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COVER PHOTOGRAPH
Details of the excavated remains at St. Paul's Square, Mdina (Photo: Anton Bugeja)

Editorial

Some important events mark the year 2001 making it a memorable one in the heritage history of the Maltese Islands. On the tenth February, excavations at Mdina yielded the remains of a fluted column probably belonging to the classical period. This find attracted the attention of the media and general public who visited the site in encouraging numbers. Work proceeded in the city (see contribution by Katya Stroud) but a vandal attack which resulted in the overturning of sixty megaliths at Mnajdra soon took the attention elsewhere. The consequences of this barbaric act were numerous. The final stages in the compilation of the Cultural Heritage Bill were made public and consultation from a number of interested parties sought. The media responded by showing more frequent coverage to cultural events and programs, including an excellent series on "Heritage in Peril" by Din l-Art Helwa. An exhibition, "Neolithia", featured a number of artistic contributions inspired by the megalithic culture and providing a wonderful environment for a number of very informative lectures. During this year a number of historical remains continued to be restored including the Victoria Lines, It-Torri tal-Hamrija and Mgarr ix-Xini. One only hopes that the events triggered by the Mnajdra incident will continue bearing fruit, as heritage issues will be addressed by a new system of management.

The present issue of The Oracle also marks another active year for the GAM. The journal compliments one of the group's main objectives namely that of making public the widespread heritage of the Maltese Islands. The journal contains a report on the preliminary work done by the group's members on a recently rediscovered hypogeum at the Wignacourt Museum. In another paper Mr. Keith Buhagiar's work on cave use in the medieval period has allowed him to provide an informative interpretation on the Latmija cave at Marfa.

Two articles are dedicated to cart-ruts. One attempts a study of the methodology of date assignment to this phenomenon, including in it a reassessment of a Bronze Age date ascribed to the cart-ruts. Another article, by Mr. Guy Schneider, presents a summary of the relevant fieldwork done by IVS on analogous features in Switzerland and the surrounding countries. Two further articles provide a reinterpretation of two rock-carved designs. Referring to details of the creation account in Genesis, Mr. Joseph L. Cilia provides a more complete interpretation of the palaeochristian iconography of the Hal Resqun hypogeum. In a separate paper engineer Mr. Chris Micallef explores the night sky in antiquity in an attempt to reconstruct the original appearance of the design on a stone found at Tal-Qadi.

It is hoped that the opinions expressed within this issue provide a positive contribution to the study of the local heritage in this eventful year

The publication of this journal was largely financed by a grant from the cultural support scheme by the Department of Culture

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The Latmija Troglodytic Settlement

Keith Buhagiar[1]

1. 45, Triq Dun Salv Zarb, Gharghur, Malta.

The troglodytic phenomenon was widespread in the Mediterranean region throughout the Middle Ages wherever environmental conditions proved favourable. Arid and semi-arid zones which suffered from a lack of timber, but on the other hand provided plentiful natural rock-cut shelters and an abundance of easily quarried stone, were instrumental in conditioning a type of architecture which was entirely stone oriented besides encouraging cave-dwelling. The Maltese landscape is characterised by the almost complete absence of woodland vegetation and scarce soil deposits leaving exposed the bare rock-face. This has led the natives to make the best possible use of the plentiful caves present within. The prevailing local environmental conditions provided an ideal springboard for the widespread diffusion of troglodytism within the Island in the middle ages[1].

Two different types of medieval cave-settlements have been identified in Malta[2]. These consist of (a) the adoption of a natural karstic depression for habitational use[3], and (b) the occupation of naturally formed caves, most commonly embedded in the sides of valleys and ridges[4]. Cave usage varied from (a) the adoption of the cave for cultic worship, (b) human habitation and, (c) utilisation as animal pens or as storage space connected with agricultural usage[5].

The adoption of natural caves as places of habitation has necessitated the construction of dry-wall partitions on the cave interior in order to create different living spaces. Dry-wall constructions partitioning a cave's interior distinguish local medieval troglodytism from its Sicilian counterpart where, the use of dry-walling is always found to be limited for façade purposes[6].

Cobbled passageways frequently facilitated access to troglodytic sites, whilst the construction of artificial ramps was often employed to ease the passage to cliff-face settlements. Ramps are similar in their method of construction to rubble-walls, but the gap in between the cliff-face and the rubble-wall is backfilled with a soil and rubble infill and capped with cobbled stones.

The collapse of the grain markets and the subsequent economic recession in the fifth and sixth centuries A.D. might have boosted the troglodytic phenomenon in Sicily. Coastal cities also suffered a decline and became unsafe due to an increase in Saracenic incursions[7] and in several instances people took refuge in mountains[8]. It is probable that cave-dwelling became widespread in Malta at a much later date and there is at present no evidence pointing to any large scale occupation of the countryside in the Byzantine and Muslim periods [9]. The definite Norman conquest of 1127 and the subsequent occupation of the urban centres shifted the Muslim inhabitants of the Island to the countryside. It is possible that the troglodytic phenomenon and the setting up of small villages became locally widespread at this stage[10].

Geophysical and Historical Considerations

The Latmija settlement is situated on high ground at an altitude of c. 150 metres above sea level and can be reached by following a footpath which from the cliffs overlooks Paradise Bay meanders towards the *Ta' Qassisu* cliffs, enjoying a clear panorama in all directions (Figure 1). The cave-settlement is a major feature of archaeological interest in this remote corner of the island. This is reflected by the toponym of the surrounding area, which is also that of Latmija. The settlement is not easy to locate and the main indicators to its whereabouts, it being of a karstic origin, are a cluster of fig trees and the remains of a dry-stone wall which once enclosed the site's entrance.

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Upper Coralline Limestone predominates in the area. As is the case with *Ghar il-Kbir* and *Maqluba*, Latmija was formed as a result of the thinning out of a stratum of clay, trapped in a layer of Upper Coralline limestone. The erosion of the clay gradually formed rock-hollows, geologically identified as karstic depressions. In flat terrain, the remaining external limestone crust collapsed, creating a natural depression some times having considerable proportions.

No documentary references to the Latmija settlement are known to exist. Latmija was most probably inhabited up to the late seventeenth or early eighteenth centuries. Even though the dawn of human settlement in the Marfa area is difficult to establish, Veronica Veen and Adrian van der Blom[11] claim they managed to identify three different prehistoric cultures within the Latmija settlement[12].

Description of Remains

Entrance to the settlement is through a doorway flanked on both sides by the remains of a dry-wall construction (Plate 1). The doorway faces the Northwest. The thickness of the dry-wall structure concealing the entrance to the settlement varies from 0.80m to 1.05m and concurs in thickness and method of construction to dry-wall partitions found within other cave-dwelling sites. All the caves adopted for habitational purposes within the Latmija settlement are located on the southeastern side of the karst feature.

The well sheltered nature of the settlement together with abundant soil deposits, provide an ideal habitat for the growth of several species of trees and shrubs that would have otherwise been unable to survive in the more hostile environment of the garrigue above. Vegetation is restricted to the central and western areas of the settlement and mainly consists of wild figs, wild almond, capers and prickly pears. These are recent introductions and were probably not present when the settlement was still inhabited. The abundant and fertile 'terra rossa' soil deposits within this natural depression are the result of runoff surface rainwater deposition and was aided by the slight east-west inclination of the garrigue landscape.

An artificially constructed ramp sloping in an eastward direction, leads down to the settlement (Plate 2). The ramp had a cobbled surface, of which only a small portion managed to survive. Four areas, all distinctively partitioned through the use of rubble-wall constructions have been identified at Latmija. Areas 1, 2 and 3 are all located on the same floor level, whilst Area 4 lies on slightly higher ground (Plate 3). Only an accurate survey of Areas 2, 3 and 4 was possible. A large mound of stone chippings concealing access to the cave in Area 1 restricted the survey to the outermost rectangular expanse fronting the cave.

Human and animal occupation of the karst feature appears to be restricted to the southeastern corner (Plate 4). A large overhanging rock ledge here shelters the area from wind and rain. All four areas share an almost identical layout, which typically consists of man-made chambers or storage recess fronted by a large open-air rectangular enclosure. All caves at Latmija are characterised by their small nature. The caves marked F, G and J (Figure 2) are too small a nature to allow human habitation and were possibly used as storage recesses. The remaining caves (fig. 2; D and E) might have been utilised as either sleeping recesses or animal pens, but the site's poor state of preservations makes this difficult to determine. In the absence of adequate historical documentation on the inhabitants of the settlement it is difficult to establish whether all four 'areas' belonged to one or more family units.

Dry-wall constructions enclosed the entrance to caves D and E. The small nature of the caves at Latmija left no scope for their internal partitioning. Dry-wall construction was on the other hand extensively used to enclose the cave entrance and to partition the area fronting the caves.

Conclusions

Our knowledge on the Latmija settlement is limited due to the absence of known historical documentation and the lack of proper archaeological investigation. This study leaves several questions unanswered. Only archaeology and archival research can help supplement the lack of historical knowledge. The dating of the Latmija settlement together with the number of family units dwelling within is difficult to determine. Basing oneself purely on architectural stylistic evidence, the complex reflects a late medieval rural set-up. The size and the layout of the Latmija settlement make it unlikely that this was inhabited by more than two or three family units.

The rural folk inhabiting the settlement were probably engaged in the farming of the surrounding land. Fertile fields fed by spring water derived from the perched aquifer are located nearby and are probably capable of producing three crop yields a year. The site's close

proximity to the sea might none-the-less imply that the cave dwellers were also involved in fishing. This hypothesis is aided by the fact that passageways hewn into the cliff-face and which lead down to the sea are only located about fifty metres from the entrance to the Latmija complex.

The out of the way location of the Latmija settlement is not aiding its preservation. Vandals that are presumably unaware of the damage they are causing to this sensitive site are demolishing dry-wall partitions only to erect temporary makeshift structures that accommodate their weekend camping-spell needs.

Endnotes

[1] Messina, A. 1989. Trogloditismo Medievale a Malta. *Melita Historica* vol. X no. 2: 109. Malta.

[2] For a more detailed study on the subject, Buhagiar, K. 1997. *The Ghar il-Kbir Settlement and the Cave Dwelling Phenomenon in Malta.* Long essay presented in part fulfilment for the degree of Bachelor of Arts in Archaeology, University of Malta.

[3]The Ghar il-Kbir and Latmija cave dwellings are a typical example of such a settlement.

[4] The San Niklaw and San Pietru cave-settlements in Mellieha and Naxxar respectively are examples of cliff-face settlements.

[5] Buhagiar, K. 1997. *The Ghar il-Kbir Settlement and the Cave Dwelling Phenomenon in Malta*, op.cit.

[6] Luttrell, A. 1979. Malta Troglodytica: Ghar il-Kbir. *Heritage* vol. 2: 461-4.

[7] Messina A. 1979. *Le Chiese Rupestri del Siracusano*: 7.

[8] Buhagiar, M. 1984. Mediterranean Architecture: Medieval Cave Dwelling and Rock-Cut Churches in Malta. In Delucca, D. (ed.) 1975. Mediterranean & Middle East Architectural Construction Review. *Atrium,* 3: 17. Malta, Penprint Ltd.

[9] Buhagiar, M. 1993. *Christian Catacombs, Cult Centres and Churches in Malta to 1530.* Unpublished doctoral thesis, University of London: 191.

[10]*Ibid.*, p. 342.

[11] Veen, V. and van der Blom, A. 1992. *The First Maltese – Origins, Characteristics and Symbolism of the Ghar Dalam Culture*, pp 59-67. Holland.

[12] The authors claim use of the site in the Ghar Dalam phase, early Temple period and the Bronze Age.

Bibliography

Brown, T. S. 1975. Byzantine Malta: A Discussion of the Sources. In Luttrell, A. (ed.) 1975. *Medieval Malta – Studies on Malta Before the Knights, pp.* 71-87. U.K., London.

Buhagiar, K. 1997. *The Ghar il-Kbir Settlement and the Cave Dwelling Phenomenon in Malta.* Long essay presented in part fulfilment for the degree of Bachelor of Arts in Archaeology, University of Malta.

Buhagiar, M. 1975. Medieval Churches in Malta. In Luttrell, A. (ed.) 1975. *Medieval Malta – Studies on Malta Before the Knights*, pp. 163-180. U.K., London.

Buhagiar, M. 1984. Medieval Cave Dwellings and Troglodyte Churches in Malta. In Delucca, D. (ed.) 1975. Mediterranean & Middle East Architectural Construction Review. *Atrium,* 3. Malta, Penprint Ltd.

Buhagiar, M. 1991. Post-Muslim Malta – A Case Study In Artistic and Architectural Cross Currents. In Fiorini, S. and Mallia Milanes, V. (eds.) 1991. *Malta: A Case Study in International Cross Currents.* Malta.

Buhagiar, M. 1993. *Christian Catacombs, Cult Centres and Churches in Malta to 1530.* Unpublished doctoral thesis, University of London

Fonseca, C. D. (ed) 1984. *La Sicila Rupestre Nel Contesto Delle Civilita' Mediterranee.* Italy, Lecce.

Loubes, J. P. 1984. *archi troglo.* France, Parentheses.

Luttrell, A. 1975. Approaches to Medieval Malta. In Luttrell, A. (ed.) 1975. *Medieval Malta – Studies on Malta Before the Knights,* pp. 1-70. U.K., London

Luttrell, A. 1979. Malta Troglodytica: Ghar il-Kbir. *Heritage* vol. 2: 461-4.

Messina, A. 1979. *Le Chiese Rupestri del Siracusano.* Italy, Palermo.

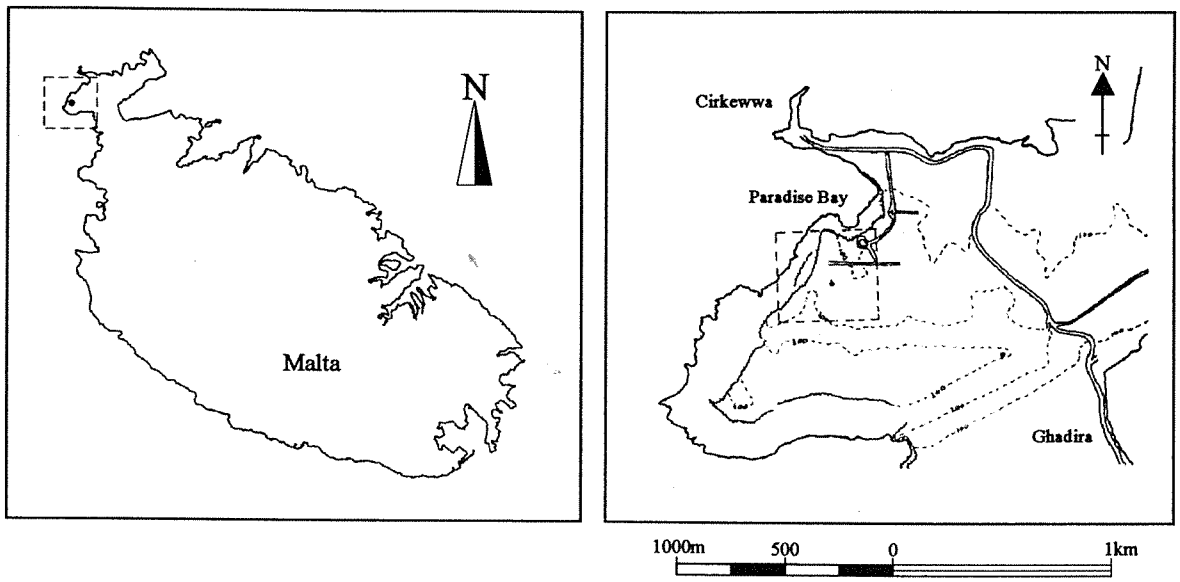
Messina, A. 1989. Trogloditismo Medievale a Malta. *Melita Historica*, vol. X no. 2. Malta.

Quintin D'Autun, J. 1536. *Insulae Melitae Descriptio.* Translated and annotated in Vella, H. C. R. 1980. *The Earliest Description of Malta.* Malta.

Ransely, N. 1984. *A Geography of the Maltese Islands*, Third edition. Malta, Progress Press.

Veen, V. and van der Blom, A. 1992. *The First Maltese – Origins, Characteristics and Symbolism of the Ghar Dalam Culture.* Holland.

Site Plan of the Latmija Area



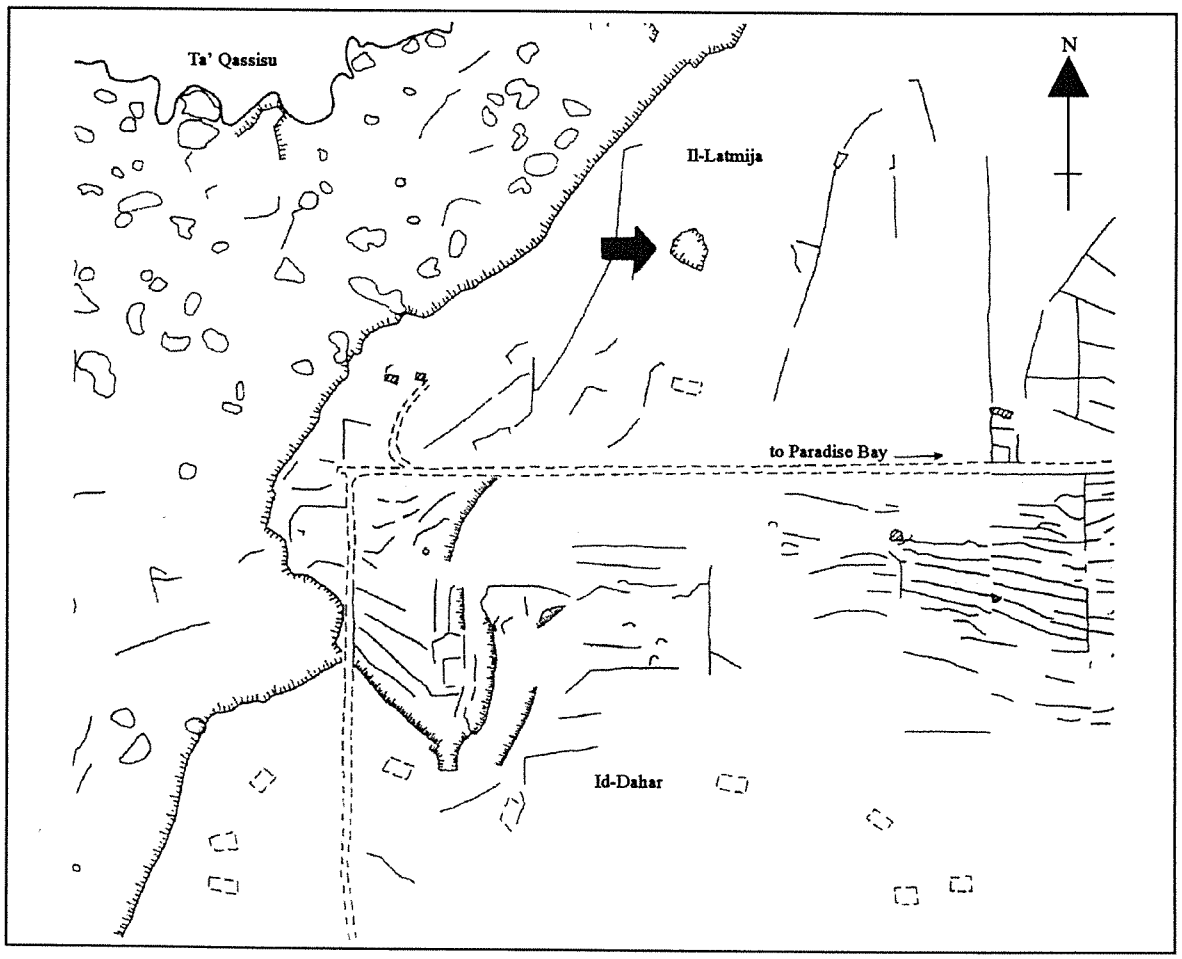


Fig. 1

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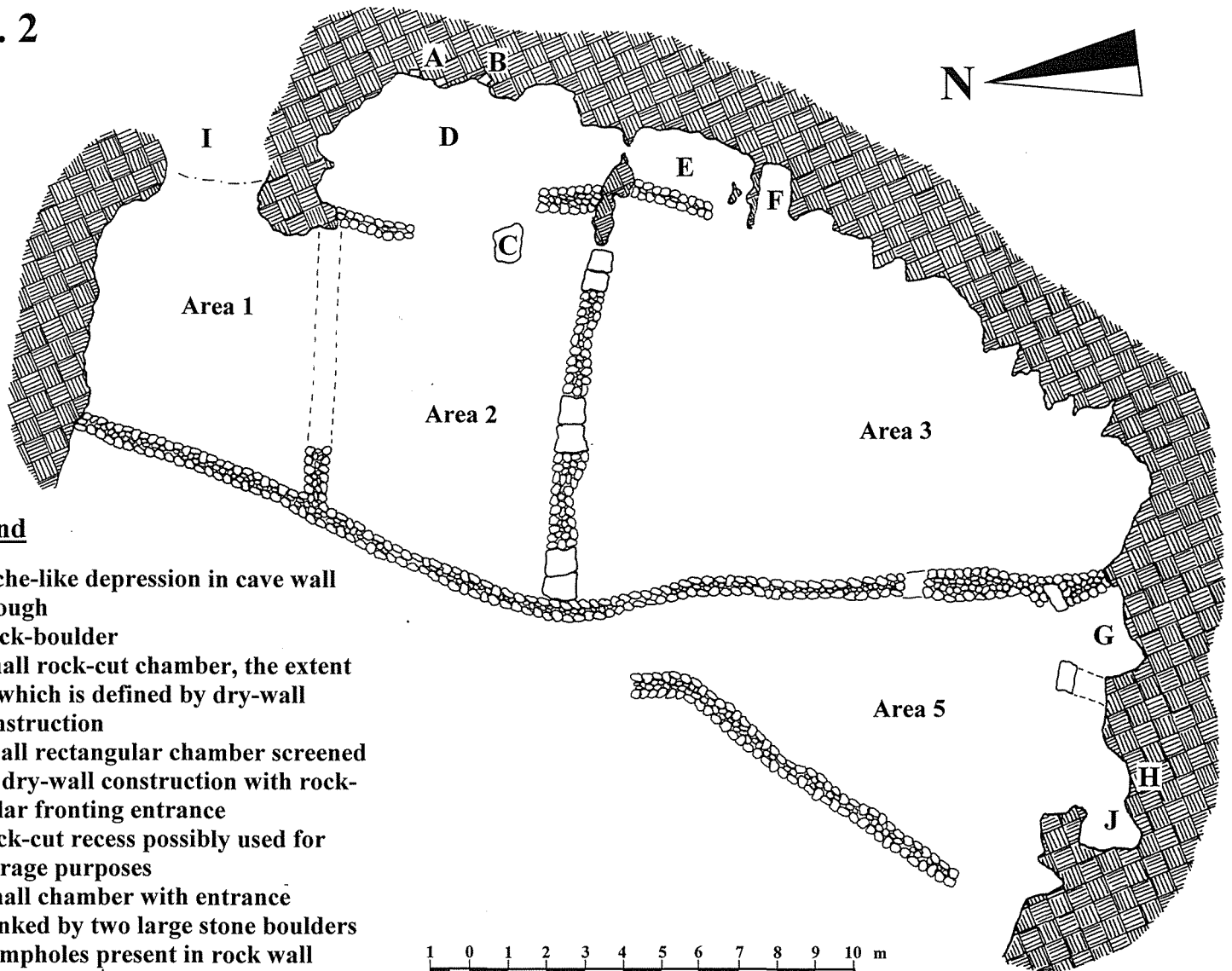
Fig. 2



Legend

A. Niche-like depression in cave wall
B. Trough
C. Rock-boulder
D. Small rock-cut chamber, the extent of which is defined by dry-wall construction
E. Small rectangular chamber screened by dry-wall construction with rock-pillar fronting entrance
F. Rock-cut recess possibly used for storage purposes
G. Small chamber with entrance flanked by two large stone boulders
H. Lampholes present in rock wall
I. Extent of survey due to debris enclosing the cave entrance
J. Small irregular shaped chamber

Surveyed and Drawn by Keith Buhagiar

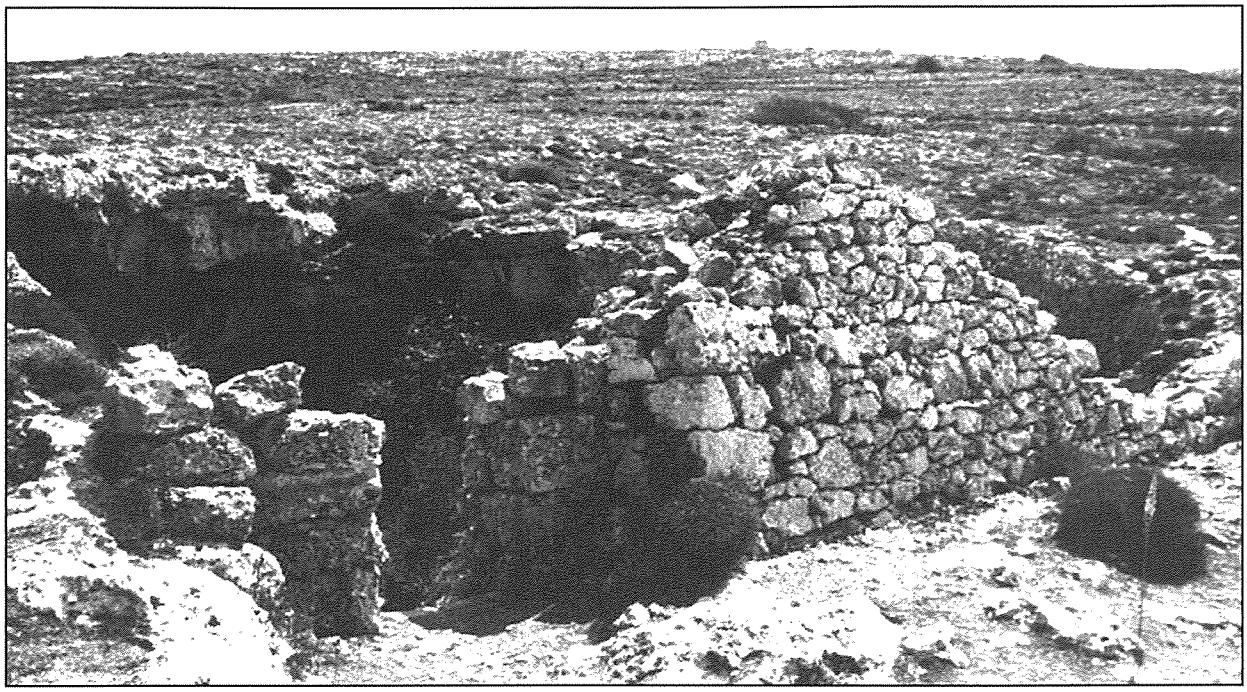


Plate 1: Entrance to Latmija Cave

Plate 2: Ramp leading to settlement

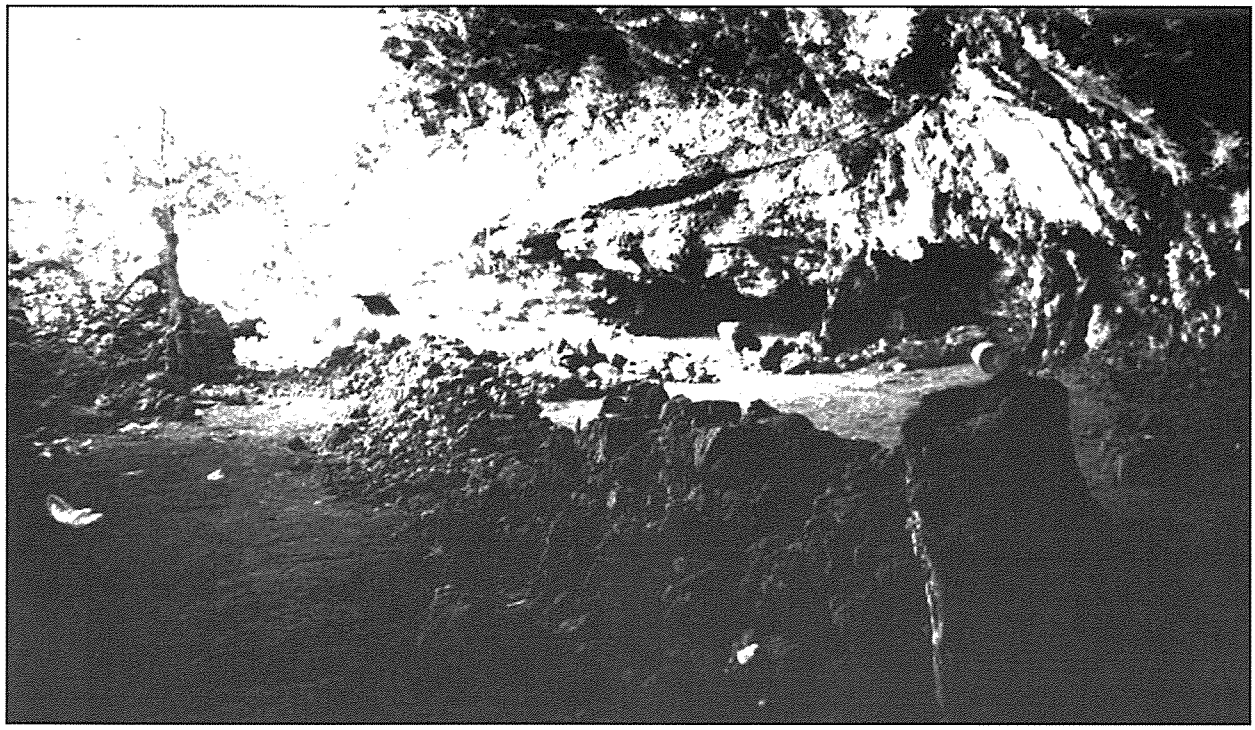


Plate 3: General view of Areas 2, 3 and 4

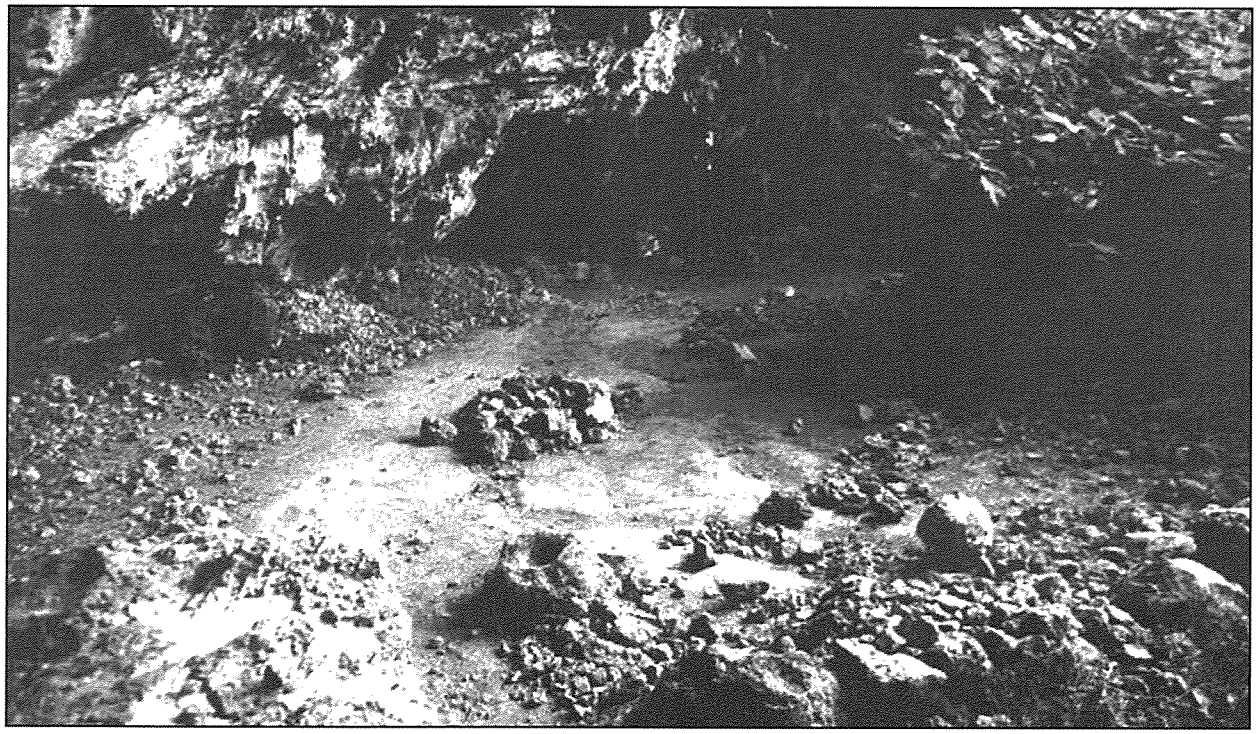


Plate 4: Areas 1, 2 and cave D

Excavations at Mdina – 2001

Katya Stroud[1]

1. ASC Limited, 76, Triq is-Sienja, Kalkara.

In an unprecedented exercise the Mdina Rehabilitation Committee engaged the Archaeology Services Co-Operative Limited to monitor trenching works during one of its projects. The aim of this exercise, which is being carried out under the supervision of the Museums Department, was not a formal excavation of the city, but intended to avoid damage to the archaeological heritage of Mdina.

