1640), for example, in his edition of the map of Malta made reference to two kinds of salt pans; the ones at Ghadira and also the new ones at Burmarrad.

The reference to the two above-mentioned salt pans that is, *le saline* or *salini nuove* and *le vecchie salini*, continued in the following decades. The new salt pans of Burmarrad are mentioned for the first time in the notarial documents of 1611. Notary Andrea Allegretto associated the region known as l-Ghallis with the presence of salt pans.³³ One can fairly conclude that the reference to the Ghallis was the same to the new *Saline* of Burmarrad, as geographically, Ghallis and Burmarrad are in the same area.



A survey map of the area surrounding the Saline of Burmarrad.

It seems that this project experienced financial difficulties because for a long period of time, there is no clear reference to the salt pans in written documents from the time that these were drawn by Perez d'Aleccio (that is around 1580) to the first written reference in the official acts of the Order, as I shall explain further down. Definitely, the publication of the map in the form of a lithograph in 1582 by Perez D'Aleccio himself³⁴ led to the diffusion of information on these salt pans. In fact, reference to these salt pans was included in Francesco Valeggio's map and later on by

Francesco Lucin in his map of 1631.³⁵

These Burmarrad Salt pans fell under what was called the *mensa* or table of the Grand Master. This meant that the Grand Master had all exclusive rights over this property, including its rental income. Therefore, it was the Grand Master's right to lease these salt pans to third parties who in turn were responsible for their upkeep and employment of labourers. It also seems that the Grand Master was also sharing with the lessees' part of the profits made from the selling of salt. At least, seventeenth - and eighteenth - century authors refer to the Grand Master as the main beneficiary of the profits made out of these salt pans.

Towards the middle of the seventeenth century, Gio Francesco Abela - the Maltese Vice-Chancellor of the Order of St. John - wrote a book about the history of Malta, in which he included among others a description of Malta of his time. In this book, Abela made specific reference to the salt pans of Ghadira as well as those of Ghallis. He mentioned the salt pans of Ghadira, although he placed them in the region of Naxxar. He distinguished the Ghadira salt pans from the new ones by describing the latter as being in the « *Contrada delle Saline nuove* ». He explained that this term was being used to distinguish them from *delle vecchie & antiche saline*. What is interesting in Abela's

31) Dingli, 13-43.

32) E.P. Theuma, 'Possible Punic-Roman Salt Pans at Bu'ibba, *Il-Lokali*', 1999.

33) NAV R 16/24, Not. Andrea Alligretto, 21-iv-1611, f.665.

34) Canado and Aguis-Vidala, (1994-95), 462-5.

35) Clarke; Canado, *Mellie'a*, 53.

book is the information given on the production of salt. According to Abela, in these saltpans *si fa ogni'anno quantita' di sale che si estrae e manda fuori dell'Isola, il cui prezzo tocca all'erario del Sig. G. Maestro Principe*. This means that at the time when Abela was writing, around 1647, these saltpans were functioning and produced enough salt to yield some exports.³⁶

In the initial stages, the saltpans of Burmarrad were a model of economic success. In a *Status Liberi* document of 1581, it clearly transpires that Malta was still relying on the importation of salt in the early 1580s. According to Anna Zirengo, her husband Galeazzo Valentino, who was *patrone della gormio* (sic), died when his ship, which was carrying wine and salt to Malta, was raided by Turkish galleys.³⁷ The reliance on salt importation was no longer in evidence by the turn of the century. In 1603, the Hospitaller Order decided to sell a *vascello* to Pier Gio Bonti. The latter decided to enter into a partnership with Gio Batta Giusolfo and have the *vascello* transferred from Malta to Naples. Bonti took the opportunity to load the vessel with a cargo of salt.³⁸

However, the situation at the Burmarrad saltpans began to encounter serious difficulties in the coming decades, and by the time Abela finished writing his *Descrittione*, they appear to have entered a period of decline. Contrary to what the maps seem to convey, the saltpans in Burmarrad were relatively distant from the coast. This meant that that they needed more maintenance to keep them in a good state. In particular the maintenance of the gutters (or *guffun* as they were called in Maltese), which permitted the seawater to reach the saltpans, forced their owners (or lessees) into recurrent expenses. This is confirmed from a petition that Gio Battista Micallef made on 14 December 1650 to the Grandmaster, who had jurisdiction, as Abela says, over this land.³⁹ This document clearly shows that the saltpans, or *tavoli*, as they were called, were small and remote from the coast, so much so that their owner, the mentioned Micallef, was spending too much money to clean the gutters. Without such a clean up each *tavola* ended up *vacua e inutile senza che possi coltivato (il sale) se non con altra grande spese*. Micallef asked the Order to

finance new pools closer to the sea, which according to him, would be used for the production of salt. For this purpose, Micallef bought the land that surrounded the saltpans from Gonsalvo Vincella and his wife Teresa and his intention was to link this area to the Grandmaster's foundation so that, it would also be used for the production of salt.

The Correspondence Section of the Hospitallers' Archives confirms the precarious state of the Maltese saltpans. In 1658, the Hospitaller Agent Spriti informed the Grand Master in Malta of the transportation of a cargo of salt from the *Regno di Calabria*.⁴⁰ Most probably, this salt originated from the mines of Salgenma, which were the main provider of salt to Calabria and Naples.⁴¹ Judging from the fact that the *Regno di Napoli* had to resort to other Italian regions to meet its daily needs⁴² notwithstanding the presence of its own salt resources, highlights the difficult situation which must have existed in Malta at the time as far as salt reserves were concerned.

