



A.C.F. Brocktorff print
showing work at the
Auberge de Castille
granaries

Il-Fosos – Underground Grain Storage in the Maltese islands

David Dandria surveys the history and structure of the means used
in the past to store large supplies of grain in the Maltese islands

The supply of grain has always played an important part in the history of the Maltese Islands. As early as 1536 Jean Quintin d'Autun wrote in his *“Insulae Melitae descriptio”*:

*“Malta is very fortunate for this one reason, namely that Sicily, very fertile in all kinds of grain, lies nearby and is for the inhabitants as good as a granary, where otherwise they would die of hunger”*¹.

Indeed, although Malta, and to a greater extent Gozo, has always produced a certain amount of cereals, especially wheat and barley, this was never enough to satisfy the demands of the population and the island has always depended on importation from Sicily, and later from other sources. As far back as 1398, Malta had been granted special privileges whereby trading licences and taxes levied on grain imported from Sicily were waived, Malta being then a territory which formed part of the Kingdom of Sicily. This privilege had been hitherto enjoyed only by the city of Messina². Prior to accepting the offer of Malta by the Emperor Charles V, Grand

David Dandria, a Lecturer in the Department of Biology of the University of Malta, is a naturalist and agronomist and the author of several papers in these two fields. He has lately become interested in Maltese history, especially pre-20th Century descriptions of the Maltese Islands.



left:
Schematic section of a typical fossa, showing stone lid, neck, chamber and drainage pit. (after Hyde and Daubney, 1960).

below:
Postcard (ca. 1904) depicting grain handling at one of the Floriana granaries. (Courtesy Giovanni Bonello)

Master de l'Isle Adam sent emissaries to the Spanish Court to convince the Emperor that this privilege, together with the right to mint their own coinage, would be extended to the Order of St. John. Charles V finally consented, but only after Pope Clement VI intervened on the Order's behalf³.

During the sojourn of the Knights of St. John, contracts negotiated by the *Università* for the supply of these commodities were the order of the day. But even before that, one of the functions of the *Università* was to purchase corn for the consumption of the Islands' population. This function was carried out by an entity known as the *Massa Frumentaria* which later continued to enjoy this privilege under the government of the knights, importing sufficient grain for the needs of the inhabitants⁴. Under British Rule the fund continued to function until 1818 when it was suppressed by Governor Sir Thomas Maitland.

Of course, with such large quantities of cereals being imported, and with the Island in constant readiness for a

state of siege, it was imperative to provide for safe, long-term storage which would protect this precious commodity from damage caused by insects, rodents, moisture and mould. Recognising this need, the *Università* opted for the storage of grain in underground chambers or *fossae*, a method which had been used from time immemorial in the Middle Eastern and Central Mediterranean regions. In 1536, Grand Master Juan d'Homedes divided the *Università* into two municipalities: Mdina and Birgu, and it was the latter which excavated the first *fossae*. 1536 was the year of Quintin d'Autun's visit and this is what he had to say about Birgu:

*"The houses are breached and falling into ruins, with walls crumbling and unfinished, on weak foundations; they are buildings without attics; the roofs, roughly made, are covered either with tiles or reeds: frightening indeed"*⁵.

It was in this dilapidated environment that the *Università* embarked on its grain storage project, excavating six *fossae*



below:
Grain handling at St.
Publius Square.

right:
Late 19th Century
view of Auberge de
Castille showing
two of the fossae
with square lids in
the foreground.
(Courtesy Giovanni
Bonello)

near the palace which Grand Master d'Homedes had built in 1538 for the Birgu *Università*. These interconnecting *fossae* are still extant beneath Main Gate Street, where one can still see the single aperture covered with a granite slab and the hook which was used for haulage of the grain⁶. They must have played an important role during the ravages Birgu endured in the Great Siege of 1565.

In the years following the Great Siege and the building of Valletta, the *Massa Frumentaria* had to resort to loans from the people to satisfy the demand for corn and to meet the high prices; the loan conditions negotiated were so favourable that the people, instead of placing their money elsewhere as formerly, were quite eager to lend to the *Università*. This enabled the latter to increase the facilities for the safe storage of the grain and also to sell it at moderate prices⁷.