Operations by machinery were kept as shallow as possible, deeper investigations performed manually by members of the archaeological team when cultural deposits were detected. All interventions were documented, areas with archaeological remains and deposits surveyed, photographed and preserved.

The results were bewildering. Over a kilometre of trenching was supervised, yielding over 10,000 pottery sherds in over 375 contexts. Cultural periods encountered range from the Roman to the Modern period, remains of the Classical and Medieval periods being particularly well represented.

Although ashlar blocks were already noted when work started at Il-Mina ta' De Redin, substantial remains were found in the northern half of Villegaignon Street. In front of the doorway of Palazzo Falzon a wall perpendicular to the street axis was uncovered and excavations were carried out on its southern part to a depth of three metres. Further down the road, in front of the Carmelite Church, another wall turned up. Two levels linked by a stairway were found to its south; excavations immediately to the wall's northern side came across a number of deposits overlying the now famous limestone fluted column. This was uncovered on the 10th February by Brian Philps, from the Kent Archaeology Rescue Unit, who volunteered help to the group.

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Further remains turned up at St Roque Str. and Our Saviour Str., but particularly interesting are finds encountered in St. Paul's Square. Under a number of road surfaces predating the present one, a stretch of wet rubble was encountered. Part of this wall rested on sizeable ashlar blocks belonging to the Classical Period. Remains of two cesspits are suspected to the eastern end of the trench.

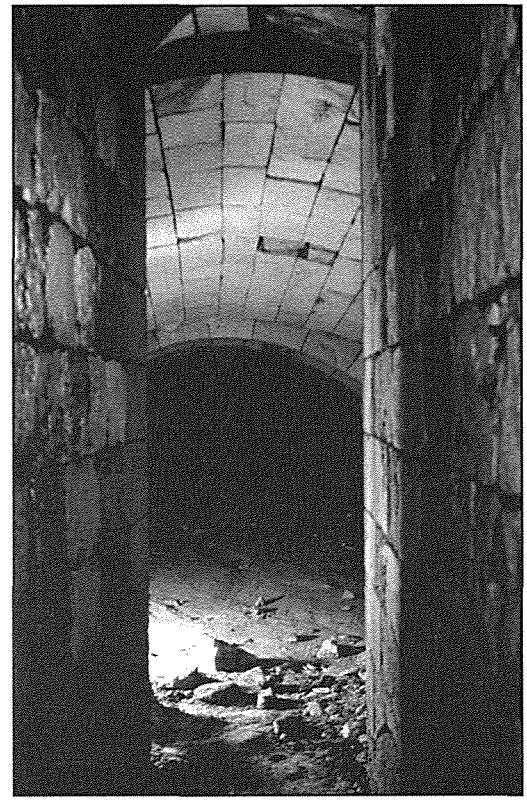
Numerous architectural elements were examined and together with a study of the pottery recovered will hopefully lead to a better understanding of the earlier history of the city. Other material finds include plaster, glass, metal, animal bones and organic material.

Mdina's archaeological potential may be viewed as a series of jigsaw puzzles layered one over the other. The nature of our work involves the uplifting of samples from these remains. The piecing together of what has been uncovered is now being tackled by what promises to be a difficult but interesting post-excavation analysis. Difficulties are not few. Some 'pieces' have been lost through the years, while others remain hidden under the buildings of Mdina. Beyond metaphoric descriptions, pottery finds have to be analysed when a satisfactory classification of local medieval pottery is still a desideratum and a similar study of Phoenician-Punic pottery on the islands still being compiled.

Despite such limitations, the amount of material and the nature of the archaeological record encountered are encouraging. The remains uncovered revealed that the urban layout in ancient Melitae was on occasions very different from what Mdina experienced in these last seven hundred years. Stratified deposits promise to provide useful information on pottery sequences during the periods under study. Interesting finds such as a comb carved from bone and a dice provide rare insights into the daily life of earlier inhabitants of Mdina.

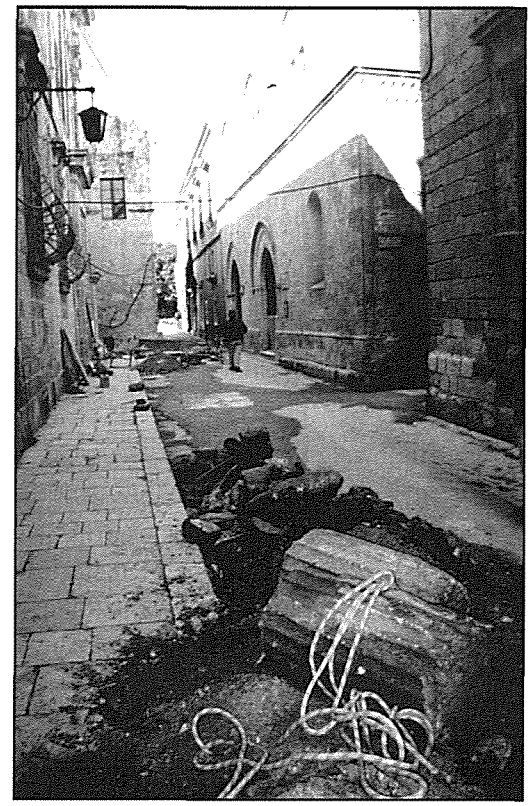
On a popular level, the discovered fluted column has attracted the Maltese community to the delightful achievements of archaeological practice. Beyond, the whole project should be considered as a benchmark for the future of archaeology in Malta whereby development is no longer seen as a deterrent to the discovery of our past.

Rubble wall on ashlar blocks, St. Paul's Square



Underground chamber near Greek's gate

Pottery from Villegaignon Street



Classical fluted column. Villegaignon Street

Investigating historical traffic routes and cart-ruts in Switzerland, Elsass (France) and Aosta Valley (Italy)*

Guy Schneider[1]

1. Inventory of historical traffic routes in Switzerland (IVS), Finkenhubelweg 11, 3012 Berne, Switzerland.

INTRODUCTION

In a research project carried out within the context of making an inventory of historical traffic routes in Switzerland (IVS), ten cart-rut sites have been investigated in Switzerland, Elsass (France) and Aosta Valley (Italy). While cart-ruts at these sites are generally ascribed to the Roman period, the research has revealed that most of the available evidence points towards a more recent date. In two cases it was possible to determine the period of use, starting from the thirteenth and sixteenth century respectively and ending in the eighteenth century. Furthermore cart-ruts discovered in the region exhibit a whole range of gauges, challenging claims for a standard gauge. Considering the recent interest in the subject experienced in Central Europe and the Mediterranean, this work is intended to be a contribution to a hopefully intensified interdisciplinary and international research in the future.

The inventory of historical traffic routes in Switzerland (IVS)

One result of the law on the protection of nature and cultural heritage (1966) was the creation of three inventories, aimed at protecting such heritage and assist in the formulation of an appropriate planning strategy. The first inventory was concerned with landscapes and natural monuments (BLN). A few years later this was followed by an inventory for constructed sites (ISOS), which aims to protect the architectural heritage. When these two inventories were being compiled, it became apparent that one element of our heritage being particularly affected by the negative aspects of modern development was the historical traffic routes. This led to the setting up of the latest inventory, IVS, intended to survey and document these routes and their networks in the country.

Started in 1984, IVS is funded by the Federal Road Office (FEDRO) and will be completed in 2003. The responsibilities of the project fell under Professor Klaus Aerni (Geography Department) and Professor Heinz Herzig (History Department) from the University of Berne, both academics now retired. The members of its staff – mainly historians and geographers - number thirty people directed from a central office with management-specialised services and divided into ten regional groups.

Historians focus on archival research and they aim to retrieve documents illustrating routes belonging to the historical period. A map series dating from the second half of the eighteenth century showing all the country to a scale of 1:25000 or 1:50000 is particularly useful.

Through this information, geographers are then able to retrace and survey the routes on the field. The final result is a documentation comprising text, illustrations and the inventory map distinguishing between routes of

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national, regional and local importance. This documentation is a binding instrument for federal authorities and will be at the disposal of the various cantons, helping them in planning decisions.

Through this project a substantial number of historic routes have already been documented. In the Alpine region, mule tracks with a width of 1.50-2.00 metres are often encountered. These tracks often reveal prominent retaining walls and are mostly paved with pebbles enclosed within a border of stone slabs at the sides.

In the Midlands wide cobbled passageways are not uncommon. Some of them are related to pilgrimage routes. Most are related to local destinations but a number lead to Santiago di Compostela in Spain. The networks of these latter routes received UNESCO recognition as a World Heritage Site.

In the eighteenth century engineered roads characterised by standardised widths, gradient and radius at curves came into use. The first to be constructed in the Alps was built by the engineer to Napoleon Nicolas Céard at the Simplon Pass in 1805. The roads are of such quality that most of them even resist the strain of modern traffic.

The inventory also comprises elements related to roads and traffic such as inns, customhouses, hospices, castles, mills and quarries. Another example are "milestones" erected by the Republic of Berne during the eighteenth and nineteenth centuries showing the duration of walking along a particular route. Chapels, road crosses, oratories and shrines are relatively common in Catholic region. However they are not found in regions touched by the Protestant Reformation of the sixteenth century. Leper asylums and the accompanying chapels are also included in such a survey. Situated at a distance from larger towns, these buildings were found along main traffic routes so that lepers could benefit from alms giving by travellers. Particularly useful are inscriptions since they often reveal the date of route construction or repair and on occasions the reason behind such an activity.

The research project on cart-ruts

This project is part of a wider research program entitled "Development of settlements and traffic networks from the Roman period to the early Middle Ages" and has been supported by the Swiss National Fund for Research. As cart-ruts are generally attributed to the Roman period, a study of the subject was included in the project. The tendency to ascribe the cart-ruts to the Romans might base on the following reasons:-

i) the fact that the major cart-rut sites in Switzerland show similar gauges (i.e. distance between the centre of each rut trail) led some scholars to believe that a standard gauge of 1.08–1.10m must exist. Subsequently this phenomenon was explained to have been only possible with a central governing empire such as occurs with the Roman period (Mottas 1987: 21-22).

ii) cart-ruts within Roman roads (e.g. the ones at Pompei) are a vivid illustration of use of ruts in this period.

iii) some cart-rut sites known in Switzerland coincide to the Tabula Peutegeriana, a third to fourth century A.D. route map of the Roman Empire.

iv) ruts incised in a solid rock may give an impression of durability and old age especially when they show signs of weathering.

v) it is not uncommon to assess things of an unknown age and ascribe to them a date older than they really are. Essentially this has something to do with the fact that remains of a more remote antiquity are generally of greater interest than others of a more recent date. Undoubtedly all this has put a bias towards an older date.

Results from archival research conducted fifteen years ago have posed a challenge to this hypothesis. Research has revealed that the cart-rut site at Vuiteboeuf (see further down) was still in use in the eighteenth century, experiencing a repair phase in 1712 (Mottas 1987). Some years back, Vogel and the author of this paper measured a number of cart-ruts and found variation in the gauge from 1.05–1.15m, challenging previous ideas on standard cart-rut gauges between 1.08–1.10 metres.

These two observations led to further research, concentrating on seven sites in Switzerland, two in Elsass (France) and one in the Aosta Valley (Italy) (Figure 1). In Switzerland the cart-rut sites tend to be grouped in the north and northwestern parts of the country (the Jura region), an area characterised by limestone ranges.

It soon became clear that standardisation of recording methods was needed in order to allow comparison of

rut profiles between different regions and countries. Initially this was done using a profile gauge, but later this was replaced by a more sophisticated device, which gave results accurate to the nearest millimetre (Plate 1). This instrument allows the measurement of co-ordinates of any profile point. The data obtained from this exercise was subsequently processed with the aid of CAD software. This allowed us to elaborate the cart-rut profile and calculate the gauge (Figure 2).

Vuiteboeuf (Switzerland)

Most of our research was concentrated on a site at Vuiteboeuf. The cart-ruts here may be followed for about 1.5 to 2km (Figure 3). The area lies in a corridor connecting the Swiss Midlands to France. As the site coincides with a route indicated on the Tabula Peutegeriana, some scholars interpreted this as evidence for a Roman communication from the nearby centre of Aventicum to the west.

Three road systems were found above the village of Vuiteboeuf. The latest one, with a general gradient of 5%, is the cantonal road still in use today, and dates back to 1838. An earlier road with a gradient of 10-11% and constructed in the 1760s, shows already standardization of features typical of engineer designed roads. Both routes reveal nine curves along their course.

The cart-ruts contrast from the two roads mentioned by having only one curve, necessitating an average gradient of 16%. Although traffic on older foot trails and mule tracks was also present in the area, cart-ruts were the first route to be used by vehicles.

Under supervision of the archaeologist responsible for the Canton of Vaud, various excavation works were carried out to determine the extension of the cart-rut system. Most of the retraced cart-ruts are found in solid rock. In areas where the rock was unfavourable, the ruts were incised in a pavement of slabs of stone to ensure continuity.

There is much to suggest that cart-ruts needed regular maintenance leading to the occasional replacement of older trails. Evidence for this comes from detached stone blocks containing carved cart-ruts found further down along the slope. In general when a cart-rut trail fell into disrepair a pair of new ruts was carved further down the slope, usually obliterating most of the earlier trail. This resulted in a lateral downhill succession (Figure 4), which consists of the whole trail of the latest cart-ruts, accompanied by remains of earlier trails further up along the slope. In one area at Vuiteboeuf a lateral downhill succession of approximately thirty trails can be observed.

In some cases the gradient of the slope became too steep for the construction of a new trail below the older one. In this situation the later cart-ruts were cut into the slope creating a lateral succession into the hillside. On flat terrain, but sometimes also on hilly regions, a vertical succession of cart-ruts can be observed showing persistence of several generations on the same track.

The study of over fifty cart-rut profiles measured with our new device revealed that in the latest twelve generations, four different gauges (approximately 1.15m, 1.13m, 1.11m and 1.09m) were in use. Contrary to our expectations, the earlier cart-ruts had the wider gauge, the gauge diminishing in later centuries. It cannot be excluded that within the older trails other gauges were in use. Unfortunately their state of preservation did not offer suitable locations for measuring profiles.

Notwithstanding these investigations, no clue as to the date of the ruts was apparent. This led us to formulate a working hypothesis to address this problem, namely that a traffic route may be dated by the objects that are lost along its course. Again under supervision of the archaeologist we conducted a survey of the cart-rut area using a metal detector. The finds were bewildering, ranging from objects relating to traffic, everyday life, tools and even weapons. Particularly numerous were nails from carts and horseshoes.

Horseshoes and coins found during the survey were very useful for dating purposes. In general both groups of objects appear on the ruts after the thirteenth century. Six coins dating from the Celtic and Roman period were also found. Their position in relation to the cart-rut system suggests that they have to be related to the traffic along the routes, which is older than the cart-ruts.

The studies revealed that coins persisted on the cart-ruts into the modern period, but no horseshoes dating after the eighteenth century were traced. It is certain that the construction of the engineered road led to this result. As transport with carts was shifted to the new road no horseshoes were found on the older route. Notwithstanding, the older route still provided a shorter way for people on foot, explaining the persistence of coins along the cart-ruts.

With the assistance of the local technical school, the cart-rut site was surveyed and results recorded through Geographical Information Systems (GIS). The GIS in this case provides a computerised inventory comprising data of archaeological interest and road history. This will serve for planning activities and further investigations in future.

Langenbruck (Switzerland)

Langenbruck is a well-known site attracting many visitors throughout the year. Its fame comes from the fact that its cart-ruts coincide well with a communication revealed in the Tabula Peutegeriana, assigning this route to the Roman period. A detailed look at the site, however, shows that this traditional opinion has to be revised.

A six metre high cut in the limestone crest with remains of a series of cart-ruts reveals that this site was used repeatedly along the centuries, resulting in a vertical succession of cart-ruts.

The final pair of cart-ruts in this succession goes back to the eighteenth century when a new road was constructed. At the same time an old winch that pulled carts up the steep slope went into disuse. It is well possible that the Roman Road passed through the same cut in the crest, but it would have been on a higher level than that visible today.

Julierpass (Switzerland)

Lying at an altitude of 2100m, the cart-ruts on the Julierpass are one of the few sites found in the Alpine region. A Roman date is claimed for this cart-rut system, because it once again coincides with a route shown in the Tabula Peutegeriana and secondary to the presence of two Roman columns on the culmination point of the pass in the vicinity. This complex cart-rut site, however, has a lateral downhill succession of seventeen tracks revealing, once again, a long period of use. Archival research by a German scholar has revealed that in the historical period the Julierpass was used for transit traffic, especially between the first and eleventh century A.D. (Ringel 1997: 211-295). A fifteenth century traveller's account describes the cart-ruts as being old and not in use (IVS Dokumentation Kanton Graubuenden 2000: GR 31.1, GR 31.1.3). While cart-ruts at the Julierpass as well as in Langenbruck might have a Roman origin, it is certain that the succession of cart-ruts has been constructed and used in the following centuries.

Donnaz (Italy)

A pair of cart-ruts passing under an arch at Donnaz in the Aosta valley are without doubt one of the more interesting cart-rut sites (Plate 2). Although the arch and milestone suggest use of this path during the Roman period two details question this attribution. An irregular base to both the arch and the milestone suggestive of lowering of the road level is conspicuous. These observations can be assumed to indicate that the original Roman road was situated approximately half a metre higher than the actual level. The lowering of the road surface seems to be the result of a vertical succession of cart-ruts, most probably revealing a post-Roman use of the route. The broadest gauge (1.60 metre) recorded in the survey was found at this site.

Saverne (France)

This site extends over several hundred metres and offers a unique opportunity for assigning a date to the cart-ruts, which are here incised in sand stone. The most important tracks occur under a rock shelter, which overlies a series of ten different cart-ruts. Rock-cut incisions along the rut are the first noteworthy features, probably intended to stop the carts along the route. The second striking features are holes for the construction of an edifice, several inscriptions and a pictograph of pliers suggesting that a forge was found along the route. The presence of incisions representing two pairs of mule shoes (most probably used as mould for their production) provides further support.

The area is illustrated in a painting showing a sledge being pulled by a man (Plate 3). It remains unclear whether the vehicle represented is painted authentically or is the result of the painter's imagination. The importance of the painting, however, comes from the illustration of two inscriptions on the overhanging rock. Fortunately these inscriptions still survive today. The first inscription records that in 1524 the Bishop Wilhelm of Strasbourg had commissioned the road for the benefit of everyone (Plate 4). The other inscription dates back to March 1616 and documents the decision to install the broader gauge of cart-ruts at the site (Plate 5). The traffic with carriages on the cart-ruts has certainly come to an end in 1738 after the construction of a modern road in the same ascent. The possibility of direct dating with the aid of inscriptions is a stroke of luck. Without the presence of these inscriptions the cart-ruts would most probably have been associated with the Roman Saverne and the *Mansio* (Roman station for exchanging draught horses) in the vicinity.

Ernolsheim (France)

This site is found four kilometres away from the previous one. In his comprehensive study, Ring (1990) postulates an old age of the site because of Celtic and Roman remains in the vicinity. Nevertheless it must be estimated that the last generation of a greater succession of cart-ruts is much younger. Evidence for this comes from the equivalence of gauge (1.22m) with the sixteenth to eighteenth century site of Saverne and documents listed in Ring's article revealing use of this route up to the eighteenth century. Both Saverne and Ernolsheim are good examples to show that dating cart-ruts with nearby settlements is highly delicate.

Formation by wear or deliberate carving

The question whether cart-ruts have been deliberately cut or the result of the mechanical wear by the passage of carriages is discussed wherever they appear. Especially in Malta this question seems to have often featured in various controversies (Evans 1934; Gracie 1954; Ventura and Tanti 1994). The author believes that the initial rut was an artificial groove of at least 4cm depth in order to provide an efficient guidance to the wheels right from the beginning. Secondary processes due to erosion and wear are then responsible for a continuing shape of the rut. Support for this comes from several places. At Langenbruck, ruts in an oak beam (placed to provide continuity to a trail of ruts) show an even and distinct form, contrasting with the rugged surface between the ruts. These features are evidence for the deliberate cutting of the ruts and the wear of the space between the ruts by the hooves of the draught animals. It appears logical that this technique used here in wood has also been applied on rock surfaces. Furthermore close examination of many cart-ruts reveals that the single ruts are often formed by a succession of straight segments with abrupt changes of direction where the segments meet each other. This feature can by no means be explained with the mechanical wear of passing carts.

Further support for carving of the ruts comes from stone working tools found near the cart-ruts in Vuiteboeuf and from a document revealing a commission to two masons to carve ruts at Hauenstein (Canton of Basel-Country). Although for some, the carving of cart-ruts may appear to require considerable labour, experiments by the author have revealed that their production can be done without great difficulties. The length of cart-ruts that may be produced daily employing traditional tools and techniques is about seven meters in limestone and one metre in granite. This rather big difference in production seems to be one of the reasons for the predominance of cart-ruts on limestone bedrock compared to harder types of bedrock.

Conclusions

Other than documenting a total of ten sites, the study reveals that in contrast to the prevailing opinion of a standard gauge, cart-ruts in Switzerland show a variety of distinct gauges. Furthermore all investigated sites show a succession of several cart-rut trails, revealing use over a long period of time. There is strong evidence that most of these sites have been in use up to the eighteenth century. In two cases (Vuiteboeuf and Saverne) it was possible to determine the period of use starting from the thirteenth and the sixteenth century respectively and ending in the eighteenth century. Only in three cases (Langenbruck, Julierpass, Donnaz) a Roman origin is possible. In addition, the succession of cart-ruts shows that the duration of life of one trail was quite limited: from the site at Vuiteboeuf an average of few decades can be estimated.

The Maltese Islands

Although the Maltese Islands are not included in the IVS research project, our interest in cart-ruts made the archipelago a necessary destination. During our (the author and Mr. Werner Vogel) stay on the islands we had the opportunity to visit the cart-ruts at Misrah Ghar il-Kbir, Nadur, Ghar Zerriegha, Ghar Mundu, Mtarfa and the areas between Hagar Qim and Mnajdra and the remains behind the Roman Domus at Rabat. In Gozo we visited similar sites at Ta' Cenc, Dwejra and Qala.

Rough tape measurements on various sites revealed dominance by two gauge ranges within the V-shaped cart-ruts: 1.30–1.32 and 1.40–1.42m. Among the modern broad ruts, a centre to centre gauge of 1.35 metres is common. The cart-ruts near the quarry at Ghar Zerriegha revealed a vertical succession of more than ten trails. Furthermore, a short section of a cart-rut following the path between Hagar Qim and Mnajdra (GR 495691) revealed a section with pointed impressions, which may be interpreted as evidence for deliberate cart-rut carving with a pick.

A number of cart-ruts occur very close to modern roads, an observation already noted by previous authors (Trump 2000: 34). Our experience in Switzerland goes a long way to suggest that some roads in the Maltese Islands might have taken the role of cart-ruts in some places.

Finally, a literature review and discussions on the subject has revealed that the cart-ruts found on the Maltese Islands still pose a considerable problem to scholars. We think that more fruitful results may be obtained in the future if more research is conducted using the following guidelines:-

i) extensive archive research may throw light on the ending phase of cart-rut use.

ii) scientific methods to date the cart-ruts directly are likely to yield better results. Lichenometry may date cart-rut surface exposure while pioneering experiments in cosmic ray dating of rock surfaces may provide further information. A promising approach is also the study of karstification as applied in a pilot project by Drew (1996). The continuation of this experiment seems to be worthwhile.

iii) creation of an inventory of known cart-rut sites and assessment using Geographical Information Systems should help in establishing the type of cart-rut network found on the islands.

iv) more detailed scientific study of cart-rut profiles may help in distinguishing cart-rut subgroups.

v) archaeological excavation of covered cart-rut sites and application of radiocarbon dating to helpful artefacts may provide useful information on the period of use of these features.

Finally there is certainly one thing that may be said on the cart-ruts found on the Maltese islands. Even if further investigations would proof - comparable to the situation in Central Europe - a younger age than generally estimated, the Maltese cart-ruts have enough outstanding characteristics to be promoted to a World Heritage status.

* *This paper is based on a lecture given by Mr. Guy Schneider on the 4 th October 2001 at Din l-Art Helwa premises. The contents of the lecture have been transcribed by the editor and corrected by the author. Both acknowledge valuable suggestions from Isabelle Vella Gregory on previous versions of this transcript.*

Bibliography

Conti, M. and Vella, R.M. 1978. *A Report on existing literature about Ancient Maltese Cart-Tracks.* Melitensia Library MZ9 P.B. 14C. Unpublished Report. Msida, University of Malta (Department of Classics).

Drew, D. 1996. Cart-ruts and karren: karstification and human impacts in Malta. In Fornós, J.J. and Ginés, A. (eds.). *Karren Landforms.* Palma de Mallorca. Universitat de les Illes Balears.

Evans E.M.P. 1934. Maltese Cart-Ruts. *Antiquity* 8: 339-342.

Fenton, E.G. 1918. The Maltese cart-ruts. *Man* 18: 67- 72.

Gracie, H.S. 1954. The ancient cart-tracks of Malta. *Antiquity* 28: 91-98.

Gerber, C. 1997. *La route romaine transjurane de Pierre Pertuis.* Berne.

Gravino, L. 1958. The Mysterious Cart-Ruts. *Times of Malta* November 5, 1958: 5,11.

Heitz, H. 1999. *La Côte et le Col de Saverne. Promenades historiques et archéologiques autour de Saverne.* Guide SHASE. Saverne.

Hughes, K.J. 1999. Persistent features from a palaeo-landscape: the ancient tracks of the Maltese Islands. *The Geographical Journal*, Vol. 165, No. 1, March, pp 62-78.

IVS Dokumentation Kanton Graubünden 2000 (bearbeitet von Hansjürg Gredig, Arne Hegland, Jürg Simonett). Berne.

Jeanin, Y. 1972. Voies à ornières du Jura. In *Archéologie médiévale.* Caen.

Lanfranco, G. 1961. *Roman Sites and the Ruts. The Sunday Times of Malta* August 27: 16.

Laur-Belart, R. 1968. Zwei alte Strassen über den Bözberg. *Ur-Schweiz,* XXXII, 1. Basel.

Magro Conti, J. and Saliba, P. 1999. The Cart-Ruts at Misrah Ghar il-Kbir. *The Sunday Times of Malta,* March 7: 38-39.

Mallia Milanes, V. 1968. *Black beneath the Night. A dissertation on cart-ruts.* Unpublished dissertation.

Mottas, F. 1987. De la plaine de l'Orbe en Franche-Comté: Voie romaine et chemin saunier. *Bulletin IVS* 87/1. Berne.

Planta, A. 1985. *Verkehrswege im alten Rätien*; Band 1. Chur.

Planta, A. 1986. *Verkehrswege im alten Rätien*; Band 2. Chur.

Ring, J.J. 1990. Le Plattenweg. Antique montée ouest de la Heidenstadt près d'Ernolsheim-lès-Saverne. *Pays d'Alsace* IV-1990.

Ringel, I.H. 1997. *Auf den Römerstrassen ins Mittelalter. Beiträge zur Verkehrsgeschichte zwischen Maas und Rhein von der Spätantike bis ins 19.* Jahrhundert. Herausgegeben von Friedhelm Burgard und Alfred Haverkamp, Mainz.

Schneider, G. and Vogel, W. 1997. Karrgeleise: Römerstrassen oder Trassen der Neuzeit? Zur Frage der zeitlichen Einordnung am Beispiel der Geleiselandschaft von Vuiteboeuf/ Ste. Croix, VD. In *Spuren, Wege und Verkehr. Festschrift Klaus Aerni. Jahrbuch Geografische Gesellschaft Bern*; Bd. 60/1997. Berne.

Sillieres, P. 1983. Ornières et Voies Romaines. In *Actes du colloque des voies anciennes en Gaule et dans le monde romain occidental.* Paris.

Trump D. H. 1998. The Cartruts of Malta. In *Treasures of Malta* Vol. IV No.2: 33-37. Fondazzjoni Patrimonju Malti.

Trump, D.H. 2000. *Malta: An Archaeological Guide.* Revised Edition. Malta, Progress Press.

Ventura, F. and Tanti, T. 1994. The cart tracks at San Pawl tat-Targa, Naxxar. *Melita Historica*, 11(3), pp 219-240.

Zammit, T. 1928. Prehistoric Cart-Tracks in Malta. Reprint from *Antiquity* March 1928 pp. 18-25.