Here one can pause to look at things in a wider context. The knight Francesco Ventimiglia wrote that among the expenses that Grand Master Fra Aloff de Wignacourt incurred during his lifetime, there was a sum of 6,356 scudi, 4 tari and 9 grani spent on salt by the Order. This was a relatively big sum. The document does not specify whether the salt was imported or whether it was produced locally.⁴³ But it is clear that important developments had occurred in Malta with regards to the culture of salt making. Other documents of the Hospitaller period show that the Order had in the past to import this product quite regularly from Sicily or Southern Italy. The population was growing at a remarkable rate in the seventeenth century. The census of the population of the Maltese Islands of 1645 showed that the island had 39,963 inhabitants,⁴⁴ a figure that was much higher than the one calculated for the late Middle Ages. This means that the demand for cured goods was on the increase and thus, more salt was necessary. This necessity was more acutely felt during times of political difficulties or in the eventuality of an Ottoman attack or siege. The Knights admittedly sought to depend mostly on fresh food supplies so much so

36) G.F. Abela, *Della Descrittione di Malta*, (Malta, 1647), 71.

37) A.A.M. *Status Libero*, 18-ii-1581.

38) AOM 1384, f. 382 r-v.

39) AOM 6389, f. 125 r-v.

40) AOM 1434, f. 106v.

41) D'Arizzeno, 134.

42) *Ibid.*, 133.

43) Dingli, 9.

44) Archivum Secretum Vaticanum, Fondo Malta 186, ff. 403i-406v.

that they transported livestock on their galleys while at sea.⁴⁵ When rumours were widespread that the Turks were going to attack Malta, more cattle were killed. Consequently, at such times they needed large amounts of salt for the preservation of meat and possibly even of fish; this increase in demand could only be met through importation⁴⁶ of meat from Sicily and presumably also of salt. Then, there was the industrial aspect. The production of leather⁴⁷ was a trade which continued to be practised during the time of the Knights, and as has been already indicated, it required a substantial amount of salt.

But if Malta had the sea as a natural resource, why would the Order have resorted to the importation of salt, thus incurring higher costs? There could be two principal reasons. First of all Malta was not producing enough salt to meet the local demand. Secondly and perhaps more importantly, this product was of an inferior quality and the Knights were disinclined to encourage refinement. With time, table salt became a connoisseur's product as suggested by the production of silver urns to hold these shining crystals at table. Even on the galleys, these culinary gadgets found their place. The captain of the Galleys of the Order had such urns on his table.⁴⁸ In this context, the state preferred to depend on the importation, especially, of table salt.

If one looks at the works of Gio Francesco Buonamico, who was a surgeon by profession, one seriously doubts the quality of Maltese salt produced towards the middle of the seventeenth century. Buonamico was one of the few Maltese who undertook the Grand Tour.⁴⁹ During his voyage, he visited different European countries and this enabled him to collect a number of recipes, which he described in his manuscript as secret recipes. Among these, one finds one on how to make salt out of nettles. The process was a very simple one. The first step was to burn the nettle, then the ashes were boiled whilst the water was left to evaporate allowing the salt to settle at the bottom. At first glance, this method may appear bizarre but in reality it was only following a similar method also used for the extraction of salt from peat. The burning of peat containing

salt water was a method used in Northern Europe by which salt was obtained.⁵⁰ It is interesting to note that Buonamico considered this salt to be of a superior quality to the one normally used at table. This does indicate that there were people seeking new ways of improving the quality of salt and of ensuring salt supplies of superior quality to the one extracted out of seawater. The latter was usually not considered to be of a good quality.⁵¹ One presumes that rock salt was being preferred at the time for table use.

Here one should also mention that the authorities started to give more importance to the quality of the salt towards the beginning of the eighteenth century. This fact emerges from the proclamation of edicts issued by the local authorities from time to time during the period.

Between 1698 and 1708 two edicts were issued concerning salt. The first one was issued in 1698.⁵² It decreed that all those who gathered salt on the island had to be licensed by the authorities. This edict reveals that those who were gathering salt were not always sanctioned to do so. Thus, it was declared that all those who worked in salt production had to be licensed to avoid uncomfortable inconveniences. Those who went against this law risked being sentenced for up to five years on the galleys.

The second and last edict was issued on 6 May 1706. This makes particular reference to the actual production of salt. In circumstances where salt was being sold without price regulations and above all without quality management and where superior salt was being blended with an inferior grade – as the document says, *il buono* was being mixed with the *mediocre et il cattivo* – this edict tried to introduce some kind of monitoring in this sector. All employees who worked in the salt industry were asked to check that the quality of the salt was good, meaning that the salt was not impure or adulterated. The edict insisted that this was important because the quality of food depended greatly on the quality of the salt. Above all, the edict demanded that the two kinds of salt sold on the market that is, table salt and

45) J. Muscat, *Food and Drink on Maltese Galleys*, (Malta, 2002), 19-21.

46) C. Testa, *The Life and Times of Grand Master Pinto 1741-1773*, (Malta, 1989), 253. Incidentally, Testa does not indicate the source of this information.

47) S. Mercieca, 'From a Rural Livelihood to a Cosmopolitan Vocation: Tracing the Origins of the Gafá Family', *Melitenium Amor, Festschrift in Honour of Dun ?wann Azzopardi*, T.Cortis, T.Freller, L.Bu?eja (ed.), (Malta, 2002), 285.

