In the Shadow of Megaliths: the forgotten tools and implements from Malta's Prehistoric Temples

A material study and contextual approach to the Neolithic Temples of Tarxien, Malta, 3600-2400 BC.

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17th of June, 2013, Leiden

Version 2.5.3, final

TABLE OF CONTENTS

PREFACE

First of all, I thank Dr Hanna Stöger for supervising my work and introducing me to her contacts in Maltese archaeology. Without this I would not have been able to carry out my research on this subject. I owe gratitude to Dr Miguel John Versluys who was the BA-thesis-coordinator and helped with useful advice on writing a thesis, and to Annemieke Verbaas for sharing her knowledge on Neolithic artefacts and helping me to group the artefacts into a typology.

Special thanks go to Ms Sharon Sultana, senior curator at the National Museum of Archaeology, Valletta (Malta), for her kind support during my internship at the museum and providing access to all available data. I also thank Dr Nicolas Vella, head of the Department of Archaeology of the University of Malta, for providing me with useful information and literature. Furthermore, I would like to thank Mr Eric Dullaart for helping me with the design of the main database, and Dr Cynthianne Spiteri for allowing me to use her digital database retrieved from Sir Themistocles Zammit's notebooks (compiled in 2004). Finally, I thank Marten van Nieuwkoop, who kindly supported me during every step of my research.

1. INTRODUCTION

The Maltese archipelago is located in the centre of the Mediterranean, about 100 km southeast of Sicily and *c.* 300 km away from Tunisia and Libya. It consists of a number of small islands, Malta and Gozo being the largest. During the Neolithic period, the islands witnessed the development of a remarkable phenomenon: over 30 large stone complexes were built and used across the islands by a Neolithic society between 3600 and 2400 BC (fig. 1).

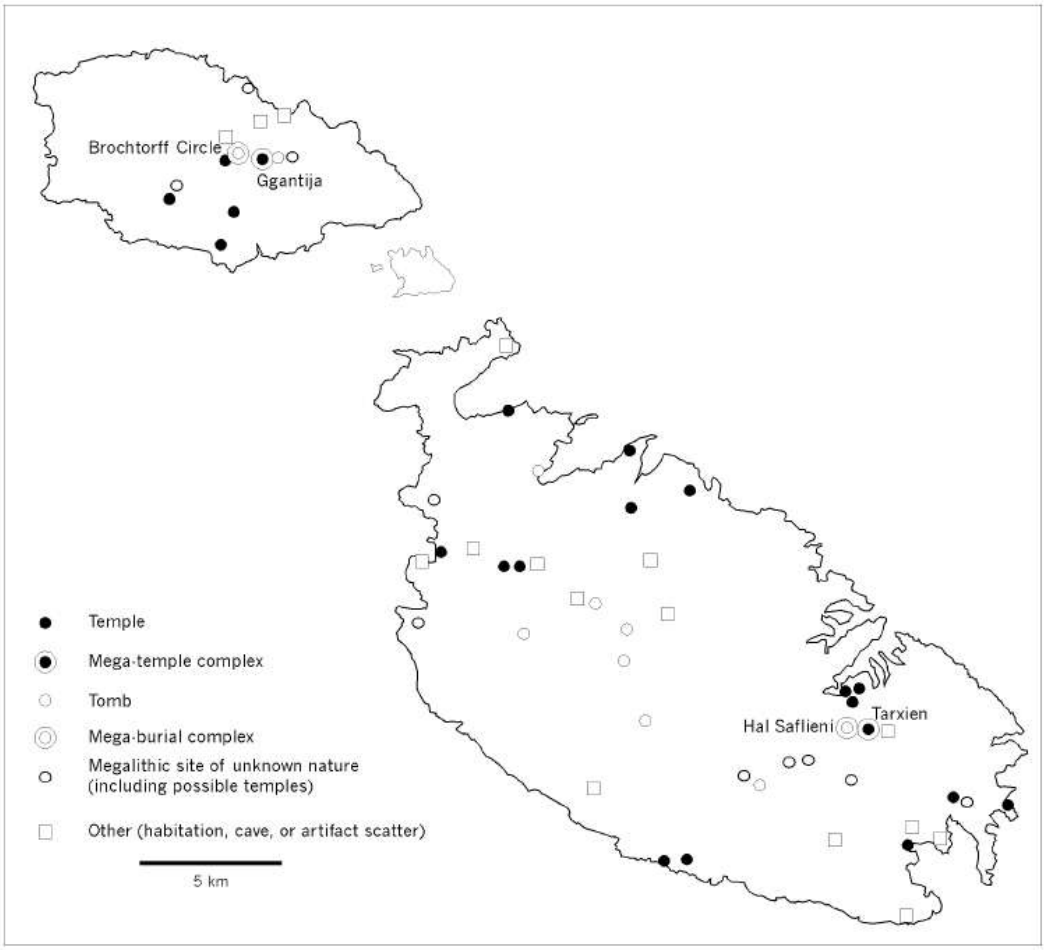

Figure 1: Map of Malta and Gozo with the different archaeological sites (from: Robb 2001, 179)

These built structures are commonly known as prehistoric megalith 'temples', and have been mainly studied and understood within the context of Neolithic belief systems. This understanding might be too one-sided since it places these marvellous structures too firmly into the realm of ritual activity, while other aspects, possibly of a more mundane nature, appear to be neglected. In order to challenge this bias, this BA-thesis turns away from the impressive megaliths and concentrates on the small finds which

remained unnoticed and hidden 'in the shadow of the temples'. These less spectacular finds were neglected both in excavations and the subsequent interpretations.

This study concentrates on a substantial amount of small objects retrieved from the Neolithic layers of the megalithic temple complex of Tarxien, Malta. It aims to shed new light on artefacts which have not received much attention since they were brought to light almost a century ago (1915-19). These objects are made of bone and local limestone or chert, but also include imported materials like obsidian and flint. The total number of artefacts present in the assemblage is not exactly known, but is probably over 350 single objects.[1] The assemblage contains objects of everyday objects like querns and grinding stones, rubbers, hammer stones, burnishers, needles and awls, scrapers, and knives (or blades) and other objects of daily use.

By carefully examining these objects and their possible functional use, new ideas about the activity patterns present in the megalithic temples can be formulated. This research presents a systematic analysis of the objects by way of a detailed catalogue, and discusses the functional quality of the objects. Within the remit of this BA study it was not possible to investigate the objects in greater detail, therefore, a microscopic study of wear traces is not included, but might be considered at a later stage. The study seeks to explain the presence of these objects at Tarxien, and seeks to explore their meaning in relation to the Neolithic complex. By confronting previous hypotheses, which emphasise a ritual function of the Neolithic structures, with the new insights gained from this study, it is hoped to contribute to a better, or more nuanced, understanding of the daily activities that went on inside the megalithic structures.

The research questions central to this study concern the tools and implements[2] and their meaning within the context of the temples of Tarxien. Since this research is based on first-hand, largely unstudied data, the initial questions will be straightforward: what types of finds were present? Can we identify patterns concerning the specific types or numbers of particular find groups? What kind of information can be obtained from the finds to answer questions about the activities which took place on the site? And most importantly, what do these activities tell us about the purpose of the temples and the

[1] The total number of artefacts mentioned in Zammit's notebooks is over 264 single artefacts and the total number of artefacts present in the museum is over 313 single objects. Further information will be introduced in chapter five.

[2] In this research, 'tools' are generally the larger objects of daily use, while the term 'implements' covers the small objects of daily use. Moreover, 'tool' is generally used when it is (almost) sure that an object has been used as a tool, while the term 'implements' is generally used to indicate that an object has *probably* been used as tool.

daily life of the Neolithic society which populated the Maltese islands during this period?

This study makes use of two major sources of information: the original notebooks recorded by the excavator of the Tarxien temple site (Sir Themistocles Zammit) between 1915 and 1919, and the actual finds which were retrieved during these excavations and are being kept in the repository of the Archaeological Museum in Malta.

This thesis comprises seven chapters, including this introductory chapter, and a conclusion. The first main chapter, Chapter Two, provides a brief overview of scholarly approaches to Maltese prehistory and puts forward various scholarly opinions on how and why the temples were built. This will help to define the aims of this study more clearly. Even more so since a stock-take of the earlier publications clearly identified the lack of attention paid to small archaeological finds in most studies concerning Maltese prehistory.

The Third Chapter focuses on the temples of Tarxien, but also presents a brief discussion of Malta's development before the Tarxien complex was built. Tarxien marks the final phase of Malta's Neolithic (or Chalcolithic) period and links up with the succeeding Bronze Age culture. This section is intended to offer the chronological framework and an overview of the cultural development during Malta's prehistoric periods; it provides the background against which we can contextualize the group of artefacts under discussion.