In 1665, one hundred years after the Great Siege, four *fossae* were excavated between Fort St. Angelo and Birgu. A Latin inscription⁸ which marked this site no longer exists but



it is recorded in Manuscript No 327 at the National Library. The inscription commemorated the building of the *fossae* and recorded the names of the Giurati of the *Università* responsible for their construction:

*“During the rule of Grand Master Nicola Cotoner, these granaries were constructed by the Jurats of the University of Grains, John Lagnano, John Leonard Roselli, John Mary Cardona and Oliver Pontis. The Year of our Lord 1665”*⁹

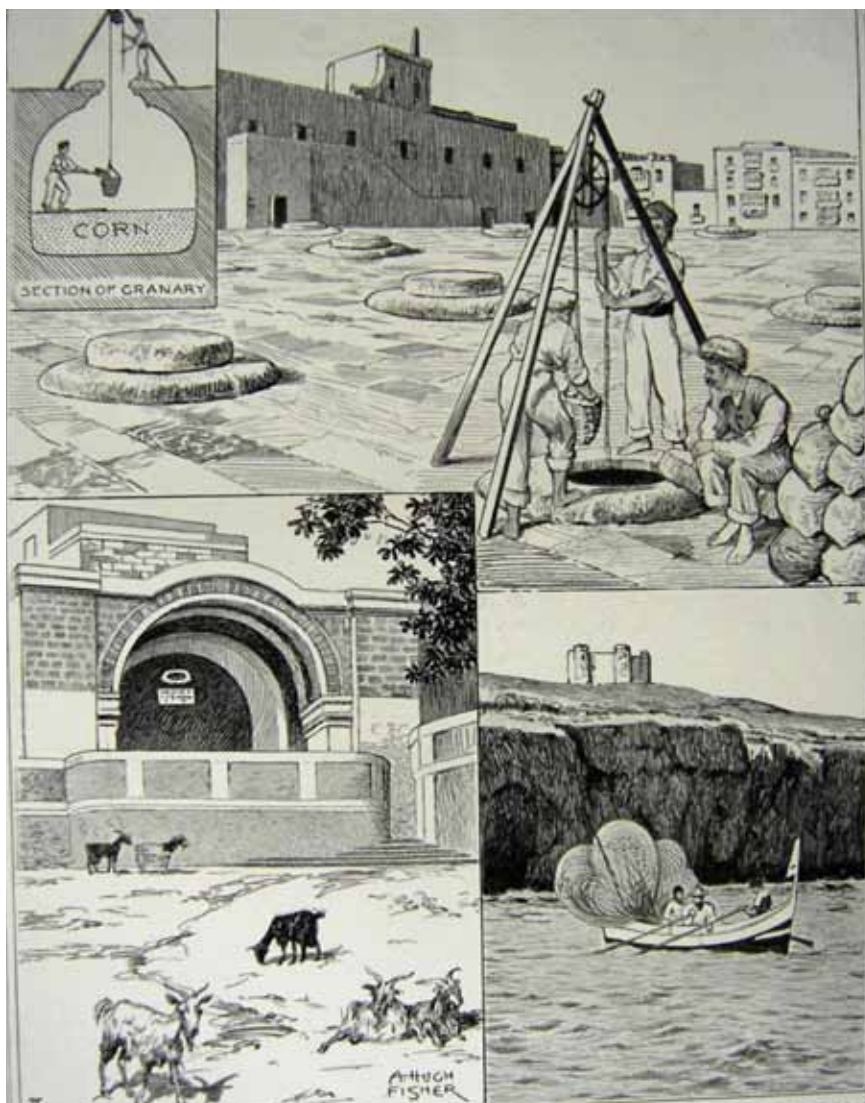
The first *fossae* in Valletta were excavated near Fort St. Elmo about 350 years ago during the Grand Mastership of Fra Martin de Redin (1657 - 1660), who is more renowned for the 13 coastal watch towers which he built around the coast. These *fossae* are underground flask-shaped pits with narrow cylindrical necks hollowed out of the solid globigerina limestone rock. The smaller *fossae* are about 4.5 metres in diameter and about 9 metres deep, including the neck which is 1 – 2.5 metres wide. Their capacity ranges from 50 tons to as much as 500 tons. The *fossae* are closed by circular or square flat stones and sealed with *pozzolana*, a reddish-brown glazed cement-like substance. At the base, each fossa has a layer of beaten earth over a perforated floor, below which is a drainage pit¹⁰. The ground around the *fossae* was paved with hard stone in order to prevent rainwater from seeping through the rock and leaching into the *fossae*.