48) Muscat, 9.

49) NLM Libr. 1191. *Memorie de Viaggi di Giovan Francesco Buonamico nella Francia, Germania, Olanda, Fiandra, Lorena, Svizzera, Italia, Sicilia, Spinggie, e varie Isole della Grecia dall'anno 1657 sin all'1666*.

50) P. C. Emmer, 'The Dutch Salt Trade and the making of the Second Atlantic System, 1580-1650', *Storia del Commercio del Sale tm Mediterraneo e Atlantico*, S. Pira (ed.), (Cagliari, 1997), 118.

51) NLM Libr. 2, f. 53r.

52) NLM Libr.740 part C f.152v. A copy of this *bandu* can be found in NLM Libr. 641, 239.

rock salt, had both to be of a good quality. Its price was established to be sixteen *grani* each *tomolo* (853.33 cm²) and 3 *grani* each *mondello*. Those who broke the law were to have their salt confiscated and could also risk three years on the galleys. Therefore the *accatapani* (or quality inspectors) were asked to monitor that the salt was sold at the price established by the authorities and not at that set by the vendors.⁵³

In other words, the Maltese authorities even if slightly lagging behind of what had been happening in Europe in this area, began to follow measures undertaken in the continent concerning the production of salt, in particular where salt quality was involved.

THE PRODUCTION OF SALT IN THE EIGHTEENTH CENTURY

The Italian historian Antonio di Vittorio commented on the success of this product in the exportation market. Success was governed by quality. For salt to be of a prestigious standard, water quality had to be good. In fact, it was a common feature all over Europe that the salt, which was sold in the market places, was of a poor quality. It was dirty and very often polluted with mud.⁵⁴

It seems that the edict of 1706 achieved the desired effect. There were periods when the Maltese salt was not of a good quality as it was getting mixed with impurities. When this happened, its market value dipped. More importantly, it was not suitable for exportation. The construction of the saltpans of Burmarrad was aimed at ensuring a leap in quality but lack of maintenance led to an unfortunate situation. The saltpans had to be cleaned thoroughly and for this process to be successful, the old saltpans had their base lined with stone slabs of globigerina limestone, as is still visible today. The use of the globigerina limestone ensured that the saltpans could be easily cleaned before they were replenished with water. The risk of pollution was lowered whilst the final product was that of white shining crystals rather than greenish or blackish salt.

The eighteenth century was a period in which it was deemed necessary for Malta to open up its closed

economy and enlarge its market. For many years, the islands' economy was almost totally dependent on corsairing and on the construction industry. Trade became even more prized as the authorities perceived the benefits of strong financial systems with the result that they were willing to intervene to revive depleted local economies.

It is in this context, that one has to evaluate the development and the use of the saltpans during this period. And it is within the understanding of this new economic revival that one has to consider the saltpans of Burmarrad. They were revived and developed to their full capacity during this century, turning them into a true industrial depot where the production of salt reached an estimated three million kilos per year.⁵⁵

The success was so evident that in republication and updating of Gian Frangisk Abela's book by Count Giovanni Antonio Ciantar, direct reference was made to salt production in Malta. The update included new references to the saltpans of I-Ghallis (Burmarrad). Ciantar informed the reader that « *da queste saline l'Erario del Principe ne suole ricevere non piccolo emolumento per la gran quantita' di sale, che se ne estraie da diversi bastimenti per varie porti* ». ⁵⁶ In other words, according to Ciantar, in the eighteenth century Malta had enough salt not only to supply the local demand but also to meet export demands.

The fact that Malta was exporting salt meant that by the middle of the eighteenth century the island was again managing to produce salt not only in massive quantities but also of a good quality. Indeed, during this period Maltese salt found a good market in Venice.⁵⁷ At the same time, Maltese salt was fetching a good price in Croatia,⁵⁸ while in Ragusa (Dubrovnic) Maltese salt was challenging that of Barletta (a town in Puglia), which was renowned for its good quality.⁵⁹

This success led to the enlargement of the Burmarrad saltpans and the establishment of new sites for the production of salt at different places around Malta and Gozo, in particular at Sliema, St Julians, Marsalforn and Valletta. Survey maps executed in 1742 by the Hospitallar Knights, give information on

53) NLM Libr. 149, f. 224-225. Copies of this public notice (or bandu) can be found in NLM Libr. 641, 277-8; NLM Libr.740 Sezione C, I180 r-v, NLM Libr. 1210, 368-9.

54) A. Di Vittorio, « Il ruolo del sale nella ripresa economica ragusea », *Sale e Saline nell'Adriatico* (secc. XV-XX), A. di Vittorio (ed.), 1979, 300, 303.

55) M. Miede, *Histoire de Malte*, (Brussels, 1841), 259.

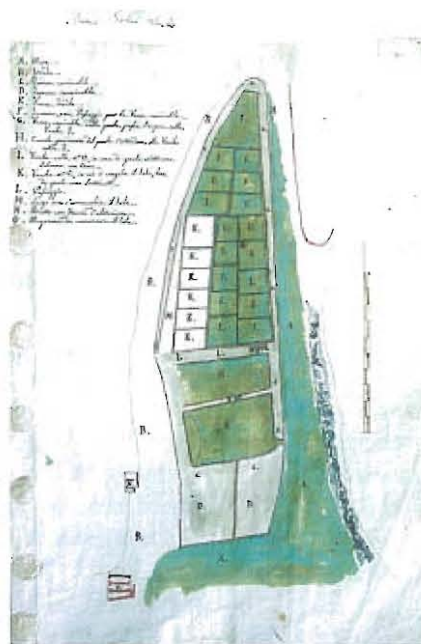
56) G. A. Ciantar, *Malta Illustrata*, (Malta 1772), Lib. 1 Not. XVIII, 389.