Chapter Four explains the research methods followed by this study. This requires some lengthy treatment since the study combines different sources of information: textual evidence, i.e. the notebooks, and the actual artefacts from Tarxien. To be able to examine and systematically analyse a quantity of over 350 individual finds, this study makes also use of a specifically designed ACCESS database into which all finds have been entered.

The following chapters (five and six) discuss the archaeological data. Chapter Five presents the objects organised into a catalogue of the Neolithic tools and implements found at Tarxien, while Chapter Six offers the results of a systematic quantitative and qualitative assessment of the groups of implements. This is followed by interpretations based on the finds, their quality and quantity and the implications of their presence at Tarxien.

Finally, the concluding chapter (Chapter Seven) presents a synthesis of the results achieved by this study. By concentrating on the meaning of the finds in the light of their context, new insights into the purpose of and the activity patterns within Malta's megalith sites will be offered, together with ideas for future research.

2. HISTORY OF RESEARCH

This chapter provides a brief history of research. The development of Maltese Prehistory will be outlined and the related problems, difficulties, misconceptions and biases will be discussed. The purpose of the chapter is to illustrate the importance of the group of artefacts under study, and above all to underline their significance for a better understanding of everyday life in Neolithic Malta. Small finds have been neglected not only in excavations but also in the scholarly approaches to Maltese Prehistory over the last century.

It was only at the beginning of the 20th century when the first 'scientific' excavations of the megalithic monuments started. The megaliths were now recognized as a prehistoric phenomenon (Mayr 1901 in Gouder 1996, 15; Mayr 1901 in Stöger 2010, 18), while earlier scholars would attribute their origin to skilful Phoenicians (Vance 1842), or leave them unexplained as the work of mythical giants (Abela 1647). John Evans' survey in the 1950s (Evans 1953 in Trump 2007, 14; Evans 1971) and the excavations at Skorba in the 1960s (Trump 1966 in Trump 2007, 14) established the chronology of Malta's prehistory based on pottery typology and C_{14} dates.

Moreover, in the 1970s it became clear that these magnificent structures were the results of an independent and local development, as opposed to following diffusionist's views claiming external origins from perhaps the Eastern Mediterranean, Minoan Crete, or even further away: from the Orient or even the not yet explored North Africa (Evans 1971). Based on radiocarbon dating, Colin Renfrew (1973, 147) finally describes the structures as the 'earliest free-standing monuments of stone in the world', known to that date (Bonanno *et al*. 1990, 192; Renfrew 1973; Trump 2007, 14; wch.unesco.org).[3]

2.1 Difficulties in the study of Malta's prehistory

The megalithic structures are commonly referred to as 'temples', built and used by a Neolithic society between 3600 BC and 2400 BC. Studies into the built structures and their social and cultural context are generally focussed on construction techniques, the study of building materials, geological and ecological factors and resources, as well as material culture studies based on artefacts assemblages from the find contexts of some of the few stratigraphic excavations.

[3] Goblekli Tepe (southeast Turkey) is much older (+/- 10.000 BC), but was not excavated before 1995 (www.gobeklitepe.info).

In most cases, the artefacts which have been connected to these megalithic structures are difficult to interpret. From the earliest excavations there are neither records nor a proper understanding of stratigraphic excavation techniques. Moreover, since the temples have been in use over a long period the majority of finds belong to the latest phase of use. Objects of earlier phases could have been reused or discarded elsewhere, which makes it hard to examine or identify these periods.

Another problem is presented by the past excavations and their poor state of documentation. Except for a few sites, notably Tarxien and Skorba, proper documentation does not exist for most sites which have been excavated before the 20th century (e.g. Hagar Qim, Mnaidra), or excavators died before committing their knowledge to paper (Fr. Magri, who excavated the Hal Saflieni hypogeum). All this contributes to the fact that a great amount of knowledge and information has been irretrievably lost as excavations are destructive by nature. Nevertheless, this did not deter generations of scholars to investigate the meaning of the temples and search for reasons for their construction.

In the last decades, various hypotheses have been suggested and discussed. Although contradictory opinions still dominate this field of research, there is general consensus among the scholarly community that the structures were expressions of belief systems and were being used as places for the performance of rituals.

2.2 Different perspectives

A popular conviction within certain groups, most of them less scientific, is that the temples were places of worship for a *mother goddess* (Piggot 1965 in Robb 2001, 178).

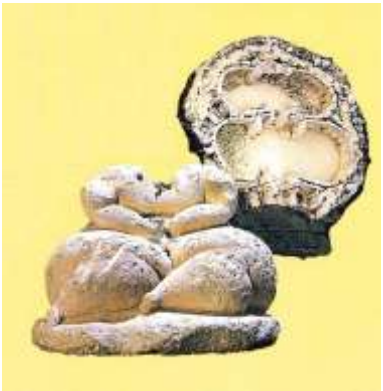

Figure 2: The female figurine body-shape compared to the floor plan of one of a standard four-apse temple plan (from: Trump 2002, 113)

This theory is based on arguments concerning anthropomorphic figurines, which were found in substantial numbers within the *hypogea* and most temples. They are thought to be (idealistic) representations of female goddesses and hence could be evidence for ruling women, or at least that women could have played a more important role than men within this society. However, since most of the representations lack distinct male or female features it is unclear whether all figures are indeed female (Bonanno 2010, 67-68). Therefore, this line of

argument was not helpful since it was weakened by the evidence itself. Related attempts to link female body shapes to the rounded apsidal structures of the temples have remained also inconclusive and have not contributed much to a better understanding of the megalith structures (Trump 2002, 113) (fig.2).

In the 1970s even Colin Renfrew was intrigued by the Maltese megaliths and their social meaning. He believed that the monuments evolved from a society increasing in social complexity. According to Renfrew the monuments were evidence for social hierarchy (chiefdoms) and the temples represented rivalling (administrative) centres of competing groups, motivated by the pressure of a growing population (Renfrew 1973, 147-159; Renfrew 1979 in Robb 2001, 185).

Stoddart *et al*. (1993) argued for a growing isolation of various communities within the Mediterranean basin, including the Neolithic population of the Maltese archipelago. They suggest that intra-community rivalry which had operated through exchange, had evolved into intra-community rivalry that was operating through the construction of temples and the development of rituals, or even a religious organization. In periods of extreme insularity, there would have been a shortfall in imported products whereas local resources would have been exploited and elaborated to the maximum to compensate for the missing foreign imports. A shortfall in imported products was recognized in the archipelago and it seems that products from local materials had indeed increased (Stoddart *et al*. 1993, 7-8, 17).

Bonanno *et al.* (1990) also argued for a (fluctuating) rivalry between communities as a reason why the temples could have been built, but the hypothesis of a centralized hierarchy (chiefdoms) as supposed by Renfrew, was already being questioned. Instead of understanding the temples as administrative centres, Bonanno's model (1990, 202) claims that the building of temples and their increasing complexity were expressions of local rivalry and ritual display. And if so, it would be very likely that the largest and most complex temples would eventually have been able to control larger territories. This is however an assumption which cannot be ascertained on the basis of the existing archaeological evidence. It is possible that there have been more monuments than are known today (Bonanno *et al*. 1990).

The question remains whether the social order was indeed hierarchically constructed, and if the temples were actually built for reasons of intra-community

rivalry in the first place. It might also be possible that the temples developed a competitive meaning over time.

Other scholars offer theories which are less focussed on material remains and instead are interested in the Neolithic mind. In their view the temples could have served as mediating places in a society which represented a layered world.[4] This layered world appears to have been structured by a cosmology of life and death, or even afterlife (Malone 1997 in Robb 2001, 178, 185). If so, the temples and the hypogea,[5] together with various related rituals, would have strengthened the sense of a common ancestral background and seem to have led to an increasing commitment to culturally defined places (Whittle 1996 in Robb 2001, 178).

From this perspective another theory appears also quite plausible: Robb (2001, 192) suggests that the temples were reflections of a Maltese identity. Unlike Stoddart and other scholars, who argue for a growing isolation in the period the temples were built, Robb believes that Malta was not facing any isolation at all. He argues that the Maltese Islands were becoming culturally very integrated.

Instead of isolation being the driving force behind the temple phenomenon, Robb argues for integration (2001, 190-2). He explains this by referring to the whole of the Mediterranean area, where various communities became more differentiated from one other around the same time as the temple building started on Malta. In the third and fourth millennium BC, Malta was only one of many 'islands' of cultural difference in existence, and the hypothesis is that this was the re-working of cultural interaction. This implies that (increasing) regional contact led to the self-definition of own cultural identities, resulting in the development of regional differences (Robb 2001, 186-190). The general assumption is that people can only form their own identity through interaction with other people or cultures. When the different groups are becoming familiar with each other, an awareness of the differences between these groups evolves. As a result, people start to identify themselves by using their own, unique characteristics. Drawing on the same arguments as Stoddart *et al*. (1993), Robb contents that by creating and constructing the temples, probably combined with the construction

[4] With a layered world I mean a cosmos that is separated in different 'worlds', or layers. For example, the Christian cosmology is layered through the worlds 'hell', 'earth' and 'heaven'. In some cosmologies it is possible to travel from one world to another during life (shamanism), in other cosmologies this is only possible after death.