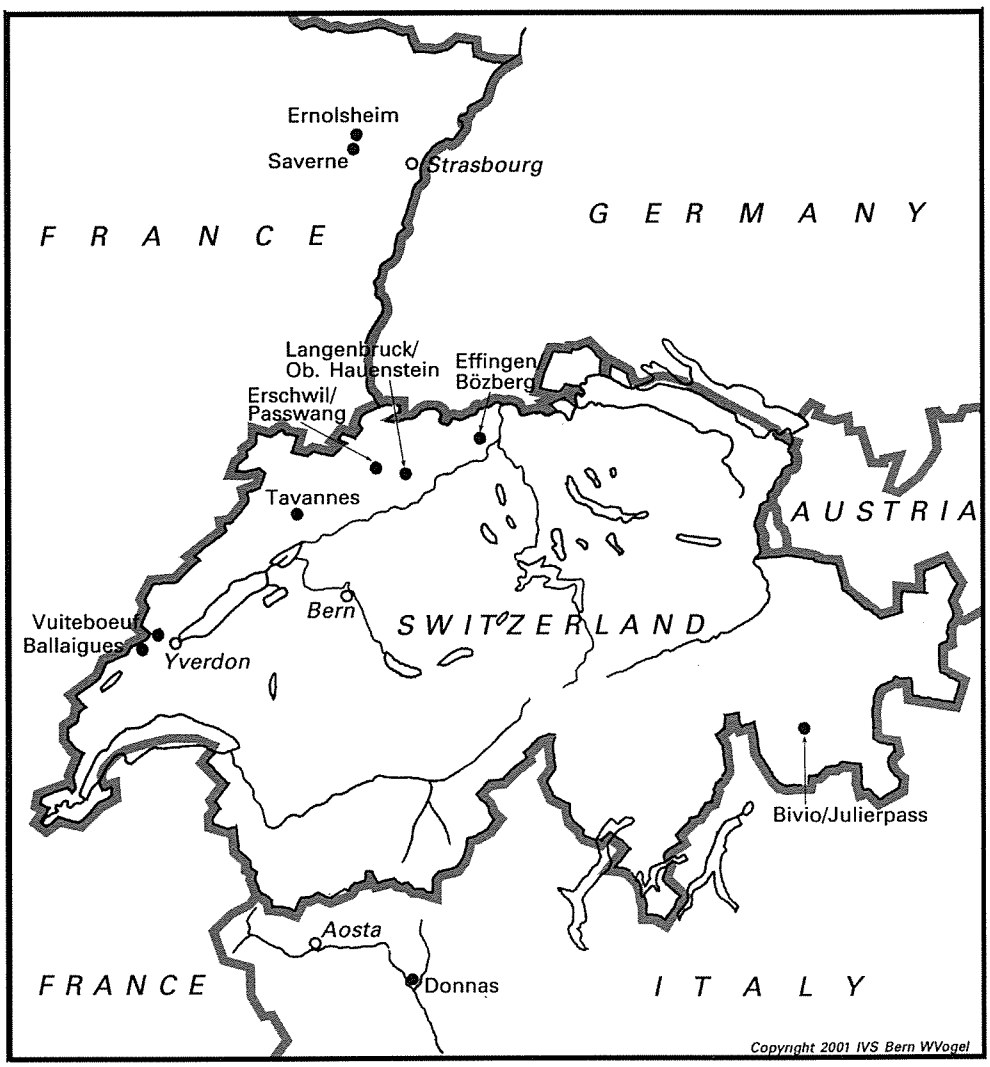

Figure 1: Investigated Cart-ruts in Switzerland, Elsass (France) and Aosta Valley (Italy)

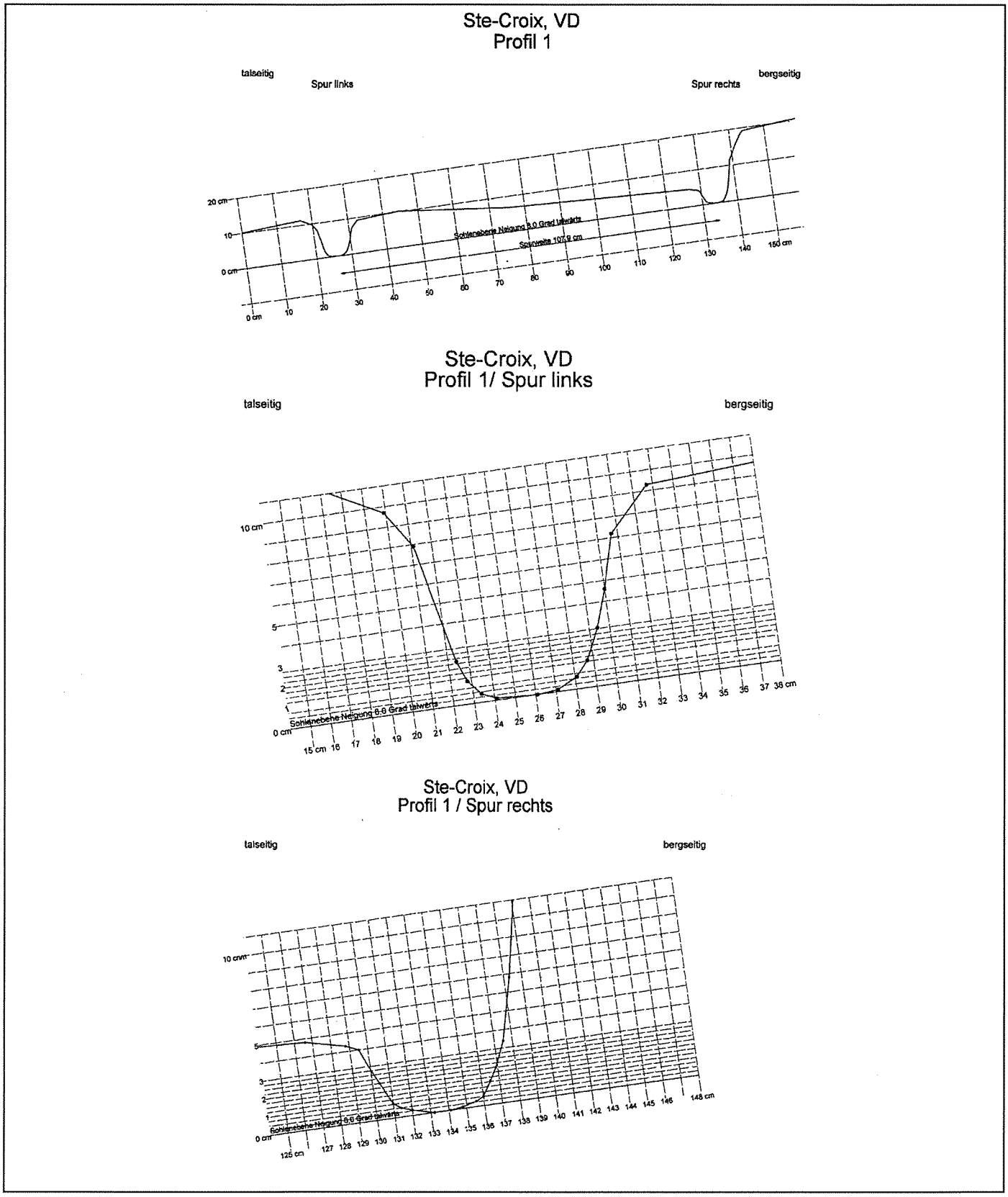

Figure 2: Measurement of Cart-Rut Width: Profile
(English translation: Talseitig - towards valley; Bergseitig - towards hill; Spur links - left rut; Spur rechts - right rut; Profil -profile; Spurweite - distance between ruts; Sohlenebene Neigung 8.0 Grad talwärts - gradient of plane between ruts is 8.0 towards valley)

Plate 1: Instrument for measuring cart-rut profiles

Plate 2: Cart-ruts at Donnaz, Aosta valley, Italy

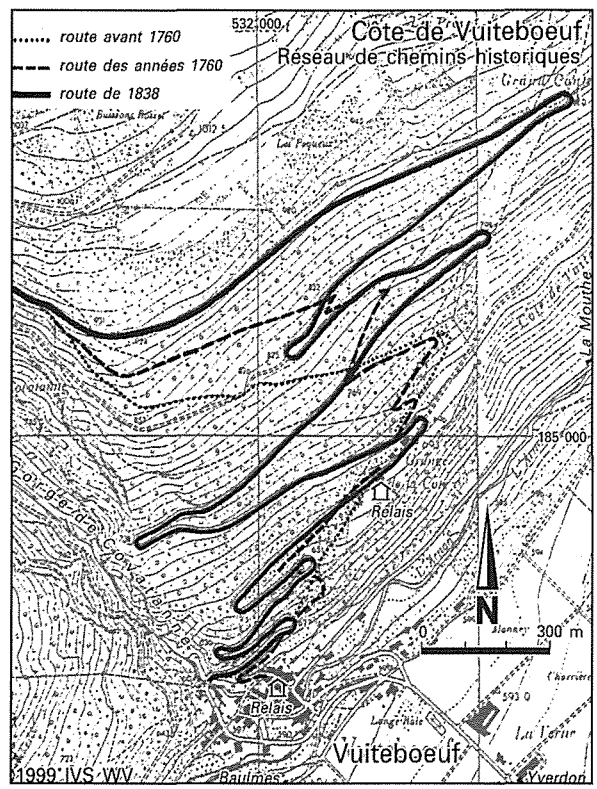

Figure 3: Network of historical routes in the hillside at Vuiteboeuf, Switzerland.
(English translation: route avant 1760 - route before 1760; route des années 1760 - route of the 1760ies; route de 1838 - route of 1838; relais - station for changing horses)

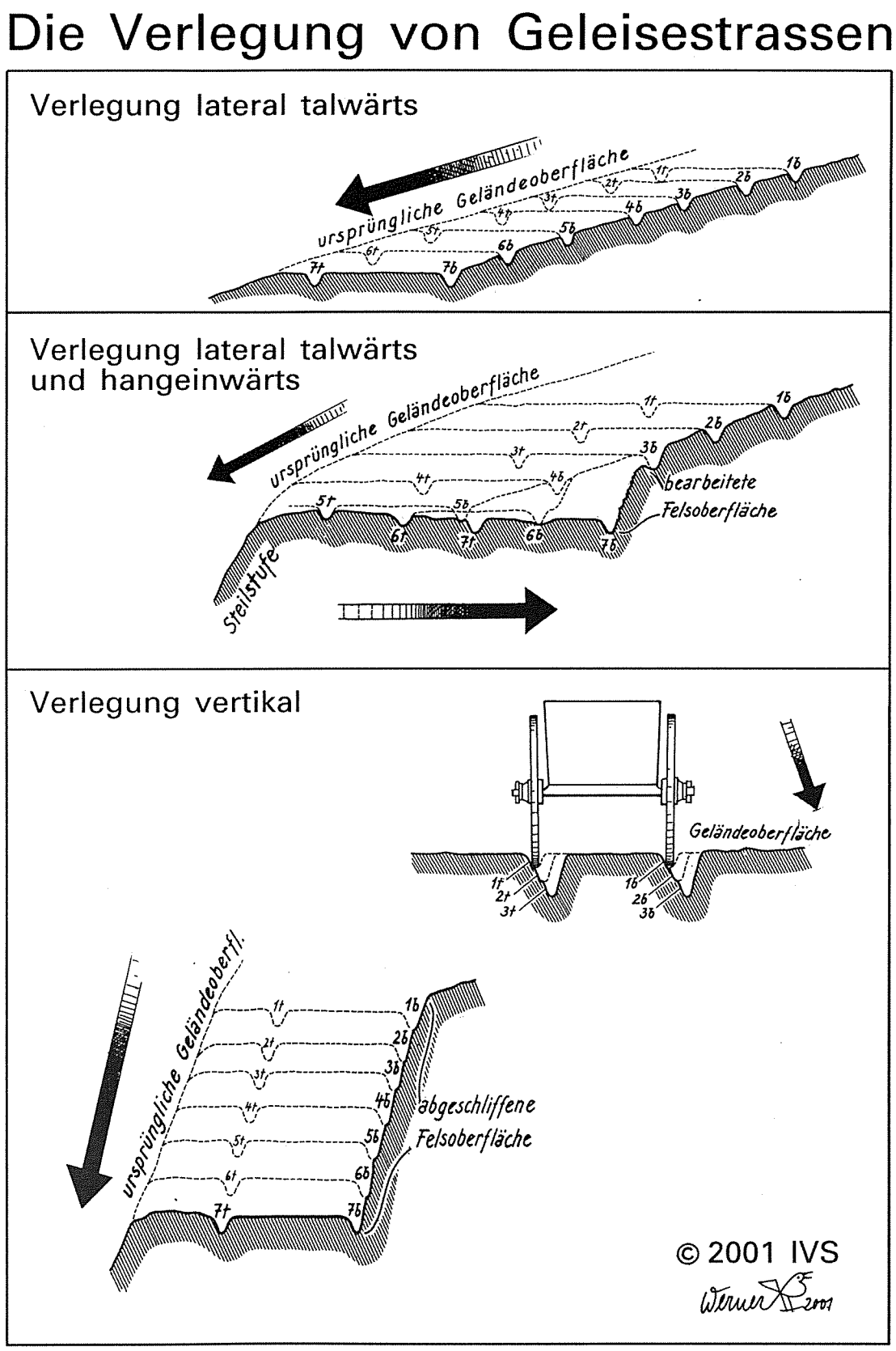

Figure 4: Succession of cart-rut tracks
(English Translation: Verlegung lateral talwärts – Lateral downhill succession; Verlegung lateral talwärts und hangeinwärts - Lateral downhill succession and displacement into hill; Verlegung vertical – Vertical succession; ursprüngliche Geländeoberfläche – original surface of terrain; bearbeitete Felsoberfläche – worked rock surface; abgescheliffene Felsoberfläche – worn out rock surface

Plate 3: A painting of the overhanging rock with a man pulling a sledge and niches with inscriptions at Saverne, France

Plate 4: Inscription recording a commission for a road by Bishop Wilhelm of Strasbourg at Saverne, France

Plate 5: Inscription recording the installment of the broader gauge on the ascent at Saverne, France

Methods of Date Assignment for cart-ruts in the Maltese Islands: Discussing relationships with Bronze Age fortified settlements on promontories

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ABSTRACT

A divergence of opinions characterises the literature discussing the period of use of cart-ruts in the Maltese Islands. A multi-period use and problems in the methodology applied to date these features are identified as causes for this situation. Insights from such discussion are used to assess the evidence forwarded to ascribe the cart-rut phenomenon to the Bronze Age period. This hypothesis is mainly based on a perceived spatial relationship with fortified Bronze Age settlements on promontories and a claimed loss of function by the Phoenician period. Reconsideration of the concepts involved in assigning dates and establishing associations between different archaeological features, together with a reassessment of field finds, challenge opinions favouring a Bronze Age date to the cart-ruts.

Few subjects in the Maltese archaeological landscape have stimulated as much discussion, created as many controversies and claimed the same number of conclusions as the cart-rut phenomenon (Figure 1). The profile, destination, dating and purpose of this enigmatic heritage have often been discussed, but many would agree that a real answer is still elusive.

The intriguing nature of these surface markings has undoubtedly been central in attracting attention to this phenomenon. Short of a convincing explanation, a number of conflicting hypotheses have emerged, the outcome of which is considerable literature on the subject. Non-conclusive and often contradictory in their results, these studies highlight our poor knowledge on the transport systems of Maltese prehistory and classical history.

Dating the Cart-Ruts

As dating issues remain central for understanding cart-ruts, most studies have attempted to assign a period of use to this phenomenon. The scope of conclusions reached, however, from what is ultimately the same corpus of evidence is worth further evaluation.

A multi-period date for use of cart-ruts could explain the diverse conclusions, even if the often-assumed position to restrict dating considerations in favour of a particular period is challenged. The possibility that the ruts were used in the transport requirements of different cultures is slowly taking ground (Anati 1988: 37; Magro Conti and Saliba 1999: 39; Ventura and Tanti 1997: 236 fn 41). The presence of ruts in different countries (Bugeja 2000: 37) favours such possibility especially when one considers the presence of similar tracks from culturally unrelated countries such as Switzerland (Schneider 2001: 12-22), Germany (Bakker et al. 1999: 783-784) and the American continent (Kelly 1997).

A multi-period date is also suggested by the three hundred years which separate the ruts used by twentieth century farmers and other ruts which were already not in use when first described by Abela (1647: 69) in the seventeenth century. Different karren features on two adjacent tracks at Dingli provide further support to a long period of use (Drew 1996: 410, 415).

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Additional evidence comes from the literature, which has for long distinguished ancient ruts with a "V" shaped profile and varying inter-rut distance from the presumably more modern, generally wider, shallower ruts with a more rectangular profile. The latter group also differs by following a more parallel trail and unlike the 'ancient' ruts is accompanied by inter-rut markings (Zammit 1928: 18-20). Even if elements of the two rut profiles are occasionally observed on the same trail (as at Mtarfa and Ta' Blankas) this subdivision into two groups with different profiles remains to date a valid generalisation.

Ghar Zerriegha is a site where both types of rut profiles may still be observed in the same area. The better-known rut pair (Trump 2000: 136) is found within metres of a presumably more modern rut pair, passing through a surface quarry further inland. Unless two different vehicle types were used contemporaneously, a period of time sufficient for the evolution of different vehicle-land relations or carving of different rut profiles explains the difference in cart-rut details.

Although an appreciation of a multi-period use for ruts does not simplify investigations, the above reveals that it is an aspect that has to be considered. Certainly it questions conclusions based on generalisations, and places emphasis on studies that draw conclusions from limited or single rut sites.

While the number of dating proposals may be considered as evidence for a multi-period date for ruts, it is also indicative of some problems in the methods utilised. Such problems allow an over interpretation of the evidence, allowing the possibility to argue in favour of any of the different dates proposed in the literature. The first part of this paper attempts to examine these approaches, in particular looking into the arguments and limitations pertaining to the conclusions. Insights from such discussion will be used in the second half of the paper to reassess relationships between cart-ruts and fortified Bronze Age settlements on promontories.

A rut within a datable stratigraphical sequence - the gold standard indirect dating method - remains desirable but elusive. A satisfactory scientific technique to date the formation of the cart-ruts (direct dating) still waits to be applied. Short of such discoveries, dating has mainly depended on indirect evidence. It is in the interpretation of this evidence that faults have been made in the past.

While other possibilities are not excluded, the hypotheses proposed in the literature have been noted to fall into three main categories. Although presented here as distinct, one has to note that it is not unusual for authors to use more than one approach in supporting their hypothesis. Furthermore, each category may be viewed as a different level of proposal contingency to the observed data.

1) Inductive/Interpretative approaches

In such approach authors formulate a working hypothesis from limited observations and subsequently elaborate social, environmental or other models to support their claims. In such discussions, observed rut occurrences are selected to support a particular hypothesis. Supportive features are emphasised while problematic aspects are overlooked. Missing evidence may even be considered as supportive of the hypothesis proposed. Arguments forwarded may be consistent but often generalised to explain the rut phenomenon. The result, however, is that often the mysterious ruts turn out convenient to explain what remains problematic in our understanding of the past.

The use of the Mgarr Barrani ruts as a transport system during the Arab period is one example in this category (Abela 1647: 69). By interpreting the placename literally, the historian attempts to include the cart-ruts as evidence for the exportation of stone to other countries. Only the presence of Arabic letters on presumably Maltese stone found in other countries is forwarded as evidence for such endeavours to have taken place during the Arab period. On the other hand Zammit (1928: 23-25) interpreted ruts as evidence for soil transportation from level ground to hilltops during the Temple period. Even when the occurrence of ruts near fields is considered supportive of this purpose, no reliable evidence is quoted to assign such activity to the prehistoric period in exclusion of other periods. Fenton (1918: 67-72) proposes that ruts represented a system connecting springs to settlements at times of a fairly dense population, supported by a humid climate. Once again, no evidence for such conditions is presented and the existence of such an environmental model remains to be proven. Mifsud et al. (2000: 42) suggest that some ruts belong to a period when the Maltese Islands were part of a larger landmass. Castagna (1888: I,8) interprets ruts at southern Gozo, Comino and northern Malta to be the last remains of a land bridge that once joined the three islands.

A problem with such an approach is that most claims are difficult to prove, while at the same time remaining possible. While a certain degree of interpretation will remain indispensable to draw conclusions, it is unlikely that a final convincing dating for the ruts will result wholly from such research method.

2) Dating by Association

An approach that allows a better correlation with the evidence is one that attempts rut dating by association with other better-known archaeological remains. An excellent summary of such studies has already been published (Ventura and Tanti 1994: 229-231) and has been a valuable source consulted in this study. Contrary to what Zammit (1928: 22) maintained, the presence of cart-ruts near megalithic sites claimed for the Temple period is not uncommon. Cart-ruts have been documented near Skorba, Hagar Qim, Mnajdra, Borg l-Imramma (Ventura and Tanti 1994: 230), San Lorenzo megaliths, Tarxien Temples, Kordin, Ta' Rozzat, Ta' Lippija, Mensija megalithic remains (Gravino 1958: 5, 11) and Qortin l-Imdawwar.

A possible link with the Bronze Age has also been forwarded. Ruts present near the dolmens at Ta' Cenc, Wardija Ta' Zuta (Harrison Lewis 1977: 60) Borg in-Nadur and Wied Filep may be interpreted as evidence of a link between ruts and the Tarxien Cemetery culture. The presence of cart-ruts near Bronze Age fortified settlements occurs (see below) and together with ruts observed at the promontories between Gebel Ciantar and Bingemma have been considered as indicative of rut use during this period (Conti and Vella 1978: 7).

Occurrence of ruts near remains of the historical periods has been mentioned by Ventura and Tanti (1994: 230), these two authors listing ten sites where ruts have been documented near shafts of Punic Tombs. Other sites such as Ix-Xaghra ta' Ghar is-Sigra, Nadur (Malta) and Ta' Zuta may be added to this list. Lanfranco (1961: 16) refers to the ruts near Pompei, Salina, Mtahleb, Birzebbuga and Mtarfa when arguing for a Roman date. Quarries attributed to the classical period have been noted to be "in close association" (Bonanno 1990: 30) and "clearly associated" (Magro Conti and Saliba 1999: 39) with cart-ruts.

While the scope of dating proposals may be glossed over as evidence for a multi-period use of ruts, the possibility of over interpretation of the evidence remains. The different dating proposals noted in the literature review do reveal problems inherent in this approach.

In an archipelago that has experienced extensive demographic pressure, a multi cultural use of a single archaeological site or area is not uncommon. Thus, any dating proposals should take such a possibility into account. Considering ruts at Zebbiegh, one should really question whether these are related to the Neolithic, Temple period or Bronze Age remains at the nearby Skorba site or the quarry and possible tomb remains adjacent to the ruts, rather than restrict dating to a particular period. Similarly ruts near the Tarxien Temples may also be related to the Tarxien Cemetery or the Roman period remains there, rather than to the Temple period. Furthermore, ruts near Kordin could be related to the eighteenth century gun emplacement on site, while post-temple period dismantling of a megalithic complex's building blocks (M.A.R. 1953-54: I) could provide a plausible explanation to the ruts near Mnajdra. These explanations of cart-ruts near temples stand without resorting to the prehistoric period for an answer.

When use of cart-ruts for transport is assumed, it often remains impossible to tell whether a particular trail is near its destination/origin or part of a longer transport route. The possibility that the latter case may occur should really question the relevance of drawing conclusions from sites where rut trails occur near an archaeological site.

A third problem concerns the nature of the relationship between cart-ruts and other archaeological features. Caution should be exercised on the meaning given to the term 'association' as used in the literature on the subject. In archaeology, two or more objects are associated if during a scientific excavation they are found to lie within the same context. If assessment of the site formation process does not indicate otherwise, a datable object in the sequence may help in giving a *terminus post quem* of another unknown find within the same context. Such conclusions are not possible when discussing cart-ruts, as a context linking ruts to other archaeological sites remains missing. Unfortunately, proximity has often been interpreted as association.

The term 'association' also carries a mathematical connotation. In statistics, two events are associated if their occurrence is found to be more frequent than that possible by chance. The literature on cart-ruts occasionally reveals that claimed associations are

sometimes considered as if arising from statistical studies (Pace 1995: 59) when such studies on cart-rut features have still to be performed. Only after such investigations and after confounding factors are excluded, may appropriate conclusions from such method be drawn.

Generally, the underlying assumption that cart-ruts may be found near sites related to the rut purpose is a valid one. Limitations are however evident in the process of reidentification of such rut to archaeological site relationships.

Much work remains to be done. Focusing on areas where ruts occur in close vicinity of a single period site may result in more sustainable conclusions. Unbiased statistical analysis of the characteristics of ruts and other archaeological sites may start to re-evaluate the claimed hypotheses in a number of cases. Other elements of association beyond proximity may also be investigated to achieve an evidence-based conclusion. The results of a cart-rut survey within a GIS reconstruction of the Maltese palaeo-landscape (as proposed in Hughes 1999) offers considerable interest to this regard.

3) Ruts spatially superimposed on archaeological features

A way to resolve the problems encountered in the previous approach involves consideration of ruts that are spatially superimposed on other archaeological features. Even in cases where cross cutting was possibly coincidental, assessments may still be attempted to provide a temporal relationship of cart-ruts to better datable archaeological remains.

Shafts of Punic tombs interrupting ruts remain the most known examples in this category, with surface quarries recently also given particular attention in the literature. Other sites in this category include cases of ruts passing over caves (Trump 2000: 133) as well as under a medieval chapel, roads and modern buildings (Magro Conti and Saliba 1999: 38-39; Trump 2000: 33).

These particular interesting cases, however, have not resolved the divergence in opinion amongst archaeologists. Ruts observed on the megalithic blocks of Temples (Gravino 1958: 11) have not been confirmed. Cliff falls and cave collapses that interrupt ruts (Trump 2000: 133, 155) are difficult to date as is the geological subsidence of the island (or rising sea level) discussed to explain the submerged ruts at St. George's Bay, Birzebbuga. In the case of the rut pair near the chapel at Ta' Bakkari (M.A.R. 1922-23: II) a pre-sixteenth century time bracket, although significant, is simply too wide to be of any help. Furthermore, although surface quarries are attributed to the classical period, more studies are needed to differentiate such sites form later medieval and post-medieval quarries. The absolute dating assigned for a pair of ruts at Ta' Dun Konz (Magro Conti and Saliba 1999: 39) may be challenged by noting that the ruts in question are lost under the rubble near the wall of the surrounding field, and can be of later date than the quarry. The latter hypothesis stands by assuming that carts were used along the ruts; if other vehicles were used, the ruts and quarry could well be unassociated.

Identical evidence considered by different authors often results in contrasting conclusions. Ruts interrupted by shafts of Punic Tombs are a case in point. The lip of the rut truncated by the Mtarfa tomb is described as a sharp right angle, Gracie (1954: 97) concluding that the rut is older than the tomb. Trump (2000: 35) argues that a particular pair of ruts at Ghar il-Kbir are "cleanly cut by, and therefore older" than the Punic tomb.

In assigning a relative later date for the ruts, Bonanno (1990: 30) questions the Punic date ascribed to these tombs. Furthermore, he argues that Punic tombs could have been dug in ruts associated with Phoenician quarries; such explanation casts doubt on the prehistoric dating usually quoted to explain ruts cut by tomb shafts. Use during the Punic period could have occurred in cases of abandonment of rut trails which later within the same period, became convenient and accessible grounds for digging of a Punic burial site (Ventura and Tanti 1994: 230).

Ignoring the rut profile, opinions were forwarded that argue that the space occupied by the Punic Tomb did not hinder a later passage of rut-related vehicles (pers. comm. J.L. Cilia). This allows scope for a later dating of the cart-ruts relative to the tombs.

In summary, the different authors disagree on the date attributed to the tombs and the time lapse between the use of tombs and ruts. What commenced as a case of hard evidence (crosscutting of ruts with Punic Tombs) ends up in a divergence of opinions and interpretations.

Two sites that are useful for dating purposes by this approach need further study of any reports of their original discovery. Taking into account the dates suggested (M.A.R. 1923-24: V) two adjacent pairs of

cart-ruts (with a gauge of 1.40 metres) on the south-western street within the archaeological site behind the Roman Domus at Rabat, provide substantial evidence that these ruts are related to a road adjacent to the buildings of the third century A.D. (Plate 1). Although the absence of documented Muslim graves on the cart-ruts (pers. comm. N.J. Cardona) leaves us without definite concluding evidence on when these cart-ruts went into disuse, the burials mark a radical change in the use of the site, suggesting that the ruts were not in use at the latest by the early thirteenth century A. D. The second site was found on a promontory at Marsa (Malta). Cart-ruts carved on a large threshold to a building were observed continuous with other ruts on the rock surface, the latter ruts being in their turn directed towards a quay constructed of sizable ashlar blocks (Barbaro 1794: 5). A long period of use for the promontory is suggested by the coin evidence, which Ashby (1915: 29) attributed to the period between the third century B.C. and the ninth century A.D. A recent reassessment of the evidence from the site attributes the inscriptions found to the Byzantine period, while the amphorae are ascribed to the period between the sixth and eighth century A.D. (pers. comm. B. Bruno; Bruno and Cutajar: in press).

Although limitations are evident in the study of cart-ruts intersecting other archaeological remains, this approach should be studied further. An appreciation of the site formation processes is essential to avoid haste conclusions. A general reassessment of the sites involved in this approach may result in new information. Search for remains previously overlooked may also contribute.

Case Study: Cart-Ruts and Bronze Age Fortified Settlements

Cart-ruts near Bronze Age settlements on promontories present an interesting case study where the above approaches were combined to assign a date for the rut phenomenon.

In the hypothesis connecting ruts to these settlements the appreciation of the hostile social environment prevalent during the period under question is crucial. It is recognised that preoccupation with security in the later Bronze Age resulted in the adoption of easily defensible territories, namely hilltop and promontories, for settlement purposes (Trump 2000: 22). Supported by similar settlements in Sicily together with the presence of relevant artefacts, this view has remained an unchallenged interpretation of the later prehistory on the Maltese Islands.

The hypothesis formulated goes beyond proximity in attempting to find association between ruts and settlements. Slopes around promontories and hilltops are thought to have provided a natural solution to creating a defensive system (Pace 1995: 59). A claim may be made that these slopes were perceived as natural barriers that hindered or prevented accessibility to the settlements. Use of these slopes as transport routes goes against the rationale for choosing such sites for defensive purposes.

The relevance of the above to the period of use of the local cart-ruts is significant. In contrast to plateaux, these promontory settlements provide focal points in the local landscape, which if coinciding with the projected direction of a rut group, may be interpreted as the destination/origin of the transport route. Such arrangement would not only provide a purpose for the cart-ruts but also assigns them a date.

Site 1 – Qala Hill

The most explicit connection between cart-ruts and a Bronze Age site is claimed for Qala Hill (GR 440773) near Mgarr (Malta). The presence of Borg in-Nadur sherds and at least fourteen silo pits grouped on a headland suggests that this area was used as a Bronze Age settlement. Megaliths found at the neck of this promontory are thought to be the remains of the settlement's defensive wall (Trump 2000: 157). Mallia (1968: 2) interpreted two groups of megaliths here as the remains of bastions to this wall. He also identified a ditch to the north-west of the site, but its vertical sides and the mutilated pit at one of its corners indicates that a date consistent with the nearby twentieth century ridge defences is more likely.

The rut pair 'associated' with this promontory is claimed to approach the area from the west dividing into two, each "branch heading for the junction of the wall and cliff lip" (Trump 2000: 157, Fig. 25) the area claimed as an access to the settlement.

Site 2 – Wardija ta' San Gorg

On the southern part of the islands, the crossing of the Maghlaq fault system with a northeast trending fault in the area of il-Wardija ta' San Gorg (GR 458670) has resulted in a promontory standing at an elevated position over the surrounding landscape. At the junction between the blue clay and the upper coralline limestone, the exposed perched water table supplies a

number of springs contributing to the fertility of the underlying fields. These springs together with the easily defensible promontory were probably noted by the Borg in-Nadur folk who transformed the area into a settlement. Several features of this culture can still be noted, namely at least thirteen pits and the remains of a defensive wall. The possibility of a settlement has been strengthened by reports of pottery finds typical of this culture and evidence of hut foundations (M.A.R. 1972-73: 72).

The main cart-rut site in the area is located within a kilometre to the north extending through the areas known as Misrah Ghar il-Kbir (GR 456679) and Ta' Dun Konz (GR 459680) (Magro Conti and Saliba 1999: 38-39).

One possibility that needs to be explored is whether a southern projection of the main cart-ruts in the area (Misrah Ghar il-Kbir k/a Clapham Junction) could have been directed to the Wardija ta' San Gorg settlement.

Site 3 - Borg in-Nadur

Borg in Nadur (GR 574656), the type-site of the Maltese middle Bronze Age, lies on the eastern part of the islands situated on the headland formed at the junction of Wied Saptan and Wied Dalam. The cyclopean wall of this settlement is the best preserved on the islands and contains within its bounding precinct remains of huts belonging to the homonymous culture (Trump 1961: 254-257).

To the north west of the defensive wall a stretch of cart-ruts on the barren rock may still be noted, "heading" towards the wall (Trump 2000: 95). Further cart-ruts close to areas with Bronze Age activity (which could possibly be related to the Borg in-Nadur settlement) are found near Ghar Dalam. Cart-ruts were recently uncovered near the Ghar Dalam Museum (GR 574660), not far from the Ghar Dalam cave that yielded rich Borg in-Nadur phase deposits (Trump 2000: 92-93). Further downhill more Bronze Age deposits were found near the Ghar il-Friefet cave. The nearest documented rut group to the latter site was found at the northern side of St. George's Bay and was allegedly continuous with another group crossing the silo-pits and running across the coast on the opposite side of the bay documented by Adams (1870: 244).

Site 4 - Misrah Ghonoq

Another interesting site occurs at Misrah Ghonoq (GR 483757), in the area containing Fort Mosta. This area is the remaining peak of an upper coralline block, which through geological movements associated with the Great Fault, came level to a larger lower coralline plateau to the south. Erosion of the surrounding clay substrata ensured the formation of a promontory, a "very suitable site for Bronze Age settlement" (Trump 2000: 144).