57) AOM 272, f. 10L.

58) I. Erceg, 'Il Commercio del sale sul Litorale Croato', *Sale e Saline nell'Adriatico* (secc. XV-XX), A. di Vittorio (ed.), 1979, 273, 279.

59) Vittorio, 300, 303.

what were termed as the *Vecchie Saline* and *Nuove Saline* of Burmarrad. The existing saltpans of Burmarrad were considered too small or inadequate to meet the rising demand for Maltese salt and the Knights devised a project to enhance the salt production in this area. It consisted in increasing the number of existing collecting saltpans from seventeen to twenty-three. Such an increase meant the enlargement of the reservoirs for the collection of seawater before it was channelled into the saltpans.⁶⁰ Moreover bigger warming pans were built in the open space separating the collecting saltpans from the sea, thus permitting the seawater to be channelled directly into the reservoirs and eventually the collecting saltpans. This project was intended to guarantee a leap forward both in quantity and quality of salt. As I shall explain further down, these Burmarrad saltpans were constructed in a way to produce white shining salt crystals. This was not the sole project of saltpan enlargement put forward during the period. Proposals were also put forward that existing sites were to be extended as was the case with the saltpans at Bahar ic-Caghaq, so that the Maltese islands could better meet the increased demand for salt.⁶¹ In addition, a map of Malta published by Boisgelin in 1804, but which depicts Malta in the middle of the eighteenth century, showed three principal regions for salt production that is, the medieval area of I-Ghadira, is-Salina ta' Burmarrad and a new site at Marsaxlokk. The fact that pools of brackish water were located at Marsaxlokk explains why this region began to be utilised for salt production. There were also other locations in Malta that are not shown on the map, but which were used for salt production like the area below Fort Tigne in Sliema, the one below fort St. Elmo in Valletta, part of the coastline of St. Julians and most probably even Qalet Marku in Bahar ic-Caghaq.⁶² From an archaeological study of these places, it was determined that the saltpans of these areas date to the herein-mentioned period.



A late seventeenth- or early eighteenth-century survey sheet describing the old Saline of Burmarrad

Malta was not the only place at the time where saltpans were being extended or developed. In the same map of Boisgelin, saltpans were also indicated on the island of Gozo, in the place known as il-Qbajjar.⁶³ These were not the sole saltpans in existence in Gozo because it seems that in 1740, saltpans were constructed in another area next to Qbajjar, that is, Marsalforn.⁶⁴

It is clear from another document that Gozo was drawn to the production of salt towards the middle of the eighteenth century. In 1746, the historiographer Francesco Agius de Soldanis mentions for the first time a location in Gozo associated with the production of salt, Mellieha ta' Ras il-Hobz.⁶⁵ According to the

author of this manuscript the salt that was produced here was « *il migliore che abbiamo nella nostra Isola* », (Gozo). It is interesting to note that according to the author, the valley of Mgarr ix-Xini, which is very close to Ras il-Hobz, acted as a natural basin for fresh water or as it was called in Italian *stagno*.

The experiment that represents best the drive for salt production, took place in Gozo in the location known as Ghar il-Qamh, where a man who is not identified by name but who, according to Boisgelin, was a watchmaker from Malta, tried to place the production of salt on an industrial level by using natural pressure to pump up sea water to the saltpans. According to Boisgelin, this man asserted that this natural method was sufficient to cover the expenses of his capital expenditure, and was also convinced that the venture was going to be a great success and leave behind a good profit.

The place identified for the purpose was a cliff next to the coast, which was between 40 and 50 feet above sea level. This meant that it was very difficult to collect water manually. Therefore, the watchmaker dug a vertical hole down to the sea and began to pump up water from the bottom and distribute it on the rocks. However, he began to notice that the water

60) AOM Treas. B. 290, f. 14 – 24.

61) *Ibid.*, f. 14.

62) Blouet, 272.

63) L. De Boisgelin, *Ancient and Modern Malta*, (London, 1804) vol. 1., 68-71.

64) Blouet, 272. Catt, (1937), 48.

65) NLM Libr. 145A, 24, (microfilm enumeration is page 29).

level in the salt pans began to recede. At first he thought that this was the result of evaporation, but then he realised that this was due to the fact that the rocks in the area were porous: the water started dripping into the grotto situated below the salt pans. Boisgelin stated that the failure of this project led this man into profound mental decline.

What started as an experiment in salt production ended in a tragedy. On days of bad weather, air got trapped in the borehole, and as pressure mounted, it caused an air explosion to the extent that seawater was forced upward, metres into the air, forming a fountain. The pressure was so strong that the water used to rise around six feet above ground level and spread itself over all the nearby countryside.⁶⁶ The result was that the surrounding vegetation died and the hole had to be dammed. The farmers sued the watchmaker for the mishap. However, the hapless watchmaker died shortly afterwards, before the case began to be heard in court.⁶⁷

The reasons that can account for the pursuit of increased salt production are also to be looked at in the context of what was happening at the time in other parts of the Mediterranean. Whilst the quantity and price were very important, these were not enough to explain such an industrial expansion. Quality played an important role. Europe distinguished between what was known as black and white salt. This difference determined the price of salt on the market. The white salt was of a better quality and it was highly prized.