[5] Hypogeum of Hal Saflieni, Malta (burial place of over 7000 individuals) and Brochtorff-Xaghra Circle, Gozo

of a local cultural religion, the Maltese inhabitants were identifying themselves as well (Robb 2001, 190-2).

Although Robb's hypothesis looks very plausible, it still raises questions since it does not take into account the material evidence from Malta's Neolithic period: the latter witnessed a decrease in foreign imports in favour of local materials. If cultural contact and trade between the Maltese islands and other groups was still present, why would the Maltese Neolithic community prefer blunt local materials over excellent, razor-sharp imported obsidian and flint? If the islands were still integrated in a larger cultural system, one would expect that useful non-local materials could still be imported. On the other hand, if Malta was suffering from increasing isolation during the temple period, it would be easier to explain the decline of imported materials. It could also be the case that both processes happened after each other: cultural contact might have resulted in the creation of a Maltese identity, but this development might have also triggered conflicts with the Sicilian culture. This would explain again the stagnation of the obsidian trade between the two communities whereby the growing isolation might have even strengthened the formation of a Maltese identity. Both processes could thus have played a role in the construction of the megaliths.

Clive Vella's work (2008) introduces a new perspective to explain the shortfall in imported products. By studying material from Skorba, a well-documented excavation, he was able to establish that at least 80% of the imported lithic tools were probably curated. This allows him to confirm the low numbers of imported lithics. Hence he proposes that the import of obsidian and flint was not only limited, but also restricted. Drawing on the material evidence he argues that interaction between Malta and Sicily was restricted to a group of knowledgeable people (Vella 2008, 91). These people could control the distribution of the imported materials and consequently, some people gained more profit over others. After all, as Vella rightly claims, a limited quantity of objects or materials increases their value (2008, 92).

Despite these different explanations, it is still uncertain which kind of economic or social factors played a role in the development of the temples. Clearly, every perspective has shed light on different elements of the Neolithic society, and, to move forward, aspects of these theories should be combined to provide a more comprehensive picture of the temples and the Neolithic society which built them.

2.3 Material studies

Except for Vella's approach, the research interests discussed in the section above were mainly focussed on the megalith structures, how they developed and what meaning they could have held for the society which constructed them. These outstanding structures dominated the research agendas to such an extent that scholars almost entirely ignored the finds which were retrieved during the excavations of the sites.

At the same time, whenever archaeological finds did receive attention, it was almost always the ceramics, or the architectural elements (Evans 1971). This is not surprising since they are the kind of finds that attracts most attention at many archaeological sites throughout the world. Pottery and architecture are important since they allow us to establish chronological information. However, they are not the only categories research should be focussed on.

In connection with the Maltese temples, some other exceptional or remarkable finds have received considerable attention too. These include the huge statues and smaller anthropomorphic figurines found at different megalithic monuments on Malta and Gozo. Other finds, related to religion, cult or rituals, have also been the focus of scholarly attention. These are for example representations of animals and spiral art, statues and statuettes of (presumed) priests or goddesses, and rare or imported products like ochre or '*greenstone axe-amulets*' (Barrowclough 2007; Malone and Stoddart 1996; Skeates 2002; Tilley 2007; Townsend 2007). These are often the kind of artefacts that museums would want to display as they are likely to attract an audience.

In contrast, small finds or everyday objects such as stone tools, worked bone or flint artefacts often remain forgotten and neglected. If not completely forgotten, scholars only describe such finds, or focus on typologies. Only in more recent years did archaeologists begin to examine these artefacts more intensely. An increasing number of scholars are realizing that these artefacts play a significant role in casting light on the daily life of past societies. Regarding the megalithic culture of Malta, Margret Murray (1923 in Vella 2011, 173), was the first who showed an interest in studying lithics; only recently the study was intensified by Clive Vella, who examines flint, chert and obsidian tools from different sites across the islands. He takes a wider perspective on these objects and investigates not only their specific function, but also explores the

interaction between Malta and Sicily through their common lithic materials (Vella 2008, 2011).

Cleary, many researchers have already explored Maltese prehistory from various angles; but still there are large areas which are not sufficiently covered. The Neolithic tools and implements are a case in point. However, before discussing the methodology applied by this study, the development of Tarxien will be introduced to provide the cultural and chronological context.

3. An Island Society: the cultural framework of Tarxien

This chapter offers a brief chronological framework of Malta's cultural development during its prehistoric periods. It then places the temples of Tarxien within this framework. It provides the chronological and cultural background against which the groups of artefacts presented in the next chapter can be contextualized.

3.1 Chronological framework

The Temple Period marks the final phase of the Neolithic period in Malta. Some scholars refer to this period as the Chalcolithic (Copper Age) to comply with a wider Mediterranean chronology. This implies that people on Malta would have been already familiar with copper and other metal materials. With regard to Malta this was not the case, since any kind of metal was not introduced to Malta before the Bronze Age. Although the term would connect to Sicily's Copper Age, it is better to refer to this period as the Maltese Temple period. Table 1 (tab. 1) gives an overview of the cultural sequences during this period, including their main characteristics as offered by Malone *et al*. (2009, 1).

Table 1: The early cultural sequence of the Maltese Islands (after: Malone et al. *2009, 1)*

Culture name	Approx. date	Main characteristics
Neolithic		
Ghar Dalam Grey Skorba Red Skorba	*c.* 5000-4300 BC *c.* 4500-4400 BC *c.* 4400-4100 BC	Rock-shelter and open settlements Open settlements Oval houses, shrines, mud brick
Early Temple Period		
Zebbug Mgarr Ggantija	4100-3700 BC 3800-3600 BC 3600-3100 BC	Rock-cut tombs, oval houses First lobed structures, plaster floors Earliest Temple structures, oval houses Final use of small rock-cut tombs
Full Temple Period		
Tarxien (+Saflieni)	3100-2400 BC	Temple building complexes Communal Hypogea
Break in dated cultural sequence		
	2400-2000 BC	No dated sites, no distinct cultural evidence
Early Bronze Age		
Tarxien Cemetery	2000-1500 BC	Cremation urn burials, domestic activity in upper ruined levels of abandoned temple sites
Middle Bronze Age		
Borg in-Nadur	1500-700 BC	Fortified settlements

3.1.1 The Early Neolithic, Pre-Temple Period

To start with, the first settlers of Malta arrived about 7000 years ago (5500-5000 BC) and came from nearby Sicily. These early farmers arrived on empty islands (little vegetation, little fauna) which they cultivated by settling in caves, rocky shelters and after time also small permanent villages (Bonanno 1997, 4-6; Evans 1971; Trump 2002, 23). Evidence from ceramic cross-correlations has proposed that these settlers were connected to the Stentinello culture of Sicily and southern Calabria and the Diana culture of Lipari and Sicily. Also the raw materials flint and obsidian used to provide efficient sharp cutting and pointed tools were imported from the rich volcanic deposits of Lipari and Pantelleria, probably via Sicily (Bonanno 1997, 4-7; Stoddart *et al.* 1993, 5-6; Trump 2002, 39) (fig. 3). Pumice, a non-local material used for grinding and polishing, has been traced back to similar sources and in particular to Lipari. Nevertheless, since pumice contains air bubbles it is very light of weight and consequently, it could have floated to the Maltese beaches (Trump 2002, 38).

