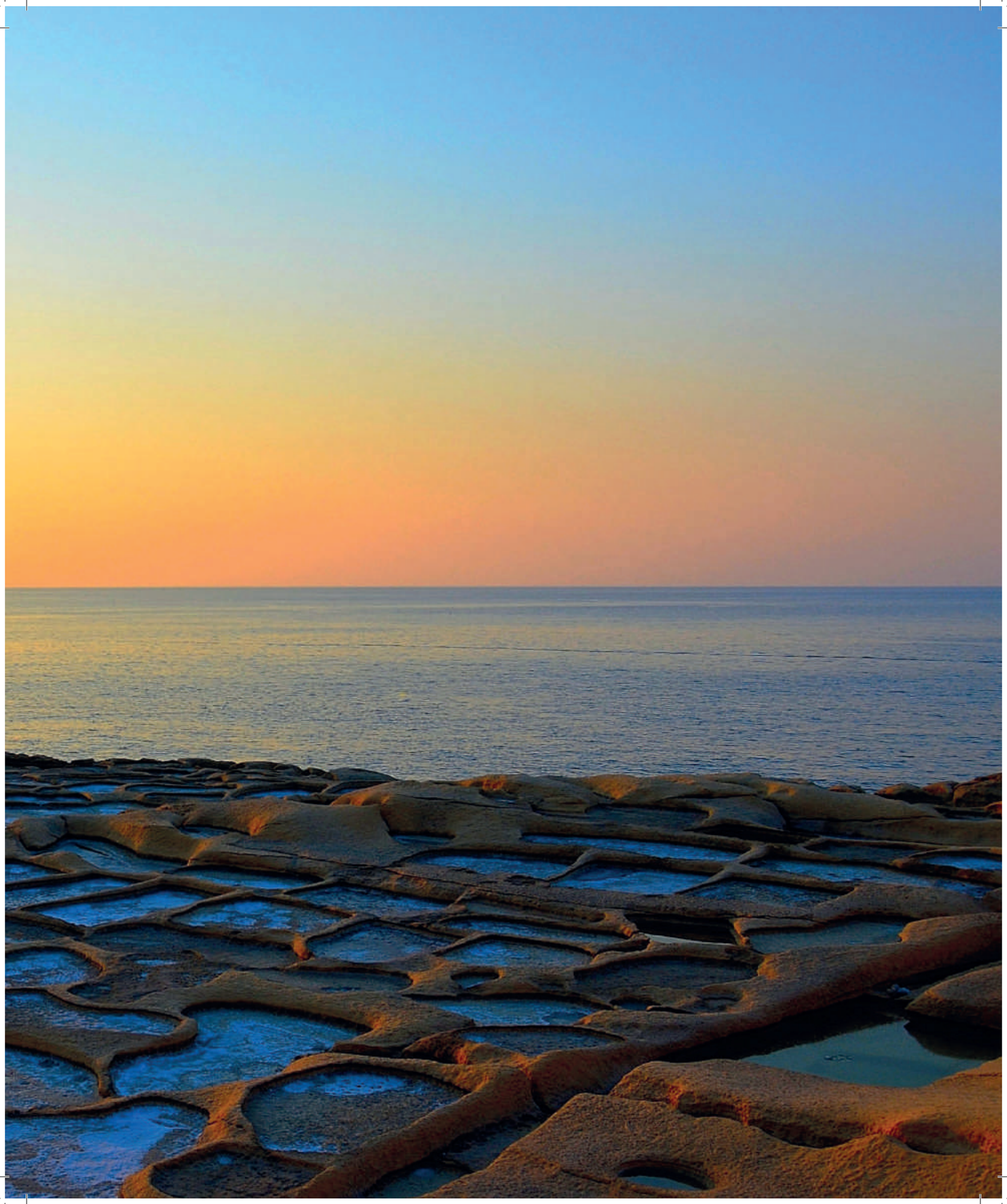
SALT PANS in MALTA

A Study of Salt Pans and Salt Production in the Maltese Islands

Pauline Dingli

Edited By
Roger Mifsud

Qbajjar Salt Pans



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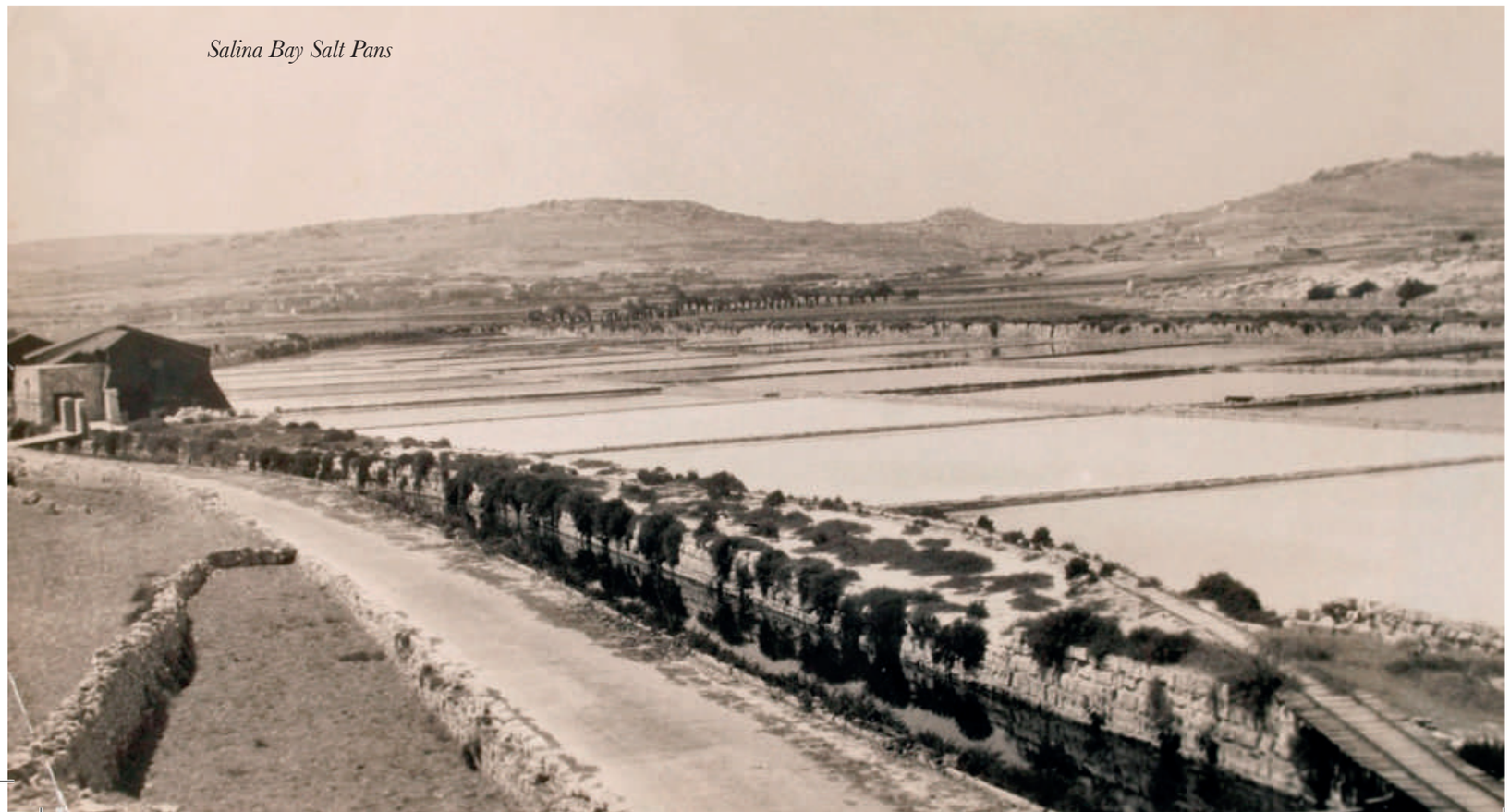
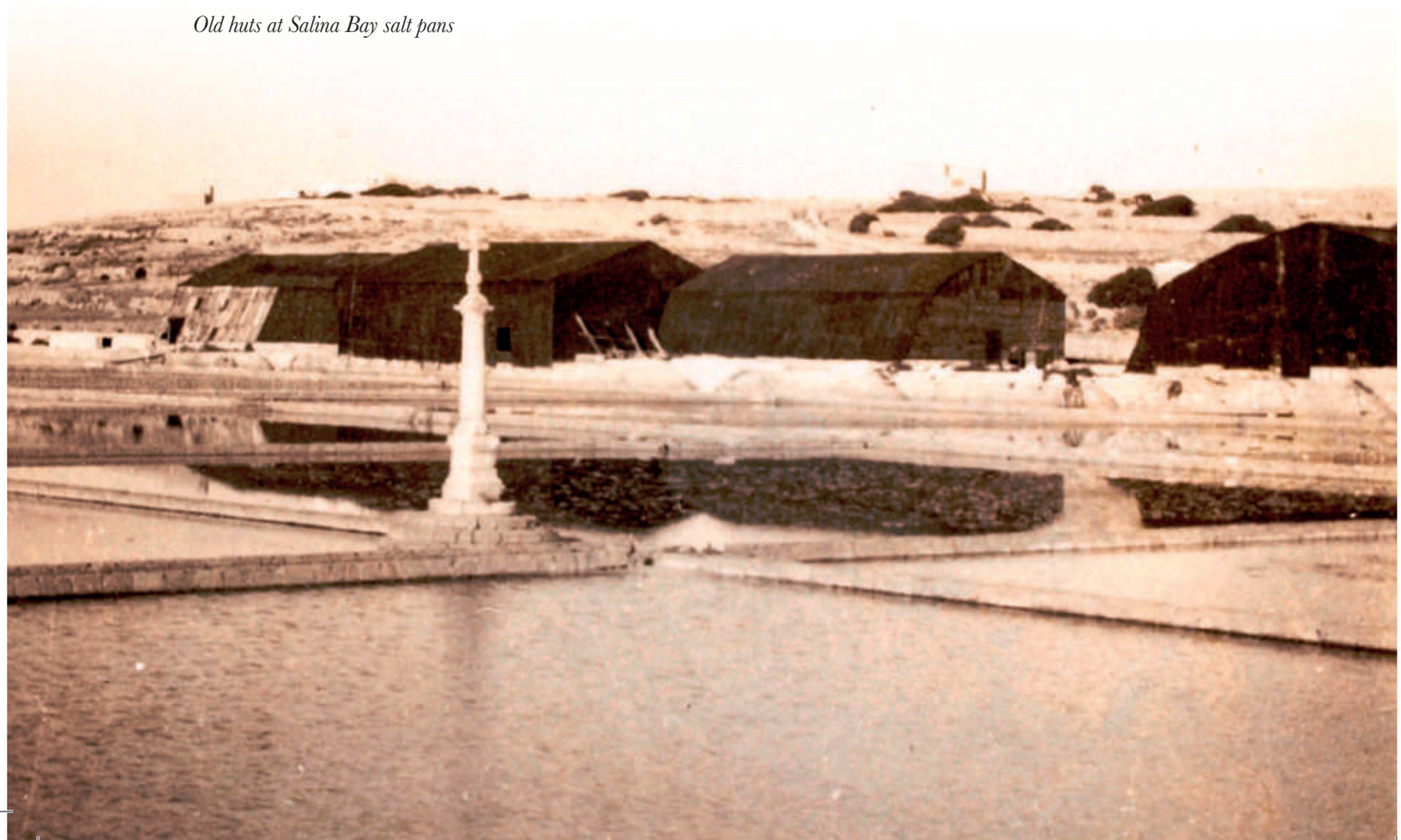