The Calveo commissioned in 1742. This survey map shows part of the proposed new salt pans of Burmarrad.



Another survey map showing another section of the proposed 'Saline Nuova' at Burmarrad.

Its colour reflected purity and as it was not impure, it was the more expensive. In Sardinia, for example, the white salt fetched twice the price of the black salt on the export market.⁶⁸

The quality of salt was also judged in terms of acid content. The level of acidity in salt was an important market factor. For example, French salt was sought after by the Dutch, as it had a high magnesium content. At the same time, the Dutch considered the chemical components in the French salt as too strong to the extent that the French salt was mixed with other salt imported from the Iberian peninsula or the New World. In general, French salt was considered too strong to be used for the preservation of fish.⁶⁹ It dried the salted fish. The same characteristics of the Iberian salt were also found in the Sardinian salt. Its attributes made it a product sought after in Northern Europe and America for the seasoning of sausages and small fish, such as cod, salmon and anchovies. It was even less acidic and less bitter than the salt to be found in other parts of the Mediterranean. Despite the fact that Spanish and Portuguese salt were graded better than the French salt for salting fish, it still had a stronger flavour and had more acidic substances than the Sardinian salt, with the result that fish preserved in Spanish or Portuguese salt got drier, lighter⁷⁰ and less flavoursome. The same process did not occur when the same fish was preserved in Sardinian salt. On the other hand, Sardinian salt was considered inadequate for domestic usage or in the preserving larger fish.⁷¹ The salting of tuna fish was predominately

66) « One day in particular a terrible storm arose, and the violence of the wind drove the raging waves into the grotto; where the body of water increasing considerably, and being confined in this almost circular spot, acted with a rotary motion, and formed a siphon (PL. VII Fig. 1) or water spout. There being no passage but the well newly opened, it forced its way through with violence and appeared like a beautiful wheatheaf of water of so large a circumference as to fill up the whole mouth of the well, formed a magnificent aigrette. Its projectile force was so great, that the wind could not act upon it till it had reached the above mentioned height; when it suddenly separated, and the aqueous particles composing of immense body of water were diffused over the country on all sides, to the extent of more than a mile. This violent rain of salt-water destroyed all vegetation and the cultivated fields, which before had been amply productive, appeared as if they suffered from fire ». Boisgelin, 69-70.

67) This water fountain or clock as it was called became a principal attraction that it came to be visited by travellers and some of them like Jean Houel left images of the water sprouting like a fountain from the hole. J. Houel, *Voyage Pittoresque des Isles de Sicile, de Malte et de Lipari*, (Paris, 1782), tav. CCLII.

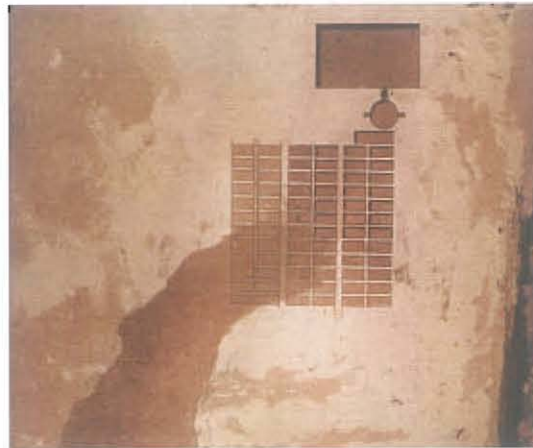
68) B. Anatra and F. Carboni, 'Sale in Sardegna nella Prima Etá Moderna, Storia del Commercio del Sale tra Mediterraneo e Atlantico', S. Pira (ed.), (Sardinia, 1997), 169.

69) Emmer, 121.

70) The question of weight was very important at the time both in terms of market and price considerations.

affected, even in Sardinia itself, with the salt of Trapani.⁷² The salt of Trapani also enjoyed a very high reputation in eighteenth-century Europe as table salt.

During the middle of the eighteenth century, Sardinian salt experienced a decline in quality due to lack of maintenance of the hydraulic systems of its saltpans, besides other problems.⁷³ The Sardinian salt that was exported to the European market at the time was dark and contained residues of clay substances.⁷⁴ This could account for the comparative success of the local product. Maltese salt had a good reputation at the time notably on the basis of its crystal-clear colour. The success of the Maltese salt in the Italian market can be equated with that of Trapani; the two places had similar geographical and climatic characteristics. Man-made Maltese salt had a mild acidic content and its shining white crystals made it for refined cuisine.



An image of the saltpans dug by the clock-maker at Gharb in Gozo. This image was drawn by Houel for his book *Voyage Pittoresque en Sicile et Malte*.

difficult to say concretely which were the locations that allowed salt to be produced through a natural process, as the urban developments that occurred along most of the island's coastline, have obliterated the relevant traces. Today, only one place remains which is still producing salt through a natural process and this is the island of Comino, where salt still naturally gathers in the fissures of the rocks.⁷⁵ However, this salt is not collected.

In the case of Malta, all methods of salt production required proximity to the sea. For this purpose, a location like a valley, at which end had a natural inlet presented the most ideal site. The place became even more attractive for salt production if at the end of the valley there was brackish water. Burmarrad had just such a geomorphologic structure and it was this, which led to this locality being earmarked for an extensive production of salt.