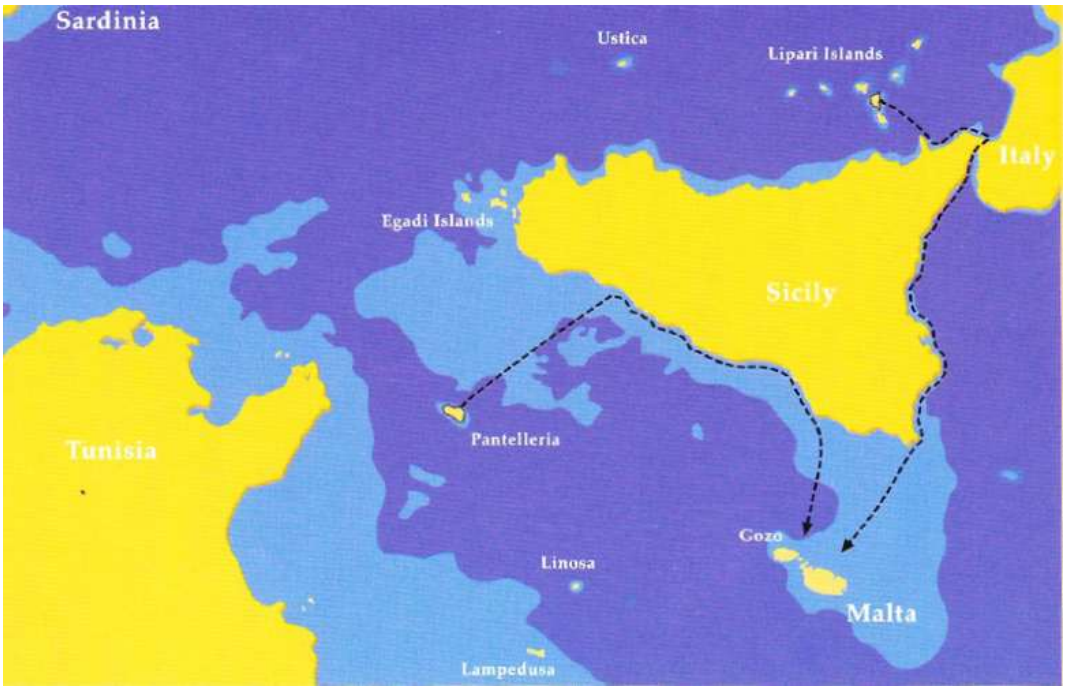

Figure 3: The route that obsidian probably travelled from the Lipari and Pantelleria sources to Malta, via Sicily (from: Trump 2002, 66)

Next to knapped stone implements from flint, obsidian and local chert, other tools that have been found from this period are for example saddle querns from local coralline limestone, ceramic spindle whorls, and biconical sling-stones which were carefully carved from local globigerina limestone. The purpose of the latter find group remains

still unclear. One could associate these objects with hunting activities, but since game was absent on the islands it was proposed that these objects might have been used for warfare against other humans (Magro Conti 1999, 196-197; Trump 2002, 52).

But although there are no wild animals represented on Malta and Gozo, from the early Neolithic sites Ghar Dalam and Skorba it is known that domestic animals were present. These included in particular sheep and goat, but also remarkable large cattle and a small dog. The large cattle have been decreasing in numbers towards later periods (Trump 2002, 34-35).

Next to animal husbandry, some form of agriculture must have been part of the economic live of Malta's Pre-Temple Period inhabitants too (Stoddart *et al.* 1993, 6). Excavations in Ghar Dalam recovered at least three newly introduced cereals, among it primitive lentils and naked (club) wheat. Also the querns and occasional flint flakes show gloss, which implies their use during the grinding of corns and the cutting of straw (Trump 2002, 34-35).

Regarding the social organisation of the Pre-Temple Period societies, it is argued that it has remained egalitarian. Also investments in rituals remained restrained and were probably only restricted to domestic shrines (Stoddart *et al.* 1993, 7). Moreover, Robb (2001, 177-178) considers that the symbolic culture, the cosmology, ideas about gender and status and social institutions would have been more or less similar to those in Sicily or southern Italy. According to him, Neolithic Malta 'must be seen as part of a network of societies stretching across southern Italy and Sicily, all different but all nonetheless sharing a common basic repertory of symbols and institutions' (Robb 2001, 177-178).

3.1.2 The Late Neolithic Temple Period

The first phases of the Temple Period do not show any significant differences from the early Neolithic Period. The Zebbug phase is marked by the arrival of a new group of farmers which are related to the Sicilian San Cono-Piano Notaro cultures. This is derived from a shift in ceramic styles and has been interpreted as a discontinuity of the Mediterranean cultural contact (Bonanno 1997, 11, Stoddart *et al.* 1993, 7). Also local materials such as bone and stone were being carved and it seems that local materials were being elaborated to compensate for a shortfall in 'exotic' products. Nevertheless, it also appears that cultural contact between Malta and Sicily was continued by the exchange of products from the Alps, obsidian from Lipari and Pantelleria, ochre from Sicily and greenstone axes from Calabria (Stoddart *et al.* 1993, 7). It is therefore arguable

that local products were being exploited while imported materials were still available to the Maltese communities. This might be due to the creation of a unique Maltese identity. Another new custom that was introduced with the Zebbug phase is the burial of the deceased in small rock-cut tombs. This is interpreted by Stoddart as the first indications of a ritual development (Stoddart 2007, 54).

Little is known about the Mgarr phase. This phase is interpreted as a transitional stage and recognized by the typical pottery (Bonanno 1997, 13). However, until now there is also still little evidence of social hierarchy (Evans 1971 in Robb 2011, 168). It is assumed that this only changed with the construction of the large megalithic sites.

The construction of these megaliths finally started around 3600 BC (Robb 2001, 178). This marks the beginning of the Ggantija phase. Not only the megaliths were unique, but also the ceramics began to form a distinctive cultural repertoire that finds few parallels outside Malta (Evans 1971, 217). This period is also characterized by a marked decrease in imported products such as obsidian, while ochre had been used intensively to decorate the new temples and the upcoming hypogea. In addition, the archaeological evidence shows that the rock-cut tombs of the Zebbug phase were getting out of fashion; nonetheless, these tombs could have served as models for the new temples above ground, as has been proposed by different scholars (Bonanno 1997; Evans 1971; Trump 1981). They suggest that the form of these temples might have been a recreation of the tombs. Furthermore, Robb (2001, 181) and Trump (2002, 87-89) present a possible line of evolution of the temples (fig. 4). Not only are these tombs considered as the possible starting point of the temples. New evidence from Skorba provides new insights. Two features, an ancestral tomb and a shrine, provided new evidence in this debate. These features are placed next to each other and it is easy to see that when they are combined, they form the outlines of a simple two-apse temple structure.

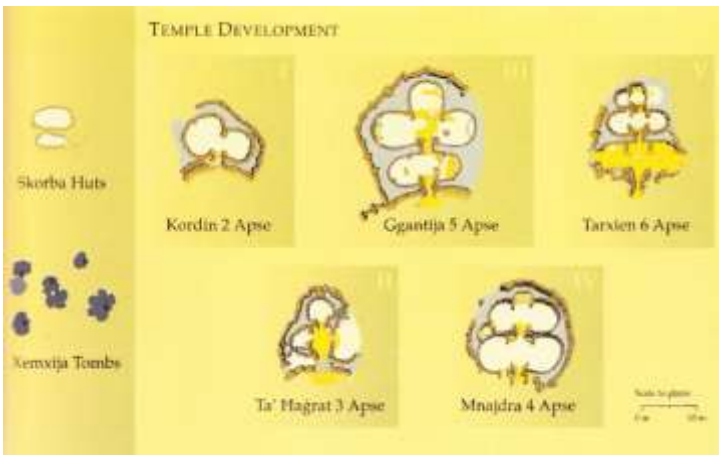

Figure 4: Possible line of the development of the temples plans (from: Trump 2002, 89)

Moreover, the megalith structures show that they have been constantly adapted, presumably to suit new rituals and other activities. Most changes occurred during the Tarxien phase. During this period a general cycle of rebuilding appeared to have taken place and several elaborate temple complexes were formed by renovating old temples and adding new ones (Robb 2001, 181). The builders not only became more skilled in constructing bigger and more elaborated structures, there is also evidence for private spaces being favoured over public spaces as the separation between those two were becoming more pronounced over time (Trump 2002, 89). This might relate to the exclusion of members of the congregation that began to be applied in the Tarxien phase, as has been suggested by Stoddart *et al.* (1993, 7).

Finally, Stoddart *et al.* (1993, 7) state that the Tarxien phase is marked by extreme cultural isolation. Exchange processes became severely restricted and depositions of obsidian, greenstones and other imported materials became increasingly rare, especially in smaller (temple) complexes. Large central complexes (e.g. Tarxien) might still have continued to be a depository of imported products, but Stoddart *et al.* (1993, 7) suggest that the effort that was earlier put in exchange processes was now 'redirected towards artisan production in the artistic elaboration of local materials, most particularly clay and limestone'. This must have been an important factor in the development of the megalithic complexes.

3.2 The Tarxien Temple Complex

Tarxien is the type-site for the culmination and the end of Malta's Neolithic period. The site of Tarxien has been in use as early as the Zebbug phase (beginning *c.* 4100 BC). It got its megalithic character already during the Ggantija phase starting in 3600 BC. By about 3000 BC the site began to become more complex and new structures were added during the proper Tarxien phase (Pace 2006, 3). While the chronology of the different structures is still subject to debate, it is certain that the easternmost temple has been built first, followed by either the south or the east temple. The middle temple must have been built after the former two were already erected, since it alters and destroys parts of both (fig. 5).[6] Moreover, the middle temple shows the most advanced temple plan (Bonanno 1997, 35; Trump 2002, 120-124).

[6] For the original map of Tarxien drawn by Zammit, see appendices.