Salina Bay Salt Pans

Contents

Old huts at Salina Bay salt pans



I dedicate this work to my family
and to the salt workers who assisted me in this study.

Delimara salt works

Through this publication, Pauline Dingli ventures to present a new history of salt-making in Malta. Dingli's interest in this subject goes back many years when, still a student reading for a BA (Hons.) in geography within the former Division of Geography at the Mediterranean Institute, she chose the salt pans and the production of salt in Malta for her dissertation. This has given a fresh approach to the history of salt-making because for the first time the geographical element, which is fundamental to the production of this important mineral, was scientifically studied. This new preliminary study led to several new studies in this area.

Pauline Dingli has now returned to her original work and, as expected in the academic world, she has undertaken the daunting task to revise it and present her findings in the format of a book, making it an interesting read both for scholars and the general public. The professional guidance and experience received during her undergraduate years at the University of Malta are today being invested for the benefit of Malta's environment. Pauline Dingli gave advice regarding the rehabilitation of the Salini saltpans at Burmarrad. Thanks to her input, these derelict salt pans, which were abandoned to the ravages of time, have now received a much needed boost of revitalization. Dingli agrees that these resources have a future in a post-industrial society.

Salt was, and still is, a product which is found in all types of substances; from food to the production of various kinds of natural materials; from clothes to cosmetics and soap. It is a mineral which primarily comes either from the evaporation of seawater or from salt mines. The demand for salt may have decreased in the recent times; nevertheless, its importance continues, even though the emphasis is now on quality rather than quantity. This new economic reality should make us more appreciative of Malta's past salt production. Unfortunately, our endogenous production is in rapid decline. Many prefer to buy imported salt. Overall the cost of the production of salt in Malta is high. Owing to our terrain, it is a labour intensive activity and this does not help to make it a competitive one. Perhaps today, when the buzzwords are products of excellence, branding, and eco-tourism, few are aware that salt was one of Malta's products of excellence. This is one of the first products that Malta began to produce at a proto-industrial level from the seventeenth century onwards. During the period of the knights of Malta, Maltese salt was exported to the European continent where it was appreciated for its quality and taste.

Now the history of salt has been relegated to memory and several places associated with its production, in particular Mellieħa and Salini, as well as through a serious of proverbs and sayings. This book should not be read as a simple historical narrative, nor should it be appreciated only for its geographical input, even if, the geographical element is central to the narrative. Dingli goes further in depth and revalues salt production, disclosing that it can be sold as a product of quality from Malta. She remonstrates that Malta should take advantage of the island's natural resources and that salt should be exploited both for culinary use and for cultural tourism purposes.

Dingli's efforts are testimony to the teaching of the Humanities subjects of history and geography which still have their niche of importance in our school curriculum. Not only do they illustrate how and why our ancestors lived and worked but they contribute to the future development of our country. This is a work that aspires to attain such an objective.

Simon Mercieca University of Malta

Salt forming in a naturally formed pit

'The precious salt… for when its particles the palate thrill'd the charm of cookery! came.'

Hesiod, Greek poet, 800 BC

'Salt is born of the purest of parents: the sun and the sea.'

Pythagoras, 495 BC

Carmel Mangion harvesting his salt

Preface

This study of salt pans and salt production was first conducted some years ago for a University dissertation bearing the title *'A Resource from the Sea – a spatial study of salt pans of the Maltese Islands'*. Since submitted at University, I have had numerous requests for information on one site or another, for information about the traditional process of salt production, harvest, or history of the salt pan systems themselves.

One particular request was for the production of a documentary based on this dissertation. The documentary, *A Pinch of Salt*, was produced for the Agro Film Festival of Vienna. *A Pinch of Salt* competed with eighty nine other documentaries from around the world and won First Prize for Direction[1].

Dr Simon Mercieca, director of the Mediterranean Institute at the University of Malta, examined my dissertation and, adding with archived documentation and drawings from the time of the knights of St John in Malta, compiled a paper for a UNESCO publication with the title of *The Production of Salt in Malta during Early Modern Times*[2].

What intrigued me most to study the salt pans was the fascinating landscape engraved manually to such a magnificent finish. Looking at those straight lines I wondered about their origins. Who had engraved them? How long did it take? Where they successful?

These questions drove me to discover more, and I must admit that I have never stopped researching since. Although the production of salt in Malta has been a main source of income for several families for centuries, very few people have felt the need to record the planning process of the elaborate salt pan systems or the process that leads to salt crystallization. Writers seemed to dodge around historical monuments next to them, ignoring completely the salt pans as if they had always formed part of the natural landscape. Over forty sites are being documented here with quantitative and qualitative data.