THREE METHODS OF SALT PRODUCTION

In the opening of this paper, a distinction was made between salt that was an anthropomorphic production and the one extracted by a 'natural' method. Here one has to add another consideration; the localised production of salt can be divided between one, which was a state enterprise and the other, which had cropped up in the eighteenth century at various parts of the Maltese coast, which was family run. These three methods had their own unique methods of production.

The natural process was the kind of production that supplied Malta for a long period of time. Today it is



The hydraulic mechanism commissioned by the clock maker for the making of a natural water sprout to fill the saltpans at Gharb in Gozo became an eighteenth-century 'tourist' attraction

When the saltpans were built in the area during the second half of the sixteenth century, these were situated some distance away from the shoreline. It was after the petition made by the above-mentioned Micallef, that things started to change. In fact, a map of the saltpans of the early eighteenth century depicts them closer to the shore. Above all, from this map one can make out clearly

certain features of these saltpans and thereby draw some conclusions on how they must have operated.⁷⁶ When the saltpans were refurbished in 1650, certain considerations were taken, among which were the building of surrounding walls made up of big slabs of globigerina limestone so that water would not

71) Pira, 184-5.

72) *Ibid.*, 185.

73) *Ibid.*, 190.

74) *Ibid.*, 193.

75) Dingli, 29, cfr. Appendix F, Plate 1.

76) AOM Treas. B. 290, f. 23a.

penetrate into the salt marshes. This boundary water was also intended to help the salt pans retain heat. Then, the salt pans were divided into three sections, that is, large areas reserved for seawater, so that after being filled, the water would be left still for days until it warmed up and turned brackish. This warm water was then passed to the warming salt pans and finally the water was distributed into the salt pans.

This project was created in an area that was more than 700 metres long. It contained seventeen warm salting pans, six collecting salt pans and another two basins that were all filled with seawater. The water was first passed into the two basins before it was transferred into the warm salting pans. The bottom of the warm salting pans was covered with clay, which was covered with sand so that the water would not seep into the rocks. On the other hand, the collecting salt pans were covered with globigerina limestone, and structured in the form of grid. In the new project, at least from what emerges from the plans of Library manuscript Treasure B 290, the early eighteenth-century structure was small, to the extent that proposals had been put forward for major alterations and additions to the salt pans. It was proposed that the number of warming salt pans would go up from nineteen to twenty-three, whilst new warming pans were to be constructed and the main reservoir enlarged. This proposal was implemented, as the main reservoir and the warming pans are nowadays placed in the same area as the one indicated in the survey map of 1742, that is, between the collecting salt pans and the sea. Moreover, the present number of the salt pans is superior to twenty-three.⁷⁷ In total, there are thirty-three collecting salt pans.⁷⁸ This means that not only the proposal put forward in 1742 was undertaken but also further enlargements were made to the Salina salt pans at some other point in time.

The first stage consisted in having seawater brought in the big basin or reservoir by means of a wooden gate that separated these warming salt pans from the sea. This reservoir was in turn connected to another basin which was in turn connected to the warming salt pans. The last stage consisted of the hot water passing into the collecting salt pans. The method consisted of having seawater passing into the first two basins that had a volume of 11,289 cubic metres and after being left for some days to warm up in the first basin, it was passed into the second basin and then to the warming salt pans which was almost half the

size of the first one. The water was left in the second basin for another period of time, to heat up. Then, this hot water was passed by means of gutters into seventeen basins so that it would turn into salt; in all, these seventeen salt pans contained around 1600 metres of cubed water.⁷⁹ In the meantime, as soon as the first basin was emptied, it was filled again with seawater and this process was repeated each time that water was transferred from recurrently one basin to the next. The sluice gate of the first basin was lifted to usher in water but they were also used to control the amount of seawater that entered the basin. By means of other gutters the hot water passed from the second basin to the warm salting pans and afterwards, by means of channels, the collecting salt pans were watered. The collecting salt pans were of the same capacity of the warm salting pans, that is, around 1600 cubic metres. These warm salting pans had gates which were opened and closed by clay. At some point in time the use of wooden pumps was introduced to assist the flow of water from one basin to another.

In this process, minute attention was given to preventing waste of energy. If water in the salt pans escaped, the system permitted its return into the warm salting pans through troughs so that it could be reused for salt production. When the salt was ready, it used to be gathered from the salt pans in bundles. The person who did the gathering used to gather salt from the top layers of the deposits to give time to the remaining water in the salt to drip out. Finally, the salt was gathered in wicker baskets and transported on the shoulders to the stores.

Very often, salt pans of this size used to be harvested once a year, usually in mid-August. However, since there could be showers in August, hay was grown in the passages at the sides of the salt pans, so that in case of a rain shower, it could be harvested and scattered over the salt. Then, it was burnt over the salt. The salt formed a crust, which prevented the rain water from penetrating and diluting the salt crystals.

The third method of salt production was slightly different from the one described above. The first major difference to be noted is in the size of the salt pans. This led to a lesser quantity of salt. These salt pans lack historical documentation and thus, their study has to rely on archaeological surveys. For example, the salt pans of Bahar ic-Caghaq or Qalet Marku, as they are better known were recently studied in great

77) Ibid., f.14.

78) Clarke.