One of the earliest descriptions of these storage chambers is given by the English naturalist John Ray who visited Malta in 1664, i.e. just six years after the first *fossae* were excavated. Ray described the *fossae* near St. Elmo as

*“caves hewn out of the rock in the form of a cupola, or ordinary beehive, having a narrow mouth above. They are constantly stored with corn enough beforehand to serve the whole city for a year”*¹¹

About twelve years later, John Henry Teonge, an English naval chaplain, wrote about the granaries in his diary, which covered the years 1675 to 1679.

Three sketches from *The Illustrated London News* dated 12th June 1912. The top sketch shows the St Elmo Granaries and bears the following caption: "In the town La Vallette built after the Great Siege to render the Island secure forever from attacks by the Turks, Granaries at Valletta – Beehive-shaped receptacles cut in the rock".



*"Their store-houses for corne and other provisions are after the manner of wells, cut into the maine rock 20 fathom deepe and more, and very spaciose in the bottom, but narrow at the top, and covered with a massy stone, and closed up with tarras. And these they have in greate numbers; and in severall vacant places in the towne, in which they have constantly corne and all other provisions before hand for 3 hundred thousand men for 3 years"*¹²

Teonge somewhat exaggerated the depth of the *fossae*, 20 fathoms being the equivalent of about 37 metres!

For a description of the way in which these storage chambers functioned we are indebted to a certain John Critien who on 14th May 1896 wrote a letter to Robert Bright Marston in reply to his request for information about the *fossae* for a book he was writing¹³. Critien wrote:

"When grain is deposited in a silo, a layer of barley straw of the thickness of a sheaf is placed all round the walls, and a thicker layer at the bottom. This is done to prevent absorption of moisture by the grain, which would make it ferment. It is of paramount importance that the silo be perfectly dry, as otherwise there will be fermentation. When

filled up with grain, more straw is packed in on the top of it, and the top slab is then put on and hermetically sealed."

The length of time for which grain could be stored in these *fossae* without deterioration depended on the condition of the *fossae*, especially on how airtight and watertight they were. Different estimates of this safe storage period are found in the literature. Some authors claim to have seen grain in good condition being extracted from the *fossae* after a hundred years¹⁴, while others indicate a more conservative three to four years¹⁵. One exaggerated claim, by Mrs. F.M. Fitz Maurice¹⁶, mentions several centuries:

"The public granaries are not among the least curious objects in Malta. They consist of a number of deep pits, hollowed out of the solid rock, and covered with large stones at the top, strongly cemented down with puzzolana to exclude the air. In one of these, which had been overlooked (on being opened after the lapse of centuries), the grain, with the exception of a little at the top, was found to be as fresh as possible."

The granaries were said to become dangerous to enter after having been empty and closed for a length of time on



left:
Old photograph showing the fossae on either side of Crucifix Hill, Floriana.

below:
The domed opening of one of the three silos at the Citadella in Gozo.

account of the foul air within. William Allen, writing in 1855, stated that just before their visit “a man who descended one fell dead before his companions had time to assist him”¹⁷. Another insalubrious anecdote regarding the granaries is recounted by an anonymous author in a book entitled *My Travels*¹⁸ published in 1837. This book takes the form of a series of conversations between “Ellen” and her younger sister “Mary”. The rather squeamish Ellen described the scene when one of the granaries, presumably near St. Elmo, was being opened:

“One day as we were walking on the ramparts, on the sea-side, where these granaries are situated, we saw some men, under the inspection of an officer and guard, drawing up wheat in large baskets. Oh! such a frightful quantity of all sorts of horrid insects as crawled out of the panniers; cockroaches of an enormous size, and great centipedes and scorpions. The sight quite disgusted me, and we quickly left the place; other people, however, did not seem to heed those things. Custom and habit familiarize a person to every sight, be it ever so revolting.”