In recent years I have published two books about my home-town Rabat[3], Mdina[4], and their

1 *A Pinch of Salt* (2005) DVD Antoine Productions, published for Ministry for Resources and Rural Affairs, Malta.
2 Mercieca Simon (2003) '*La Navigation du Savoir – Reseau des arsenaux historiques de la Mediterranèe*' in Villefranche, France, '*The Production of Salt in Malta During Early Modern Times*', UNESCO publication 122–38.
3 Dingli Pauline (2007) *Rabat: Discover Historic Treasures, Mystic Legends, History and Culture*. Malta
4 Dingli Pauline (2009) *Discover Rabat, Mdina and Exceptional Outskirts*. Malta

Straight rows of salt pans

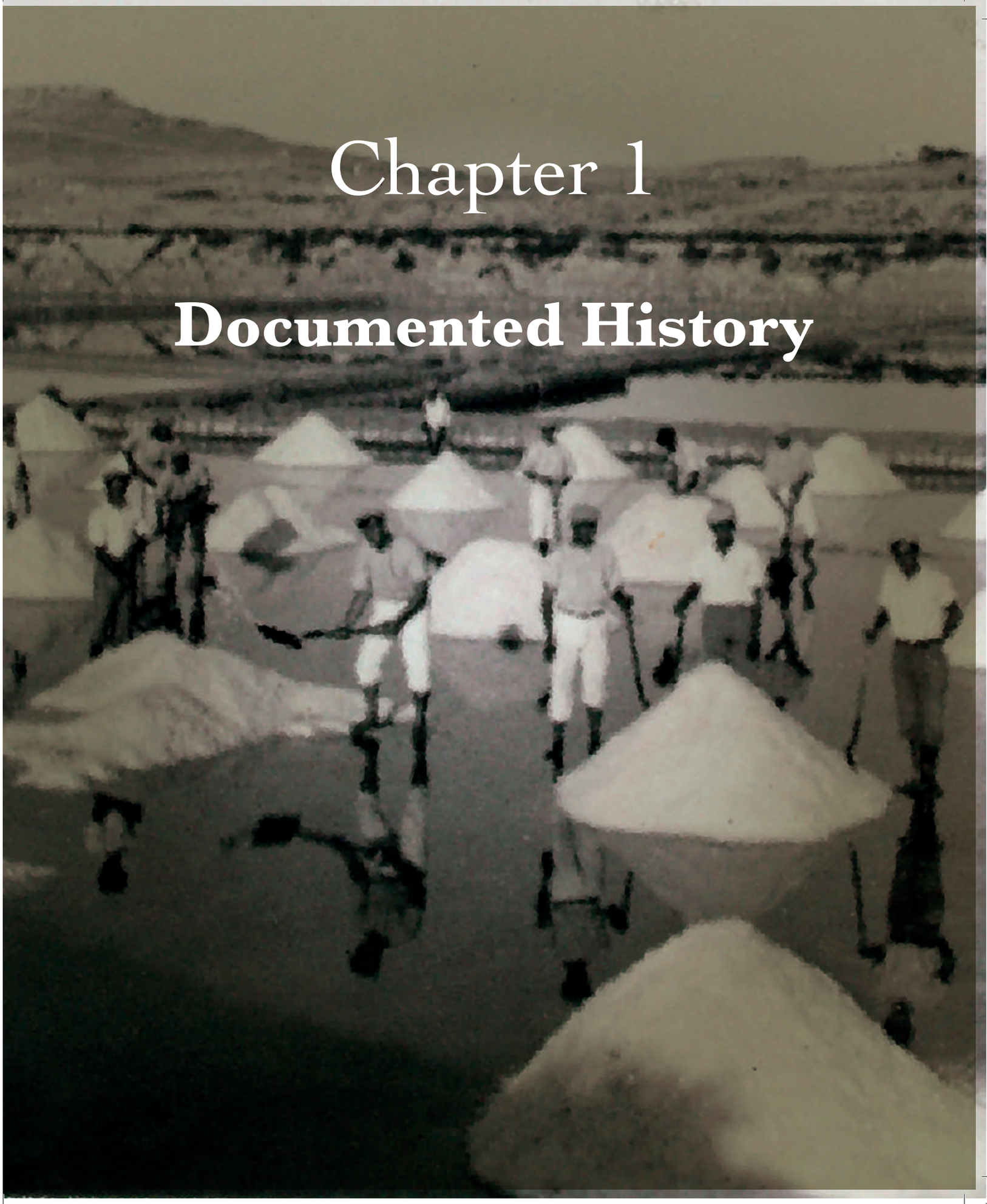
Stand for the filling of warming pans at Baħar iċ-Ċagħaq

surrounding villages and hamlets. The success of the books made me realize the yearning of the locals (in Malta and overseas) for Melitensia documents. I was therefore encouraged to review my dissertation and, after visiting repeatedly every salt pan site on the islands and update the information researched during these years, I decided to publish this book.

Since the thesis was submitted, and my books were published, I am pleased to say that most of the heritage sites, documented as deteriorating, have now received the attention that they deserve. This includes the grand salt pan of the knights – Is-Salina – at Burmarrad. I am hoping that this publication will create a greater understanding of the salt-works tradition, the salt pan systems of the Maltese Islands, and their significance as part of Malta's impressive coastal and cultural heritage.

Pauline Dingli

Salt works at Delimara



Chapter 1

Documented History

1.1 Contributions by writers

The village of Mellieħa took its name from salt. 'Mellieħa' is a Semitic word for a *salt pan* derived from *melħ*-salt. Mellieħa's motto is *ex sale et melle nomen meum,* meaning, *my name derives from salt and honey.*[5]

In the study *Place Names of the Maltese Islands circa 1300–1800*,[6] Godfrey Wettinger mentions a number of Mellieħas around the islands, Mellieħa being only one of them *Salini tal-Mellieħa* 1592 by Cath. Mugs. Wettinger documents *Mellieħa Cappella* in De Mello's Rollo in 1436, *Mellieħa taż-Żonqor* by the Universitas in 1509, *Tal-Mellieħa Vinea Vitibus… Bir il chut* by Brendano Caxaro in 1547, *Mellieħa ta' Bengħisa* by Brendano Caxaro in 1557, *Salini tal-Għallies*' by Notary Allegritto in 1611/2 *Ramla tal-Mellieħa* in 1645 by Gian Franceso Abela, and *Mellieħa ta' Ras il-Ħobż* on the southern shores of Gozo mentioned by Gio. Pietro Francesco Agius De Soldanis in 1746.

Wettinger also notices a process of depopulation in coastal localities during the fifteenth century, owing to pirate attacks. The sense of security that was given to the people with the building of the coastal towers and fortifications by the Order during the sixteenth and seventeenth centuries empowered the people to frequent the coast more and embark on salt production, resulting in the creation of more small salt pans all around the islands. Other names on the Islands with Mellieħas include Mellieħa Point close to the port of Mġarr in Gozo and Mellieħa ta' Marsascala.

Maurice Agius Vadalà published a paper written by E.V. Clarke in September 1951 for the State Veterinary Journal (UK) with the title *Salt Pans of Malta*,[7] discussing the system of Salina Bay. This micro study includes a short historical background of salt works in Malta, sixteenth and seventeenth-century maps which refer to salt works, and photographs taken in 1937 during harvest-time in the same salt pans.

5 Fiott Charles, *Towns and Villages in Malta and Gozo*, publishers *Reliġjon u Ħajja;* The North (Malta, 1997), 189.
6 Wettinger Godfrey, *Place-Names of the Maltese Islands ca. 1300–1800*, publisher PEG (Malta, 2000), 372.
7 Agius Vadalà, Maurice (Undated), '*Salt pans of Malta*', re-publication of paper compiled by E.V. Clarke (1951) from the State Veterinary Journal (UK), Vol. VI. No. 18, September, 8 –11

Fr Eugene Paul Teuma wrote an article[8] about the Buġibba salt pans as seen through the eyes of an architect. He gave a detailed description of the site enriched with photographs and explained his claims that they may date to the Punic-Roman period. Teuma also describes the process of salt production within the Buġibba salt pan system.