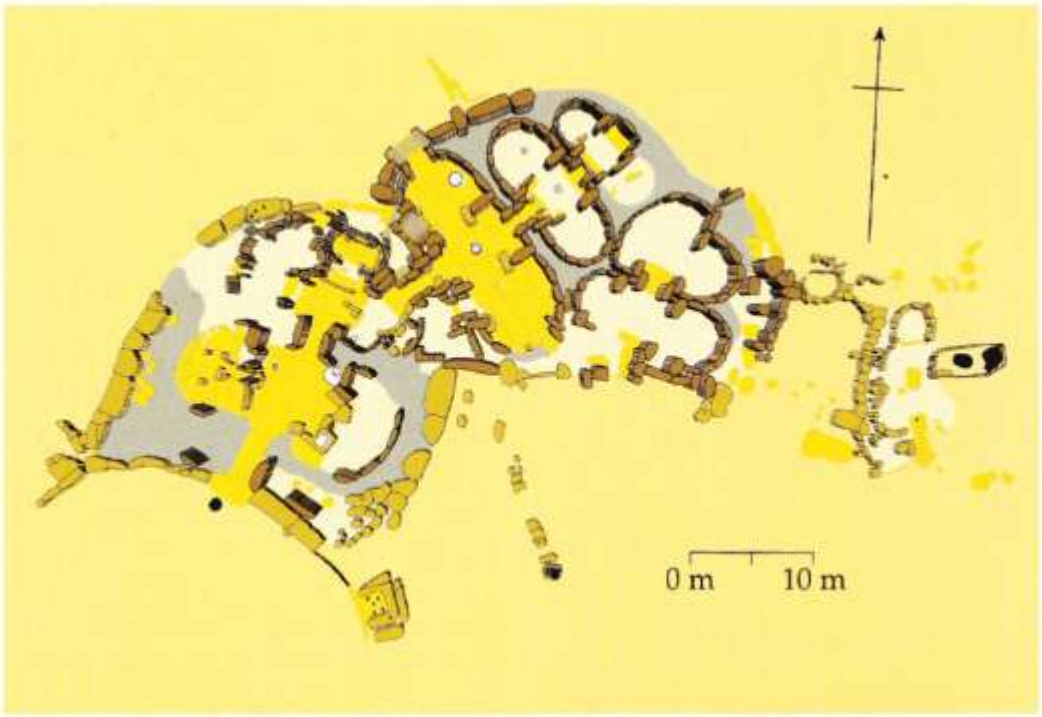

Figure 5: Floor plan of Tarxien, showing clearly that the construction of the central temple required alterations of the eastern and southern temples (from: Trump 2002, 121)

The easternmost temple had been built in the Ggantija phase and has a five-apse floor plan, similar to the Ggantija temple and to parts of Hagar Qim, but much smaller in proportion. The east side of the temple has poorly survived, due to a combination of quarrying, the use of small stone blocks, and re-utilisation of the stone after the original structure had fallen out of use. Also a large pit, undated, has been cut into the floor level of the central eastern apse. The purpose of this pit is unclear; it might have been a votive pit or a place for storage. It is doubtful whether the pit has been used for burials (Pace 2006, 14-15).

The southern temple was constructed during the start of the Tarxien phase, but has been much altered and augmented afterwards. This implies that the importance of this temple increased over time. The original design of the temple contained only four apses but it has changed by the addition of a small niche at the northern enclosure of the structure. Other alterations have been made too, but it is difficult to establish whether these changes took place at once or were spread across time. It is certain however that some alterations must have taken place during the construction of the middle temple (e.g. the passageway between the northeastern apse of the south temple and the southeastern apse of the middle temple) (Pace 2006, 17-18).

The south temple is further characterized by the many elaborate stone carvings (animal friezes, ship graffiti, and spiral art), the colossal statue and the famous hollow altar that contained sheep and ox bones, marine shells, flint flakes, a bone spatula and a chert knife (fig. 6) (Zammit 1915-1919, *unpublished notebooks*).

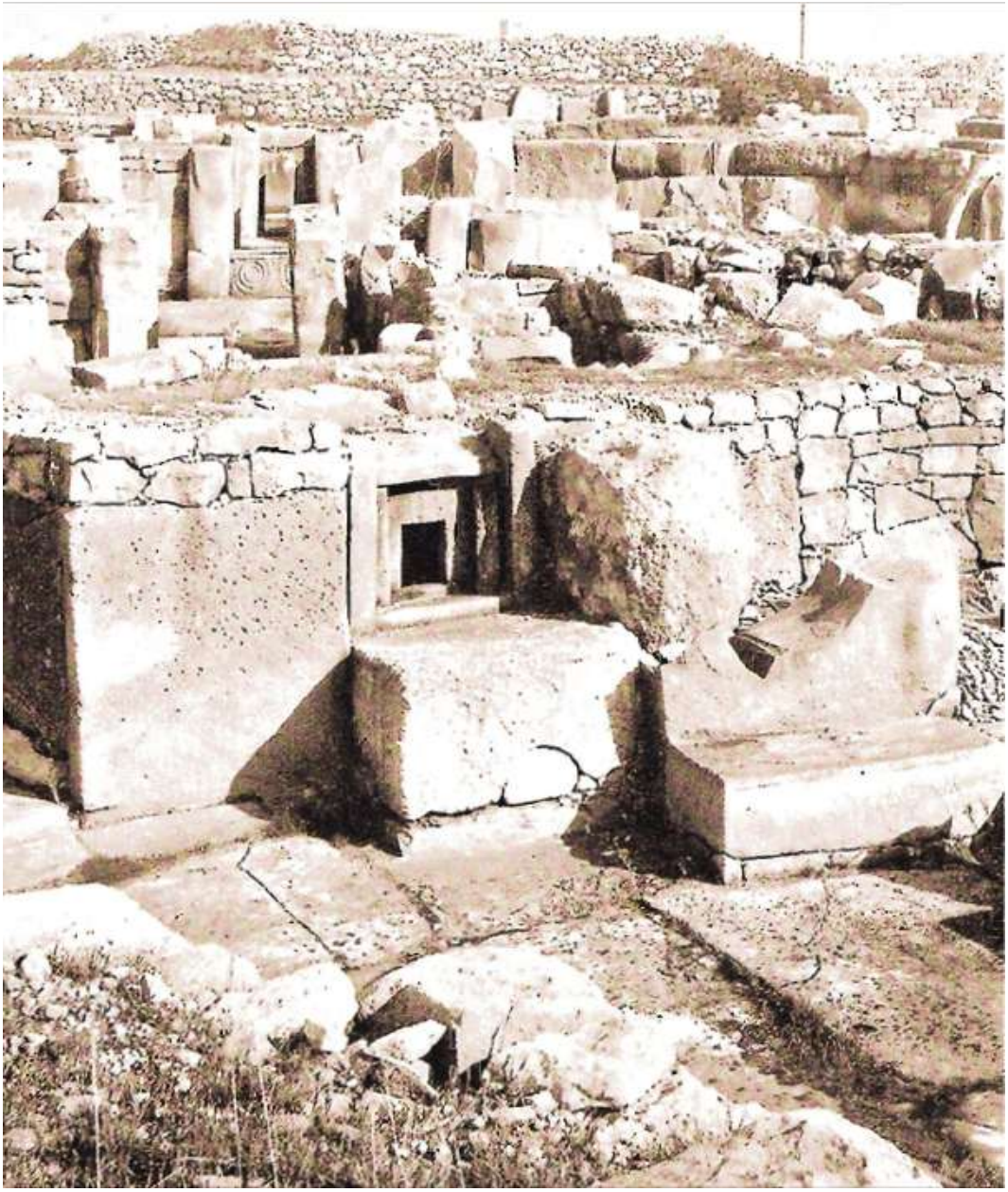

Figure 6: The famous hollow altar, or Niche Q (from: Pace 2006, 13)

In contrast, the east temple is much plainer, lacking carvings. Nevertheless, the large orthostats which form the walls are extraordinarily well cut. The northwest apse is missing due to interference in the Roman period, when a cistern was built. It must have

been altered either to make place for the new middle temple, or to link with the innermost apse of this temple. Likewise, a flight of narrow steps has been placed between the east and middle temple, which leads to speculations about an upper floor or an entrance from (or exit to) the roof of the buildings (Pace 2006, 30, 33; Trump 2002, 123).

The middle or central temple stands out from the other two by its unusual six-apse symmetrical design and its refined, sophisticated stone blocks that imply highly developed building techniques. In addition, the southern pair of apses is separated from the four northern apses by a low-lying stone slab decorated with spirals. While this slab allows people to catch a glimpse of the inner temple, it also requires visitors to climb over it if they wish to enter the space. Some scholars believe that the spiral motive on the slab was a sign to warn off undesired intruders, but it could also be a way of defining different functions of the individual interior spaces (Pace 2006, 27-28; Trump 2002, 122).