An eighteenth century documentation of a megalithic wall sixteen metres in length (Grognet 1854), possibly to be identified with the enclosing wall of the settlement, may be claimed as support for this use. This proposal finds further support from a silo shaped cavity found close to the British fort, and the location of these man made features on a promontory.

Cart-ruts have been described by various authors to the south-west of this promontory (Ventura and Tanti 1999: 222-229; Magro Conti and Saliba 1999: 38-39). Despite modern dumping present in the area, a pair of ruts may still be followed for a distance of at least thirty metres. This group may be part of the cart-ruts described by Vella (1972: 13) winding in alternate north and east directions, of which 275 metres were still visible to the east of the fort. These tracks divided into two pairs of ruts, with a length of 50 and 55 metres. Further cart-ruts described in the survey sheets have not been retraced.

Trump (2000: 145) interprets the cart-ruts here as heading for the Bronze Age village, further progress beyond that point "barred by the cliff".

Site 5 – Ras il-Gebel

At Ras il-Gebel megaliths 1.50m high, with possible remains of a tower at the north-eastern end (GR 419767) together with Bronze Age sherds suggests a Bronze Age village (Mallia 1968: 2-3). Although ruts are found near Ta' Mrejnu, the pair that is linked to this settlement follows a long course along the promontory. Trump (2000: 157) interprets once again such an arrangement as indicative of Bronze Age use for the cart-ruts.

Summary

Thus at three sites, namely Misrah Ghonoq, Wardija ta' San Gorg and Ras il-Gebel, one direction of the cart-rut group in the area could be interpreted as heading towards these promontories. At Qala Hill and Borg in-Nadur the ruts are not only heading towards the settlement in the area but are found within metres of the settlement itself. These observations have been interpreted as placing the cart-ruts securely to the later

Bronze Age (Trump 2000: 35), and as a clear evidence for an association between ruts and Bronze Age settlements better than "with sites of any other period" (Trump 1998: 37).

This conclusion finds support from the prehistoric date of ruts as interpreted from cases of ruts superimposed on Punic tombs. A review of the literature on the subject has revealed that the use of cart-ruts during the Bronze Age has gathered wide support by scholars (Conti and Vella 1978: 20; Evans 1971: 204; Gracie 1954: 98; Lewis 1977: 63-64; Mallia Milanes 1968).

Discussion

In the last decade, through examination of other sites, an historic date for cart-ruts appears to be increasingly favoured by Maltese archaeologists (Bonanno 1990: 30; Magro Conti and Saliba 1999: 38-39). This has shifted attention from the conclusions presented above, but resulting in alternative rather than substitutive explanations.

Although such new interpretations are welcomed, the concerns of this paper remain on the evidence discussed to propose cart-rut use during the Bronze Age settlement. The questions that need to be asked here are whether a revision or confirmation of a late prehistoric date for ruts may be forwarded when considerations are made of the methodology used and significance of the evidence.

The socio-cultural preambles for the Bronze Age hypothesis remain unquestioned. The significance of Borg in-Nadur settlements' location remains a valid method to assign an association between settlement sites and cart-ruts beyond the problems provided by proximity considerations.

Although only a full survey of the areas discussed will provide an appropriate assessment of these claims, further observations and the possibility of alternative explanations call for caution in proposing an association between cart-ruts and the Bronze Age period.

1) Qala hill

Revisiting Qala Hill, only the 'main' rut pair and the northern 'branch' were retraced, a southern 'branch' heading parallel to the settlement's wall before being lost under the fields. A separate trail follows a direction parallel and about 300m away from the defensive wall, while another rut pair approaches the southern aspect of the settlement.

On closer examination it was noted that the northern branch ended at a surface quarry some forty metres to the west of the suggested Bronze Age wall and could not be traced beyond this quarry (Plate 1). It is important here to note that the surface texture on Qala hill appears to be divided into three areas. The land to the east of the claimed remains of the prehistoric wall contains low vegetation on karstic terrain. Immediately to the west of the wall for a distance of at least twenty metres is an area of rough ground with an even more pronounced karstic erosion. Further west the ground is characterised by a much smoother surface. The ruts and quarries at Qala Hill are restricted to this latter, westernmost area.

A claim may be made that the purpose of the northern cart-rut is more compatible with quarrying activity in the area rather than with the prehistoric settlement. Such quarrying activity is at present attributed, on questionable grounds, to the classical period. The southern trails head for an area with features of quarrying but this claim is supported by less convincing evidence. The value of such observations is that the presence of ruts here may be explained without resorting to the Bronze Age.

2) Wardija ta' San Gorg

The Wardija ta' San Gorg promontory is not the only Bronze Age site in the area. Considerable amount of pottery sherds were also found about 600m to the north-west of this location in the fissures of an underground system of passages known as Ghar Mirdum (GR 453672). The finds here have been interpreted as evidence of a settlement which was destroyed following collapse of the underlying limestone secondary to blue clay erosion (Mallia 1965: 9). The finds here were unstratified, but enough to reveal a significant activity characterised by pottery production in the middle Bronze Age.

Cart-rut sites also abound in the area. A group is located to the south-east of Misrah Ghar il-Kbir, at Ghar Mundu (GR 461676) and may be followed into il-Misrah tal-Mielah (GR 462677), both close to a pair following a direction perpendicular to the ruts near the junction between the Girgenti and Tal-Gholja road (GR 463675). To the south of this area other rut groups may be found and include two pairs to the northeast of the Madliena Chapel (GR 447678) and a number of long ruts at Ta' Zuta (GR 462668). The latter ruts could possibly be connected to other ruts further east along the cliff edge (GR 463666). Only a short trail of around twenty metres at Il-Hmieri (GR 466667) north of

Gebel Ciantar has been found of the claimed connecting trail between the ruts at Ta' Zuta and the long trail found near the shaft and chamber tombs at Ta' San Lawrenz (GR 470673)(Gracie 1954: Fig. 2; Zammit 1928: 19).

From this description of the relevant sites in the area, it is clear that proposing relationships between the Bronze Age settlement and ruts would be an oversimplification for a number of reasons.

The cart-ruts at Misrah Ghar il-Kbir may be followed at the northern side of the nearby valley, Wied ix-Xaghri, and are last traceable in a direction away from the Wardija ta' San Gorg site. If an association had to be made, it is more plausible to link them with the ruts at Ghar Mundu and Misrah il-Mielah, were they may well have been in continuity, any evidence disappearing through extensive quarrying activity at Misrah il-Hawt.

Even if a south-directed projection had to be made of the Misrah Ghar il-Kbir ruts, it would be likely that they would continue along the cart-rut trail at Ta' Zuta, around 300 metres away from the settlement site. Despite a number of field walks no ruts were found connecting the Ta' Zuta cart-ruts and the Wardija ta' San Gorg site. The rut closest to the latter site lies at the neck of the promontory just south and parallel to the road (GR 457670) two hundred metres away from the Bronze Age site. No ruts were found in the vicinity of Ghar Mirdum.

The above considerations reveal that proposing links between cart-ruts and Bronze Age settlement sites in this area would have weak supporting evidence. The presence of quarrying in the vicinity of ruts at Ta' Dun Konz (Magro Conti and Saliba 1999: 38-39) is noteworthy especially when one considers that quarrying may also be observed near ruts found in the vicinity of the Madliena Chapel, Ta' Zuta, Ghar Mundu and Ta' San Lawrenz.

3) Borg in-Nadur

Only a short cart-rut trail may be found today at St. George's Bay (GR 577655), but reviewing the original documentation describing the trails present in this area revealed that the ruts here continued for a considerable distance along the shoreline (Adams 1870: 244). A pair of ruts "running into the sea" were possibly related to the pair observed until a few years ago fifty metres further north, on the other side of the bay (Trump 2000: 95).

Although the author was unable to link the ruts shown by Leith Adams to the Bronze Age settlement, the main problem arises through the concentration of sites in the area. The area around Borg in-Nadur contains remains of the Neolithic, a megalithic temple, dolmens and remains pertaining to the classical period. Assignment of ruts to a particular period in exclusion of others should certainly be approached with caution in this area.

Adams (1889: 249-250) had noted that a particular rut crossed one of the silos on the Birzebbuga coastline. The value of this observation is weakened from the fact that these features remain undated, being only loosely attributed to the Bronze Age (Trump 2000: 95), 'Phoenician' or early Punic (Sagona 1999: 53) and the Middle Ages (Adams 1882: 249-50). Only excavation of intact deposits here may throw light on dating issues for cart-ruts, other than giving valuable information on environmental characteristics and possibly insights into the tilting rate of islands.

4) Misrah Ghonoq

Although the setting at Misrah Ghonoq is typical of a Bronze Age settlement, only a few sherds testify to this possibility (Trump 2000: 144). The original descriptions of the bell-shaped cavity (M.A.R. 1928-29: VI; Vella 1972: 36) interpret it as a tomb, contrasting with the prehistoric interpretations usually assigned to it. Other than the megalithic remains illustrated by Grognet further megalithic remains are present over 900 metres to the west (Sant 1996: 19). Multi-period pottery noted in the debris to the east of Fort Mosta provides further problems into the nature of the remains at this locality

Further problems are also provided by a largely unknown cart-rut pair (GR 486756) (Plate 2) which can be followed for twenty-nine metres and going in an east-northeast direction, descending the slope to the northeast of Mosta Fort. Its upper end terminates abruptly, around fifty metres from the Wied il-Ghasel Hypogeum. The location of these cart-ruts challenges opinions on the barring of rut progress by the cliffs at Misrah Ghonoq.

A final word on this area is at present not possible, as the exact location of the presumed Bronze Age settlement and a relationship with the cart-ruts described is unknown. Unfortunately, further investigations were hindered by failure to get the necessary police permits to explore the area and

inability to retrace Grognet's illustrations at the National Library at Valletta.

5) Ras il-Gebel

Cart-ruts originally described here were already noted to terminate a considerable distance away from the area containing the Bronze Age settlement (Trump 2000: Fig. 18). A field walking survey in the area confirmed this situation (Figure 2). At a turn on the road from Mgarr to the Ghajn Tuffieha Bay a country lane, now bearing the name Sqaq ta' Ciantar, goes towards the Ras il-Gebel plateau. The cart-ruts are found immediately after the turn to the left behind the water reservoir. Just beyond a surface quarry (GR 427766) two long cart-ruts follow a northerly direction, roughly along the rubble wall that crosses the plateau. Back to the above-mentioned surface quarry, further cart-ruts follow the northern side of the country lane, another track following on the left hand side of a west-heading sidetrack. Along this latter sidetrack, a shaft (GR 426765), with evidence of a chamber just visible through the containing rubble, brings home a familiar situation of cart-ruts in close vicinity to Punic/Early Roman tombs. A stretch of curving cart-ruts are found to the southwest of the reclaimed area that now crosses the plateau, a surface quarry located within a few metres away. The area to the west of this reclaimed land is characterised by a flattened step appearance possibly the result of quarrying and markedly different from the more karst-characterised terrain further to the west. A further rut trail (with the 'modern' profile) is found to the north of the deep quarry in the centre of the plateau, and continues within the path leading to a farmhouse in the area. No other trails suggestive of cart-ruts were found on the plateau, although a more detailed assessment of this area is desirable.

Quarrying activity may explain the presence of cart-ruts here, one particular pair more comfortably accounted for as a route to the farmhouse in the area. The ruts in question occur 500 metres and 200 metres away from megaliths attributable to the defensive wall of the Bronze Age settlement.

Reinterpretation

Even when a multiperiod use of cart-ruts is taken into account, the above discussion reveals that there appears little evidence to link cart-ruts to the Wardija ta' San Gorg settlement. While appreciating the limitations of date assignment by proximity, the distance of the cart-ruts from the Bronze Age site at Ras il-Gebel calls for caution in suggesting a link between the two archaeological features, especially when remains closer to the cart-ruts are reminiscent of a more common situation. The location of the cart-ruts, quarry and settlement on Qala Hill once again may suggest an explanation that moves away from the Bronze Age. The rut-pair recently discovered near Fort Mosta poses new problems to the prehistoric dating, while the repeated use of Borg in-Nadur promontory makes links to the Bronze Age weak.

This general situation finds parallels with other areas containing Bronze Age settlements and ruts, which also have remains belonging to other periods. At Mtarfa and Nadur (Malta), where ruts are alleged to be found near Bronze Age sites (Harrison Lewis 1977: 60), remains of Punic Tombs and other archaeological remains indicate that the areas were used in other periods. Furthermore ruts running towards promontories are not exclusively found near areas containing Bronze Age villages. Hughes (1999: 74) had already contested that temple sites and megalithic remains close to cliff edges suggest that such localities were probably used before the Bronze Age period.

Contrasting with Trump's communication to Hughes (1999: 74), other field finds reveal that the Bronze Age is not always represented where ruts occur on promontories. At Is-Sidra in Qala, Gozo (GR 394789), a long trail may be traced directed to/from remains of rubble constructions at the tip of the promontory. The latter remains, which could be related to the underlying agricultural landscape, contain no evidence for use in the Bronze Age. Excavations here, however, could be revealing. In the same area a short trail follows the footpath to the south. A number of caves may be observed here but beyond their use as animal shelters possibly in the late medieval or early modern period, no earlier use can be ascribed at present.

An unrecorded rut pair follows a faint trail for over fifty metres along the promontory at Il-Qortin tal-Magun (GR 377898). While depressions to the south should be investigated, no evidence for the Bronze Age was noted here. The only remains on site included a small agricultural tenement and a chapel dedicated to St. Philip that has long been lost through cliff falls. Approaching Ras il-Wardija (Gozo) a rut pair was recorded in the sixties (Caprino 1965: 167). Although a Bronze Age use of the promontory was claimed through the presence of these ruts (Buhagiar 1988: 72), nothing earlier than the Punico-Phoenician period was found following extensive excavations of the site. No prehistoric settlements have been documented amongst the megalithic remains known near Ta' Lippija. This is

a promontory close to where Abela (1647: 69) described the Mgarr Barrani cart-ruts. Although the cart-ruts at these four sites cannot be convincingly attributed to a particular period, their location on promontories without Bronze Age remains is noteworthy.

Furthermore, no ruts are recorded near Bronze Age settlements in Sicily and the Western Mediterranean (Pike 1963 as quoted in Evans 1971: 204)

Conclusions

Short of investigations into the late prehistoric activity near Bronze Age settlements together with no secure attribution of ruts to other periods at these sites do not exclude that cart-ruts found in proximity of these settlements were already in use during the Bronze Age. Notwithstanding, when considered in its entirety, the evidence reveals that the occurrence of cart-ruts near Bronze Age fortified settlements is not in itself enough to propose a Bronze Age use of the cart-ruts. Short of revision by more detailed surveys at these sites, the author is of the opinion that in the areas examined more plausible explanations (when possible) could be reached when considering possibilities that do not include the Bronze Age.

Beyond specific dating concerns, failure to come to more definite conclusions was inevitable following problems resulting from the methodology currently used to date the cart-ruts. Much can be achieved if this problem is addressed in the future by further studies, fieldwork and discussions.

Although riddled with immeasurable variables and limitations it is high time for research to consider in the coming years methods that directly date the cart-ruts. A pioneering work studying karst features on cart-ruts has already suggested a long period of use ranging from the second to the tenth century A.D., possibly earlier but probably after 500 B.C. (Drew 1996: 410). Comments on the possibility of a date consistent with that suggested by Abela (Drew 1996: 415) and the paucity of available evidence on the Arab period go a long way to highlight the limitations of indirect dating methods. When the dates proposed by Drew for two main cart-rut sites (i.e. Misrah Ghar il-Kbir and Ta' Alla u Ommu - pers. comm. David Drew 13/11/01) are considered with those suggested from ruts behind the Roman Domus and by the evidence for the use of the Marsa promontory, it may well be that more promising results for dating a number of cart-ruts could be obtained by pursuing research to these periods.

The author cannot but conclude by emphasising that "a final point could well be that a careful assessment of an intractable problem like that of the Maltese cartruts tells us more about archaeology than about cartruts" (Trump 1998: 37). Inspired by such observation, it is hoped that this paper provides another step in a discussion that will hopefully lead to the development of a better methodology or search for new investigative techniques to study this enigmatic but interesting heritage.

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References

Abela, G.F. 1647. *Della Descrittione di Malta Isola nel mare Siciliano, con le sue antichita.* Malta.

Adams, A.L. 1870. *Notes of a naturalist in the Nile valley and Malta: a narrative of exploration and research in connection with the natural history, geology and archaeology of the lower Nile and the Maltese Islands.* Edinbrugh.

Anati, A.F. and Anati, E. (eds.). 1988. *Missione a Malta.* Brescia, Centro Camuno di Studi Preistorici.

Ashby, T. 1915. Roman Malta. *Journal of Roman Studies* 5: 23-80.

Bakker, J.A. et al. 1999. The earliest evidence of wheeled vehicles in Europe and the Near East. *Antiquity* 73 (1999): 778-790.

Barbaro, C.A. 1794. *Degli avanzi d'alcuni antichissimi edifizi, scoperti a Malta l'anno 1768.* Malta, Stamperia del Palazzo.

Bonanno, A. 1990. The Archaeology of Gozo: From Prehistory to Arab Times. In Cini, C. (ed.) *Gozo: The Roots of an Island*, pp. 11-45. Malta, Said International.

Bruno, B. and Cutajar, N. (in press). Archeologia Bizantina a Malta. Primi risultati e prospettive di indagine. *Racolta' di Studi in onore di Antonia Ciasca.*

Bugeja, A. 2000. Cart-Ruts at Monopoli. *The Oracle* Issue 1: 37. Malta, Salesian Press.

Buhagiar, M. 1986. *Late Roman and Byzantine Catacombs and Related Burial Places in the Maltese Islands.* BAR International Series 302, Oxford.

Buhagiar, M. 1988. Two archaeological sites - Ras ir-Raheb, Malta and Ras il-Wardija, Gozo. *Melita Historica* Vol. X, No. 1, pp 69-87. Malta Historical Society.

Caprino, C. 1965. Lo Scavo. In Universita degli Studi di Roma, Missione Archeologica a Malta: *Rapporto preliminare della Campagna 1964.* Italy, Centro di Studi Semitici.

Castagna, P.P. 1888. *Lis Storia ta Malta bil Gzejer tahha.* Malta.

Conti, M. and Vella, R.M. 1978. *A Report on existing literature about Ancient Maltese Cart-Tracks.* Melitensia Library MZ9 P.B. 14C. Unpublished Report. Msida, University of Malta (Department of Classics).

Drew, D. 1996. Cart-ruts and karren: karstification and human impacts in Malta. In Fornós, J.J. and Ginés, A. (eds.). *Karren Landforms.* Palma de Mallorca. Universitat de les Illes Balears.

Evans, J.D. 1971. *The Prehistoric Antiquities of the Maltese Islands.* University of London, Athlone Press.

Fenton, E.G. 1918. The Maltese cart-ruts. *Man* 18: 67- 72.

Gracie, H.S. 1954. The ancient cart-tracks of Malta. *Antiquity* 28: 91-98.

Gravino, L. 1958. The Mysterious Cart-Ruts. *Times of Malta* November 5, 1958, pp 5,11.

Grognet de Vasse, G. 1854. *L'Atlantide.* Ms 614/5. Valletta, National Library.

Harrison Lewis. 1977. *Ancient Malta – A Study of its Antiquities.* Colin Smythe Gerrards Cross, Bucks.

Hughes, K.J. 1999. Persistent features from a palaeo-landscape: the ancient tracks of the Maltese Islands. *The Geographical Journal,* Vol. 165, No. 1, March, pp 62-78.

Kelly, L.A. 1997. http://www.goldrush1849.com/thumbnails/deeprutshill.html (29 December 2001)

Lanfranco, G. 1961. Roman Sites and the Ruts. *The Sunday Times of Malta* August 27: 16.

Magro Conti, J. And Saliba, P. 1999. The Cart-Ruts at Misrah Ghar il-Kbir. *The Sunday Times of Malta,* March 7: 38-39.

Mallia, F.S. 1965. Secrets of a 3,000-year-old avalanche revealed. *The Sunday Times of Malta,* March 7: 9.

Mallia, F.S. 1968. The Prehistoric fortified sites of Malta and Gozo. Proceedings VIII Scientific Meeting, International Castles Institute: *Les Fortifications depuis l'antique jusqu'au Mouen Age dans le monde mediterraneen, Athens* 1968, pp 1-3.

Mallia Milanes, V. 1968. *Black beneath the Night.* A dissertation on cart-ruts. Unpublished dissertation.

Mifsud, A., Mifsud, S., Agius Sultana, C. and Savona Ventura, C. 2000. *Malta: Echoes of Plato's Island.* Malta, Proprint Co. Limited.

(M)useum (A)nnual (R)eports. Malta.

Pace, A. 1995. Malta and the Dawn of the Metal Age. *Treasures of Malta* Vol. II No.1. Malta, Fondazzjoni Patrimonju Malti.

Sant M.A. 1996. Mosta through the Ages. In Scerri, L. (ed.). *Mosta the Heart of Malta.* Malta, Midsea Publications.

Sagona, C. 1999. Silo or Vat? Observations on the ancient textile industry in Malta and early Phoenician interests on the island. *Oxford Journal of Archaeology* 18: 23-60.

Schneider, G. 2001. Investigating historical traffic routes and cart-ruts in Switzerland, Elsass (France) and Aosta Valley (Italy). *The Oracle* Issue 2: 12-22.

Trump, D.H. 1961. The Later Prehistory of Malta. *Proc. Prehist. Soc.* XXVII (1961), pp 253-262.

Trump, D.H. 1998. The Cartruts of Malta. *Treasures of Malta* Vol. IV No.2: 33 – 37. Fondazzjoni Patrimonju Malti.

Trump, D.H. 2000. *Malta: An Archaeological Guide.* Revised Edition. Malta, Progress Press.

Vella, E.B. and others 1972. *Storja tal-Mosta bil-Knisja taghha.* Second Edition. Malta, Empire Press.

Ventura, F. and Tanti, T. 1994. The cart tracks at San Pawl tat-Targa, Naxxar. *Melita Historica,* Vol. 11, No. 3, pp 219-240. Malta Historical Society.

Zammit, T. 1928. Prehistoric Cart-Tracks in Malta. Reprint from *Antiquity,* March 1928 pp. 18-25.

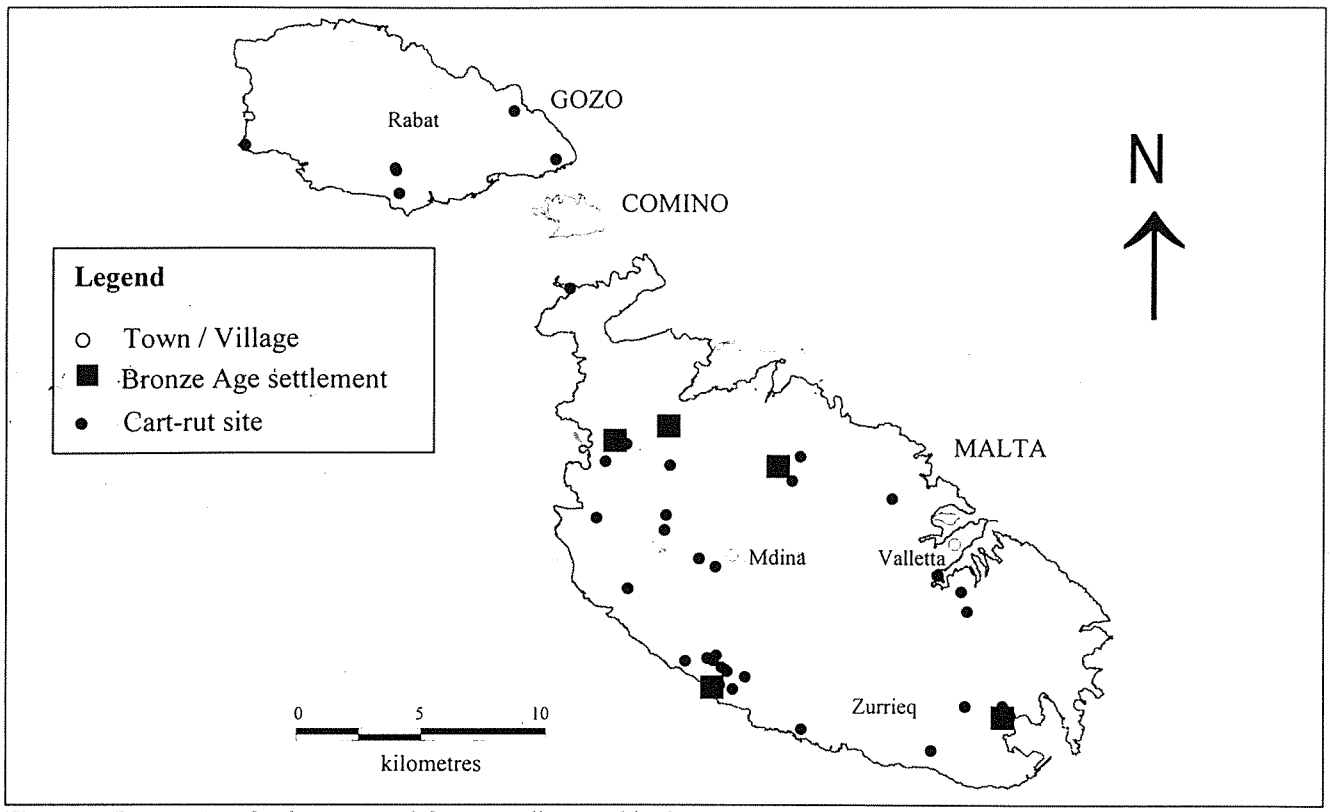

Figure 1: Bronze Age Settlements and Cart-ruts discussed in the paper

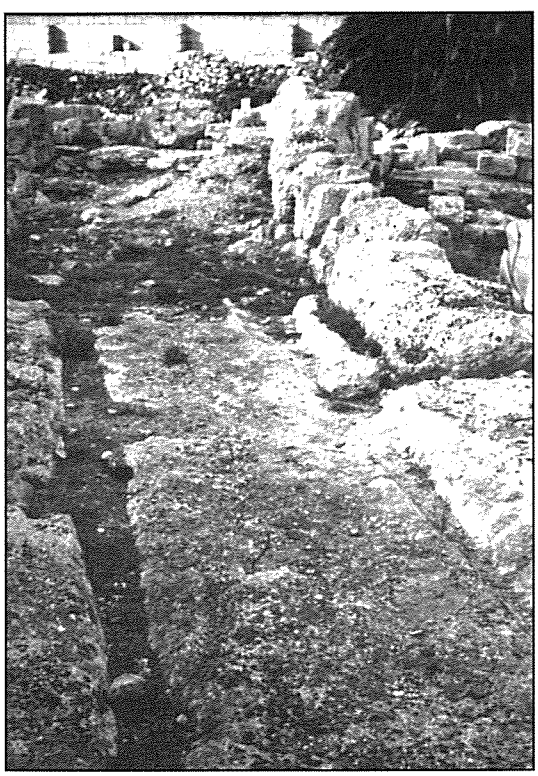

Plate 1: Cart-ruts within street behind the Roman Domus, Rabat (Malta)

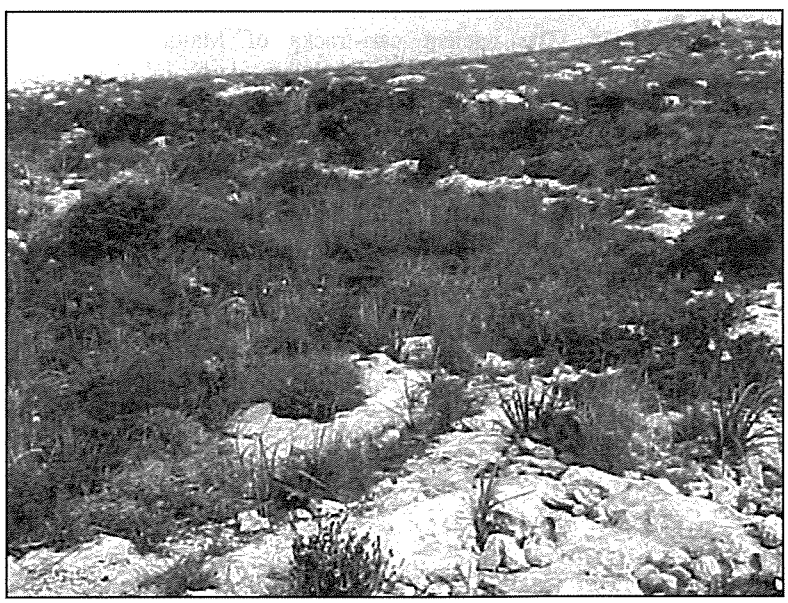

Plate 2: Cart-rut (foreground) and surface quarry (area with a more dense vegetation in background) at Qala Hill, Malta

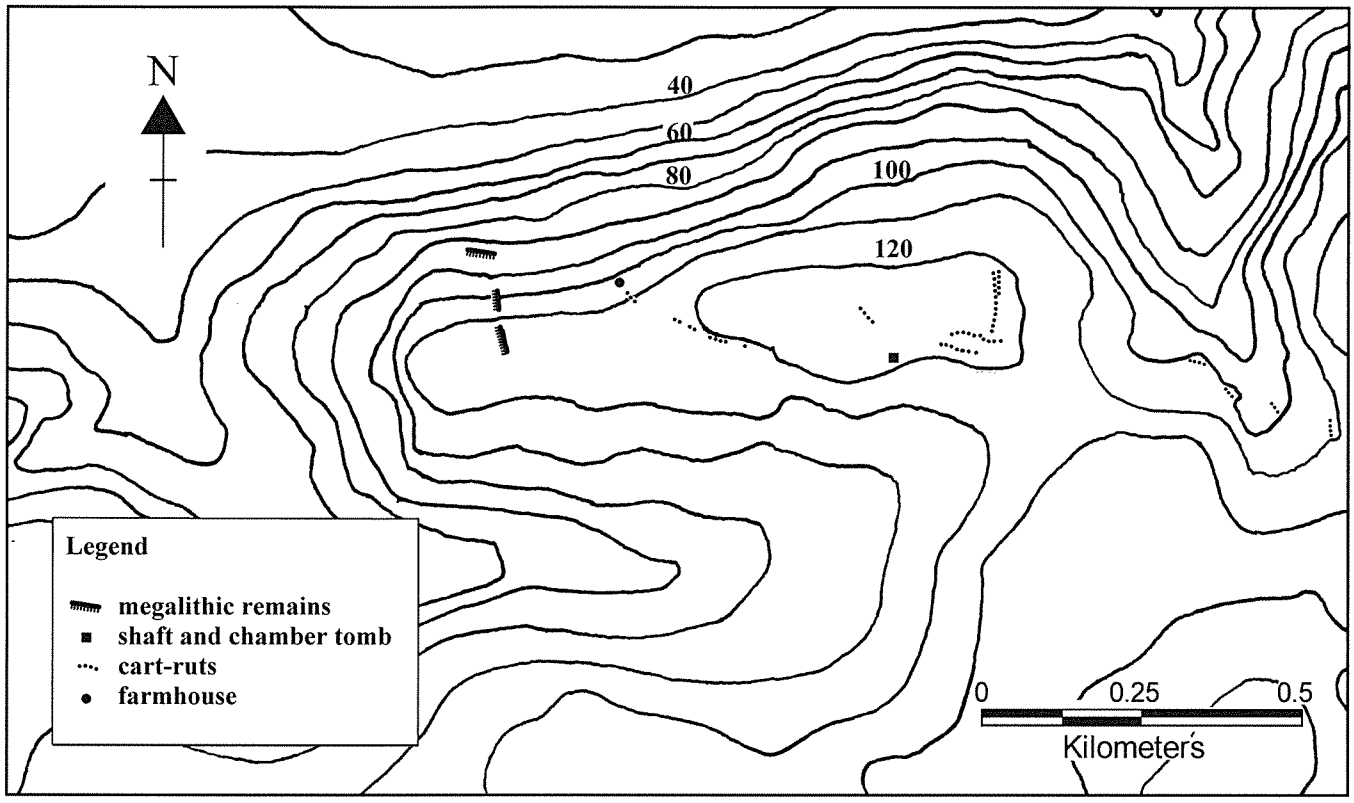

Figure 2: Cart-ruts and Bronze Age settlement at Ras il-Gebel, Malta

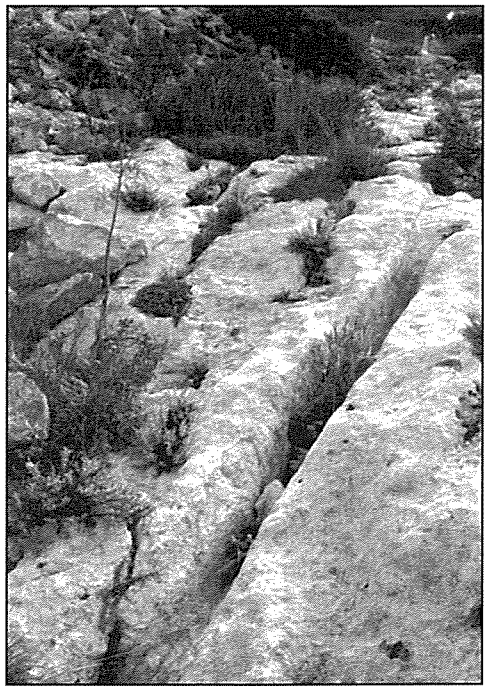

Plate 3: Cart-rut (foreground) to the north of the Victoria Lines near Fort Mosta

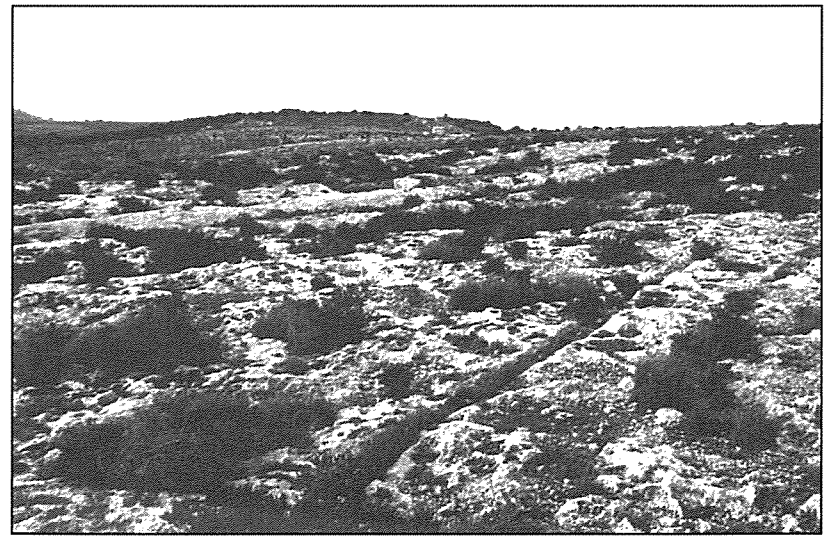

Plate 4: Cart-rut (right foreground) on the Ras il-gebel plateau. Bronze Age settlement is in background.