Paul P. Borg wrote various articles in *It-Torċa*[9] based on his interviews with the salt pan owners. He wrote some of the articles in their own words, explaining the process when salt works flourished. Borg also wrote information on various sites in Malta and Gozo and tried to make the general public aware of the numerous problems that the salters face not only with the work itself, but also to maintain the coast.

Charles Fiott, in his four-volumes: *Towns and Villages of the Maltese Islands*[10] put a sign in his maps to indicate the salt pans around the Islands. He also discusses briefly the process of salt evaporation and says that most local salt pans date to the eighteenth century.

Nikola Zammit in his *Malta e Le Sue Industrie* (1886) [11] wrote: *For the extraction of marine salt on the banks of the island, besides the small salt pans spread on its shores, there exists a factory on a grand scale. It produces as much as is needed for the local consumption and exports the rest. 6,000 Imperial Quarters of salt are extracted every year.*

Simon Mercieca states that archival documentation associates *Il-Mellieħa taż-Żonqor* with salt production even before the arrival of the knights of St John.[12] He adds that Malta has other late medieval toponomistic evidence with direct reference to salt. *There were, at least two other places which can be linked to the production of salt: Il-Mellieħa ta' Bengħisa* and *Il-Mellieħa taż-Żonqor.*

It is documented[13] in the early 1580's that Galeazzo Valentino died when his ship, carrying wine and salt to Malta, was raided by Turkish galleys. In 1603 Pier G. Bonti purchased a vessel from the Order to take to Naples. Bonti took the opportunity to load the vessel with a cargo of salt. This documentation indicates that at the time salt was being imported and exported on an industrial level.

8 Teuma Eugene P. (1997) 'Buġibba Salt Pans in Danger of Destruction', *The Sunday Times of Malta*, 1 June , 44, 45.
9 Borg Paul P., '*Interviews with Salters*', It-Torċa Magazine:
'*Tiġrib*', 8 October 1995, 6-7
Tiġrib', 14 August 1994, 6-7
'*Tiġrib*', 19 November 1995, 16-17
10 Fiott Charles (1997), '*Towns and Villages of Malta and Gozo*', 4 volumes; Religjon u Hajja, Malta
11 Zammit Nicola, (1886), *Malta e Le Sue Industrie*, Malta 72
12 Mercieca Simon 124
13 Public Works Volumes:
1, p. 109, nos. 390/391, pet 1815
15, p. 310, no.272, Pet.7084B
15, p. 389, no. 354, pet 7551G
15, p.177, no. 141, pet 5540T
25, p. 7, no. 6081G, dated 1877
26, p. 114, no. 1876, M&B
23, pp. 95, 98, no.1334, pet 1334G
32. pp. 57, no. 1305G, 1890

At the National Library of Malta, a 1620 document[14] written by Fra Francesco Ventimiglia, Grandmaster Alof de Wignacourt's (1601–22) financial controller, lists the donations the Grandmaster had offered during his rule. The list states that *Both as aid as well as storage for salt, the Grandmaster spent 6,356 Scudi, 4 Tarì and 9 Grani.*

Also at Malta's National Library, *Il Cabreo del Magistero* manuscript [15]compiled on instructions by Grandmaster Jean Paul de Lascaris de Castellar (1636-1657), exhibits site plans of the Salina salt pans in different design stages.

Gian Francesco Abela, vice-chancellor of the Order, around 1647 stated that at Għallies salt pans *Si fa ogni anno quantità di sale che si estrae e manda fuori dell'isola il cui prezzo tocca all'erario di Sig.G. Maestro principe.*[16] The Grandmaster benefitted from the quantity of salt that was harvested and exported every year. During the eighteenth century, Malta managed to enter in the European salt-trade routes.

In *Malta Illustrata*,[17] Count Ciantar states that Malta then had enough salt not only to supply the local demand but also to meet export demands *da diversi bastimenti per varie porti.* Ciantar adds that the Grandmasters never managed to export salt across the Atlantic owing to the limitations of their sea vessels to fare across the oceans.

There is no written or archaeological evidence in Malta's museums regarding storage vessels for the transportation of this highly corrosive mineral. This gives rise to questions like were the containers made of wood, clay or maybe leather?

Mercieca quotes Miege (1841) that, during the eighteenth century, the Burmarrad salt pans were developed to their full capacity in a reviving economy and they reached an estimated three million kilos of salt per year.[18]

Mercieca adds that *salt pans were constructed close to Qbajjar at Marsalforn in 1740. In 1742 the salt pans of Is-Salini were extended with a further two large reservoirs nearer to the sea and those at Baħar iċ-Ċagħaq were similarly extended.* This is the first time that Baħar iċ-Ċagħaq cropped up. Would they be the ones referred to as Ghallies salt pans? If so, they were already mentioned by Allegritto in 1611/12. Was the creation of these salt pans the cost of over 6,000 skudi spent by Grandmaster Wignacourt (1601-22) for salt?

14 Fra Ventimiglia (1620) *Id-Donazzjonijiet ta` Alof de Wignacourt lill-Ordni*, *Gran Mastri*. no. 7, Malta National Library, April 1991

15 http://www.timesofmalta.com/articles/view/20120603/life-features/Rendering-justiceto-u-eppi-Callus.422598 *the Cabreo del Magistero, which was compiled by Gio Battista Michallef on the instructions of Grand Master Jean Paul de Lascaris de Castellar, who ruled in Malta from 1636 to 1657,*

16 Mercieca Simon, 129.

17 Ciantar Giovanni Antonio, (1772) *Malta Illustrata*, Malta

18 Mercieca, 131.

A Public Works document dated June 1815[19] (hand-written in Italian) states that Giovanni Grech, the farmer of the *Salina tal Hallis*, had requested compensation from the government after having suffered damages owing to a shipwreck that had inhibited him from collecting one-third of his salt harvest. The document adds that another farmer, Luigi Chetcuti of the *Salina detta Ghisira tal Halip,* also suffered damages on the same occasion and was requesting compensation. In an additional note, the public official stated that from further research it had resulted that there had been a shipwreck during the best time of the salt harvest season. He added that Chetcuti had been compensated £37 and the damages had amounted to £72. The official recommended the government to pay the difference.

Xwejni Gozo salt pans

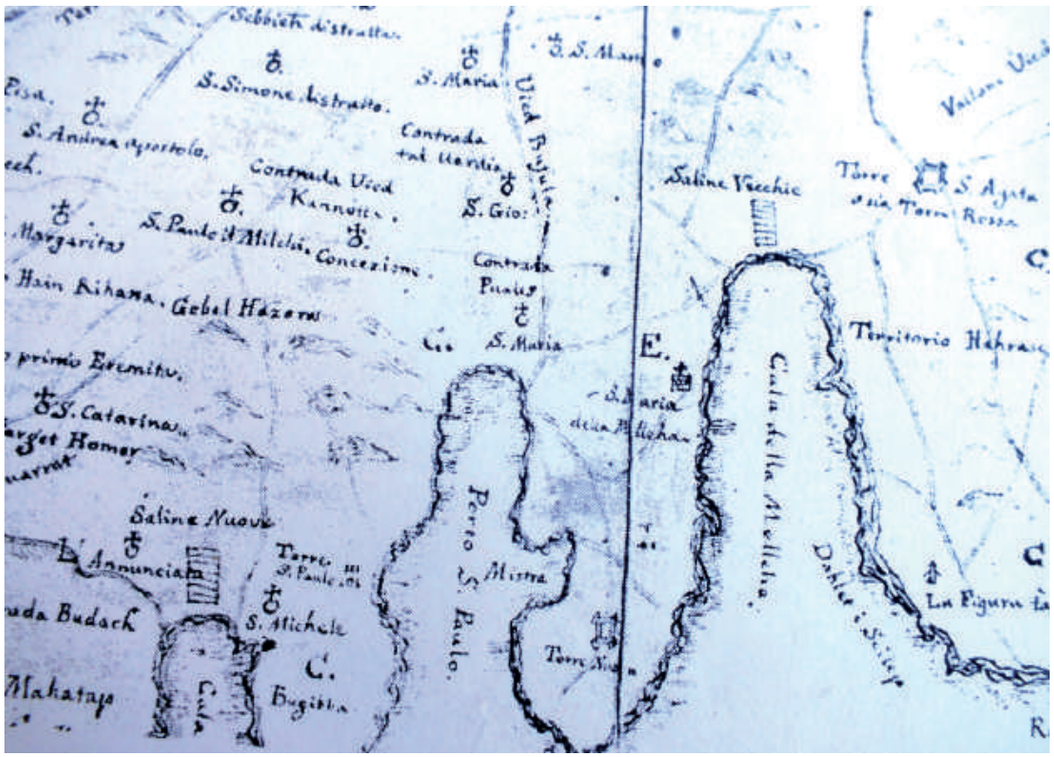
In his article *Unique Gozo Salt Pans*,[20] J.G. Walmsley discusses the Xwejni salt pans and observes that the *Salt pans of Xwejni Gozo represent some of the earliest known, primitive salt pans that produced sea salt under natural conditions … A much later series of salt pans, probably of Roman origin, were constructed alongside the more primitive ones, and can clearly be identified, as they are symmetric. The most important aspect of these salt pans today is that some of them are still exploited in an artisan way and are producing salt. This is a unique habitat in the Mediterranean region, although similar salt pans do exist on some Atlantic Islands. Today these primitive salt pans should be declared Natural Heritage Sites and preserved for their aesthetic value.* Walmsley also suggests that they should be included in future maps and in lists of historical sites for tourists.