While the southeast apse of the central temple leads to the east temple, the southwest apse houses a large bowl carved out of a single stone block. Its purpose is still unknown. Between the two apses, in the main court of this temple, a heart is present, while another one is located between the middle pair of apses; signs of firing are still visible. These hearts would have required good ventilation when in use. This suggests that only the apses would have been completely roofed, while the main passage ways and central courts would have been open, providing fresh air and light (Pace 2006, 28).

What took place within the Tarxien temples remains unknown, but it is highly unlikely that they were related to burials, since the Hal Saflieni Hypogeum is located only at a distance of few hundreds of meters. According to Pace (2006, 38), monumental buildings as Tarxien were created out of basic social needs to form central focal points that would have served to establish political organization, religious concepts, ideology, commerce and exchange. He adds that they give us a glimpse of the worldview of the people who built Tarxien (Pace 2006, 38). The statues may have served as votive offerings or mementos and the carvings show the importance of (farm) animals, or could also have been a display of wealth. These depicted animals might have been part of sacrificial rituals, but would have also provided the primary source of food and related secondary products (wool, bone, hides). If the temples had control over these valuable animals, they might have had certain influence on food production and distribution.

Unfortunately, confirmation for this is still lacking (Pace 2006, 40), but there is evidence that large storage vessels contained both liquid and solid materials (Evans 1996, 42).

Evans' intensive studies of the Maltese temples allowed him to formulate a number of interesting ideas about activities that occurred in the temples. He argued that the complex had no defensive purposes and thought that it was unlikely that the complex held residential functions too (Evans 1996, 39). The abundance of ceramic bowls and dishes for offering food underpins that the primary use must have been ceremonial and ritual. But since the temples were increasingly closed off from the outer world, the complex would not have addressed large scale public activities. Instead, communication between the inner temples and the outer world would have been via an intramural "communication" chamber (oracle room) (Evans 1996, 39-42). Furthermore he suggests that some kind of 'art school' could have been attached to the complex hence the abundance of figurines and engravings (Evans 1996, 44). Despite all speculations, there is no doubt that the Late Neolithic community must have been highly organized and disciplined to have been able to construct, use and maintain such a complex building.

Around 2400 BC, the temple period came to an end, when not only Tarxien, but all temples on the islands were suddenly abandoned and fell in disuse. How and why this occurred remains an open question. The collapse of the temple period could have been related to a natural disaster, but also population growth and increasing demands on resources made by the temples might have also played a role. One only needs to imagine a sudden loss of animal food resources in combination with over-exploited agricultural land; these two factors alone might have been enough to ensure a catastrophe in such a fragile island ecology. Also diseases, outrageous intra-community rivalry or a combination of social and cultural change might have helped the demise of the temple period (Pace 1006, 41-42; Trump 2002, 238-241).

It is unclear whether the whole island was deserted at the time when new Bronze Age settlers arrived, or whether some Neolithic communities have survived. Nevertheless, around 2000 BC, a new Bronze Age culture arrived and settled on the island and brought along completely new customs. They introduced metal tools and weapons and reused the old Neolithic megaliths to cremate their deceased (Tarxien Cemetery) or adapt the structures to form fortified settlements (Borg in-Nadur). New monuments, dolmens, were built, and silo pits were cut into the rock.

Although much has been said and written about Neolithic Tarxien, it still remains unclear which kind of activities took place in the temples. To gain more insights about daily life inside and around the temples, this study is focused on the tools and implements which have been retrieved during the first excavations. In the next chapter the methodology that was applied to the study of the Neolithic assemblage of tools and implements from Tarxien will be discussed.

4. METHODOLOGY: A COMBINED CONTEXTUAL APPROACH

This chapter explains the research methodology followed by this study. Two different sources of information form the core of this endeavour: the field notes of the excavator of Tarxien and the actual finds which were brought to light during the excavations at the beginning of the 20th century. The major tasks of this study consist of retrieving as much information as possible from these two sources. Each source adds specific information, and combined and contrasted they shed not only new light on the Maltese Neolithic but also on the working methods of Sir Temi Zammit. In order to structure and to perform a systematic (quantitative and qualitative) analysis of the data digital methods were used.

4.1 The notebooks of Sir Themistocles Zammit

When the temples of Tarxien were excavated for the first time (1915-1919), the excavator Sir Themistocles Zammit recorded his progress in a series of notebooks.[7] These notebooks provide detailed accounts of his discoveries, ranging from general notes to elaborate explanations, including sketches, exact measurements and descriptions of the finds. Some additional smaller excavations and surveys took place more recently, but the findings of these investigations, have not been included in this study.

The study presented here began with a careful reading of Zammit's notebooks.[8] This was done with the help of an existing database that included all notes already in digital form (fig. 7).[9] However, to be able to systematically retrieve and collect the information specific to this study, a new database (henceforth called Notebook-Database) was designed by the author of this thesis.[10] This was necessary since the existing digital Zammit database did not systematically provide the detailed information on the small finds which are at the centre of this thesis.

[7] Sir Temi Zammit kept five notebooks (numbered 9, 11, 12, 13 and 14) varying in number of pages. Notebook 13 was kept up to date during different seasons of excavation (1915-1918) while the other notebooks recorded just one season (notebook 11: 1915, notebook 12: 1916 and notebooks 9+14: 1919). In 1916 and 1919 Zammit recorded his progress even in two different notebooks (notebook 12 in combination with 13 and notebook 9 in combination with 14).

[8] Photocopies of the handwritten notebooks were provided to me by Prof. Bonanno from the Department of Archaeology at the University of Malta.

[9] This database was made by a Maltese student in 2004, now Dr C. Spiteri. She copied the handwritten notes from all notebooks into a digital ACCESS database. The database was made available to me by Dr N. Vella, head of Department of Archaeology, University of Malta.

[10] The Notebook-Database was designed with the help of Eric Dullaart, University of Leiden (see section 4.3 Databases and data entry).

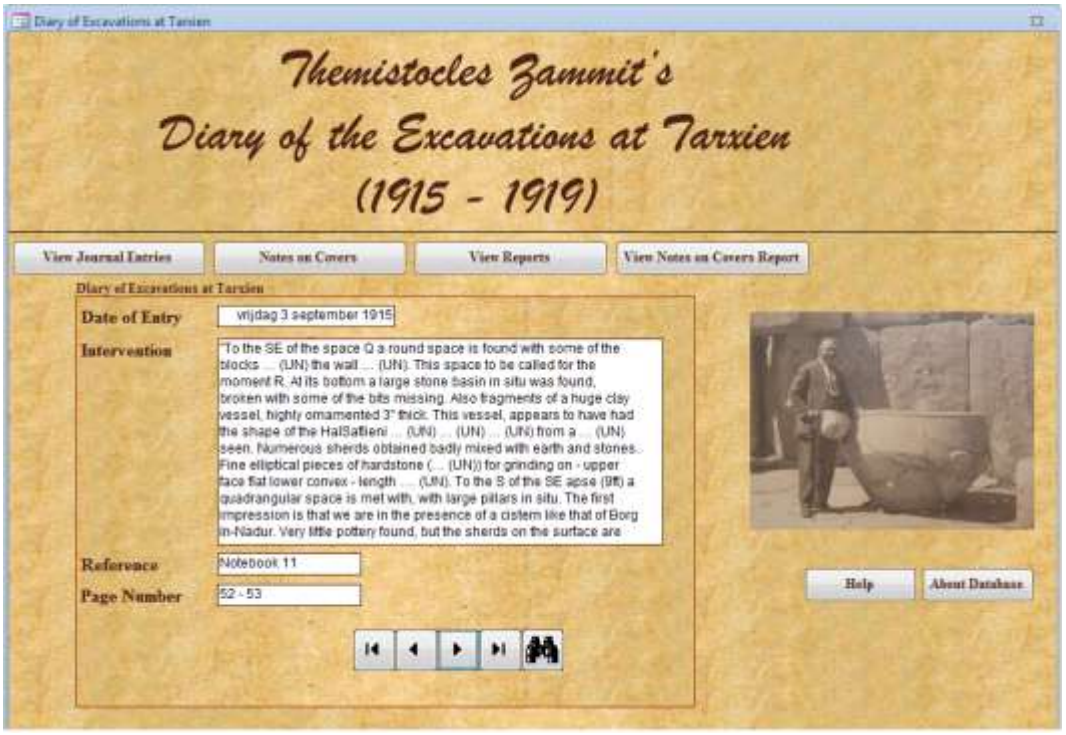

Figure 7: Selected record (3 sept 1915) of the digital database of Zammit's notes on the excavations at Tarxien (C. Spiteri).

4.2 National Museum of Archaeology, Valletta (Malta)

As part of this research, an internship was arranged at the National Museum of Archaeology, Valletta (Malta).[11] During this period the museum granted access to its repository with the actual finds from the Neolithic layers of Tarxien, and made available all data concerning the objects under discussion. This included access to the Museum's database where a substantial number of finds from the Neolithic layers of Tarxien had been entered by Museum staff for archiving purposes.