The Tal-Qadi Stone: A Moon Calendar or Star Map

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INTRODUCTION
The Tal-Qadi stone has always been an archaeological enigma amongst scholars. It has always been thought that this broken fan-shaped artefact has representations of stars and the crescent moon. The objective of this paper is to question these interpretations and investigate further by analysing possible scenarios that may help decipher the code of the Tal-Qadi stone.

Keywords: crescent, gibbous, first / last quarter, alignment, azimuth, astronomy, declination.

I. Introduction

At a small temple at Tal-Qadi (GR 478772), near Burmarrad (Malta) a broken fan-shaped stone (TQ/S.1) was found, with very interesting features (Plate 1). Measuring 29 cm by 24cm, this stone is 5cm thick. This broken fan-shaped stone has carved radiating lines on one of its sides, which have been interpreted as representing stars and a crescent moon (Ridley 1971: 71). There are five sectors on the Tal-Qadi stone. The first sector, which is only preserved in part, has three short lines and one symbol interpreted as a representation of a star. The second sector has seven stars, and three short lines. A crescent moon or first quarter moon is represented on the third segment while the fourth segment has nine stars and 2 lines in the shape of the letter I. The fifth segment has eight stars (Plate 1).

It is difficult to give an interpretation of the short lines and what look like a letter "I". Probably these represent the initial stages in the carving of the star symbol, which were subsequently left unfinished for unknown reasons. This possibility, however, remains open to discussion.

Amongst scholars who investigated and attempted to give an interpretation of the Tal-Qadi stone is Richard

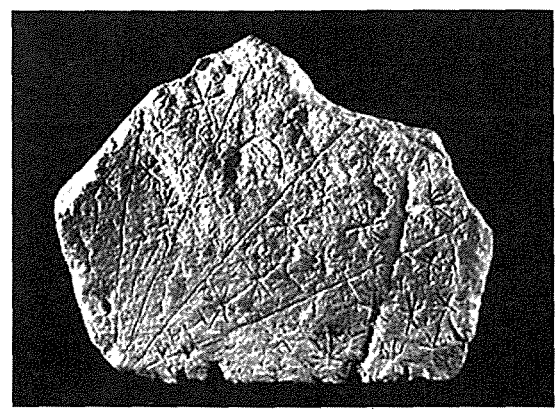

Plate 1: The Tal-Qadi stone (reproduced courtesy of "The Megalithic Temples of Malta" Website – Cilia 2000)

England, Malta's leading architect. Inspired by research in Northern Europe, he had studied the possible use of notches in the hills around the temples as horizon markers for observation of the moon and stars by Neolithic sky-watchers.

II. History of the Site

According to Sir Themistocles Zammit, the remains at Tal-Qadi were first brought to light by Mr. Henry Sant who worked as a Government civil engineer (M.A.R. 1916-1917: 8). The Tal-Qadi temple (Figure 1) is situated on the right-hand side of the Mdawra road to Salina Bay. Although the land on which the temple stands is Government property, Zammit had persuaded the Government of the time to buy a couple of fields, which adjoined this land to the west. This was done because Zammit had noticed that some standing stones seemed to form an entrance to a building at a higher level (M.A.R. 1927-1928: II-III).

Excavations were carried out on this site between 11th May and 15th September 1927. These were first supervised by L. Upton Way and later directed by Temi Zammit. The shallow soil and lack of megaliths made it quite difficult to follow the ground plan of the temple. Zammit recorded the results of this excavation in the Museum Annual Report 1927-28, and a plan of the remains was made in 1952 (Evans 1971: Plan 13).

Architecture and orientation characteristics of the Tal-Qadi Temple

The main features of the remains are the outline of two apses to a temple, the main axis of which evidently ran from east to west. According to Evans the temple was of the four-apse type. He arrived at this conclusion because remains of a corridor, probably leading to a second pair, were found to the east of the two surviving apses. However nothing remains of these apses except for four horizontal slabs which lie about four metres to the east of the corridor, and which may be the remains of the temple's paving (Evans 1971: 42). One of the main problems is to determine whether the temple faced west or east. According to the excavation reports, Zammit believed that the temple was oriented towards the west (M.A.R. 1927-1928: III).

According to Zammit's field notes, work started in the lower field called *ic-cens tas-Sinistru.* In his description it appears that he had established the existence of a path or avenue leading to the eastern ruins at a higher level. One must also mention at this point that Zammit was not entirely convinced by this assertion, since one can still notice a question-mark after his statement in the notebook (Evans 1971: 42). Zammit's report describes the passage as consisting of a few blocks of coralline limestone aligned in the lower field. Zammit states explicitly that the corridor formed by these megaliths was 3.66 metres wide. These led to the main entrance of the building facing due west. According to Zammit, it seems that there might have been steps leading from the lower field to the temple's entrance, which he measured as being 1.53 metres above that of the lower field. He cites no evidence for the use of these steps to bridge this height. The steps that now lead into the eastern remains have been built following the excavations for the convenience of visitors.

The four flat slabs to the east of the corridor at the back of the two surviving apses, challenge the hypothesis that the main entrance of the temple faced west. It seems that these represent the paving of another corridor, and if one had to take the geometric plan of

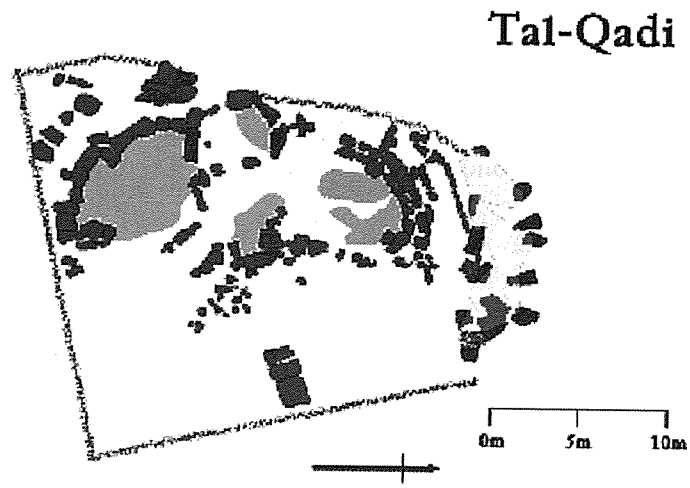

Figure 1: Tal-Qadi Temple (reproduced courtesy of The Megalithic Temples of Malta Website – Cilia 2000)

the temple consisting of four apses, then one will conclude that this was the entrance to the temple. A reconsideration of Zammit's hypothesis, namely that the remains of the stones on the west disclose the main width of the corridor, reveals that such width of four metres is too wide to be considered as the width of the corridor. Such corridor widths (between two pairs of apses) are usually under 2 metres, as other megalithic structures around the Maltese Islands reveal.

Notwithstanding, there are still further arguments, which support Zammit's hypothesis. If the temple entrance faced east, then it must have been facing up hill, which would certainly make it unique when compared with other megalithic sites in the Maltese Islands. The second pair of apses is missing and therefore it is not possible to compare the size of the apses with that of the surviving pair. Another difficulty in determining the orientation of the temple comes from the absence of remains consistent with those of the temple's façade. In view of the above, Evans concludes that the temple's entrance faced west, (Evans 1971: 42).

The original size of the temple at Tal-Qadi (Figure 1) is also problematic, as is the paving to the east. The latter might have been part of a corridor leading to some eastward extension, or even to another building. Evans remarked that its orientation appears to be slightly different from that of the two surviving apses and the corridor on the eastern side of these remains (Evans 1971: 42).

If we are to consider the western entrance, there are very little remains. One can find three stones, now level with the ground on the southern side, which were probably uprights. Two of these stand back to back and project into the apse. The broken stumps of two uprights represent the northern side of the temple. It seems that they were placed there quite recently, but perhaps they rest on ancient foundations.

The central space between the temple's apses, and the demolished walls further east is quite well marked by the position of the corridor. One of the paving slabs which measures 1.6 metres in length and 0.8 metres in width lies lengthways across the corridor, and its length probably gives the original breadth of the corridor. The remains of a small upright flanks the northern part whereas the remains of two stone uprights are on the southern part.

Zammit records the discovery of Bronze-Age material pertaining to the Tarxien Cemetery phase at the south-west corner of this corridor, which occurred just above the remains of these stones. These consisted of one large and some smaller pots, an amulet and an object resembling a spindle-whorl.

Zammit states that the latter might have been the fragment of a small figurine of the Tarxien Cemetery type, which could have been easily mistaken for part of a spindle-whorl.

It seems that to the east of the corridor the only recognizable remains are the four slabs mentioned above, which could have resulted from two horizontal slabs that were pulled down and eventually broken. Alternatively these may be the paving of a further corridor. The orientation of this corridor must have been east north-east. According to Evans, Zammit was uncertain whether these could have any direct relation with the remains further south, (M.A.R. 1927-28: III). However it seems that when one compares these remains with the Bugibba temple, these slabs could have been the outer façade of the temple. In his diary Zammit recalls that in a conversation he had with Giovanni Stivala, who was the tenant of the land where the temple was found, Stivala stated that he had destroyed a group of globigerina uprights in the north-west corner of the field years before (Evans 1971: 43). These might have been further remains of the outer casing of the temple or indeed the missing façade.

Archaeological finds at Tal-Qadi temple

The archaeological finds from Tal-Qadi temple include a fragment of a statuette (seemingly representing the abdomen of a human figurine) and another fragment of a figurine of lightly baked grey-buff ware. A pestle and a whetstone were also found. Of particular importance is a decorated broken slab of globigerina limestone, roughly worked but with a rather uneven decorated surface. According to Evans, the whole slab, of which the surviving piece probably represents a part adjoining the centre, was probably circular, and divided by various incised radial lines into numerous segments (Evans 1971: 43)

III. The observational data and method of data analysis.

Determination of azimuth and declination

The orientation from true north or south is an accepted means of measuring the azimuth of a temple. The objective of this investigation is to correlate the orientation of the main axis of the Tal-Qadi temple

with celestial objects. It is for this reason that azimuths were converted to declinations, that is to positions on the celestial sphere. The azimuths quoted in this paper were measured north through east.

A work published by Ventura and Agius in 1980 gave the azimuth of the Tal-Qadi temple as 76°. A theodolite measuring with an accuracy of one minute of an arc (Ventura and Agius 1980: 7) was used. Several sources of error could have effected the precise determination of azimuths. The errors could have arisen from weathering and erosion on the main portal entrances of the Tal-Qadi temple. On the other hand, one should note that the position of the temple eliminates the refraction at the moment of sunrise, thus making the calculations more precise.

The latitude of the Tal-Qadi temple was taken from an Ordinance Survey Map (Ventura and Agius 1980: 7). The latitude makes an appreciable difference on the declination corresponding to a particular azimuth (Roy & Clarke 1977: 36-67). Looking from inside the temple along its main axis, the horizon opposite the main entrance can be below, at, or above eye level. This also plays an important role on the declination at which the sun would appear to rise from inside the temple.

The unique engravings, showing the crescent moon and groups of stars enclosed in sectors by carved lines, on one side of the Tal-Qadi stone (Ridley 1971: 71) show that the megalithic builders might have shown interest towards the heavenly skies. Although interpreted as symbols for stars, one can never be sure that this is a correct interpretation. It is only with adequate analysis and investigation that we will eventually determine the interpretation of the Tal-Qadi stone. The objective of this paper remains to determine the interpretation of the symbols on the Tal-Qadi stone.

The apparent interest in the stars during the temple building period may serve us with an objective to investigate whether in fact any alignments did take place along the main axis of the Tal-Qadi temple. One should not overlook the fact that during the rising and setting of stars, these may appear much fainter due to atmospheric extinction. Furthermore, certain stars can easily be missed due to hazy conditions and moonlight. However one must state that the hill profile and altitude of the temple, helps to minimize such effects (Hawkins 1974: 160).

Although the stars seem to be fixed year after year, on closer observation, one will observe that some are rising to higher declinations whilst others are going to lower declinations in the sky. Over hundreds of years such movements become evident, a phenomenon referred to as precession. Every 25,800 years the Earth's axis precesses at a slow rate. The Earth's poles revolve with reference to the celestial sphere of fixed stars. Thus stars that are presently visible from a particular latitude may be invisible in a few hundred years and vice-versa.

The rate of precession is well known and considering the real motion of the stars, their exact positions in the

Date	Constellation	Remarks
January 2650 BC	Sagittarius - Capricornus	Star observations difficult since magnitude was low.
February 2650 BC	Capricornus-Aquarius	Mars and Venus could be seen. Star observations difficult since magnitude was low.
March 2650 BC	Aquarius - Pisces	The constellation of Pisces was in a straight line. Star observations difficult since magnitude was low.
April 2650 BC	Pisces-Cetus-Taurus	Star observations difficult since magnitude was low.
May 2650 BC	Cetus-Taurus	Star observations difficult since magnitude was low.
June 2650 BC	Taurus-Gemini	Star observations difficult since magnitude was low. At the end of June the main axis of the temple was aligned with the crescent moon.
June – July 2650 BC	Gemini-Auriga	**In the beginning of July, the main passage of the temple was aligned with the crescent moon. It could be that the Tal-Qadi stone is a representation of these constellations.**
August 2650 BC	Cancer-Leo (in the beginning of the month) Virgo-Leo (at the end of the month)	Star observations difficult since magnitude was low.
September 2650 BC	Virgo-Libra	Star observations difficult since magnitude was low. Mercury could have been observed easily.
October 2650 BC	Virgo-Libra-Scorpius	The main axis of the temple was aligned with the moon There is no indication that these stars are represented on the Tal-Qadi stone.
November - December 2650 BC	Ophiuchius-Sagittarrius	Star observations difficult since magnitude was low. The planet Mars could have been easily observed.

Table 1: Rising stars at Tal-Qadi temple during all possible crescent and first quarter moon days (Source: Author's derived data of rising stars along the main passage of the Tal-Qadi temple).

sky could be calculated relative to the direction in space of the Earth's polar axis and to the equinox positions for any age. The values of the relative longitude (35.84°) and latitude (14.4°) of the Tal-Qadi temple were entered into the computer astronomical program RedShift II, together with the azimuth of 76° (considering the eastern orientation) and 256° (considering the western orientation) and respective declination of 11.3° and –11.3°. The base year that was investigated was 2650 BC, which pertains to the Tarxien phase (3000BC-2500BC), and which is logical to investigate as most pottery found was of this period. The base year 2650 BC was chosen as the year representative of the Tarxien phase. The results for the night sky derived for this particular year would not be much different for ± 100 years.

IV. Results-Correlation with the moon and sun along the Tal-Qadi temple axis.

Research was conducted to correlate the temple's declinations with significant celestial bodies alignments. The computer astronomical programme was used to investigate whether any alignments existed with the temple's main passage. The latitude of Tal-Qadi temple was taken as 35.84°N, its longitude as 14.4°E, its azimuth as 76°, and declination of 11.3°. Considering the representations on the Tal-Qadi stone, the motion of the crescent/first quarter moon and stars were studied taking into account these four temple features. All possible crescent moon days (2-5 moon days and 24-27 moon days old) were investigated. No alignments were found with rising planets for the year 2650 BC. Remarks on constellations that could have been observed (i.e. visible magnitude) were noted in relation to the respective crescent moon days (Table 1).

Since the exact orientation of the temple is subject to discussion, it was again necessary to study the motion of the crescent/first quarter moon and stars using the Tal-Qadi longitude and latitude, declination and azimuth, but this time considering the other orientation (azimuth of 256° and declination of -11.3°). The investigation yielded the following constellations in the respective crescent and first quarter moon days (2-5 moon days and 24-27 moon days old) (Table 2). No alignments for setting planets were found for the year 2650BC. Observations on the stars that were listed are once again those that were close to the crescent/first quarter moon for the year 2650 BC and with a visible

Date	Constellation	Remarks
December 2650 BC	Aquarius-Pisces	Star observations difficult since magnitude was low.
January – February 2650 BC	Cetus-Pisces-Taurus	Star observations difficult since magnitude was low. Although there was an alignment with the main axis of the temple, there is no indication that the stars that could have been observed are those indicated on the Tal-Qadi stone. The planet Jupiter could have been observed
February – March 2650 BC	Taurus-Orion-Gemini	Although there was an alignment with the main axis of the temple, there is no indication that the stars that could have been observed are those indicated on the Tal-Qadi stone. The planet Jupiter could have been observed In February the planets Mars and Jupiter could have been observed whereas in March the planets Mars and Saturn could have been observed. Star observations were difficult since magnitude was low.
April 2650 BC	Cancer-Leo-Gemini	The planets Mars, Saturn and Mercury could have been observed. Star observations difficult since magnitude was low.
May 2650 BC	Leo-Virgo	Star observations difficult since magnitude was low. The planet Mars could have been observed.
June 2650 BC	Virgo	Star observations difficult since magnitude was low.
July 2650 BC	Libra-Virgo	Star observations difficult since magnitude was low.
August 2650 BC	Scorpius-Libra	Although there was an alignment with the main axis of the temple, there is no indication that the stars that could have been observed are those indicated on the Tal-Qadi stone. The planet Jupiter could have been observed. Star observations difficult since magnitude was low.
September 2650 BC	Sagittarius-Ophiuchius	Star observations difficult since magnitude was low. The planet Venus could have been observed.
October 2650 BC	Capricornus-Sagittarrius	Star observations difficult since magnitude was low. The planet Venus could have been observed.
November 2650 BC	Capricornus-Aquarius Cetus-Pisces	Star observations difficult since magnitude was low. The planet Venus could have been observed. The planet Venus could have been observed at the end of the month.

Table 2: Setting stars at Tal-Qadi temple during all possible crescent and first quarter moon days.
(Source: Author's derived data of setting stars along the main passage of the Tal-Qadi temple).

magnitude.

V. Discussion of results and alternative approaches.

From the results obtained above, it is difficult to compare the symbols represented on the Tal-Qadi stone with a rising or setting constellation that used to be seen in the year examined. The only stars that seem to resemble the pattern on the Tal-Qadi stone are the stars of the constellation Gemini and Auriga. These could have been observed in the period June-July 2650 BC (00h 58min) (Figure 2).

The symbols found on this stone have been subject to debate amongst scholars. Graham Hancock in his book "The Mars Mystery" shows rock carvings of comets from Easter Island (Hancock 1998: 278). The sun is here represented like the 'star' symbol found on the Tal-Qadi stone. Since the symbol of the moon is incised on the Tal-Qadi stone, what has been always thought of as symbols for stars may well represent the number of days between one phase of the moon to the next Considering the more complete sectors, we may argue that the first sector represents seven days, the following sector shows the crescent moon or first quarter moon, while the fourth and fifth sectors represent nine days and eight days respectively.

One way to decipher this enigma is to reconstruct the night sky during the period of use of the Tal-Qadi temple and observe the movement of the moon, looking for a pattern that fits the above hypothesis. In these calculations, the latitude of the temple was taken at 35.84°, with a longitude of 14.4°, azimuth of 256°, and a declination of -11.3°. After a thorough investigation of the setting moon for the year 2650 BC, the number of days appearing between one phase of the moon and another was determined (Table 3).

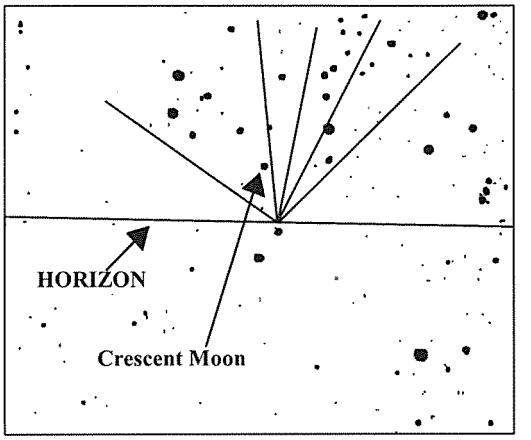

Figure 2: Representation of the constellations Gemini and Auriga as seen from the Tal-Qadi temple. (Source: Derived data from computer astronomical programme).

If the purpose of the Tal-Qadi stone was to read off the movements of the setting moon, then it was the intention of its users to count the number of days between one phase of the moon and another. One must not forget, that the number of days between two successive phases of the setting moon is not constant.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crescent[1] (2-5days)	4	3	4	4	4	4	4	4	4	3	4	3
First quarter[2]	2	3	3	3	3	3	2	3	3	4	2	2
Gibbous[3] (9-12 days)	4	4	4	3	4	3	4	3	2	2	3	4
Full[4]	5	5	4	5	4	4	4	4	5	4	5	5
Gibbous[4] (17-20 days)	4	4	4	3	3	4	3	3	3	4	4	4
Last quarter[5]	4	3	3	3	4	3	4	4	4	4	4	4
Crescent (24-27 days)	3	3	4	4	3	4	3	4	4	4	3	3
New[6]	3	3	3	3	4	4	4	4	4	3	4	3

Notes

[1] Crescent-A phase of the moon when less than half the disc is illuminated.

[2] First quarter- The phase of the moon when half the visible disc is illuminated and the moon is waxing towards full. First quarter occurs when the celestial longitude of the moon is 90° greater than the sun's.

[3] Gibbous-An adjective used to describe the phase of illumination of a body shining by reflected sunlight such as the moon when it is between half and full.

[4] Full-The phase of the moon when its celestial magnitude is 180° greater than the sun's and its disc appears fully illuminated.

[5] Last quarter-The phase of the moon when it is waning towards new moon and appears as an illuminated semi-circle. Last quarter is formally defined as the time when the moon's celestial longitude is 270° greater than the sun's It occurs about 7 days after full moon.

[6] New-The Moon's phase when it is at the same celestial longitude as the sun and thus totally unilluminated as seen from the Earth.

Table 3: Number of days between successive setting moon phases for the year 2650 BC
(Source: Author's derived data between one phase and another of the setting moon for the year 2650 BC).

In view of the above, the author is forwarding three proposals for investigation:-

Proposal 1: During the Temple period, observations and records of the following setting moon phases due West, namely crescent, gibbous, gibbous and then crescent were observed and the number of days between each phase recorded (Table 4).

Proposal 2: During the Temple period, observations and records of the following setting moon phases due West, namely first quarter, full, last quarter, and new were observed and the number of days between each phase recorded (Table 5).

Proposal 3: During the Temple period, observations and records of the alignment of the setting moon along the Tal-Qadi temple main passageway were kept and the number of days between each alignment recorded (Table 6).

After analysis using the astronomical program, Table 4 was drawn up for the first proposal while Table 5 resulted by studying the second proposal.

During each and every lunation the moon sets opposite the temple. This occurs once or twice every month. For the third proposal the alignments of the setting moon along the main passage of the temple with a declination of -11.3° and azimuth of 256° for the year 2650 BC was determined. The intervals between alignments of the moon along the main axis of the temple were calculated as shown in Table 6. As one can observe from the table, the number of days between each alignment is constant that is nine and seventeen days, except for five occasions only, where there are eight, ten and eighteen days between consecutive alignments. When these numbers are compared to those on the Tal-Qadi stone, one concludes that this was not used to observe and record the setting moon alignments along the main passage of the temple.

Once again, whether the Tal-Qadi stone was used to record the intervals between the first quarter, full, last quarter and new setting moon or else the crescent and gibbous setting moon, one may never know. It seems, that the observations were made by skipping a moon phase, that is either first quarter, full, last quarter and new, or crescent, gibbous, gibbous, crescent. It is interesting to note, however, that the number of days revealed on the Tal-Qadi stone match closely parts of proposal number 2. Thus it seems that during the Temple period a study of the number of days between one phase of the moon and the other was undertaken. Since this is not always constant a note was taken between the different segments between one phase of the moon and the other. Using this information one may tentatively reconstruct a representation of the original stone (Figure 3).

A similar investigation was also performed to determine whether the Tal-Qadi stone was used to observe and record the movements of the rising moon. Results that were derived are very similar to those presented for setting moon. It seems more likely, however, that the temple is aligned towards the setting moon rather than the rising moon. One must mention certain features, for example, the Wardija hill opposite the temple, and the valley between the temple and the hill. If one considers that the temple was aligned towards the rising moon than it must have been looking up-hill, which is unlikely.

TYPE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crescent (2-5 days) to Gibbous (9-12 days)	6	6	7	7	7	7	6	7	7	7	6	6
Gibbous (9-12 days) to Gibbous (17-20 days)	9	9	8	8	8	7	8	7	7	6	8	9
Gibbous (17-20 days) to Crescent (24-27 days)	8	7	7	6	7	7	7	7	7	8	8	8
Crescent (24-27 days) to Crescent (2-5 days)	6	6	7	7	7	8	7	8	8	7	7	6

Table 4: Observations and records of the following setting moon phases - crescent, gibbous, gibbous and then crescent - and count of the number of days between each phase. (Source: Author's derived data from astronomical program for 2650B.C.).

TYPE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
New-First quarter Number of new moon days + crescent (2-5) moon days	7	6	7	7	7	8	8	8	8	7	7	7
First quarter-Full Number of first quarter moon days + gibbous (9-12) moon days	6	7	7	6	7	6	6	6	5	6	5	6
Full-Last quarter Number of full moon days + gibbous (17-20) moon days	9	9	8	8	7	8	7	7	8	8	9	9
Last quarter-New Number of last quarter moon days + crescent (24-27) moon days	7	6	7	7	8	7	7	8	8	8	7	7

Table 5: Observations and records of the following setting moon phases - first quarter, full, last quarter and then new - and count of the number of days between each phase. (Source: Author's derived data from astronomical program for 2650 B.C.).

Date	Declination	Azimuth	Number of days between each alignment	%-Illumination-Phase
14.12.2651 BC	-09.45.53	258.01.27	0	41% – (First quarter)
01.01.2650 BC	-08.27.33	259.27.13	17	42% – (Last quarter)
10.01.2650 BC	-12.21.47	254.25.50	9	15 %– (Crescent)
29.01.2650 BC	-12.51.16	254.00.49	18	58% – (Last quarter)
09.02.2650 BC	-08.59.23	258.59.49	9	5% – (Crescent)
28.02.2650 BC	-11.14.20	256.01.59	17	82% - (Gibbous)
06.03.2650 BC	-11.56.13	254.58.14	9	0% – (New)
24.03.2650 BC	-09.04.32	258.45.09	17	97% – (Full)
03.04.2650 BC	-08.05.25	259.55.36	10	5 %– (Crescent)
21.04.2650 BC	-12.42.22	254.19.51	17	100% – (Full)
30.04.2650 BC	-10.11.15	257.24.46	9	25% – (Crescent)
19.05.2650 BC	-09.27.53	258.20.29	17	93% – (Full)
28.05.2650 BC	-12.02.20	254.42.48	9	46% – (Last quarter)
16.06.2650 BC	-12.47.32	254.09.30	17	82 %– (Gibbous)
24.06.2650 BC	-14.09.35	252.06.55	8	72 %– (Gibbous)
11.07.2650 BC	-10.19.54	257.11.51	17	56 %– (First quarter)
21.07.2650 BC	-10.28.00	256.58.36	9	86% – (Gibbous)
07.08.2650 BC	-08.33.06	259.17.28	17	29 %– (Crescent)
16.08.2650 BC	-13.48.51	252.51.51	9	99% – (Full)
03.09.2650 BC	-12.58.32	254.01.12	18	16% – (Crescent)
13.09.2650 BC	-10.28.35	256.56.10	8	99% – (Full)
01.10.2650 BC	-10.53.30	256.24.26	17	0% – (New)
11.10.2650 BC	-13.16.38	253.18.10	9	86% – (Gibbous)
28.10..2650 BC	-08.00.16	259.59.27	17	3% – (New)
09.11.2650 BC	-08.48.17	259.18.09	10	73% – (Gibbous)
26.11.2650 BC	-11.13.53	255.59.04	17	12% – (Crescent)
05.12.2650 BC	-10.40.18	256.47.15	9	46% – (First quarter)

Table 6: Alignments along the main passage of the temple with an azimuth of 256° (Source: Author's derived data for setting moon along the main passage of the Tal-Qadi temple.

During the investigations performed on the rising and setting of the moon along the main axis of the temple, it was noticed that the sun performs a pendulum motion during its rising and even in its setting. Hence there must also be sun alignments along the main axis of the temple. Once again through the astronomical program calculations were made considering the latitude and longitude of the temple, by first considering the declination of 11.3° and azimuth of 76° and subsequently with values of 256° and −11.3° respectively. It is interesting to note that on 20th April 2650 BC and 23rd August 2650 BC, the sun rose along the main axis of the temple, and that on 20th February 2650 BC and 18th October 2650 BC the sun set along the main axis of the temple.