19 Public Works , i, 109, nos. 390/1, pet. 1815.
20 Walmsley John G., *Unique Gozo Salt Pans*,. Letter to the Editor, Sunday Times of Malta, 31 October 1993.

1.2 Old maps

The need for maps with landmarks for military, navigation and exploration purposes resulted in several early sketches and navigation charts. Such maps and charts, although not always accurate, can reveal valid information with regards to coastal land use. After evaluating hundreds of map publications, few conclusions could be drawn.

Top: 1551 map
Top Right: Map (1631) showing the arrival of assistance for the Grandmaster on 7 September 1565



Map by Parish Priest Fiteni (1735) with geometrically constructed salt pans at Għadira Bay and Salina Bay

In a map of 1551 by Antonio Lafreri,[21] entitled *Melita insula, quam hodiae Maltam uocant* the word *Saline* is in plural and written on the Marfa ridge side of Għadira Bay showing the bay as a river delta.

Antonio Francesco Lucini's engraving (1631) [22] states *Porto delle Saline Vecchie,* port of old salt pans on Għadira Bay while the flatland at the hinterland of the Bay is marked '*Pianura*' (most likely the salt flat). It gives detail on the Turkish attack on Malta during the siege of 1565. The map (like many others), also has geometric salt pans at Salina Bay, constructed in a square shaped system on land not in the sea.

The map of 1735 by Parish Priest Giorgio Fiteni of Naxxar, whose parish extended as far as Mellieħa, includes geometrically-constructed salt pans on Għadira Bay. This is another interesting feature that is hinted on several other maps where they refer to the Ghadira Salt pans in the plural and not as a salt flat and also drafted in different shapes. Furthermore, Wettinger referred to 1592 where *Ta Salini de la Melleha, contrata* was mentioned.[23]

Probability of constructed salt pans at Ghadira marked in plural as Saline

Fig.2 Anonymous map of Malta published c.1560 to highlight the projected fortified city

21 Lafreri, Antonio (c. 1512-1577). *Melita insula, quam hodiae Maltam uocant* . 1551. Engraved map of Malta
22 Lucini Antonio Francesco (1631) map engraving featuring the Great Siege of 1565 copied from Matteo Perez D'Aleccio.
23 Wettinger Godfrey,(2000) *Place-Names of the Maltese Islands ca. 1300–1800*, PEG Malta, 372.

The attached four map segments all show some form of constructed salt pans at Għadira Bay, while they all refer to the salt pans in the plural; *saline vecchie* or *calle delle saline vecchie* or *porto delle saline vecchie.* Could there have been salt pans constructed in the marshland of Għadira Bay?

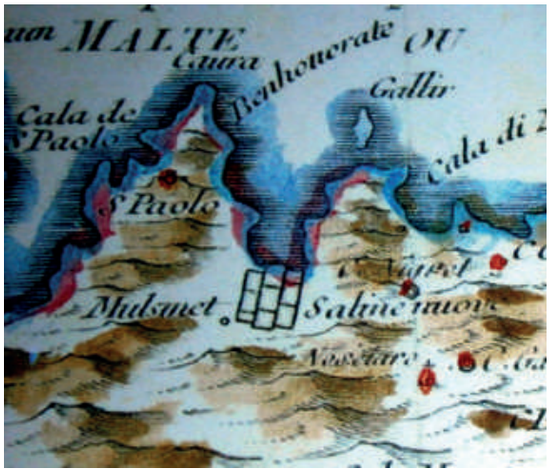
Between 1575 and 1580 the Italian painter Mattia Perez d'Aleccio was commissioned by Grandmaster Jean Lavesque de Cassier (1572–81) to fresco scenes of the Great Siege of 1565[24] on the walls of the *Sala del Gran Consiglio* at the Grandmaster's Palace in Valletta. D'Aleccio marked *Saline Nove* (new salt pans) at Burmarrad (Salina Bay), also in a square shaped system on land.

Fresco Scene from Sala Del Gran Consiglio in the Grandmasters' Palace Valletta

When examining all maps and documents concerning the Salina salt pans one finds that, over the centuries, they have been referred to as *Saline Nove; Burmarrad salt pans*; *Salina tal Hallis*; *Għallies salt pans*, and, during the last century, *Salina salt pans.* One can conclude that during the Great Siege of 1565 there were salt pans at Burmarrad. Also they were probably on land and not in the sea as they are today! (See pg 133)

Maps published in 1823 by W.H. Smyth, Knight of St. Ferdinand and Merit, one also observes salt pans at Marsaxlokk, Selmun, Bugibba and Salina. Those at Marsaxlokk were significantly larger than anywhere else on the Islands. They did not survive during the course of time.

24 Perez D'Aleccio Fresco Map of the Great Siege of Malta at the Grandmasters' Palace Valletta.



Map segments showing Salina salt pan system on land not in the sea

1.3 Historic proclamations (Il-Bandu)

During the time of the Order, proclamation of edicts were made by the government as orders imposed on the people. This proclamation was called a *Bandu* and used to be read in the streets and posted on walls for everyone to see. A proclamation of 14 December 1650 stated that Burmarrad was a Roman port.

Another proclamation of February 1694 claims that salt workers in Mellieħa and Burmarrad were stealing salt from each other. This declaration imposed the need for all future salt collectors to have a license.

These proclamations may give an indication that in 1650 Burmarrad was a port and in 1694 it produced salt. (The date found deeply engraved on the Salina salt pans is 1764.)

A proclamation of May 1706 ordered that the quality of salt should be the best possible and the price had to be fixed by the government. Anybody caught selling dearer salt would be sentenced to three years *service* on the galleys of the Order.[25]

25 Borg Paul P., 'Tiġrib' *It-Torċa Magazine,* 19 November 1995, 16, 17

Reading of il-Bandu in the street

1.4 Żebbuġ Gozo phenomenon (Tal-Arloġġar)