The internship at the museum made it possible to carry out a close study of the tools and implements available. Furthermore, in order to produce a catalogue of the tools and implements, the museum granted permission to take detailed photographs of the objects. These visual recordings allowed the investigation to be carried on even upon returning to the Netherlands.[12]

[11] Sharon Sultana, senior curator at the National Museum of Archaeology, and Vanessa Ciantar kindly supported my research during this internship.

[12] The National Museum Archaeology and Heritage Malta granted permission to carry out research on the artefacts from the Tarxien temples and any related archival material.

4.3 Databases and data entry

Databases and data entry were required in order to be able to collect and structure the known information about the finds concerned in this thesis. This includes both the information obtained from the notebooks as well as the information from the museum database. It was also attempted to incorporate information from Evans' survey (1971), but most records from the museum had already been supplemented with Evans' notes.

To collect and systematically structure the information recorded by Zammit, the Notebook-Database (ACCESS database) was specifically designed. The primary information that was gathered in the Notebook-Database consisted of the *typology* of the artefacts as established by the excavator Zammit. This was done for the sake of consistency with Zammit's notebooks. It has to be noted however, that his classification of these objects is often his own interpretation of their presumed functions, and to make matters worse, it is not always consistent. Based on the notebooks alone, it was not possible to securely determine a relationship between the typology and the (presumed) function of the objects. In order to ascertain the object's genuine use, a microscopic analysis would be required. This type of further research has not been conducted as yet and is not within the scope of this BA thesis. Therefore, at this stage it cannot be excluded that a number of objects may have had a different function to the one suggested by Zammit's typology. Nevertheless, by reusing his typology, the information in the Notebook-Database can easily be retraced to its original context.

Additional data was recorded to ensure that the objects can be found back in the notebooks. This includes the *date* of excavation, the specific *notebook* and the *page number* on which the objects have been described by Zammit. Furthermore, the *raw material* of which the object was made of, and the *number* of the objects as stated by Zammit were recorded. If he did not give an exact number but only mentioned 'a few' or 'many', the number '999' was entered. In addition, the indication of the quantity, 'many, a few, a lot', was recorded within the field of *remarks*. In some cases, Zammit also mentioned the *size* or the *shape* of the object and sometimes also (more or less) their specific *location*. This was recorded as well. Other information, like the archaeological *context* of the object or an idea or observation which Zammit expressed, was also entered into the database. If there were any sketches included, this was indicated by a *Boolean* field (yes/no indication).

The initial idea of this research was to begin with a general survey of all kinds of objects that were mentioned in Zammit's notebooks. Hence all small finds mentioned by Zammit were entered into the Notebook-Database. These finds concerned all artefacts from both the Neolithic and the Bronze Age layer and included for example also copper chisels, remains of humans and animals, and personal ornaments such as beads and pendants. However, after having read the first notebook, it became clear that the field of study needed to be restricted to only the Neolithic tools and implements. Otherwise the immense amount of objects would not have been manageable within this thesis.

At this point, a second (separate) database was devised (by the author) to collect only those artefacts relevant for this bachelor thesis, i.e. the Neolithic tools. This database (henceforth called Neolithic-Database) also allowed for the incorporation of artefacts present in the museum and related information gained from the work in the museum: i.e. the *museum ID*, if *photographs* were available and the original *references* given to the objects by Zammit during and after his excavations.[13] There was also room for additional information about the objects which had been previously entered in the museum's database. This included more specified materials, dimensions and descriptions of the objects.

All information pertaining to the tools and implement of the Neolithic Tarxien layers was now entered into the Neolithic-Database. However, both datasets, the Notebook- and the Museum dataset, were still separate and needed to be combined to link identical objects. This was done by the addition of new fields that united the information of both datasets (see appendix). Again, to provide consistency the typologies used by Zammit and the museum were also used here. After carefully examining the contexts (location, description and dimensions) of the objects, identical objects present in both datasets were identified and could be matched and merged. In this way, a combined database providing the most complete and best possible dataset was achieved, and is now ready to be further analysed. The next chapter will present a structured and summarized catalogue of all information on the artefact types that was gathered in the Neolithic-Database.

[13] Zammit did not mention any of these references in his notebooks, but used them in his publications concerning his excavations (1930). These references consist of the site the objects were found (T, Tarxien; TC, Tarxien Cemetery), the material of the objects (S, stone; B, bone; P, pottery, etc.) and a number to identify the (group of) objects. Example: T/S/56.

5. The Tarxien Finds

This chapter offers a descriptive catalogue of the Neolithic finds from Tarxien. To begin with, the two datasets, i.e. the data retrieved from the Notebooks and the information gained from the study of the actual finds at the museum, will be compared and contrasted. This will allow insights into Zammit's working methods and will highlight problems that arise from subsequent find processing and archiving.

This is followed by the actual find categories that have been studied to provide an overview of all the different materials and functional categories, as well as quantities and descriptions. At the end of the chapter, preliminary interpretations are made by introducing presumed activities that relate to the discussed tools and implements.

5.1 Comparing the datasets

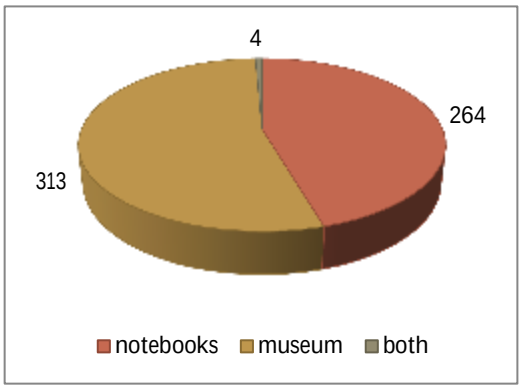

Figure 8: The total number of finds from the notebooks, the museum and the finds that are present in both.

The tools and implements analysed during this research consist of 313 actual finds present in the museum's collection, and 264 objects described in Temi Zammit's notebooks. Regrettably, only four objects have been successfully identified in both datasets (fig. 8).[14] Ideally one would expect these numbers to match since the finds retrieved during the excavation should be stored in the museum's repository. While some of these numeric discrepancies can be explained by Zammit's inconsistent way of recording,[15] some other aspects need to be looked into in more detail. Indeed, a close look at the individual find categories which are represented in both datasets, and the differences between them, is quite revealing (fig. 9). While most of the find groups are present in both datasets, some even in more or less equal quantities, others, when compared give conflicting information.

[14] This was done with the help of the original reference numbers provided by Zammit (1930) and Evans (1971) and the measurements, sketches and descriptions from the notebooks and the museum database. Unfortunately, Zammit does not always include elaborate descriptions and measurements. Also sketches are not always provided. Therefore, it is not possible to match more artefacts in both datasets.

[15] Zammit writes 75x about tools where he does not specify their quantity (42x flakes); also two bags of *uncounted* lithic flakes are stored at the museum. The 75 incidents in the notebooks could concern one or more finds, both bags in the museum probably contain 50-150 (or more) flakes (thus probably more than is indicated by Zammit). During this research the total of 77 incidents without specified quantity is *not* included in catalogue and analysis.