At the present time these underground storage chambers are concentrated in Valletta (near Fort St. Elmo) and Floriana (at Il-Fosos opposite St. Publius Church and at St. Anne’s Bastion). Only 39 of the original 70 St. Elmo granaries remain, the rest having been obliterated to make way for the road and nearby buildings (one of the surviving *fossae* is actually located in a traffic island!). The largest number (76) is found at the esplanade in front of St. Publius Church, Floriana. Another 9 are still extant at St. Anne’s Bastion in Floriana but more of the underground grain stores existed previously. A September 1908 edition of *The Malta Government Gazette*¹⁹ lists no fewer than 191 granaries on the St. Publius esplanade with a total capacity of 61,555 salms²⁰. An old photograph shows another group of *fossae* on either side of the upper part of Crucifix Hill leading from the Harbour to Floriana. Antonio Schembri published a pamphlet²¹ in 1854 in which he mentions “*quindici fosse*

della capacità di 7,050 salme sul bastione dirimpetto Albergo di Castiglia” The Castille *fossae* were filled up and covered when the square was turned into a bus terminus. A number of old photographs and postcards of the Auberge show these *fossae* in the foreground with square lids. A lithograph by the Schranz brothers shows grain being aired at Castille Square with some granaries and Annona House in the background. All dealings in connection with the importation of grain was carried out at Annona House, which was built by Grand Master Giorgio Carafa (1680 – 1690)²².

Other *fossae* were to be found at Senglea. These were excavated during the rule of Grand Master Claude de la Sengle (1553 – 1557) in order to ensure sufficient stores of grain whenever supplies of corn which had been promised by the Kings of Aragon and Sicily were either suspended or delayed. The Grand Master decided on granaries at Isola (Senglea) since a good quantity of grain used to be milled there. The granaries were excavated in the highest part of Senglea²³. These granaries still exist below Victory Street, but they were covered over when Senglea’s main street was constructed. Unfortunately when the street was to be resurfaced some years ago a portion of the upper structure of the granaries gave way when a heavy construction lorry was passing through²⁴.



The interior of one of the Gozo silos, looking up towards the opening. The rendering of the walls was executed when the silos were converted to water cisterns in 1877.

In 1926 Temi Zammit wrote that Grand Master Perellos (1697 - 1720) “caused large granaries to be built for the storage of wheat”, which apparently was being regularly imported in large quantities under his peaceful rule. Unfortunately Zammit does not quote the source of this information, nor does he give details of the type of granaries or their location²⁵.

The Knights of St. John also took pains to ensure that the population of Gozo had enough grain in store for times of need, especially when the population was forced to seek shelter in the *Cittadella* during the frequent attacks by Moorish corsairs. Three grain silos are still extant in the Citadel just behind St. John’s Cavalier. These *fossae* were connected by tunnels during the British Administration in 1877 and converted for use as water storage cisterns. The complex was beautifully restored by Wirt Ghawdex in 2009 and opened to the public; access to their interior is possible through the tunnel leading to the St. John Battery behind the Polverista²⁶.

The Valletta and Floriana grain storage *fossae* were in constant use right up to 1962, when they were made redundant by the large above-ground modern grain silos which were built in the harbour area, notably in the newly constructed Deep Water Quay near Pinto Wharf. Apart from their normal use, the *fossae* had played a significant part on two important occasions: the plague epidemic of 1813 and the second Siege of Malta during World War II.

The British authorities took several measures to contain the plague outbreak of 1813. The plague was prevalent in Valletta and Floriana and in order to prevent the spread of the disease to rural areas all communications between Valletta and Floriana and the rest of the island were cut off. Since most of the wheat in Malta was stored in the Valletta and Floriana granaries, this measure prevented the transport of wheat to the various villages, whose reserves were limited and would therefore soon have become depleted. This problem was overcome by the erection, on the fortifications of



Floriana, presumably near the St. Anne Bastion granaries, of a machine which delivered grain into the carts coming from the countryside without their entering Valletta and Floriana, thus preventing direct contact between the two towns and the rest of the island²⁷.