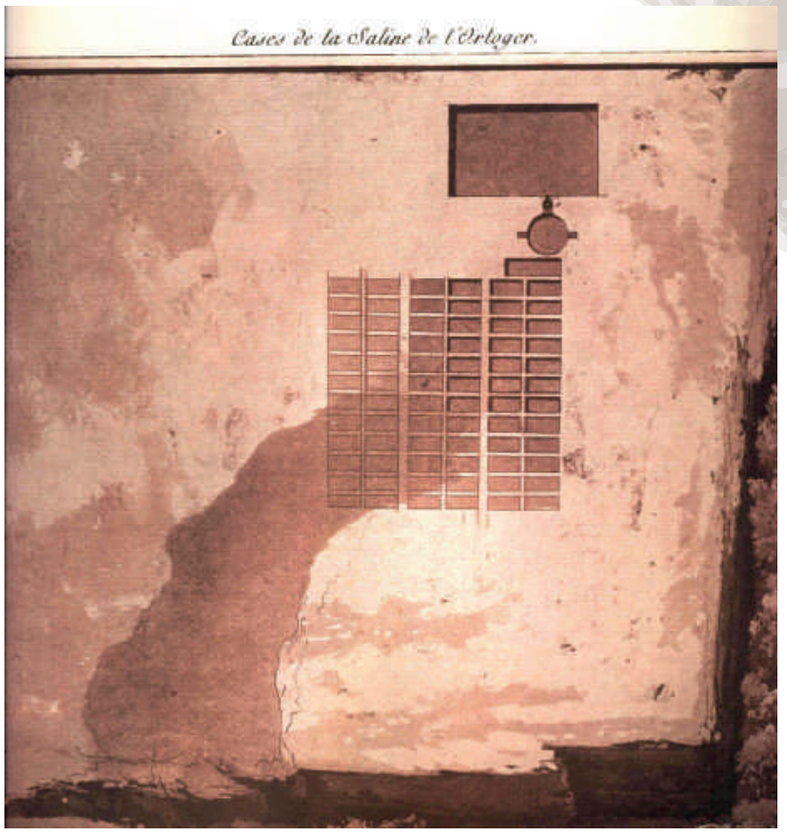
A picture published in London by G. & I. Robinson in 1804[26] shows the salt pans of Għar il-Qamħ of Żebbuġ Gozo with a well amidst the pans in the form of an enormous fountain. This salt pan site is known as Ta' l-Arloġġar (The Clockmaker's). Boisgelin (1804) says: *40 years ago*, a clockmaker dug salt pans on this shore platform situated 12 to 15 metres above sea level. The clockmaker discovered that below his salt pans was an underwater grotto. He pierced the rock vertically and created a well that led to the sea to facilitate the task of extracting water. Piercing the rock was a hazard and the following caption describes the result as Boisgelin documented it.

One day in winter, a terrible storm arose and the violence of the wind drove the raging waves into the grotto. The body of water, increasing considerably, and being confined in this almost circular spot, acted with a

The well today is blocked with boulders

Raging waves beneath the well formed a wheatsheaf

26 Boisgelin L., (1804) *Ancient and Modern Malta*, 1, Facsimile Edition Malta, re-published by Midsea Books Ltd., 1998, 68–71.



The clockmaker's salt pan system

rotary motion and formed a siphon, or waterspout. There being no passage but the newly opened well, it forced its way through with violence, and appeared like a beautiful wheat sheaf of water so large a circumference as to fill up the whole mouth of the well; and rising perfectly entire to the height of sixty feet, and formed a magnificent aigrette.

Its projectile 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 this immense body of water were diffused over the country to the extent of more than a mile…The water spout washed all surrounding fields to the sea. The tremendous noise of these violent explosions, which resounded through all the grottos, resembled a discharge of artillery with one succeeding the other. The owners of the fields tried in vain to reverse the process by blocking the well, only to create more violent explosions.

In his Gozo book[27], Fiott refers to this phenomenon and says, *The fields disappeared from the area and the clockmaker's salt pans are still in business.* However, during the year 2000 and 2013 on-site analysis, this well had been blocked with boulders and from the damages recorded on the site it seemed that it had been abandoned.

27 Fiott Charles, (1998) *Towns and Villages in Malta and Gozo*: vl Gozo, Malta

The clockmaker's salt pans c. 1764

Outstanding salt pan architecture

1.5 The mysterious rock-hewn pans of Gozo

An article in *The Gozo Observer (No. 3)*[28] by Prof. M.N. Cauchi and J. Jaccarini discusses mysterious rock-cut pans that have been discovered at Mġarr ix-Xini and Dwejra, Gozo in 1946. These pans, measure about 1.5 metres square, and have slanting bottoms with the depth increasing on one side. Surrounding these pans is a gutter, presumably meant to divert rain water. They also have a system of smaller pans around them.

There is nothing to prove that these pans were ever used for salt-making and it has been suggested that they could have been used for the storage of wine. However, since these ancient pans are present on coastal localities where there are salt pans, one has to ask, could they have ever been used for the storage of salt? Were they the alternative storage tanks for this extremely corrosive mineral? Conversely, they resemble the pans of the ancient factories of Garum production.

Could they have been used during the Roman Empire for the production of this salt and fish delicacy? (See Chapter 9 for more details)

Perched well at Reqqa Point, Gozo

28 Cauchi MN. Jaccarini J, (1999) *The Mysterious Pans of Gozo*, The Gozo Observer, no. 3

1.6 Parliamentary questions

The subject of salt production has also been discussed in Malta's House of Representatives. In parliamentary question number 34292 of 1 July 1996, the Hon. Portelli asked the Minister for Economic Services about the amount of salt being imported; at what price; what was the reason for Maltese salters not selling their salt; how many local factories use salt; and which were they. In his reply, the minister concluded that provisional figures for the previous year (1995) show that 1,147 tonnes of salt were imported for human consumption for the value of Lm90,000. The minister added that he had never received any complaints from local salters about lack of sales. Finally, it was not possible for all the factories using salt in their work to be identified.

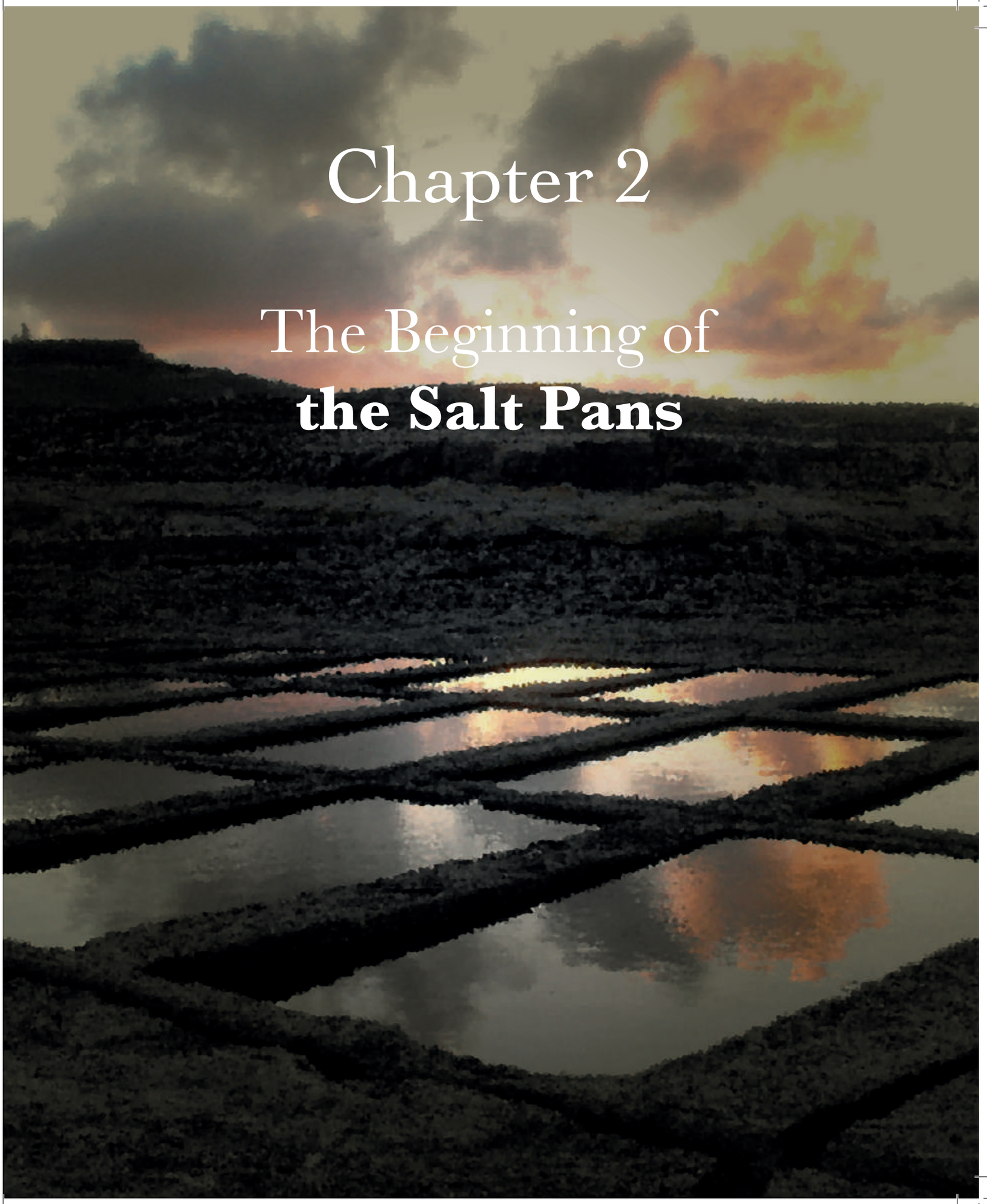
In parliamentary question number 34631 of 22 July 1996, the Hon. Calleja asked the Minister for Economic Services, what kind of protection the government was giving to the local salt industry, keeping in mind its historical and traditional importance to Malta. He suggested imposing some measures on the imported salt. The minister replied that, since Malta produces only a stable amount of 30 tonnes annually compared to the 1,147 tonnes of salt imported the previous year, local production is only a fraction of what is being consumed and no particular measures were required.