Conclusion

Whether the Tal-Qadi stone was used to read the number of days for the rising or setting of the first quarter, full, last quarter and new moon phases, one may never know. However it is interesting to note that the interval of days between these moon phases fits in the Tal-Qadi stone sequence. The alignment of the temple's main passage with the different phases of the moon is indeed an intriguing fact and an achievement

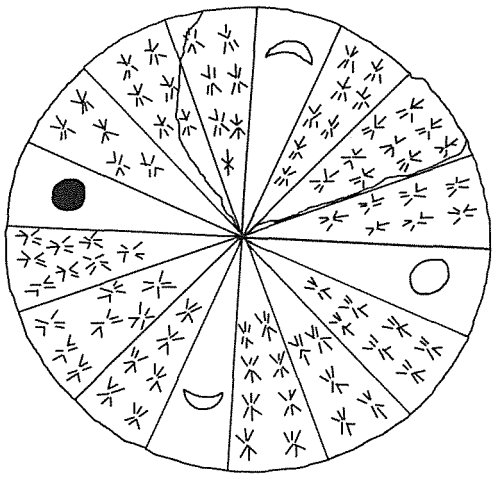

Figure 3: Possible reconstruction of the Tal-Qadi stone showing first quarter, full, last quarter and new moon interval. The symbols in the other sectors reveal the number of days between these phases. Shaded area is the still extant part (Author's interpretation)

for the Temple period culture. The alignment with the sun is also another interesting feature. If one considers alignment with the rising sun then the dates 20th April and 23rd August 2650 BC are the days when the rising sun was aligned along the main passage of the temple. If one considers alignment with the setting sun then the dates 20th February and 18th October 2650 BC are the days when the setting sun was aligned along the main passage of the temple. In the beginning of July 2650 BC, the main passage of the Tal-Qadi temple was aligned with the crescent moon. It is also possible that the Tal-Qadi stone is a representation of the constellations of Gemini and Auriga.

Acknowledgements

Thanks is due to my advisor Professor Frank Ventura for his continuous interest in the publishing of this paper. I would like to extend my gratitude to Professor Emeritus Maelee Thomson Foster of the University of Florida and to Ms. Marlene Saliba, Mr. Edwin Camilleri and Dr. Anton Bugeja for fielding their opinion on the subject matter. Mr. Daniel Cilia kindly allowed me to reproduce Plate 1 and Figure 1 from "The Megalithic Temples of Malta Website". Last but certainly not least a word of thanks to all at home, my father Maurice and my mother Agnes and to the Scicluna family without whose interest and support the purpose of this paper would not have been reached. It was indeed my sister Marie Louise who pushed me in the publication of this paper because she strongly believes that I have cracked an old-age prehistoric enigma of the Tal-Qadi stone.

Bibliography

Cilia, D. 2000. The Megalithic Temples of Malta. http://web.infinito.it/utenti/m/malta_mega_temples/

Evans, J.D. 1971. *The Prehistoric Antiquities of the Maltese Islands.* University of London, Athlone Press.

Ridley, M. 1971. *The Megalithic Art of the Maltese Islands.* Hampshire, Dolphin Press.

Hancock, G. et al. 1998. *The Mystery of Mars.* Penguin Books.

Hawkins, G.S. 1974. Astronomical alignments in Britain, Egypt, and Peru. In *Philosophical Transactions of the Royal Society of London*, A 276 (1974).

(M)useum (A)nnual (R)eport 1916-1917: 8.

(M)useum (A)nnual (R)eport, 1927-1928: II-III.

Roy, A.E. and Clarke D. 1977. *Astronomy: Principles and Practices*, pp 36-37. Bristol, Adam Hilger Ltd.

Ventura, F. and Agius, G. 1980. *Investigation into the possible astronomical alignments of the copper age temples in Malta.* Malta, University Press.

A Note on the Interpretations of the Iconography at Hal Resqun Palaeochristian Hypogeum, Gudja (Malta)

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ABSTRACT
The figures incised on the lintel of the entrance to the hypogeum and on the conch of the western burial chamber of the Hal Resqun hypogeum are analysed in detail and additional interpretations of the figures are given in the light of biblical and early Christian accounts.

Keywords: Hal Resqun, iconography, Late Roman, Byzantine, burial

The Hypogeum

Although the Hal Resqun hypogeum was discovered in 1887, the first reports were made decades later by Sir Themistocles Zammit (M.A.R. 1912-13; Zammit 1934). The remains were rediscovered in 1975 and later, precautions were taken to protect the hypogeum by sealing it with stone slabs. It is probable that the hypogeum still lies within a traffic island at Gudja, on the way to the Malta International Airport (Buhagiar 1986).

The hypogeum (Figure 1) was reached through a flight of eight steps leading into a spacious room, the entrance having a semi-circular arched lintel with a graffito of birds. A triclinium funebre in a roughly semi-circular exedra lay due north. A semi-circular recess was documented half way down the steps on the north facing wall. Two burial chambers were found due east and west of the space in front of the exedra. All entrances to the chambers and recesses were flanked by pilasters decorated with vertical fluting and "barley sugar" half-columns. A reassessment of the photographs available reveals that the latter type of decoration corresponds to 'diagonal fluting' described in the literature on architectural elements (Parker 1996). A more detailed description of the hypogeum has already been provided by Themistocles Zammit (1934) and Mario Buhagiar (1986) and readers are referred to these references for further details.

Decoration in the hypogeum does not only consist of fluted pilasters but also of various incised graffiti. The descriptions and interpretations of the iconographic elements have already been studied by Zammit (1912 – 13; 1934) and Buhagiar (1986; 1998). More recently a further interpretation has been provided by Mifsud and Mifsud (1997). The more intriguing elements in the decoration are the graffito of a pair of birds feeding a chick (found on the lintel of the entrance) and the decoration on the west burial chamber entrance depicting a possible biblical scene.

The Birds' Graffiti

Zammit's interpretation of these graffiti (Figure 2) is that the birds represent the "charity and love of the redeemer" in the image of two pelicans which were reputed in popular folklore, to feed their young with their own flesh. It is not the purpose of this article to

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discuss the origins of this legend but in Christian iconography it often represents the Holy Eucharist, where the body and blood of Christ is offered as bread and wine to the congregation.

Buhagiar states that the bird images "pose iconographical difficulties" because he interprets the branched lines on the head of the birds as "stag antlers", one bird referred to as having four legs and a tail (Figure 3). A review of Buhagiar's "queer peculiarities" reveals that these are compatible with stylisations and conventions probably used by the iconographer to emphasize particular details.

Mifsud and Mifsud (1997) hypothesize that the birds can be "identified with the extinct Maltese crane" and that the art forms are Palaeolithic in date. They suggest that later the rock was cut to form the hypogeum, leaving the graffiti intact. These authors also suggest that "the inner array of designs in the same tomb are similarly thought to be Palaeolithic." This interpretation is considered by the present author as erroneous. The Maltese extinct crane is only known from three localities containing quaternary deposits and consists of semi-fossilized bone material (Harrison 1979; Borg 1999). The context of the Hal Resqun graffiti goes a long way to exclude a date going back to the quaternary.

If the illustrations presented by Zammit and Buhagiar (Figures 2 and 3) are faithful representations of the incised lines on the lintel, a further interpretation that can be proposed is that the images depict two crested birds feeding their chick at the nest. The legend of the pelicans as noted by Zammit could very well be the reason behind these images. The iconographer working in the hypogeum, possibly having seen for himself the pelican or known a figure of the bird from descriptions, provides a fairly accurate rendering of the birds in their breeding plumage. Pelicans exhibit a crest of feathers during their breeding season (Fitter et al 1972). It must also be noted that pelicans are a rare occurrence in the central Mediterranean and occur as vagrants in the Maltese Islands (Sultana et al 1975).

The graffiti may be considered as a form of stylised iconography with the use of conventions, which depend on and accommodate the medium used in their artistic execution. In the depiction of the supposed "four legged" creature, the two legs of the bird are represented by the spaces between the three vertical lines midway under the body. Furthermore, the tail is illustrated by the space between the two other lines at the rear of the bird, accentuated by additional lines probably representing feathers. The right wing is depicted by a slightly curved line in the flank of the bird. Other quadrupeds depicted in the biblical scene, referred to below show the same style and conventions.

The Biblical Scene

A scene with three anthropomorphic figures, several quadrupeds and fish is depicted on the arched lintel of the entrance to the west burial chamber (Figure 4; Plate 1). Buhagiar and Zammit also comment on the presence of other bird representations but these are not shown in their illustrations. In the late seventies, Stevenson (1978) published the illustration by Zammit, Buhagiar later publishing this figure the other way round (ie left shown as right). A study of the plan and photographs reveals that the illustration by the former two authors is the correct one.

Zammit interpreted this scene as " the Biblical account of God's creation of the world..." "The Allmighty appears..." "with outstretched hands..." "over the numerous creatures that came out of his hands..." (Genesis 1:1- 31). Stevenson (1978) on the other hand interprets the scene as the naming of the animals by Adam (Genesis 2:18-20) and the central ghost-like/ anthropomorphic figure as " the word of God", the "Demiurgus". An additional interpretation was given by Buhagiar (1986) who interprets the scene as "the heavenly paradise with three orantes, the latter presumably representing the persons buried in the tomb. These three interpreters of the scene, however, appear to have missed the main details of the graffiti.

The main ghost-like/anthropomorphic figure in the centre of the panel seems to show the Almighty, with raised hands creating all creatures around him. Fish and quadrupeds are clearly seen and identified. However the figure representing God is shown with only one full hand with five fingers. To his left, beyond two quadrupeds is another similar figure (also ghost-like but smaller and with both hands raised, the right with four fingers, the left with five). There are two interpretations to this figure. It either represents the Almighty creating the animals or Adam naming the animals in the Garden of Eden. An inverted bare breasted figure can be seen to the right of the central figure. The hands not being important to the story are not shown, but important characteristics to represent a female, (i.e. the breasts) are clearly seen. The inverted figure shows that the female is not standing but lying down. Again to the right of the Almighty is another interesting feature. A semi-circular shape appears above the figure of the female. It is divided vertically

into two quadrants. Inside the left quadrant are five slanting lines while the right quadrant has four lines slanting the other way. This feature seems to indicate a human torso with ribs. Since there is one less on the right side there is good reason to believe that it represents Adam's torso during the creation of Eve.

"The man gave names to all the cattle, and to the birds of the air and to every beast of the field; but for the man there was not found a helper fit for him. So the Lord God caused a deep sleep to fall upon the man, and while he slept took one of his ribs and closed up its place with flesh; and the rib which the Lord God had taken from the man he made into a woman and brought her to the man" (Genesis 2:20-22)[1].

Therefore through analyses of these details, the interpretations of this iconographical account appear compatible with the story of creation and naming of the animals. This is done with special reference to the creation of woman as related in Genesis.

Zammit's suggestion that the figures of our "progenitors appears barely sketched on the sides" as if not central to the plot of the story is quite misleading. Buhagiar on the other hand, in suggesting the theory of the three orantes, did not consider that one of the orantes was inverted, a rather unusual position for giving praise. Again the figure's missing hands do not suggest a gesture for prayer where the position of arms and hands are of significance. All three authors ignored the meaning of the semi-circular figure above the female representation.

It is interesting to note that as Buhagiar suggested the artistic style of this graffiti give a hint to a North African influence. The graffiti bring to mind the numerous depictions of various figures and designs on stelae from North African Punic sites. Could this be a remnant of the Punic artistic conventions barely influenced by the Hellenistic and Latin images and architecture, in which even the tombs pilasters do not copy any Hellenistic or Latin architectural orders? A non Greek/Latin language (Trump 2000: 23) possibly of a Punic origin was spoken by the local population during the first century A.D. Also of interest are Neo-Punic inscriptions from Tac-Caghqi Secondary School S.E. Hypogeum dated to the first or second century A.D. (Borg, Rocco; 1972). However Buhagiar (1986) suggests a later date on "stylistic considerations", perhaps third or fourth century A.D. If language and writing survived so long during the Roman Period, artistic styles could very well have survived too. The Tac-Caghqi Catacomb does not indicate Christianity but the use of the Punic language at such a late date is interesting. Cultures do overlap each other, especially in isolated populations and it is very possible that these Christian symbols and narratives were depicted in this ancient style, the art of the common people.

Endnote

1. Biblical texts cited in this article have been taken from The Holy Bible. 1966. Revised Standard Version (Catholic Ed.). London.

Bibliography

Borg, J.J. 1999. A check list of the Quaternary Avifauna of the Maltese Islands. In Mifsud, A. and Savona Ventura, C. (eds.). *Facets of Maltese Pre history.* Malta, The Pre Historic Society of Malta.

Borg, V. and Rocco, B. 1972. L'Ipogeo di Tac-Caghki a Malta. *Sicilia Archeologica* (V) 18–19-20: 16 – 72. Trapani.

Buhagiar, M. 1986. *Late Roman and Byzantine Catacombs and Related Burial Places in the Maltese Islands.* B.A.R. Int. Ser. 302: 246 -249.

Buhagiar, M. 1998. The Iconography of Maltese Rock Tombs, Punico–Hellenistic, Palaeochristian and Byzantine. *Melita Historica* XII (3): 221 –238.

Fitter, R. Heinzel, H. & Parslow, J. 1972. *The Birds of Britian and Europe with N.Africa and the Middle East.* London, Collins.

Harrison, C.J.D. 1979. The Extinct Maltese Crane. *Il-Merill* – M.O.S. 20: 14 – 15.

(M)useum (A)nnual (R)eports, 1912 –13: 6-7.

Mifsud, A. & Mifsud, S. 1997. *Dossier Malta – Evidence for the Magdalenian.* Malta, Proprint Co. Ltd.

Parker, J.H. (ed.) 1994. *A Concise Glossary of Architectural terms.* London, Senate.

Sultana, J. Gauci, C. and Beaman, M. 1975. *A Guide to the Birds of Malta.* Malta, M.O.S.

Stevenson, J. 1978. *The Catacombs: life and death in early Christianity.* London, Thames and Hudson.

The Times of Malta (1978).

Trump, D.H. 2000. *Malta: An Archaeological Guide.* Revised Edition. Malta, Progress Press.

Zammit, T. 1935. An Early Christian Rock Tomb on the Hal-Resqun Bridle Road at Gudja. *Bulletin of the Museum* (Malta) Vol. 1 (V): 189 –195.

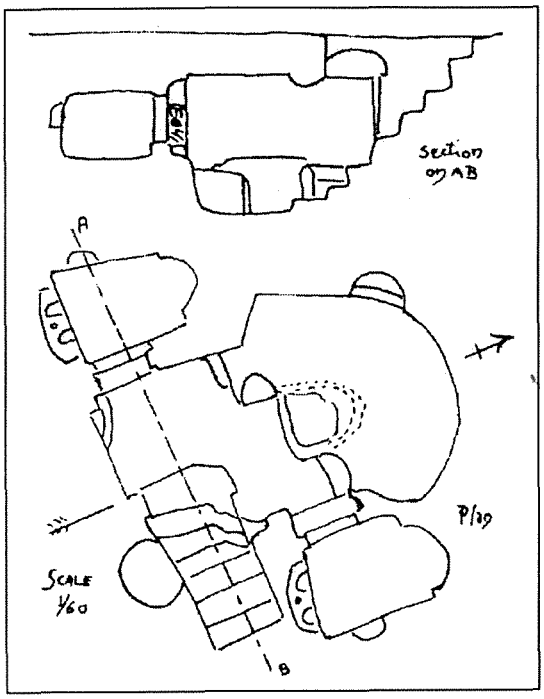

Figure 1: Hal Resqun hypogeum (redrawn after Zammit 1935)

Figure 2: Graffito of Birds (redrawn after Zammit 1935)

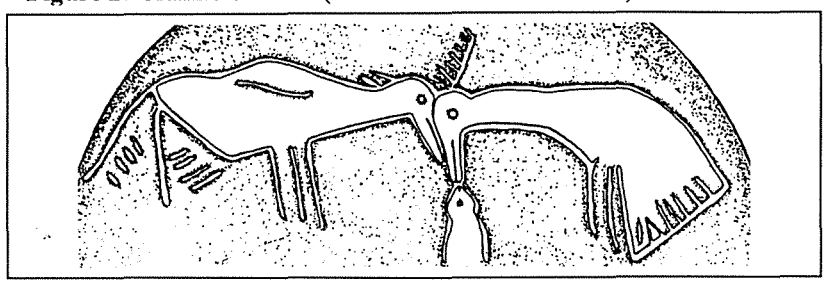

Figure 3: Graffito of Birds (redrawn after Buhagiar 1998)

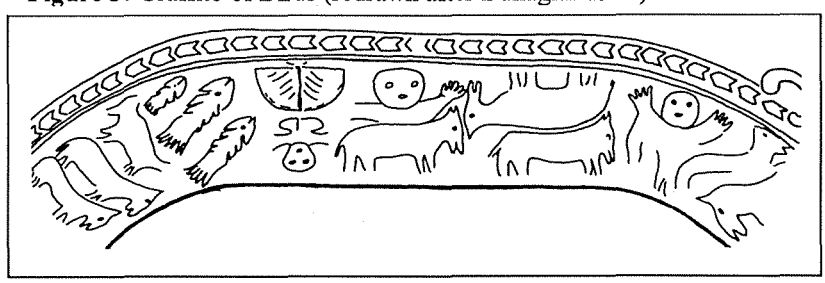

Figure 4: The Biblical Scene (redrawn after Stevenson 1978)

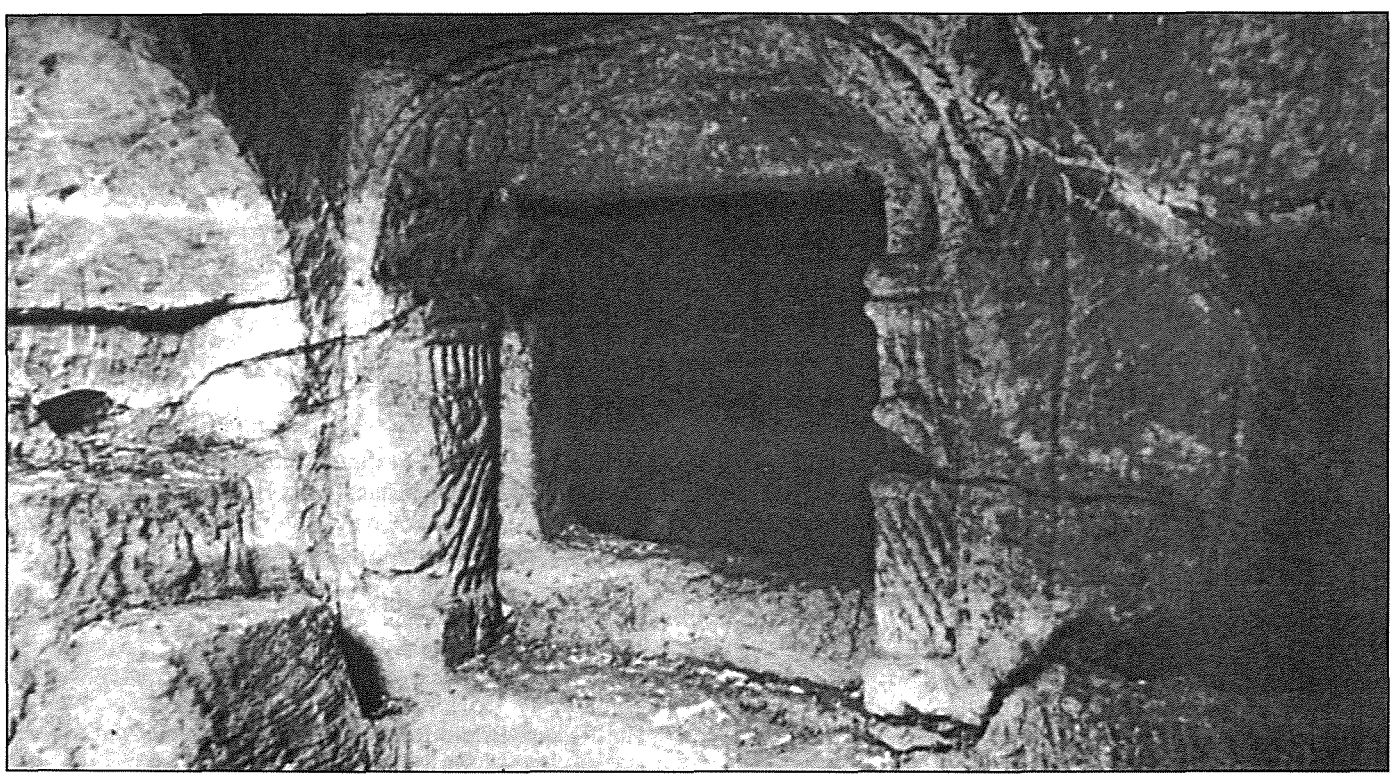

Plate 1: Graffito on the arched lintel to the west burial chamber (after Stevenson 1978)

A preliminary assessment of the Wignacourt Museum Hypogeum I at Rabat, Malta

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A hypogeum had long been suspected on one side of the staircase leading to the World War II shelter under the Wignacourt Museum. Under surveillance from the Museums Department (Buhagiar C.M. 2000; 49) and through continuous encouragement from the Curator of the Museum Monsignor John Azzopardi, the Grupp Arkeologiku Malti (GAM) decided to take over the work of partially clearing the hypogeum.

The eleventh and thirteenth December 1999 were selected for preliminary work on site, some clearing already being performed on the fifth December by the Qrendi Boy Scout Group. A number of later visits were conducted to finish the preliminary survey of the hypogeum.

The pre-medieval burial remains within the Wignacourt Museum

The area now containing the southern part of Rabat (Malta) is well known for its richness in Punico-Phoenician and late Roman and Byzantine burial archaeological sites (Buhagiar 1986: 49-216; Caruana 1898: 35-36). The Wignacourt Collegiate Museum is certainly no exception, hosting an interesting number of funerary remains (Figure 1).

A number of burial sites were already known from within the premises of the Wignacourt Museum (Azzopardi 1990: 366). This heritage may already have been encountered when parts of this edifice were under construction (Buhagiar 1990: 55). In the autumnal months of 1983 a hypogeum leading to one side of St. Paul's Grotto was rediscovered (Figure 1.2). This was subsequently excavated and later surveyed (Buhagiar 1990: 55-62).

In 1998, one of the present authors (AB) had accompanied Mr. Keith Buhagiar and Ms. MariaElena Zammit to assess the presence of an exedra and a baldacchino tomb within the garden behind the Museum (Figure 1.6). The location and arrangement of the remains make compatible identification with the rector's garden hypogeum (Buhagiar 1986: 68, Figure 13E) likely.

Monsignor Azzopardi pointed to us another mutilated hypogeum. This may still be found along the stairway, which from the underground World War II shelter led into the nearby school. Loculi and remains of what are probably window tombs were noticed here.

A further tomb was noticed closer to the shelter's outer entrance. In this part of the shelter, a cistern mutilated the lower part of a shaft and chamber tomb preserving some deposits in the shaft which may still be noted in situ (Figure 1.3).

The walls of one of the storerooms in the inner garden contain a number of depressions and recesses (Figure 1.10). Only an appropriate survey in the future may throw light on whether these are remains of hypogea or the *grotta con cortile e adito* mentioned in the notarial documents (Azzopardi 1990: 361; Buhagiar 1990: 55).

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Another addition to the already rich archaeological heritage was the rediscovery of features from a hypogeum found along the staircase communicating the Museum to St. Paul's Grotto (Figure 1.4). Examinations performed by GAM members and the youth members of Din l-Art Helwa had to be suspended, following considerations into the stability of the overlying road. Remains of a chamber may be noted on the other side of the staircase.

Interest in the potential of a rock-cut feature suggestive of a burial site was aroused in the last months of 1999 and eventually led to excavation of the hypogeum studied in this paper (Figure 1.5).

Preliminary Assessment

The group entered rather late in the investigations, when over a metre of deposit had already been removed from the hypogeum. At this stage the various rock cut features exposed (F1 to F8) were identified and labelled (Figure 2), while the deposits were numbered to facilitate cross-reference during the investigations.

A roughly rectangular opening (F8) to one side of a flight of steps leading into World War II shelter provides modern access to the hypogeum. Monsignor John Azzopardi informed us that at least half a metre of the lower part of this feature had been recently removed to allow a better access into the hypogeum.

A chamber with oven-like opening (F2) and a rectangular cavity (F3) were found open and disturbed while the openings to what appeared as two baldacchino tombs (F1 and F5) were not visible. A rectangular opening (F6) was identified in the southern side of the hypogeum, while the nature of an arched recess (F4) was already known to be a funerary exedra as the lip of its mensa element was exposed. Another arched recess (F7) was also noted.

A deposit containing globigerina chippings and rubble [1] extended over most of the upper parts of the hypogeum. It occupied the space above F1 but the levels found around this tomb were lower, exposing the openings to F2 and F3. The stone chippings also covered the rectangular space to the west of F4, most of F4 and the space between F5 and F7, but sparing the corridors east and north of F5. It is likely that the deposit removed by previous workers on site was similar to this deposit and filled the hypogeum to within a few centimetres of its ceiling. One of the present authors (AB) had noted, a year earlier, that this deposit was filling F8 sparing only 0.05 metres of the upper part of the hypogeum. The group was informed that a number of 'modern' bottles were discovered close to F8 but these were not available to study. A soil and stone deposit [2] was noticed to emerge from under the stone chippings and extended into the upper parts of F6 (Plate 1). Furthermore a number of stones ranging from 0.10 to 0.40m, each covered by a thin layer of soil [9], were noticed immediately to the east of this deposit [2] on the southern part of F4.

Interventions and Results

The interventions made by the group started after this preliminary assessment. Permission from the Museums Department was given to remove the globigerina rubble and to leave the remains of the soil and stone infill [2] for later investigations. Within these guidelines our aim was to study the later activity occurring within the hypogeum without compromising earlier deposits and future excavations on site. Thus, excavations proceeded until the soil-rubble interface was encountered. Once this was achieved a few centimetres of globigerina chippings were left overlying deeper deposits. Finds were bagged according to context. Indications to their location, with reference to the main features in the hypogeum were also noted.

A roughly rectangular cavity F3 (0.34m high, 1.12m wide and 0.57m deep), containing a single roughly finished headrest in its western end was found in the wall to the south of F1. In front of this cavity, soil was noted on the globigerina rubble and distinct from the soil layer at the bottom of the hypogeum (Figure 3; Plate 2). This fine dark brown soil layer [4] was similar in colour and consistency to that within the rectangular cavity F3. Examinations carried out by the Museum Department are reported to have recovered the bones of 'a baby' from the material in this tomb and the adjoining soil deposit [4] (Anon 2000: 6). Remains of plaster were noticed at the western edge of the opening to this chamber.

Work proceeded by removing the globigerina rubble around tomb F1. Only a few sherds, glass pieces and cans were found within this layer. As a dark brown deposit [3] containing a number of stones found to the west of F1 was likely to be disturbed due to its position close to the modern entrance, clearing of this small mound of soil was performed. This deposit, restricted to the corridor west of F1, was 0.10metres in height in its middle section and thinned out as it approached the northwest and southwest corner of F1. Animal bones

together with a few sherds and modern material were noted within this deposit. This soil layer covered a reddish brown soil deposit, which extended in the corridors north, west and south of F1. It was in the latter area that continuity with the soil and stone deposit [2] was established.

To the north of F1 a rectangular opening (0.44m wide and 0.60m high) in an arched recess (0.75m wide and 0.70m high) leads into an oval chamber (1.67m long and 1.10m wide). In the upper layers of this tomb (F2) a fine globigerina powdery layer [5] was found lying over globigerina chippings mixed with lumps of a compact sterile light brown clayey soil [6]. These two layers rested over and totally covered a dark brown soil deposit [7] from which bones retrievable in fragmentary nature were observed.

A baldacchino tomb F1 occupies the space between F2 and F3. This baldacchino tomb is 2.80metres long and 1.50 metres wide and revealed plastering on its flat upper surface and most of its southern and eastern sides (Plate 3). Two superimposed hand impressions, probably applied by the medial four fingers of a left hand are found within the plastering at the north-eastern corner. Curvilinear impressions (0.5 to 1.0mm) on the plastering were noticed on the southern and eastern side of this tomb, but these impressions were absent from the upper surface of the tomb, which was exceptionally smooth.

When clearing was effected to the east of F1, a layer of compact sterile light brown soil 0.05m thick [8] was found 1.20 meters below the ceiling (Plate 4). This layer was similar in colour and consistency to the lumps of clayey soil in context [6] discovered within the window tomb. Once again only few finds were found within the globigerina chippings here. The group's work allowed partial uncovering of the entrance into the two baldacchino tombs. Various human bones were observed inside both baldacchino tombs, long bones appearing to be particularly well represented (Plate 5). The occasional pottery sherd was also noted within the funerary chambers. The remaining globigerina chippings around F5 and on F4 were removed following the guidelines indicated above.

This work allowed a better assessment of the other baldacchino tomb (F5) in the hypogeum. Measuring 2.40 metres in length and 1.50 metres wide, this baldacchino tomb is unusual in having a convex northern end and a concave eastern side, and is characterised by a saddleback upper surface. A human femoral head was noted at the northwestern corner on the tomb's upper surface.

The two sides containing the opening to the Baldacchino tombs form the northern and western sides of a rectangular space. This space is enclosed on the eastern and southern side by a funerary triclinium (F4) and an opening (F6) respectively. This last feature is a framed rectangular opening (F6) measuring 1.12 metre in width and at least 0.50metre in height. On its southern side a wider bordering frame was noticed. Evidence of a horizontal arc cut in stone was noticed above this opening on its southern side, further details being lost within the fill [2] to the south of the rectangular feature.

The funerary triclinium (F4), 2.60m wide and 1.80m deep, occupies the eastern end of the hypogeum. Its upper surface is characterised by a circular mensa having a diameter of 0.94 metres, a lip 0.11 metres wide and 0.02 metres high. The present stage of excavations did not allow assessment of further details of this feature. A ledge of rock above the exedra contains remains of six lamp holes. These lamp holes are roughly hewn in a triangular or rectangular shape and face westwards (Figure 6; Plate 6).

To the west of F5, an arched recess (F7) has a rough niche and a central rectangular excavation; the area immediately in front of this feature was left uncarved for a height of about 0.5m and length 1.70m.

Other details may be noted in the hypogeum. In the sides closest to the exedra, the upper parts of the corridors south of F1 and west of F5 reveal a concave curvature forming a semicircular apsidal adornment. A number of other lampholes were noticed, and their position marked on the section drawings (Figure 5). Two deeply incised numbers (19 and 1941) were found on the walls north and south of F1 respectively. Faint horizontal black lines were noticed on the inner sides of the baldacchino arrangement to F1, while more pronounced areas with black discolouration were noticed in other parts of the hypogeum

Interpretation

Classical History

The various architectural features visible reveal that the Wignacourt Museum Hypogeum I can be comfortably included to other underground burial sites of the late Roman and Byzantine periods found on the Maltese Islands (Buhagiar 1986). Its location is certainly interesting as a number of authors have identified in

the depression containing St. Paul's Parish Church and St. Rita street, the vestiges of the ditch to ancient Melitae (Bonanno 1992: 19; Caruana 1898: 85; Trump 2000: 127). The location of the Wignacourt Museum Hypogeum 1 and the richness of burial sites within the Museum and the immediate vicinity find a meaning in the reconstruction of the ancient classical landscape. Considered together, these sites are a testimony to the prohibition by Roman law for burial within the city walls and the extensive necropolis arising beyond the surrounding ditch.

The opening F6 was the original access into the hypogeum. It is still unclear whether the present arrangement is part of a larger complex or is served by a staircase to an opening above. The entrance (F6) led into a rectangular space, which was illuminated by lamps placed in the holes above the exedra to the east. Such arrangement, containing lampholes on the exedra, recalls that present at Tar-Raghad hypogeum.

Excavations have revealed four tombs in the hypogeum. Tomb F1 has been identified as a troughless baldacchino tomb while F5 is a saddled-back baldacchino or canopied tomb (classification as proposed by Buhagiar 1986: 23 is here being followed). The larger size, more detailed finishing and plastering in most of the eastern and southern sides of Baldacchino F1 (2.80m by 1.80 metres) reveals that this was probably a more important tomb or was finished earlier than tomb F5. The plastering and position of baldacchino tomb F1 with respect to the exedra make comparisons with a similar arrangement at the nearby St. Catald noteworthy and such arrangement supports the former hypothesis. On the other hand, the presence of the unfinished feature F7 does not exclude that work on tomb F5 was also left unfinished.

Another burial chamber F3 has all the features of a loculus, evidence from the bones confirming that this tomb served as the burial place for an infant. Although F2 still remains to be fully excavated enough features are exposed to suggest a window tomb.