During the Second World War the granaries assumed great importance since it was vital to conserve safely all the grain shipments which reached Malta in the convoys. By August 1942 the grain stored in the *fossae* became so depleted that recourse was had to importing grain from Gozitan farmers. This managed to bridge the gap until the arrival of the St. Maria Convoy on 15th August²⁸. The granaries, especially those at Floriana, were an open target but were thankfully never seriously damaged by enemy bombs.

The church of St. Publius received a direct hit on 28th April 1942 and was heavily damaged. The late Emanuel. S. Tonna, who was present in the church immediately after the raid, gave the following graphic description of the raid:

“It was the most sacrilegious act because the bombing was intentional and deliberate. Bombs were showered all over the church and there was not a single place left unscathed. The dome was hit probably several times and the masonry tumbled down destroying the pavement beneath. The blast

went right down into the crypt killing all those seeking refuge there and injuring many others”²⁹

Providentially the granaries themselves escaped with slight damage. It is not easy to understand how the church was preferred as a target to the more strategically important granaries nearby!

Some of the *fossae* developed faults over the years, mainly cracks extending for up to two metres in the limestone rock; this damage was aggravated by vibrations from the wartime bombing and from the ever-increasing modern traffic nearby. As a result these *fossae* no longer remained airtight and waterproof and the quality of grain stored in them deteriorated rapidly. In 1949/50 these cracks were repaired and the walls of the *fossae* rendered with cement³⁰.

As already stated the granaries were in use right up to 1962 when more modern grain silos were constructed. Just four years previously, however, the Government was still attaching great importance to the *fossae*, so much so that in 1958 Dr. Mary B. Hyde, an expert from the Pest Infestation Laboratory of the Agricultural Research Council of the U.K., visited Malta in order to study scientifically Malta’s grain storage *fossae* and to explore possible improvements. Together with C.G. Daubney of the Standards Laboratory, Department of Trade and Industry, Valletta, she carried out an experiment between November 1958 and May 1959. In this trial one *fossa* was lined internally with a special treatment consisting of a cement rendering plus four coats of aqueous bitumen emulsion with a layer of glass fibre mesh sandwiched between the second and third coats. Grain stored in this *fossa* up till May 1959 (6 months) was then compared with grain stored for the same period in a *fossa* with the traditional straw lining. The results showed marginally better quality of the grain in the treated *fossa*, but these results were never acted upon, presumably in view of the projected above-ground grain silos³¹.

The granaries at Floriana, *Fuq il-Fosos* in popular parlance, are one of the largest urban open spaces in Malta

and have now become synonymous with the staging of important events, principally mass meetings, rallies and other celebrations organised by the political parties. They were also the site of a number of open air concerts, including one by Elton John and the more recent “Isle of MTV” festivals. But perhaps the most important events which took place at the Floriana Granaries were the Holy Mass celebrated by Pope John Paul II during his visit to Malta in 1990, the beatification of Dun Gorg Preca, Nazju Falzon and Suor Adeodata Pisani during his second visit in 2001, and the celebration of Holy Mass by Pope Benedict XVI during his visit last April.

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Notes

- 1 Vella Horatio C.R. *The Earliest Description of Malta (Lyons 1536)* by Jean Quintin d’Autun. Malta 1980, 35.
- 2 Aloisio Mark, ‘A Test Case for Regional Market Integration: The Grain Trade between Malta and Sicily in the Late Middle Ages’ in Armstrong L., Elbl I. and Elbl M. (Eds.) *Money Markets and Trade in Late Medieval Europe*. Leiden 2007, 306
- 3 Sammut Joseph C. *Currency in Malta* Central Bank Of Malta, Valletta 2001, 34-35.
- 4 de Boisgelin Louis *Ancient and Modern Malta*. London 1805. Vol I, 41.
- 5 Vella Horatio C.R. *op. cit.* p.,31
- 6 Gregory Gauci, personal communication.