1.7 Table of Chronology

The table below shows small excerpts taken from texts during the research to give the reader an indication of the historic chronology concerning the salt pans. These were placed in the date order and may not all match since their writers may not have been aware of all other documentation present to that day.

Dates	Chronology of important dates or developments as documented by various authors and found along the text	Authors
Pre-history	*Xwejni represent some of the earliest known primitive salt pan*	Walmsley
Phoenicians	*Salt was one of the products they traded* (around the Mediterranean)	Giuuillaumier
Punic-Roman	Bugibba Salt Pans	Theuma
Roman	*A much later series of salt pans, probably of Roman origin, were constructed alongside*	Walmsley
Roman	Salt pans all around the Roman Empire Territory (from 400 BC)	RAI TV
1231	Constitution of Melfi – Frederick II made salt the prerogative of the Sicilian Crown	Mercieca
1436	Mellieħa Cappella	De Mello's Rollo
15th Century	Signs of abandonment of population in coastal areas	Wettinger
1509	*Mellieħa taż-Żonqor*	Universitas

1530	Arrival of the Knights of St John	
1533	First documentation of salt pans	Giacomo Bosio
1540–70	*The water has risen so much that it rendered them useless*	Teuma 1977
1541	Plot of land called *tal-Mellieħ* in Ħal-Kbir Burmarrad, in notary act	Brendano Caxaro
1547	*'Tal-Mellieħa Vinea Vitibus … Bir il chut'*	Brendano Caxaro
1551	Għadira shown as a river delta with the word *Saline* on the Marfa Ridge side	Map Lafreri
1557	*Mellieħa ta' Bengħajsa* (Ben Ghisa)	Brendano Caxaro
1565	Map showing Turkish attack and indicating *Saline Vecchie* and *Saline Nove*	Map (1631)
1565	Several (30+) maps of the Great Siege showing a square-grid salt pan on Salina marshland	Maps of Malta
1575–81	Frescoes at Grand Master's Palace indicating *Saline* at Salina Bay (square form)	Fresco GM Palace
1580	Salt was being imported	Public Works Documents
1592	*Salini tal-Mellieħa*	Cath. Mugs
1603	Salt was being exported	Public Works Documents
1610–20	Huge donation as *aid and storage for salt* by Grand Master Alof de Wignacourt	Ventimiglia
1611	*Salini tal-Għallies* (first mention in notorial documents)	Notary Allegritto
1615	*Saline Vecchie* but no mention of new salt pans. New ones were functioning	Valegio Map
1645	*The sands and the salt pans*	G.F. Abela
1647	Seasonal water-level changes; no mention of Salina; yet mentions profit from sales of salt	G.F. Abela
1650	Salina salt pans were refurbished	Mercieca
1694	First proclamation that salt workers required a licence	Proclamations
1715	Building of redoubts at entrance of Salina Port by Grand master Perellos	Steven Hess
1735	Geometric salt pans at Għadira	Map Fiteni
1742?	Plans of new salt pans at Salina *Cabreo del Magistero*	Mercieca
1742	Construction of salt pans at Fort Tigné, Sliema; St Elmo, Valletta; Marsalforn; and the extension of the Salina and *Baħar iċ-Ċagħaq* salt pan sites	Mercieca
1746	*Mellieħa ta' Ras il-Ħobż*	Agius de Soldanis
1764	Engraved dates on Salina floor slabs and construction of *Tal-Arlogġar* salt pans beyond Qbajjar Gozo	
1773–75	Restoration and extension of Ximenes Redoubt as a guard room for Salina salt	
1804	Salt works inside Marsaxlokk Bay (possibly *Tal-Ballut* marshland) Geometric salt pans at Għadira Geometric salt pans at Salina Bay The name *Saline* near Qbajjar, Gozo	Boisgelin Map
1873	First mention of conditions to be inserted in the annual lease of the salt pan site	Public Works



Chapter 2

The Beginning of **the Salt Pans**

2.3 Other man-made salt pans

Other man-made salt pans are those that were built on a large scale in the form of an industrial factory. The Salina salt pans were constructed on a grand scale and cover a significant part of the port, almost one kilometer long. They were planned by the engineers of the Knights centuries ago, and, (rather than engraved) were built on a reclaimed island of clay.

Until 1970, the extensive salt pan area at Xrobb l-Għaġin, consisted only of small rock-hewn salt pans, most of which are still in their original state and which cover a good part of the peninsula. In mid-1970's, the government issued a financial scheme to boost salt production[29].

Xrobb l-Għaġin salt pans

The new owner was granted such financial aid which made it possible for him to set up a salt-production factory on a large scale. The manual machinery was exchanged to a heavy-duty plant and alterations were made to one side of the peninsula. Large reservoirs were built with a surface area of 448m^2 each together with an additional 15 large salt pans. The irrigation channel became one metre wide and one metre deep and a well was dug in the platform right through to the sea.

Another similar project, dating to the same time, was started at Ir-Reqqa Point and Għar il-Qamħ in Gozo. The result of this project was very different. Large salt pans were dug with heavy machinery and, unlike the other salt pan sites on the coast, are an unpleasant scar. Trenches and embankments were constructed in concrete. This project was never completed and the pans lie half-finished and deteriorating along the coast.

29 Personal interview with salt pan owner Pascal Pulis of Xrobb l-Għaġin

Delimara Point

Ta' Żirka Gozo

2.4 Leases of salt pan sites from the government

The land of most salt pan sites has always been state property and is now administered by the Estate Management Division, within the Lands Authority. Stretches of the Coast are leased to salt producers who have to abide by a number of conditions. These contracts are written in Maltese and a few points are listed and explained briefly hereunder.

Points from the conditions for lease

1. The rent had to be paid up front at the Department of Lands every first day of the month, and it was considered not punctual if it was not paid within three days.

2. The salt pans and rooms were rented tale quale and the lessee was duty-bound to keep the site maintained and in good condition without expecting any financial aid. He was expected to return the site in good condition when the lease was over.

3. The maintenance was to be done by the salter and the repairs had to be according to the Ordinance Article regarding food, drink, and drugs, 158, of chapter 54.

4. The lessee had to inform the Commissioner of Lands before the repairs commenced so that they could be assessed by an architect at the expense of the salter.

5. The lessee was forbidden to use the site for different purposes other than that leased to him or to affix any posters or advertising signs on the walls or roof of the rooms.

6. The lessee was forbidden to change the format, or destroy any paintings, scriptures, engravings, signs, or writings that may have any historical, archaeological, or artistic value that exist or that may be discovered in the future and that fall under the protection of the Act of Antiquity.

7. The lessee was forbidden to store on the premises any flammable material or liquids that could burn or damage the site and any other government property adjacent to it. The lessee would have to pay the government the value of the premises, which value would be decided by the Lands Department Commissioner, even if the fire was not his fault.

8. The lessee had to allow any government official to enter the site to inspect the area when necessity arose, on any working day. The lessee had to pay a penalty of £1, if the official was not allowed in.