The corridor to the west of tomb F5 appears to have been left unfinished. Recess F7 corresponds to a niche of window tomb, further excavation probably abandoned as this could have resulted damage to the window tomb F2. It is interesting to note that unfinished features appear to be concentrated in the northern part of the hypogeum. Once again this may suggest that this part was the last part of the burial place to be dug. Notwithstanding, there is nothing in the southern part of F5 to suggest that this part of the hypogeum was dug as an afterthought.

The small size of the hypogeum suggests that this burial site may be included with others classified as family or private hypogea (Buhagiar 1986: 42).

Later history

The final assessment of the later history of the hypogeum will only be possible through further work on site. A preliminary opinion is being expressed here which hopefully will be revised with further excavations. Short of such work it appears that an early event to occur on site was the opening of tombs. The presence of skeletal remains contrasts with the apparent relative absence of pottery within the chambers. This may suggest a selective pottery looting of the site from treasure hunters or for materia prima in making *deffun*. Furthermore no particular arrangement can be observed for the bones visible within the chambers of F1 and F5. When considered with the presence of the femoral head on F5, this observation suggests a substantial disturbance to the burial deposits.

The hypogeum then experienced (at an as yet unknown date) a sizable soil deposit through its original entrance F6. It would be interesting to examine whether this deposit is related to the building phases of the Wignacourt Museum. Whatever its source, soil sloped from the entrance and filled most of the hypogeum. It is the high level of deposit within the entrance F6 and the gradual slope into the other parts of the hypogeum that points to the entrance as the source of such material.

It is still unclear whether a rubble heap [9] on the southern part of the exedra entered the hypogeum with these events or was already present on site. Furthermore it pertains to future excavations on site to ascertain whether deposits visible with the bones inside the baldacchino tombs are contemporaneous to the burial or the abovementioned soil deposit.

The hypogeum was accidentally rediscovered again when a stairway to an underground World War II shelter was being cut. Fortunately enough the hypogeum was spared destruction by lying off the projected course of the works and probably by the intervention of Mr. Louis Degiorgio. Graffiti of numbers (1941 and 19) in at least two parts of the hypogeum probably reveal the date of this fortuitous encounter (1941). It is probable that at this stage the

shelter diggers, equipped with candles or lamps that left soot marks on the ceiling, explored the site. A number of lampholes for small candles may have been carved at this time. This is suggested by black soot marks present around some lampholes. Such marks contrast with the red discolouration of the stone resulting from flames with a more complete combustion. The latter have been probably produced from the classical oil lamps.

Interest in exploring the original entrance may have led to the partial removal of its containing deposit. This activity could provide a further alternative explanation for the rubble [9] found on the exedra. The shelter diggers proceeded with their work turning the hypogeum into a convenient place where they could deposit the rubble resulting from the shelter's excavation. This last scenario is suggested by the nature of deposit [2]. The absence of globigerina chippings [2] on the innermost parts of the exedra and the corridor east of F5, together with the concentration of contemporary remains (cans and glass) towards F8 provide further corroborative evidence

The origins of the compact sterile soil layer [8] to the east of F1 is likely to have come from soil-filled fissures found within the rock formations encountered during shelter digging. An alluvial event is one possibility through which this deposit finished as a layer within the hypogeum. Alternatively removal of a sizable original deposit and subsequent disposition within the hypogeum could be a further possibility.

Conclusion

The results obtained from this preliminary assessment have provided information on this hypogeum comparable to what is available in publications on similar burial places. The presence of four tomb types and an exedra in such a small hypogeum is noteworthy and together they add further interest to the already rich heritage within the Wignacourt Museum.

Through the scope of investigations allowed, insights into the often-neglected post-classical processes effecting the transformation of underground burial places have been gained. Furthermore it is hoped that the preservation of early deposits will in the future allow a full scientific assessment of the remaining deposits as necessitated by the still unanswered questions on this intriguing subject.

Acknowledgements

The authors wish to thank the Museums Department, Mr. Nathaniel Cutajar in particular, for issuing the necessary permits and monitoring this preliminary study of the hypogeum. A word of gratitude is extended to Monsignor John Azzopardi for his constant help and encouragement provided during the course of the works. Mr. Keith Buhagiar and MariaElena Zammit were helpful by conducting preliminary assessments of other hypogea within the museum premises. The authors acknowledge the help of T. Zammit, M. Azzopardi, W. Azzopardi, M. Jones, Prof. G. Camilleri, AM Grima and the Qrendi Boy Scouts during the excavations done at the Wignacourt Museum.

References

Anon., 2000. 11 archaeological findings in 5 months. *The Malta Independent,* 15 June 2000,6.

Azzopardi, J. 1990. The Museum of St. Paul's Collegiate Church at Wignacourt College, Rabat. In Azzopardi J. (ed.). *St. Paul's Grotto, Church and Museum at Rabat, Malta*, 355-378. Malta, Progress Press Co. Ltd.

Bonanno, A. 1992. *Roman Malta. The Archaeological Heritage of the Maltese Islands.* Rome. World Confederation of Salesian Past pupils of Don Bosco.

Buhagiar, C.M. 2000. National Museum of Archaeology News: 1998 & 1999. In *Malta Archaeological Review 2000*, Issue 4: 44-50. Malta, PEG Ltd.

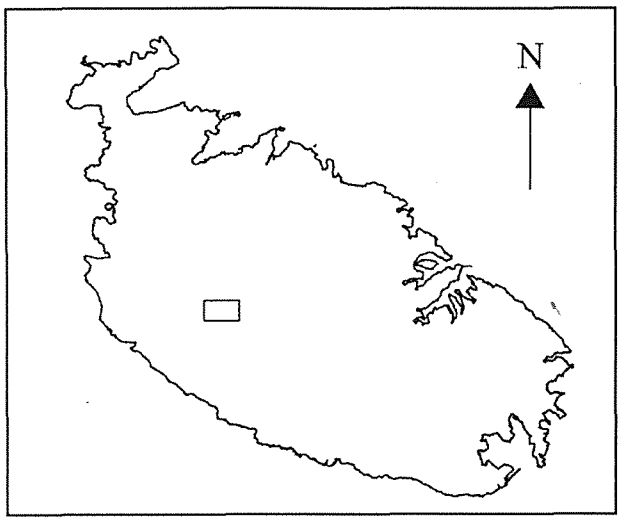
Buhagiar, M. 1986. *Late Roman and Byzantine Catacombs and Related Burial Places in the Maltese Islands.* Oxford, BAR International Series 302.

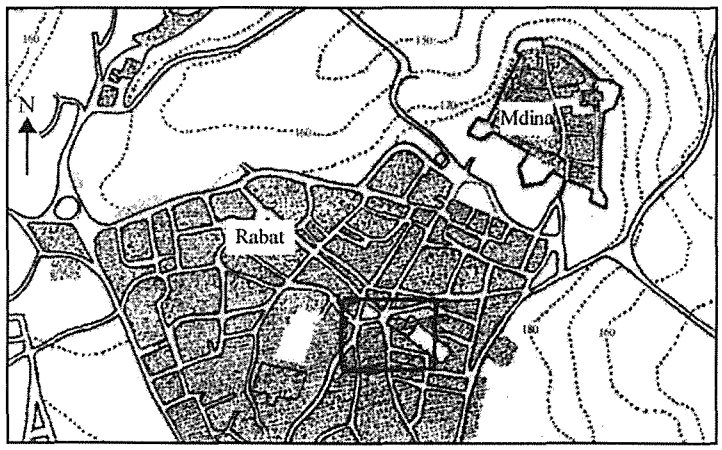
Buhagiar, M 1990. The St. Paul's Cave Complex at Rabat, Malta, and its archaeological importance. In Azzopardi J. (ed.). *St. Paul's Grotto, Church and Museum at Rabat, Malta*, 55-62. Malta, Progress Press Co. Ltd.

Caruana, A.A. 1898. *Ancient Pagan tombs and Christian cemeteries in the islands of Malta. Explored and surveyed from the year 1881 to the year 1897.* Malta.

Trump, D.H. 2000. *Malta: An Archaeological Guide.* Revised Edition. Malta, Progress Press.

Site Plan of Wignacourt Museum Hypogeum I





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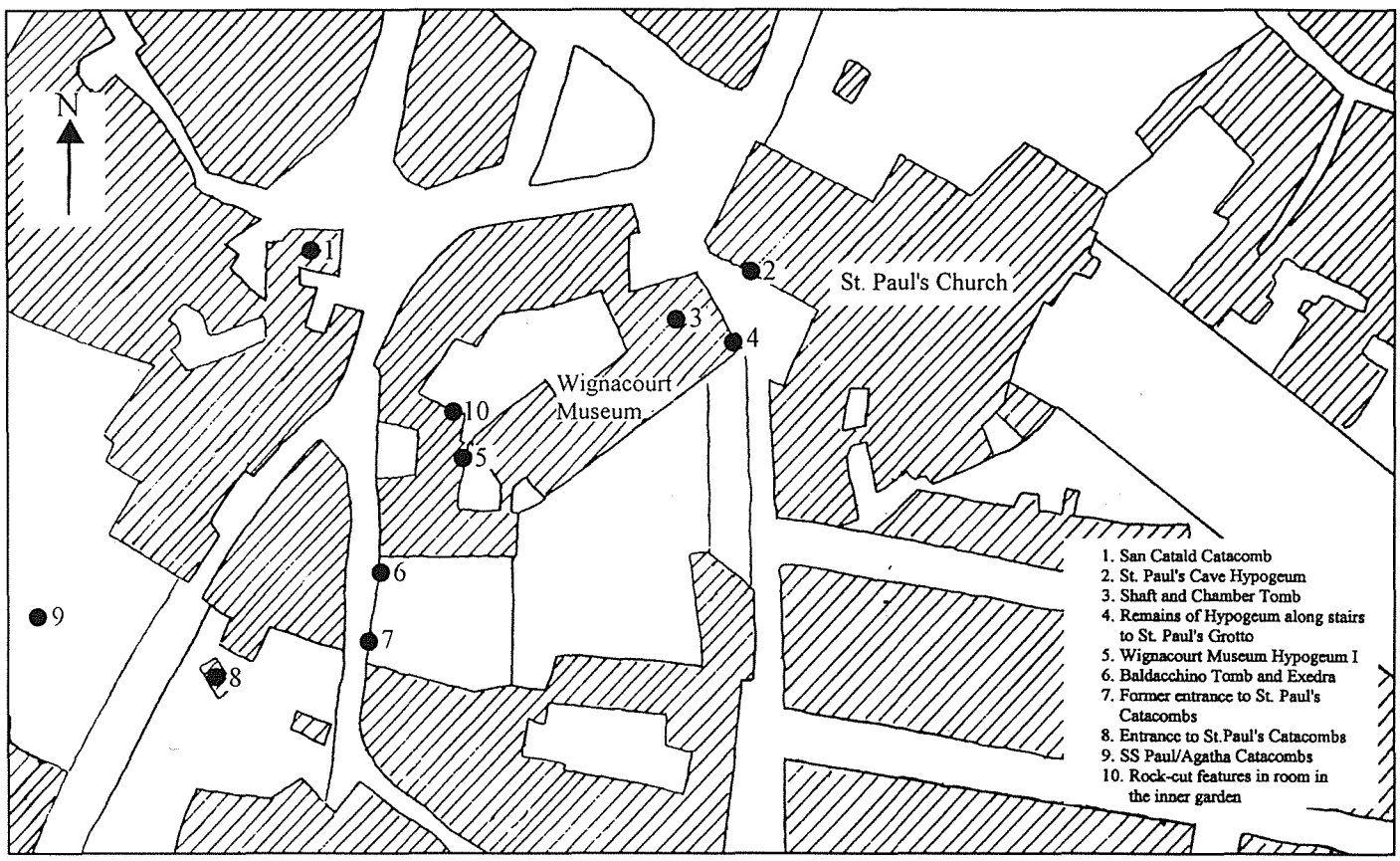

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Figure 1

AB 2001

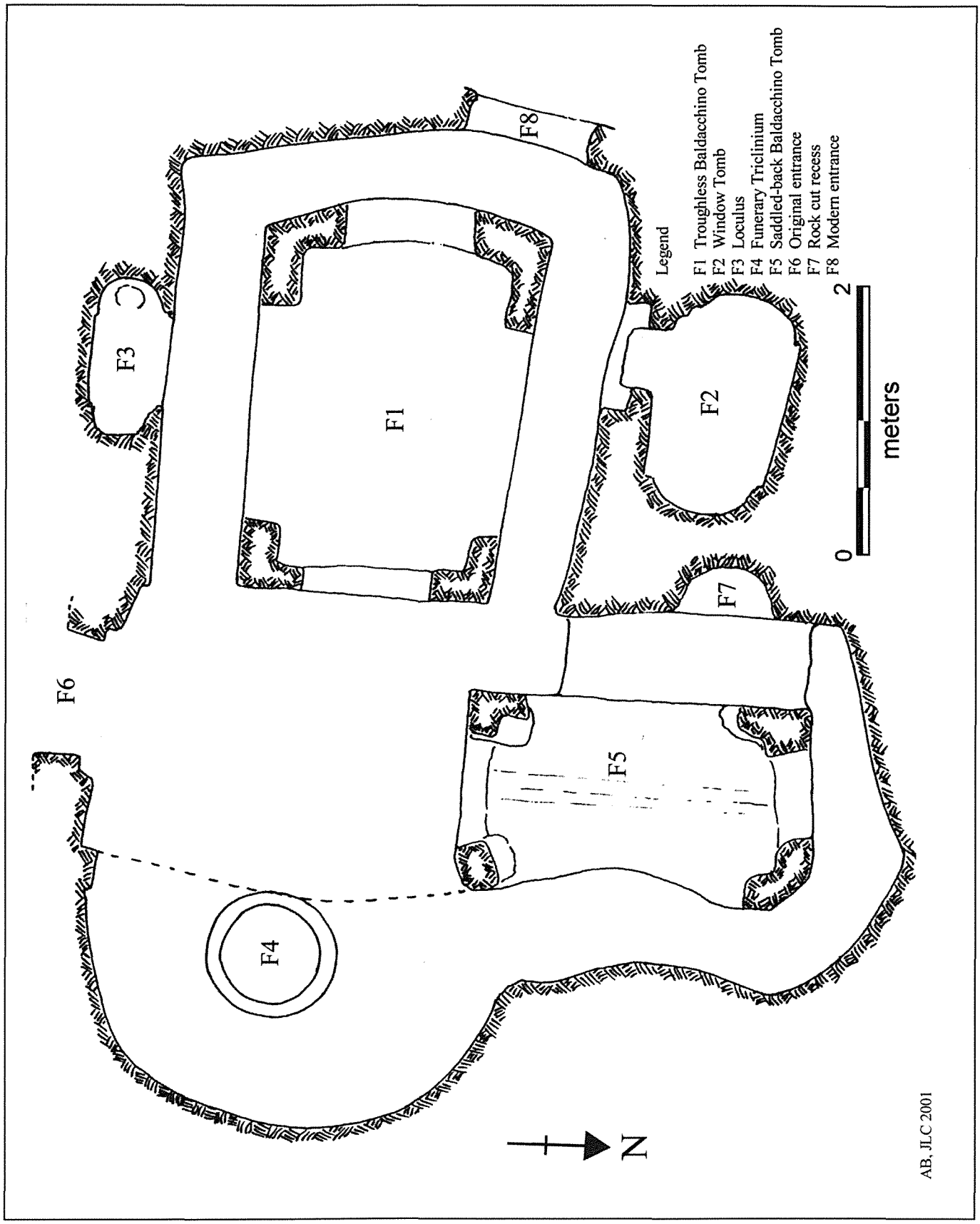
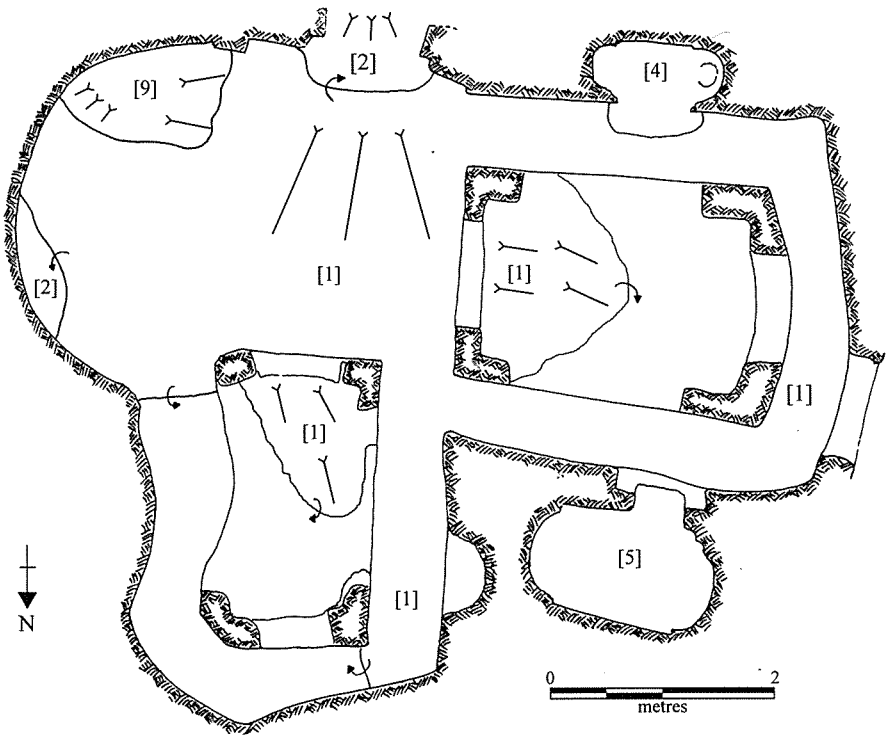


Figure 2: Plan of Wignacourt Museum Hypogeum I

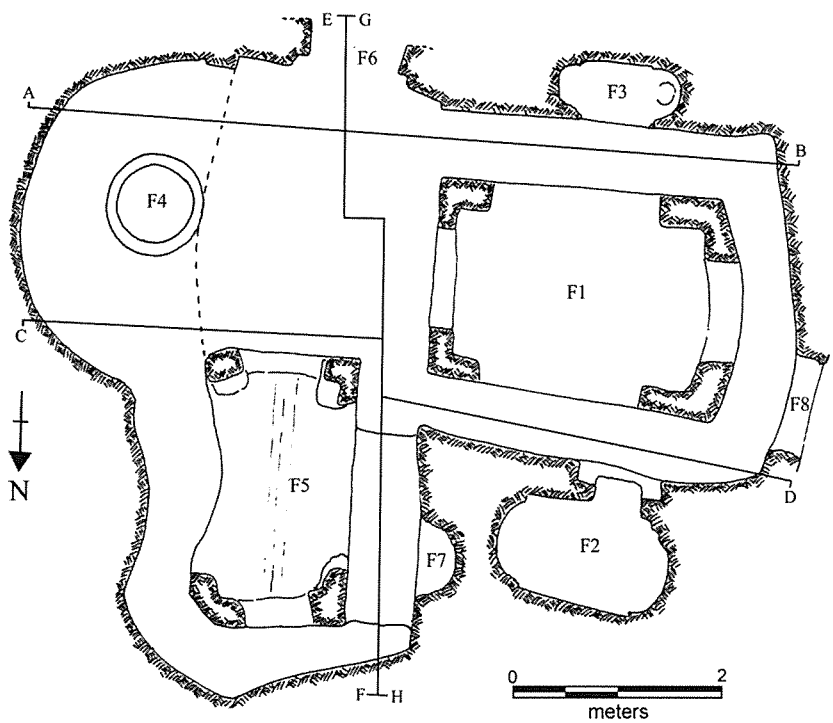


Description of deposits

[1] globigerina chippings and rubble
[2] soil and stone infill
[4] soil from loculus
[5] fine globigerina powdery layer forming upper layer of window tomb
[9] stone rubble over exedra

JLC, AB 2001

Figure 3:- Distribution of globigerina chippings [1] and location of other deposits



Legend

F1 Troughless Baldacchino Tomb
F2 Window Tomb
F3 Loculus
F4 Funerary Triclinium
F5 Saddled-back Baldacchino Tomb
F6 Original entrance
F7 Rock cut recess
F8 Modern Entrance

JLC, AB 2001

Figure 4: Sections through hypogeum

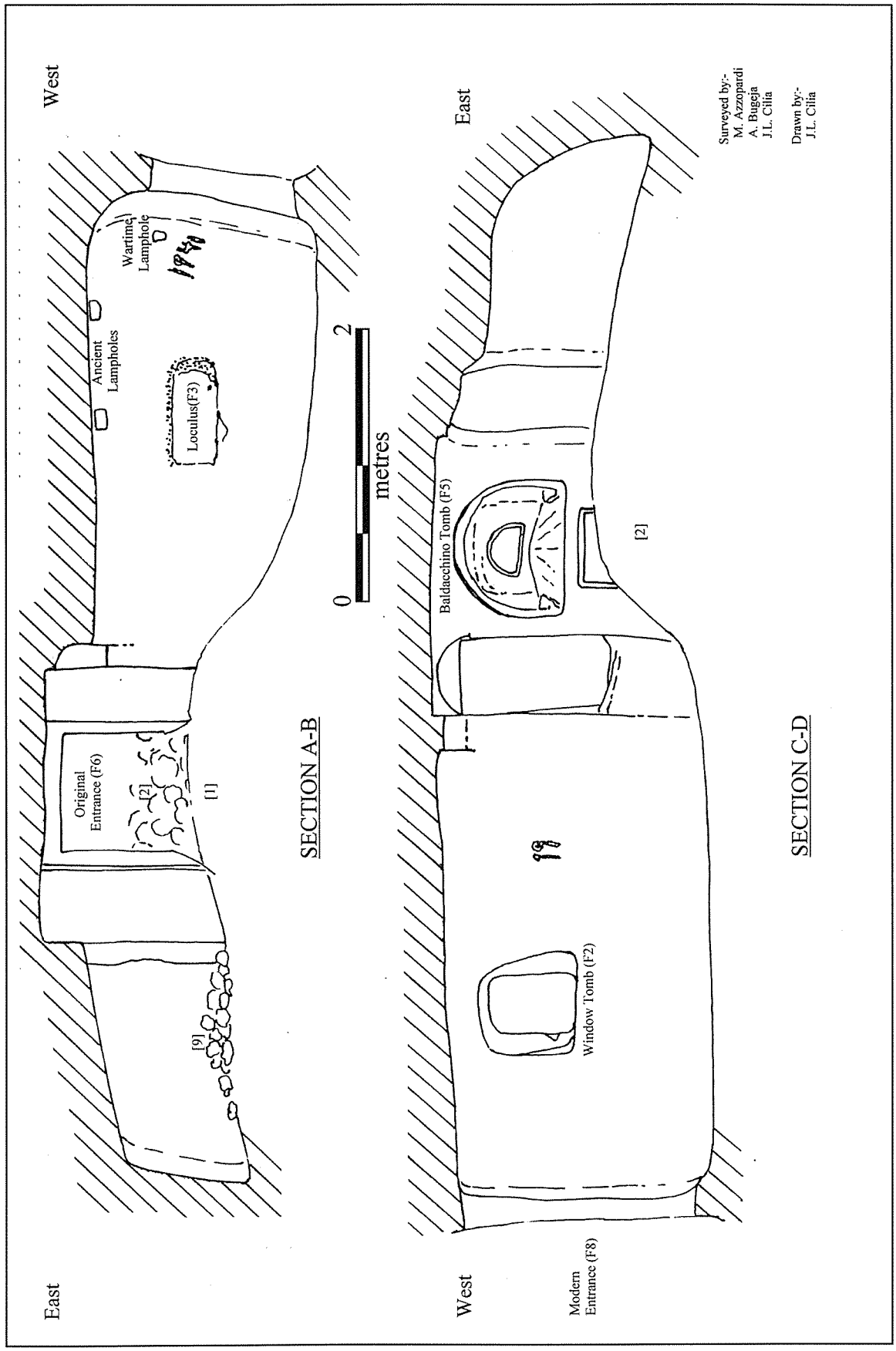


Figure 5: Sections A-B, C- D through Wignacourt Museum Hypogeum 1 as at end of excavations (stippled area represents plastering)

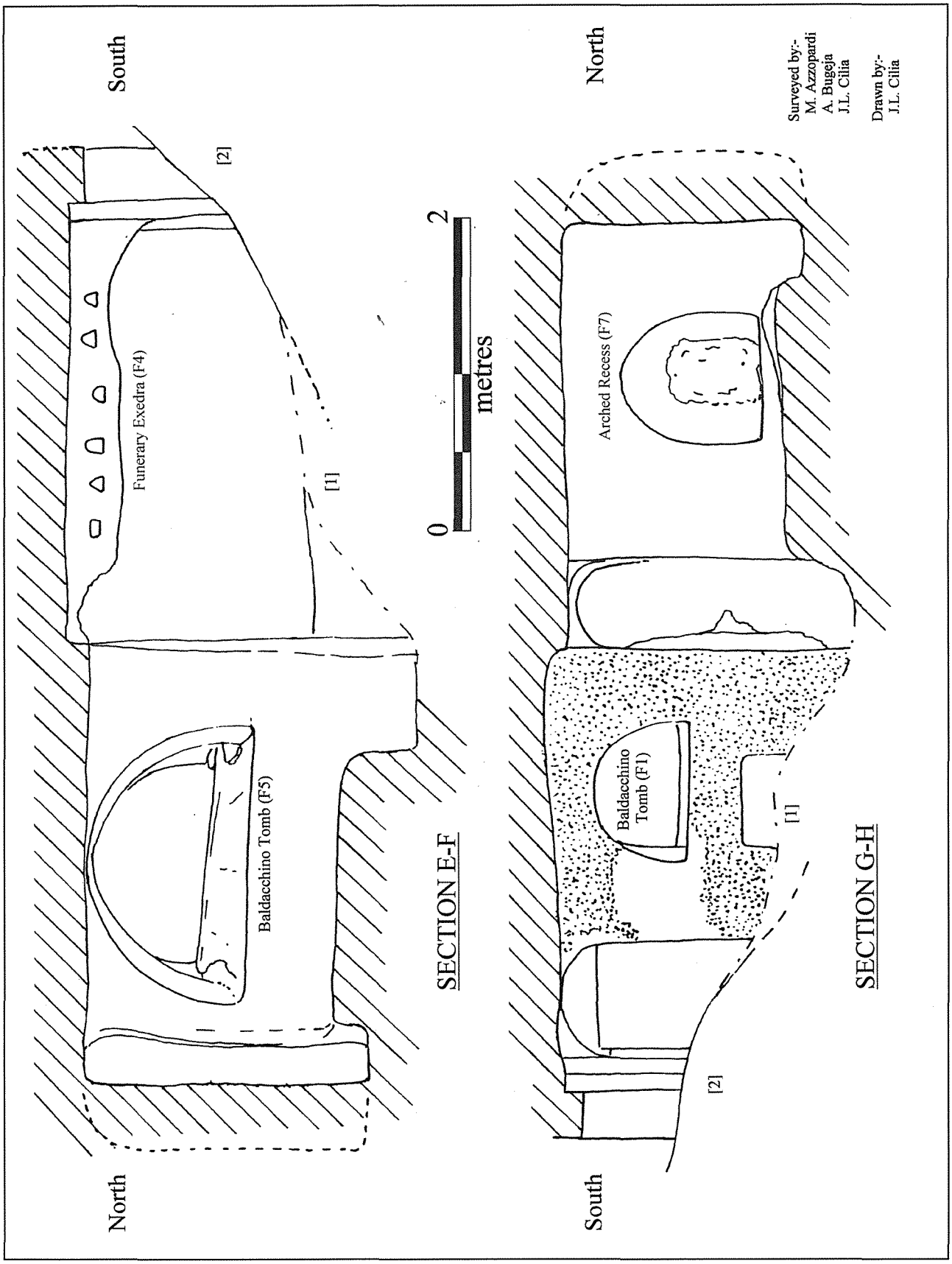


Figure 6: Sections E-F, G-H through Wignacourt Museum Hypogeum 1 as at end of excavations (stippled area represents plastering)