- 7 Boisgelin Louis de *op. cit.*, 42
- 8 “REGNANTE DNO. MAGNO. MAGRO. DNO. FRA. NICOLAO COTONER PRINCIPE DIGNISSIMO GRANARIA HOC UNIVERSITATIS HORREUM JURATI JOANNES LAGNANO. JO. LEONARDUS ROSELLI. JOANNES MARLA CARDONA ET OLIVERIUS PONTIS CONSTRUI FECERUNT ANNO DNI. 1665”.
- 9 English translation by J.F. Darmanin in “The Buildings of the Order at H.M. Victualling Yard, Malta.” *Melita Historica* 2:2 1957, 71
- 10 Hyde, Mary. B and Daubney C.G. “A Study of Grain Storage Fossae in Malta”, *Tropical Science* Vol II No. 3 1960, 115 – 116.
- 11 Ray, John. *Travels through the Low Countries, Germany, Italy and France – with curious observations natural, topographical, moral, physiological et. Second Edition*, London 1738, 259 – 260.
- 12 Teonge, Henry *The Diary of Henry Teonge, Chaplain on board His Majesty’s Ships Assistance, Bristol and Royal Oak Anno 1675 to 1679*. Printed from the original MS. London 1825, 47.
- 13 Marston’s book, *War, Famine and our Food Supply* was published in 1897 by S. Low, London. Critien’s letter is reproduced in full, together with a sketch of a *fossa* and two photographs of the granaries in front of the church of St. Publius.
- 14 Teonge Henry *op. cit.* 47
- 15 Bigelow, Andrew *Travels in Malta and Sicily*, Boston 1831, 156 and Lieber F. (Ed.) *Encyclopaedia Americana*, Philadelphia 1838, 234
- 16 Fitz Maurice F. M., *Recollections of a Rifleman’s Wife at Home and Abroad* London 1851, 138
- 17 Allen, William *The Dead Sea: a new route to India Vol. I*, London 1855, 17
- 18 Anon *My travels, a series of conversations with a younger sister, after returning from journeys in France, Italy, Malta, and Turkey*. London 1837, 135
- 19 *The Malta Government Gazette* 30/9/1908: Table showing “Storage accommodation and estimate of goods in bond and private warehouses”
- 20 According to de Boisgelin, *op. cit.* p xiii, “*Salm*, a corn measure, makes 34 Leghorn sacks: the Leghorn sack of wheat contains 162 pounds, and a sack of flour 150 ditto”. This would mean that 1 salm = 5,508 pounds! Bonnici and Cassar in “*The Malta Grand Harbour and its Dockyard*” (Malta, 1994, 390) state that in 1908 1 salm ranged between 462 and 510 pounds.
- 21 Schembri’s pamphlet, entitled *Sul Debito della Massa Frumentaria e Progetto economico per estinguerlo* was presented to Her Majesty’s Government.
- 22 Zammit V. & Grima J.F. *Il-Gran Mastri Vol II 1680 – 1758*, Valletta 1990, 293 – 296
- 23 Bonnici Alexander *L-Isla fi Ġrajjet il-Bazilika-Santwarju ta’ Marija Bambina Vol I* L-Isla 1981, 37
- 24 Joe Abela, Senglea Historical Society, personal communication
- 25 Zammit Themistocles, *Malta - The Islands and their Histor*, Valletta 1926, 210
- 26 See Press release by Wirt Ghawdex dated 26th May 2009 on the occasion of the opening of these silos to the public.
- 27 Cassar P. The use of wood as a writing medium during the plague of Malta of 1813. *Medical History* 10:3 1966. 278. One of the letters on wood (a material which was thought incapable of transmitting the plague) hints at the depletion of grain supplies in the villages.
- 28 Tonna E.S. *Final Focus on Floriana*. Malta 1979, 101
- 29 *ibid.* p.129
- 30 Hyde, Mary. B and Daubney C.G. *op. cit.* p. 116
- 31 *ibid.* pp. 115 – 129