9. It was the duty of the lessee in the maintenance or any installation of water and electricity, where needed and not already installed,

10. Payments of the rentals of meters of gas, water, and electricity bills, including telephone or other installation, fell under the duties of the lessee.

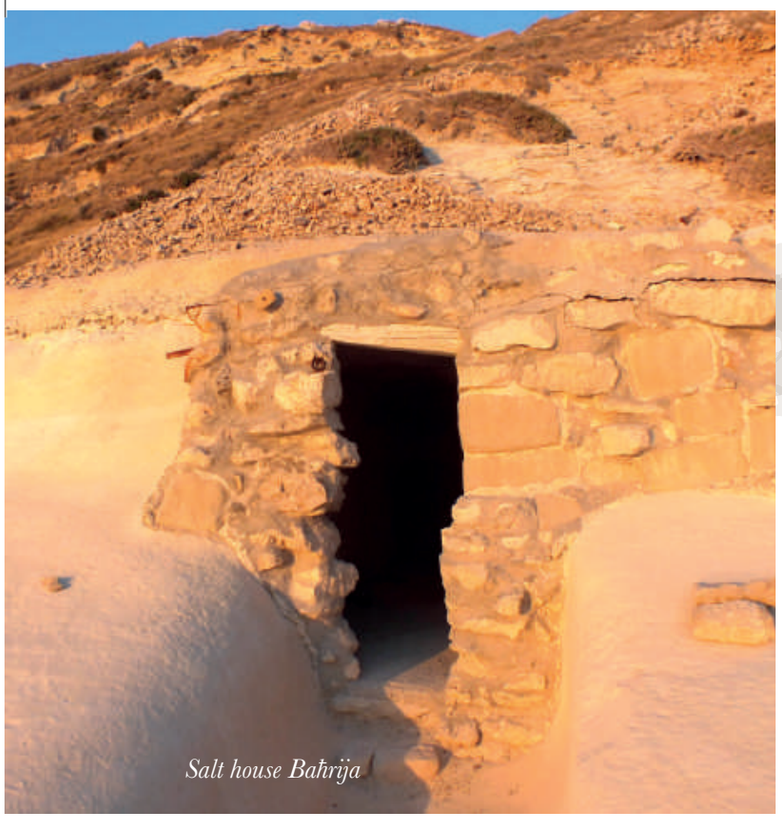
11. The lessee could not give or release the lease, to a second person without the government authorization.

12. The government reserved the right to end the lease if the lessee failed to perform any of the above duties, conditions, and responsibilities. The Commissioner of Lands or any other official acting in his name could terminate the lease in writing, without the need for juridical acts. The termination of the lease was to be without any prejudice.

13. The government reserved the right to order any construction and or repairs that it felt necessary for the service of the same salt pans.

14. The lessee could not do any construction which might change the nature of the site of salt production in any way.

Salt house Gozo



Salt house Baħrija

Salt house Xwejni

Salt house

2.5 A BASIC SALT PAN SYSTEM

Most salt pan sites have a system that functions through a process. In Malta there are various types of systems. In some cases, different systems can be found on one site. A basic system includes: the salt pans, a warming pan that holds enough water to replenish the salt pans several times, a cold-water reservoir, a well, a draining pan, and an irrigation channel which links them all.

A basic salt pan system

The irrigation channels

Irrigation channels are normally hewn carefully in the rock to deliver water from the reservoirs to the pans. They had to be leveled carefully so that water reached its destination, yet without unnecessary speed that disturbed the process. The salter channels the water to fill one set after another, opening and closing the channels required, by means of wooden or mud-molded sluice gates. Buġibba site has a rock-hewn channel within the salt pans' embankment. Those sites whose locations lie below adjacent land or fields have got drain channels enclosing the pans for protection. Drain channels act as a barrier against sliding earth, precipitation run-off, or rainwater seeping from higher rocks on to the shore platform of the salt pans. Some channels also drain away access water from salt crystals while drying. Drain channels always lead to the sea. A drain channel is on average 20 centimetres wide and as deep. This varies in some localities like Selmun's Mġiebaħ, where the channels are much larger, with the largest being at Xrobb l-Għaġin.

Salina has the longest channel between salt pans, measuring 502.7 metres. The site is also enclosed by a storm water course that starts at sea, goes round the site, and ends again at

sea. This is constructed in a way that the currents enter from one side and exit at the other, making it a self-cleaning channel. Another water channel, 112 metres long, constructed above Il-Qolla il-Bajda site in Gozo, leads to the street and, although linked to the salt pan site, may not have a direct connection with salt production. Some natural channels have been altered to form salt pans. Channels are also present within naturally formed salt pan sites, like those of Ċirkewwa, Comino, Ras il-Ħobż and Qala. Some channels are also terraced on different levels of the shore platform.

Embankments

Embankments are the low walls that enclose each salt pan. They have also been formed in different ways. Those formed naturally have no uniformity at all, but constructed ones have regular shapes and depths. The widths of embankments vary from 10 to 30 centimetres and are between 10 to 20 centimetres high.

Robber Trench

Some embankments were fitted into robber trenches hewn in the ground. These are rock hewn canals that hold the embankments firmly within, so they could not be washed away with the power of the waves. Localities with such embankments include Buġibba, Selmun, Xgħajra and Baħar iċ-Ċagħaq. They differ in size from one location to another.

Some embankments on the Delimara coast are natural and exceed 50 centimetres, while others are made of limestone blocks, laid one after the other. Those at Salina form a footpath network. Embankments of one system at Xwejni, Gozo have irregular patterns but are still quite uniform in width, while some others have been built with pebbles.

Built embankments are washed away relatively easily and require constant repairs, while those hewn in the rocks are the most resistant.

Archimedes Screw

Traditional tools and weights

The following list gives a brief description and an English translation of the names of a few tools and weights that were used. The salters themselves were the source.

	Tools and Weights
Luqqata	Scraper
Salt-gatherer	A wooden tool in the shape of a broom with a piece of wood fixed horizontally instead of the bristles (This tool has been replaced by a broom with rough bristles or a piece of metal)
Dugħ	Two pieces of wood for collecting salt by hand
Barmil tax-Xaħam	A wooden bucket that used to be imported as a lard container (now replaced with plastic buckets)
Qfief	Baskets made of straw, cane or wicker
Menqa	A wooden rod balanced on the shoulders of the salter with a short rope and a hook attached on each side to enable him to carry two buckets simultaneously.

Sienja	A series of buckets joined together to lift water from the sea on to the shore platform while turning. A wheel rotating them would be pushed by a man or pulled by a blindfolded beast going round on the same track
Ġibba	The wheel turning the series of buckets mentioned above
Istwil	A pillar that linked the equipment to the beast *(pilastru li jzomm il-miġeb)*
Ilqugħ	Strips of wood placed in the ground around a heap of salt to prevent saltslides
Skulatur	Water that drains out of a salt heap
Manxar or Qiegħa	Draining pan or draining area
Gubja	Two or three poles erected vertically around a well and tied together at the top (in the shape of an Indian wigwam)
Tarjola	A pulley with a rope passing around it placed inside the above-mentioned structure and with a hook at the end of the rope to pull up a bucket from the sea.
Għarbiel	A sieve used to stratify salt grains according to thickness. The sieve was hung from the ceiling down to the level of the waist of the persons who operated it. It had two long handles on each side which enabled workers to swing it to and fro to sieve the salt.
Lembut	A huge funnel that directed salt crystals into the wringer to be crushed
Pompa	Manual wooden Pump to distribute water
Trabixù	Archimedes pump or screw. A hollow tube, 30–40 cm in diameter and 150–250 cm long. A spiral wheel rotates within and collects water from the bottom and deposits it in another pan while turning. In Sicily, the Archimedes pump is connected to a windmill sails. Such windmill mechanism is also used to crush the salt grains to the required size.
Katlan	Container for water (*bieqja tal-ilma*)
	The weights
Siegħ	A round container which the salter referred to as - *landa tal-kunserva imburġata*. It is 20cm in diameter and 20cm deep and filled to its maximum capacity.
Tomna	6 times the container mentioned above (4 imperial gallons)
Wejba	4 times the latter
Mott	4 times the latter (16 times the Tomna)