Plate 1: Original entrance containing soil below globigerina chippings

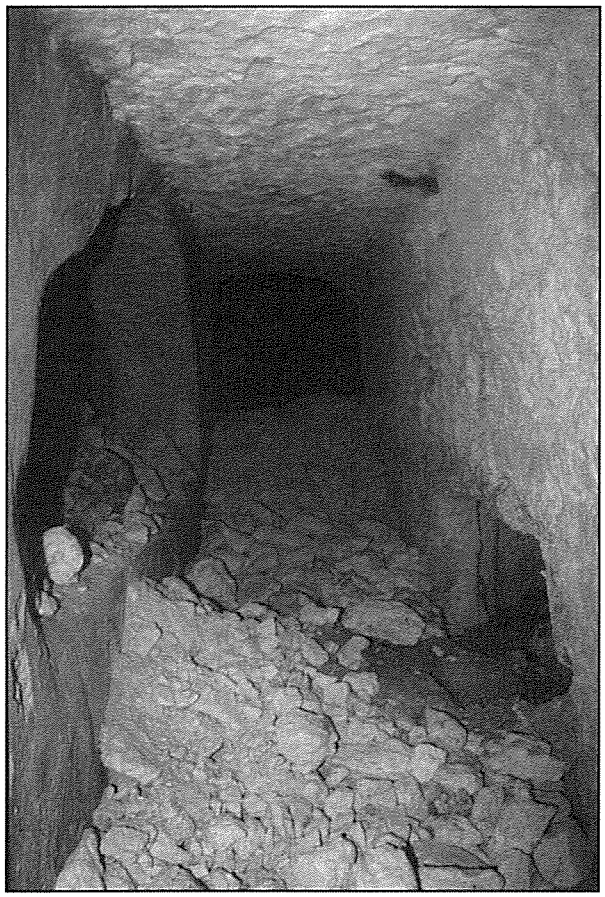


Plate 2: Soil in front of loculus

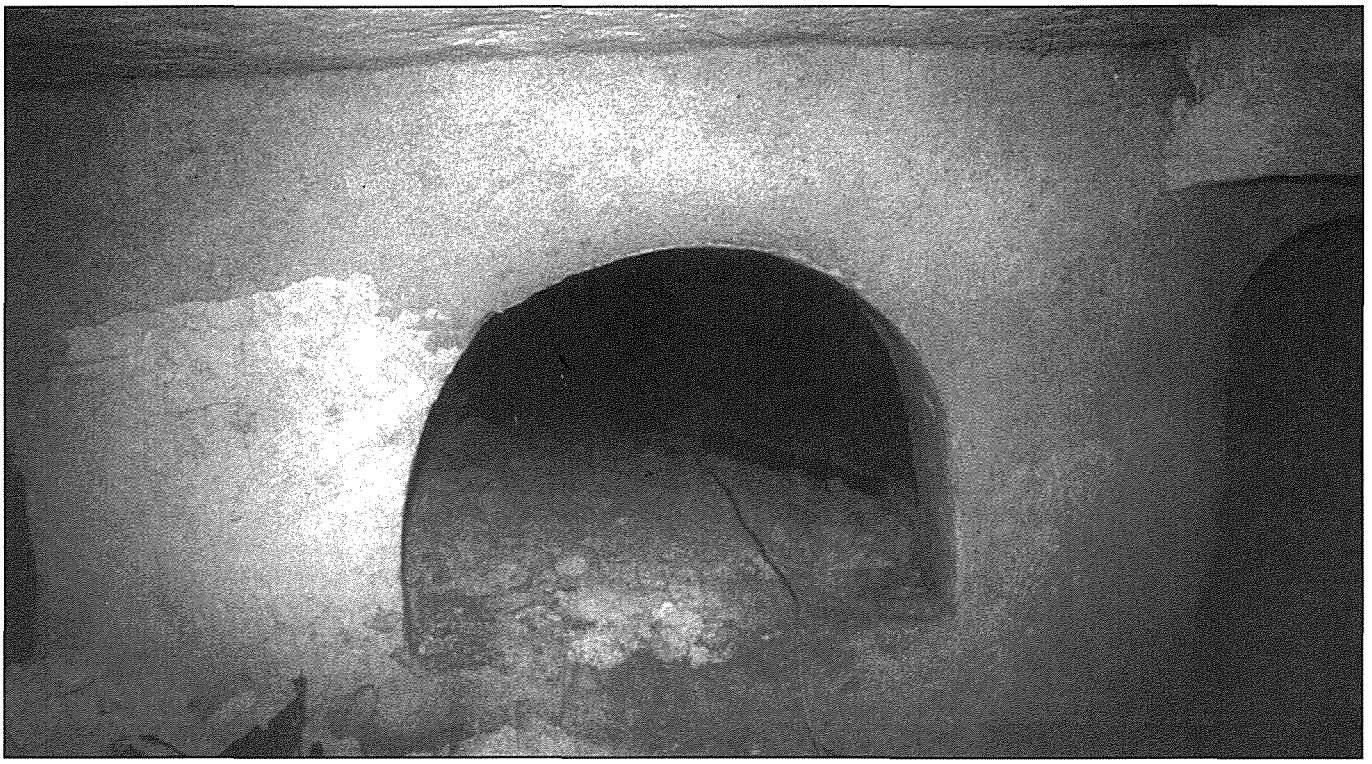


Plate 3: Cocciopesto on eastern face of Baldacchino F1

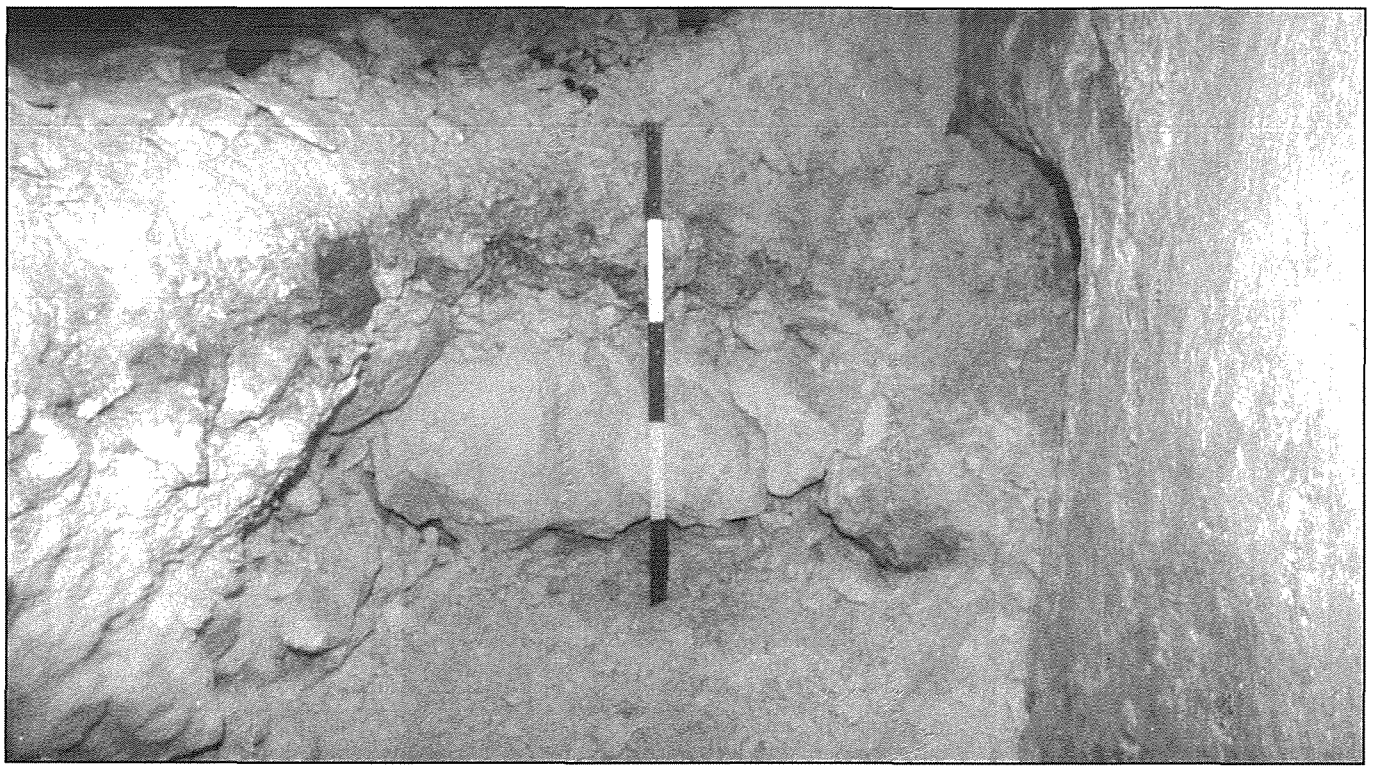


Plate 4: Sterile soil layer within globigerina chippings

Plate 5: Bones in Baldacchino tomb F5

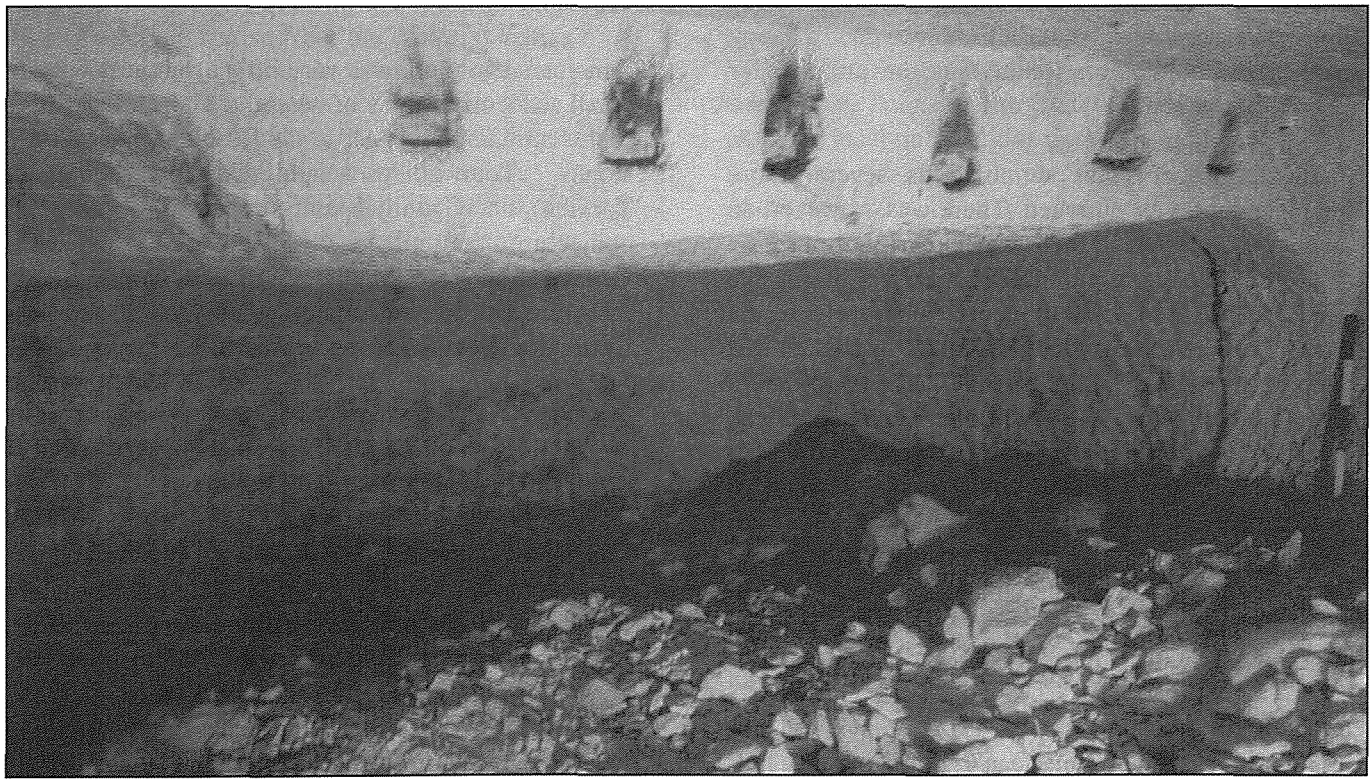


Plate 6: Lampholes over exedra

The OTS Foundation

Linda Eneix

Ten years ago, a Maltese scholar stood in the sun at Hagar Qim Temple. In conversation he said something to the effect that: "They are quite amazing, aren't they. But the temples are being ruined by exposure like this. They need to be covered with domes over them or something, but that would cost a lot of money. The government doesn't have it." He happened to say this to someone who took him seriously and an idea was conceived for an American non-profit corporation that could attract US Dollars for the purpose of protecting the temples. American tourists would love to learn about Malta, and they are generous for a good cause. If it could be properly harnessed, cultural tourism - as opposed to the exploitative kind - would be the natural way to fund expensive preservation projects. An organization could be incorporated in such a way that it could do fund-raising and collect donations, which would be U.S. tax-deductible. It seemed such a good fit. "All that's needed is to teach North America about the temples and ask the Maltese government to tell us what they want to do... a happy productive cooperation." And thus the premise for The OTS Foundation was born.

Predictably, the infant stumbled as several more fundamental issues emerged. There was, however, an inexplicable drive and there was integrity of purpose. A program for continuing education credit for the American Institute of Architects came early in the growth process. It demonstrated that when the temples were examined with background in a discipline outside the traditional archaeological, remarkable observation was the result. That first architect's program opened many eyes. Because of an expensive provider registration process, it also left the burgeoning foundation with three meaningless letters in the legally registered name of the company. (In answer to a demand for interpretation, Old Temples Study is the current choice.)

In the years since then, The OTS Foundation has brought thousands of American visitors to the islands to learn about Malta. Revenues from a successful educational travel program, generous donations and much hard work on the part of OTSF staff resulted in an archaeology laboratory for the University of Malta, a meeting of conservation experts to examine the temples, a prehistoric heritage awareness campaign for youngsters, filming of a documentary about the temples for broadcast on the Discovery Network, a grant for continuing research and rebreeding of the Maltese Ox, upcoming free seminars for educators in Gozo and Malta focused on the temples, and a temples preservation support campaign. Less publicly, the foundation has liased with scholars and researchers from all over the world, harnessing resources such as a manufacturer of long-term-use tent structures, a forensic anthropologist who does facial reconstruction on skeletal material, DNA and carbon-dating laboratories, a company which leases ground-penetrating radar equipment, a chemist in Hawaii with a stone consolidant formula, a specialist in acoustical archaeology, a researcher of ancient monumental measurement, and numerous university-level instructors who are putting Malta in the picture of prehistory.

Ten years ago there was very little awareness outside small academic circles of what the Maltese megaliths represent. To most people the temples were just old stones. Tour guides would take their clients to Tarxien or Ggantija and unfold any sort of conjecture they liked. The National Tourism Organisation of Malta published and widely distributed full-colour materials on Valletta, Mdina, Cottonera, Gozo, Golfing in Malta, Diving in Malta, Food in Malta and even Weddings in Malta, but no brochure on the islands' incomparable archaeological remains. Ten years ago there was only one traffic light in Malta.

The islands have come a long way in a decade. It does seem that more and more people are beginning to recognise the priceless national treasure, which the temples represent, and there is hope on the horizon that the monuments will soon get the conservation attention they deserve. Ongoing research will undoubtedly reveal more of the secrets of the astonishing civilisation that created them. If The OTS Foundation has had any part in a growing interest and appreciation for the Maltese temples, then it has served its purpose well.

Publications of Archaeological Interest

A review of a number of books and articles of archaeological interest published in 2000-2001 is provided in this section

Il-Preistorja
Anthony Bonanno
Publikazzjonijiet Indipendenza

Attempts to write the prehistory of the Maltese Islands in the vernacular language are not few and are mostly restricted to works concerning the history of villages. While some provide information not accessible elsewhere many leave much to be desired in terms of content and accuracy.

The thirtieth book in the Maltese Encyclopedia Kullana Kulturali distinguishes itself by providing an excellent updated and reliable overview of prehistory equalled by no other local publication in the Maltese language. Such characteristics arise from the editorial decision to entrust this task to Professor Anthony Bonanno, a scholar with a long experience in the study and research on the subject. In works by this author, other than an overview of local prehistory a secondary theme usually develops, such as a focus on the island of Gozo or Malta's relevance to the Mediterranean. In the present work it is the archaeology of the landscape, which features prominently.

The book under review contains a chapter describing each period of Maltese prehistory. Beyond giving information on cultural development of these phases, insights into the economy, commerce, agriculture and architecture of the various periods are also provided. Two other chapters, namely on the development of prehistoric chronology and a study of the Maltese archipelago (or land mass) before the arrival of man, provide an appropriate introduction. The notes and references to each chapter do not only supplement the contents, but often provide the only information available on observations made by the author and other unpublished material. A glossary and an index at the end of the book provide a useful aid to those intending to use the publication as a reference book.

The editorial work on the text has been thorough leaving the orthography virtually flawless. This comment, however, cannot be extended to the illustrations. A twentieth century staircase now provides the exit not the entrance to the hypogeum (page 68). Megalithic remains at Borg in-Nadur (page 111) should not have been included with a plan of the fortified Bronze Age village in the same locality. While the Maltese lettering accompanying the plans on page 78 shows the thoroughness of adapting the diagrams to the present publication, this has not been applied to the plan on page 54.

Notwithstanding these minor observations, the reader should not be distracted from the true value of the book, which provides a synthesis of current thinking on Maltese Prehistory. Its scholarly nature and the use of the Maltese language are likely to make it a reference work for local publications on archaeology.

Anton Bugeja

The Roman Villa at San Pawl Milqi
History and Perspectives of an Archaeological Site
David Locatelli
(Treasures of Malta Vol. VII no. 2 pp 73 - 77)

A communication on the remains at San Pawl Milqi is provided by an article in the Easter issue of Treasures of Malta (2001). This overview contributed by David Locatelli, starts by describing the excavations carried out by the Italian Archaeological Mission. The strategic location overlooking possible coastal landings and at the same time allowing communication to other internal settlements are considered as the reasons why prehistoric communities used the site in the Zebbug Phase and in the Bronze Age.

More substantial remains from the site belong to the Punico-Hellenistic period (IV-III B.C.) from which a rural tenement with residential areas was uncovered. The site later experienced a decrease in size to a Villa Farm in the Republican period and remained in use during the Imperial Period. The site was also fortified on its western side by double fortification walls and a tower.

The tradition linking these remains to the advent of St. Paul to the Maltese Islands is discussed briefly by considering historical, topographical and archaeological evidence. These data are "not very determining if examined singularly" but are considered to "acquire the value of an indicative sign if examined in their entirety."

The contribution provides insight into the current work being done on the site for the eventual opening of the remains to the public. Archaeological work has re-examined previous finds, embarked on a stratigraphical survey of the remains and attempted a geological study of the area. Documentation of the remains and details into the restoration work on site indicate that San Pawl Milqi may in the future become one of the key sites presented to the tourist and Maltese public.

Anton Bugeja

Malta: An Archaeological Guide
D. H. Trump
Progress Press Co. Ltd.

Trump's archaeological guide needs no introduction. For collectors of Melitensia it is well known to combine an eloquent style with first hand knowledge of Maltese Archaeology to produce a publication which is both a useful guide to archaeological sites for the beginner and a reference to scholars.

Only the tri-partite division of the front cover reveals that originally it was meant to form part of a series edited by Glyn Daniel, describing many ancient cultures. Since that first edition the book has undergone two reprints and two further editions.

The book starts with a useful introduction to the Maltese Islands and than continues to highlight the important aspects of the various sites. The latter are divided according to six geographical regions, and a useful map indicts the location of the archaeological remains.

This revised publication reproduces much of the text appearing in previous editions. New discoveries or hypothesis have made necessary the revision of some parts and no opportunity is lost to this regard. Comments are expressed on proposals of Palaeolithic human presence on the islands (page 92, 103) while the nature of transition between the Temple and Bronze Age period commented upon (page 33). Descriptions of the Museum of Archaeology at Valletta and the hypogeum were revised following works on these two sites. The addition of three paragraphs on the Brochtorff circle is a welcomed addition (pages 177-178) but thoroughness of detail is revealed by comments on recent finds at Mdina (page 119), the discovery of a wall at Borg in-Nadur (page 95) and the rediscovery of the location of the Xaghra Tomb (page 178).

The book is now illustrated with colour plates, which unfortunately are blurred reproductions of those in previous editions. Notwithstanding anyone interested in Maltese archaeology cannot refrain from obtaining a copy of the book which is certainly to be recommended.

Anton Bugeja

Malta Archaeological Review
Patricia Camilleri (editor)
Archaeological Society
(Issue 4 - 2000)

The commitment of the Archaeological Society towards scholarly publication is evident in the increasing number of colour-illustrated pages, which characterise its annual review, now in its fourth issue.

It is through interpretation of archaeology as a discipline that studies the material remains of the past, that allows the inclusion of two articles dealing with historical buildings. Stephen Spiteri calls upon his extensive knowledge of military architecture to review documentary, cartographic and physical evidence on the *Castellu di la Chitati* and the *Fasil* of the Mdina. Extensively illustrated, the article revises previous ideas on the subject and concludes through a valuable reconstruction of the fortifications of Medieval Mdina. Kenneth Gambin provides a well-researched overview of the early history of the Inquisitor's Palace in Birgu, with special emphasis on the intervention of Carapecchia on this building.

A seven-page overview of the busy schedule of the Museum's Department is summarised by Buhagiar. Such communication, more generous than that provided by the Annual Reviews, is certainly welcomed but considering the value of this information, fuller reports are always desirable. The Review appears to address this situation by including an article by members of the Missione Archaeologica a Malta, whereby results of previous work at Tas-Silg and reports on current excavations are given a lengthier treatment. Likewise a report is given by Dr. Nicholas Vella who, co-ordinating several students in the B.A. Archaeology course, reassesses the value of the Ghajn Klieb area excavated in the early decades of the twentieth century.

Two other articles constitute a summary of more extensive research. Quercia analyses the evidence for ritual meals found in Punic tombs and the sanctuary of tas-Silg, while Stöger provides a review of the archaeological legacy of Albert Mayr.

Fr. Camilleri, curator of the historical complex of St. Agatha in Rabat gives an overview of the heritage lying within this well known area in Rabat.

The increasing number of journals and books on the islands currently dealing with heritage issues is certainly encouraging. Notwithstanding, five articles in the 'Review' could easily have been developed further to occupy separate publications. It is only hoped that in the future, government or private initiatives are undertaken to provide publication space for such studies. But for now, one can only congratulate the Archaeological Society for doing its part in bringing these contributions together.

Anton Bugeja

Il-Wirt Arkeologiku Ta' Hal Kirkop
Anthony Bonanno and Nicholas C. Vella

The number of books describing different historical aspects of various localities has flourished in the past months. Taken together they are a welcomed contribution, which helps to form a better mosaic of the history of the Maltese Archipelago.

Hal Kirkop u l-Inhawi ta' Madwaru, edited by H.C.R. Vella, is one of the latest contributions in this field. With only eight pre-medieval sites to discuss, this presented no easy task to write the first chapter but was tackled particularly well by Professor Anthony Bonanno. A geographical assessment of the landscape around the village introduces the study and provides reasons why particular remains were found (or not found) in the area under study. The individual sites are discussed within the wider development of the prehistory and early history of the islands leading to an article that not only provides essential information on the sites but aids in their understanding.

A comment on the controversy of Palaeolithic human presence on the islands, the proposal of structures in stone and mud as the earliest stages of temple building and the erroneous reference by Jean Houel of the Safi wall are noteworthy. The well known menhir at Kirkop is attributed a Bronze Age date. Reference is made to the little known classical remains at Tad-Dawl, which appears to have been another casualty of the construction of the Luqa Airport.

The study is accompanied by photographs and plans prepared by Dr. N.C. Vella, providing a tangible representation of the subject matter discussed.

Anton Bugeja

The Excavations at Tas-Silg: Malta and the Archaeology of the Ancient Mediterranean
Antonia Ciasca and Maria Pia Rossignani
(Treasures of Malta Vol VII, No 1, 2000: 63-65)

This short article provides a valuable description of the results achieved by the Missione Archeologica Italiana a Malta in its archaeological investigations of Tas-Silg, San Pawl Milqi and Ras il-Wardija. Although the title of the article mentions only the site of Tas-Silg, it in fact describes very concisely the main conclusions reached by the Missione in the two latter sites as well.

The archaeological investigations by the Missione started in 1963. Although the eight consecutive years of the campaign were followed by preliminary reports, few publications have been issued after these reports by the team of excavators that revealed further information than the latter reports. Besides vaguely describing the major conclusions, this article also wets our appetites by informing us about ensuing final reports of the investigations at San Pawl Milqi and Ras il-Wardija.

The site of San Pawl Milqi was an agricultural complex that was founded in Punic times (3rd century

BC) and inhabited later by both the Romans and the Byzantines. The latter probably linked the site to the Pauline cult in Malta, hence the toponym of the area and the still-standing chapel upon the remains of the farm.

The article provides very few information on the Hellenistic sanctuary at Ras il-Wardija on the island of Gozo. One augurs that the publication of the excavations of these two sites will reach us "in the next few years" as specified by the authors (pg. 64).

The site of Tas-Silg provided a more complex scenario to the Italian archaeologists because of the long stratigraphic sequence ranging from the Tarxien phase to modern times. The sequence of occupation of the sanctuary-site provided a number of problems to be solved and questions to be asked. These were re-taken by the Missione in 1995 when further archaeological investigations were carried out. This is taking place together with the conservation and preservation of the site, which is badly needed.

The authors put forward a number of valid interpretations on the site, and described the sequence of events that formed the site. They have also provided a glimpse into the conclusions reached after the recent investigations especially pertaining to the Christian era of the site. However, this together with much more data is expected to appear in the long-awaited final reports of these excavations.

Marlene Borg

Grupp Arkeologiku Malti

During the two-year period 2000 – 2001 the Grupp Arkeologiku Malti has consolidated elements which now characterise the group and had the opportunity to respond to changes currently experienced by heritage organisations.

Tours to archaeological and historical places remained the backbone of the group's activities. A number of localities with a concentration of sites were identified and chosen as destinations for the weekend meetings. The southern side of Salina Bay remains a favourite venue where remains of the prehistoric (Tal-Qadi), classical (Salina catacombs) and the Knights period (fortifications and fougasse) were visited through a comfortable walk. Another interesting activity was the visit to the cart-ruts, Bronze Age settlement and the alleged remains of a dolmen near Qala Hill in the vicinity of Mgarr. This was well attended by members of the group despite the heavy February rainfall. The Punico-Roman tombs and the Latmija cave on the Marfa ridge were visited in another activity.

A number of archaeological remains incorporated within the buildings at Mdina, the Roman *Domus* and St. Paul's catacombs were visited during a walk intended to allow appreciation of the various functions of the landscape in ancient Melitae and its environs. In an unprecedented exercise, a number of tours open to the public were organised to Ghar il-Kbir and the nearby 'Clapham Junction'. Xemxija Hill is another area rich in archaeological sites, the prehistoric temple, tombs and apiaries providing an excellent setting for a vivid discussion.

The Gozo trips now in their third year were well attended. A visit to the Gozo Museum and Citadel featured prominently, but the group did not fail to visit Ghar Gerduf, Ras il-Wardija, L-Imrejsbiet, Ta' Marziena, Nuffara Hill and the menhir and cart-ruts at Qala. Other sites of historical interest visited included the Gozo Folklore Museum and the saltpans at Tal-Arloggar at Ghasri.

Although recorded archaeological remains make up most of the sites visited no opportunity was lost to discover newly found or recovered sites. The remains excavated in Mdina were a well appreciated detour to one of the activities while an unexpected large group made it to the bath and cave at Ta' Baldu. The Ghajn Klieb burial site, which has recently been surveyed in further detail, was also visited. References were made to the possible silo-pit under the bastions of Mdina.

It is well known that GAM does not refrain from taking the less trodden track to find the virtually unknown sites that manage to escape the best guidebooks available on the islands. Ta' Mrejnu and Ta' Blankas are the names of localities containing remains of dolmens. The alleged remains of a hypocaust at Torri Falka were also visited. The Mtahleb tombs and l-Ghar ta' Fuq ir-Rixtellu documented by Temi Zammit and Cesare Vassallo respectively were highlights during other visits.

Notwithstanding these interesting activities, an appropriate understanding of the various sites necessitates familiarity with the main sites that represent the prehistory and early history of our islands. Through substantial help from the Museum Department visits were made to the National Museum of Archaeology, Ghar Dalam, Hal Saflieni Hypogeum, Borg in-Nadur and San Pawl Milqi.

Certain concepts are only adequately communicated through formal lectures and in the past two years the number of talks organised increased substantially. Three lectures highlighting the archaeology, geology and military architecture of the Great Fault prepared the way for another walk along the Victoria Lines. Guy Schneider from IVS gave an interesting talk on studies of historic routes and cart-ruts in Switzerland. Members of the group discussed the dolmens of the Maltese Islands and countryside heritage in another two talks.

First hand experience into the techniques of excavation was provided to members of the group through works at the Wignacourt Museum and Mdina under the supervision of the Museum Department and the Archaeology Services Co-op Limited respectively. Abseiling, boat trips and night hikes were always well attended. Particularly well remembered is a night visit to the cultural sites in Siggiewi.

Maria Azzopardi (secretary for Social Activities)
Anton Bugeja (secretary)

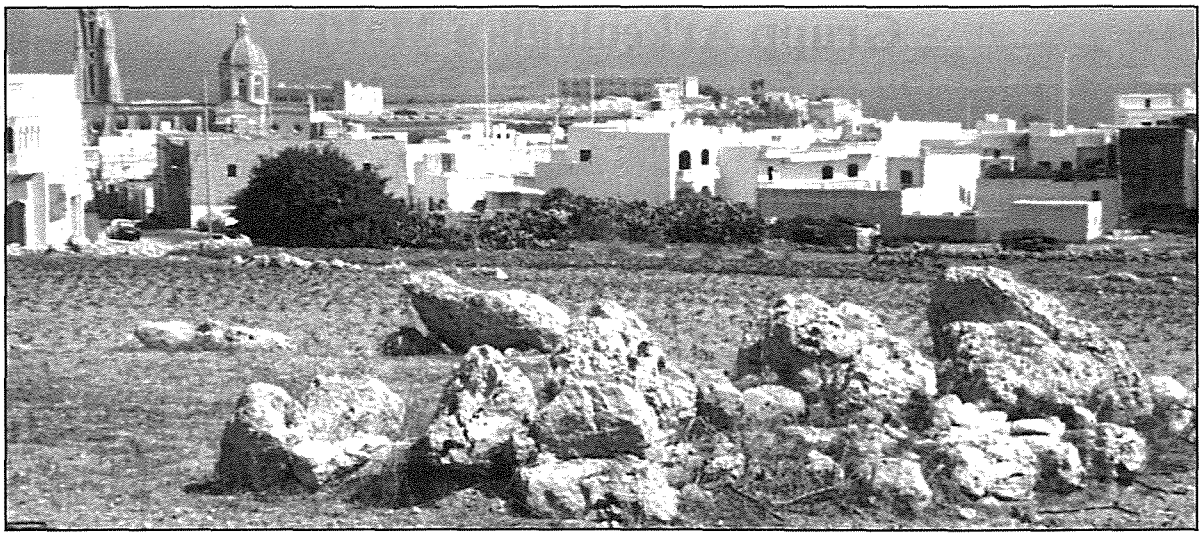


Plate 1: Megailths of l-Imrejsbiet overlooking the village of Ghajnsielem (Photo: A. Bugeja)

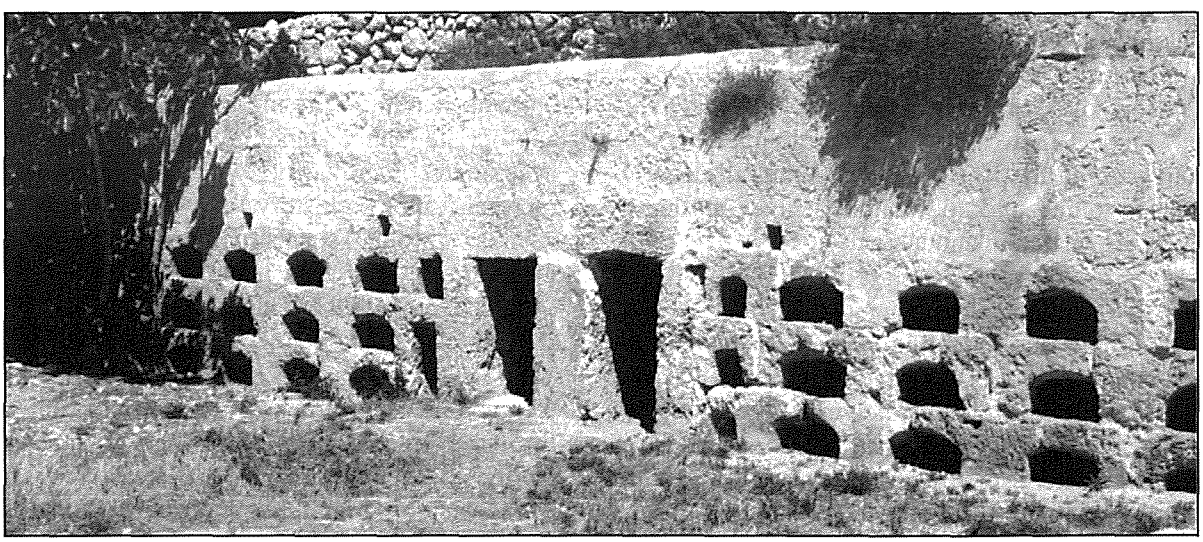


Plate 2: Il-Migbha, an apiary at Xemxija (Photo: A.Bugeja)

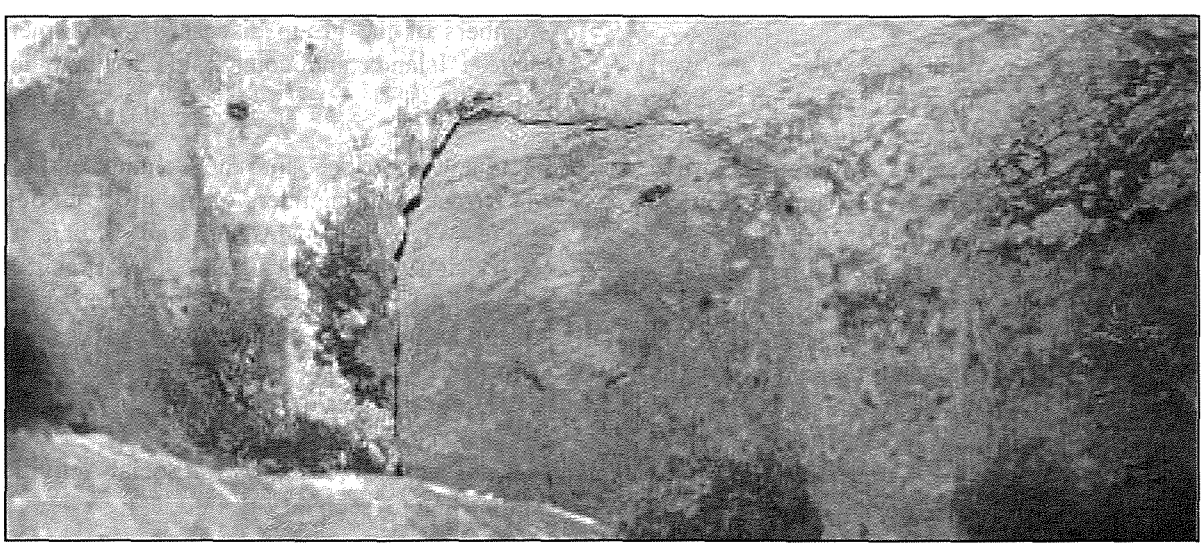


Plate 3: Details of a Temple period burial chamber at Xemxija (Photo A. Bugeja)