79) Dingli, 32.

detail.⁸⁰ The following reflections are based on research carried out by Pauline Dingli as part of her undergraduate dissertation in geography. As a general trend, the saltpans around the coast did not have large basins. This could be the result of the fact that more often than not, they were dug in hard rock. By means of mason's pickaxes (known in Maltese as *fies* and *baqqun*) a number of square sized boxes were dug to simulate the grid construction in use for the big industrial salt production. The fact that the Maltese coast is characterised by extensive flat coastal areas and that globigerina limestone is situated at the surface helped the development of saltpans because this type of stone is relatively easy to cut. Above all, globigerina limestone offered another advantage. This material quickened the crystallisation process because water heated up faster. However, these basins took a number of years before they could be used, that is, until the stone itself produced a kind of crust that was a form of self-protection. Moreover the crust closed the porous inside the rock, thus stopping the lost water from dripping.

With these saltpans one can also speak about three phases in the production of salt. First a well or a large pool was dug very close to the sea. This pool used to fill up with seawater in spring by a natural process. The sluice gates were opened and this permitted this large pool to be filled up. Then, the water was transferred to the warming saltpans and finally to the collecting saltpans.

Production started in March, when the saltpans and the pool for hot water were cleaned, the water, which would have entered in winter due to rough seas, changed and wherever necessary also repaired. The fact that the pools were situated next to the seacoast meant that they suffered from erosion. Moreover, the waves hitting the shores, in particular in stormy weather, damaged the pools' boundary walls. Afterwards, the new water was left to stand for eight days. Nature itself did the work as once the water level receded, the remaining water in the pool would become warmer. The water was left still in the big pool until a temperature of around 37 degrees Celsius was reached. Then it was transferred into the pool of hot water. It was calculated that the size of these latter basins had to be seven times the size of the collecting saltpans. In these warming saltpans, the water was left for another eight days,⁸¹ that is,

until it again reached a temperature of 37 degrees Celsius⁸² and afterwards the water was poured in the saltpans. One has to note that the bed of some of these coastal saltpans was covered with stone slabs.

Naturally, a lot depended on the strength of the wind during these eight days, even if one has to say that Malta has the ideal natural elements for salt production that is, high temperature, low pressure, strong and frequent wind and little rain.⁸³ Still, nature played its part. If the wind blew from the north, the water would evaporate more quickly. On the other hand, the southerly wind is more humid and this lengthens the process of water evaporation. If there was a storm, and seawater infiltrated into the saltpans, the whole process would be ruined. Thus, the ideal time for salt production was between July and August. If the weather was favourable, salt could be gathered even after five days.

The process of how the water passed from one basin to another was manual, through the use of wooden buckets. This did not exclude engineering techniques, like gutters dug in the rock. Where the pools were distant from the principal reservoir, a system of channels connected the reservoir to facilitate the transportation of water by means of gravity. These channels (known in Maltese as *guffuni*) also used sluice gates that very often were closed by means of a piece of wood covered by pieces of cloth that was placed at the entrance of the gutters to keep the water from flowing in or out. If the use of the gutters was impossible because of the nature of the land, the transportation of the water used to take place manually or else the saltpans would be placed next to each other, honeycomb fashion, so that the water would ripple over from one saltpan to the other.

Thus, the saltpans had to be continuously supplied with water from the warming saltpans almost on a regular basis for seven days. The number of days depended on the weather. When the level of water in the saltpans dropped through evaporation, water was added from the warming saltpans. In the end, these saltpans would have consumed seven times their volume. This was the volume needed to produce a medium sized bundle of salt of about a *silt*. The latter is a Maltese measurement, which was equivalent to one sixth of a tumolo. During this process, salt formed a crust to prevent further evap-

80) *Ibid.*, 40-47.

81) *Ibid.*, 22.

82) *Ibid.*, 57.

83) A. Bissanti, « Le Saline di Santa Margherita di Savoia: Localizzazione e cambiamento nell'organizzazione del territorio », *Salie e Saline nell'Adriatico (secc. XV-XX)*, A. Di Vittorio (ed.), 1979, 32.

oration. The man who was producing salt had from time to time to smash the crust before adding warm water to the saltpan.⁸⁴ One should here note that the tools that were used for this process and for the gathering of salt in bundles, were all made of wood.

While the gathering of salt generally took place once a year in the big saltpans of Burmarrad, salt from the smaller saltpans was harvested up to twice a year because apart from August, if the weather permitted, another gathering took place in September. This aspect is related to the size of the saltpans; since they were smaller, evaporation took place more rapidly. Their size very often varied from 0.8 square metres to 2.5 square metres. The number of saltpans was also considerable. For example, the saltpans of Bahar ic-Caghaq that are derelict today number around one thousand. Xrobb l-Ghagin in Malta and Xwejni in Gozo had around two thousand saltpans each.⁸⁵

This difference in the size of the saltpans affected the quality of the salt. Due to their size, the saltpans of Burmarrad produced large crystals that had to be sieved and broken before being sold.⁸⁶ When the salt was sieved, rock salt and table salt were separated. Then, whenever very fine salt would be required, rock salt was ground. Above all, it seems that the small saltpans produced high quality salt – it was considered to be among the best of its kind for table salt.

Irrespective of the type of salt production, the salt labourers had to work in dismal conditions. All the Mediterranean saltpans demanded long working hours for a miserly pay. In other words, the workers received what Michele Mollat Du Jourdin described as a 'mediocre remuneration'.⁸⁷ Yet, this was not a *sui generis* situation. The same author puts the Mediterranean saltpans workers on the same level with their counterparts working in the Atlantic saltpans. The latter also had to work very hard in poor conditions.⁸⁸ Perhaps the saltpans of Sardinia are one of the best examples illustrating the difficulties that both employers and employees had to face vis-à-vis salt production. The saltpans of Sardinia were heavily labour intensive; the pans were practically filled by hand.⁸⁹ Sardinia had difficulties in recruiting

labour, in particular during summer time, as salt production and gathering was considered too tough and it coincided with the harvesting of grain. The Sabaudic State reacted by imposing forced labour on its peasants; the reaction was inevitable. It was a measure that was met by strong resistance by the local population.⁹⁰ Unfortunately, little is known about the Maltese situation. One cannot doubt that the work in the local saltpans was hard but until now, there are not figures available concerning the type and amount of workers employed in this industry at the time of the Knights. However, judging from the low profile role played by women in seventeenth- and eighteenth-century crafts in Malta, it is difficult to assess the precise involvement of women in salt gathering process. Unlike in the Netherlands, where women were employed in salt refineries⁹¹ as they did not require much vocational training, those in Malta were even refused any participation in humble jobs which remotely could give them any sense of equality with man. The official jobs reserved for women were mainly that involving midwifery, household jobs and that of sewing. On the other hand, one cannot exclude the fact, that unlike other Northern European countries, corsairing and piratical activities could have helped the Mediterranean world to find the required workforce in the form of slaves. This is an aspect which until now has not been well researched. In the case of Malta, however, the use of slaves at the Salina saltpans could have only been a casual one. The surviving documentary evidence does not give any information on the systematic use of slaves in the salt-making process. In his incisive study on Slavery in Malta, Godfrey Wettinger gives no reference to the use of slaves in the Maltese saltpans at the time of the Knights. At this point one has to remember that Wettinger's main documentary source was the Hospitaller's archives. In this context, it is highly improbable that, if such a source material had existed, it would have escaped Wettinger's extensive research.⁹² What is important to note here is that irrespective of whether slaves had been employed in the local saltpans or not, the local scenario was not different from the one existing in the rest of the European continent where workers had to work hard for a pittance. Information given by Clarke about the workforce needed

84) Dingli, 24.

85) *Ibid.*, 56.

86) *Ibid.*, 24.

87) Mollat du Jourdin, 13.

88) *Ibid.*

89) Pira, 180.

90) *Ibid.*

91) Emmer, 120.

92) G. Wettinger, *Slavery in the Islands of Malta and Gozo, ca. 1000-1812* (Malta, 2002).

at the Salina salt pans during harvest time at the turn of the twentieth century can give an idea of the number of labourers required during the eighteenth century to make this place functional. The salt-producing process and the gathering methods had not yet experienced big changes and those employed at the opening of the twentieth century were practically the same as those used in Grand Master Pinto's times. According to Clarke, the Salina salt pans employed between twenty-four to forty men on a contractual basis.⁹³ Such a huge workforce made the Burmarrad salt pans one of the few proto-industrial plants, (excluding maritime organisations) of eighteenth-century Malta.

CONCLUSION

When one analyses the commercial aspect of this product, one has to admit that for many years, Malta was not on the salt trade route. According to Cianfar, it was only in the eighteenth century that Malta entered the major salt trade routes. It is known that during the seventeenth century, the Hospitaller Knights tried to build a trading relationship with the Atlantic through the possession of the islands in the Caribbean. However, the Knights lacked suitable vessels seafaring on the oceans.⁹⁴ In fact, this experiment had to be abandoned.

When one considers the short distances that the galleys of the Order travelled, one realises that there was little opportunity for Maltese salt to be commercially successful in the seventeenth century or previously. One must also remember that salt production was a common feature in many Mediterranean lands. Thus, one must admit that Malta had a difficult market and strong competition. Moreover, one

had to see whether the local production was good enough to meet the demand. Secondly, one has to ask whether the regions that Malta traded with, namely Sicily and Marseille, were interested in importing Maltese salt. They had their own production. Here one enters into the mechanisms of commerce. For Maltese salt to be exported, it had to meet a demand. But it needed also to create a demand for the Maltese salt. Thus, Malta had first to identify neighbouring countries that were interested in importing salt. The practical limitations imposed by the small galleys had made it impossible for Malta to export salt across the Atlantic. Secondly, Malta had to produce salt that was considered superior to the salt produced by the other Mediterranean countries, which had an established tradition in the export market. This goal was achieved in the middle of the eighteenth century, when the Maltese salt began to be known for the fine quality of its clear crystals. It was then that Malta managed to start exporting this product and to make a name for itself in this niche market in Europe. Yet, it proved to be a very short-lived experience. The dynamic of Maltese trade changed in the nineteenth century. Malta, as a British colony, had other economic priorities. Salt production began to focus more on the local and the British services' needs. It was an experience that largely held true until recently. It was only during the post-Second World War period that Malta experienced a truly industrial birth. One has left no space for many of the traditional crafts and for the labour intensive salt production. Slowly, Malta followed other Mediterranean Islands, such as Sicily and Sardinia, where due to industrialisation, salt production went into long-term decline.

⁹³ Clarke (unnumbered).

⁹⁴ The vessels of the Order were small and suitable for shorter voyages - for this purpose, the galleys and later on the half galley (*mezza galera*) were used. For short distance and especially in selected transportation of goods, the *tarfana* held pride of place and during the eighteenth century there was also the brigantine and the *speroniera* boat.