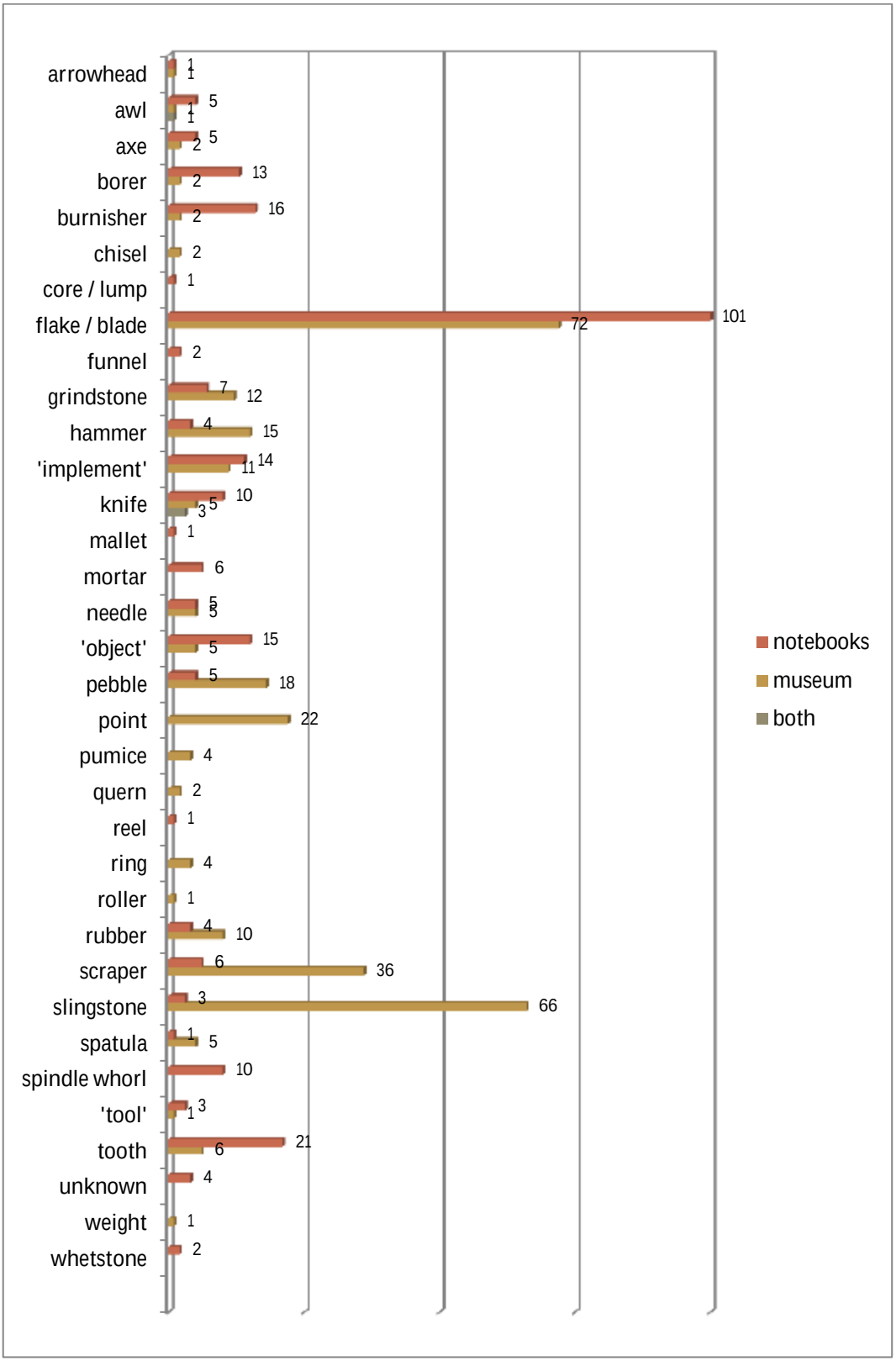

Figure 9: The number of objects as mentioned in the notebooks and the number of objects present at the museum.

If each dataset would have been examined individually, different results and consequently different hypotheses might have been reached. However, by analysing and comparing both datasets additional information on Tarxien's Neolithic assemblage has been obtained. Moreover, this methodology also allows us to gain a better understanding of Zammit's working practice since it gives us an impression of the finds Zammit considered to be important and the ones he neglected.

As visible in figure 9 (fig. 9) one outstanding category of finds concerns the so-called sling-stones. According to the museum's collection, over 65 sling-stones were found in the Neolithic layers of Tarxien. Interestingly enough, these objects are almost absent in the notes of Zammit. The same applies to a number of other objects that are part of the existing museum collection and are hardly mentioned by Zammit. These include grinding stones, querns, pebbles (used for grinding), pumice stone, and also scrapers. If this study would have been merely based on Zammit's notes, and had not included the museum's collection, the importance of the scrapers and sling-stones and their related activities might have been missed. The same applies to the tools that concern the pounding or crushing of cereals.[16]

In contrast, artefacts that were often mentioned by Zammit, but are not (or little) present in the museum collection, mostly concern bone objects: awls, borers and teeth. Also bone and stone burnishers, mortars and unknown 'tools' or so-called 'objects' are mentioned more often in the notebooks than they were present at the museum. This could be due to the perishable nature of the organic materials. Bone is not easy to conserve and it could even be that these objects were not preserved in the first place. Another reason could be that the museum attributed them to different activities and hence labelled them with another name. The museum typology does not always follow Zammit's typology.

A case in point is the group of bone points that is present in the museum. One of these bone points can be safely matched to an awl from Zammit's notes (for further information see description of awls, borers and bone points in chapter 5.2.1). Hence, it is possible that the museum registered the awls and borers not as they were called by Zammit, but opted for a more neutral description, simply calling them 'bone points'.

[16] In this research, grinding refers to the pounding or crushing of grains, corns and other materials, not to the polishing of objects.

Another issue worth discussing is the abundant presence of flakes both in the dataset of Zammit's notebooks and in the museum collection. It is very possible that both datasets concern the same objects. Zammit only sketched a few of the flakes he found and he nearly always mentioned them without a proper description. He also often notes 'a few flakes' or 'many flakes' without mentioning their exact quantity. This means that the number of flakes can be much higher than is indicated in the diagram (fig. 9).

The museum keeps a large quantity of flakes and is also in the possession of a bag full of flint flakes and a somewhat smaller one full of obsidian flakes. These bags possibly count more than 150 individual flakes; this means that over 200 individual flakes can be counted from the museum's collection.[17] It is not sure whether these cover all the flakes mentioned in the notebooks. Some might have been lost or were not stored at all. Nevertheless, even if all flakes from the museum correspond to the flakes mentioned in the notebooks and/or vice versa, this find category is by far the most abundant one from Neolithic Tarxien. Before going into detail about this, all different find groups will be presented, grouped by their raw materials they are made of.

The differences between the two dataset can thus be explained by Zammit's inconsistent way of recording, while also the museum typology does not always matches Zammit's. Regrettably, because of this only four objects have been successfully identified in both datasets.[18] These four objects are three knives and an awl (Zammit typology). It is nevertheless clear, that probably more finds in the museum collection correspond to Zammit's descriptions. Unfortunately, Zammit does not always include elaborate descriptions and measurements. Also sketches are not always provided. Therefore, it is not possible to match more artefacts in both datasets.

5.2 A structured catalogue

The catalogue presented here is divided into four main categories defined by the materials the objects are made of. These are bone, knapped stone (chert, flint, and obsidian), stone (other) and clay. Within these categories the different artefact types are grouped according their appearance or characteristics. They follow the typologies used by Zammit and the museum. The groups are:

[17] These are estimated numbers; the number of objects within these bags is not counted. Next to the bags, about 70 flakes or small blades from chert, flint or obsidian are present in the museum collection.

[18] This was done with the help of the original reference numbers provided by Zammit (1930) and Evans (1971) and the measurements, sketches and descriptions from the notebooks and the museum database

- *Awls, borers and bone points;*
- *Burnishers;*
- *Grinding stones, querns, rubbers and pebbles used for grinding;*
- *Hammer stones and mallets;*
- *Knives;*
- *Needles;*
- *Scrapers;*
- *Sling-stones;*
- *Small blades and flakes;*
- *Spindle whorls;*
- *Teeth;*

Other artefact types which are not mentioned above and which are also too small in number or not able to add substantial information to this research will not be described in this catalogue. Nonetheless, they are incorporated in the analyses and should be mentioned here to offer a complete view of the Neolithic assemblage of tools and implements at Tarxien.

Within the group of bone materials these artefacts are: a couple of *spatulas* and *undefined tools* or *implements*. Within the group of knapped stone these artefacts are: one *awl,* two *borers,* one *axe,* two *arrowheads* and one *flint point.* Also *cores* or *lumps, unspecified tools* and *implements* and *other unspecified objects* are not described in the catalogue. Within the group of stone materials these artefacts are: *pebbles*, five *mortars*, four *pumice* stones, four *rings*, one *roller*, one *weight, flakes* and *unidentified implements* or *objects*. Finally all clay objects are not described in the catalogue, these are: ten *spindle whorls*, a *reel*, two *funnels*, two *burnishers*, a *flake* and four *unknown clay objects*.

The following descriptions provide general information and details on the quantity,[19] specific materials (if known), measurements (if known), description and some interpretation and special remarks. Related activities are also mentioned, but these are further extended in section 5.3. For each find category a number of representative photographs are included to give a visual impression.

In order to be consistent with the museum and excavator Zammit, it was decided to describe and catalogue the artefacts according to the typology that was initially given to them by Zammit or the museum. However, in some cases it deemed necessary to include a more objective perspective, and hence some of these typologies have been described in more neutral terms.

[19] The numbers providing the quantity of objects are divided into the number of objects that are present at the museum (museum) and the number of object that are mentioned by Zammit in his notebooks (notebooks). Also the number of objects that were matched in both datasets are indicated (both).

5.2.1 Bone implements

The bone implements that were found at Tarxien according to Zammit, and the bone implements that were present in the National Museum of Archaeology include so-called awls, borers, burnishers, chisels, needles, bone points, spatulas and three undefined tools or objects. Also tusks and teeth are included in this category.

Awls, borers and bone points	
General	These objects are the most common implements found in the bone assemblage from Neolithic Tarxien.
Quantity	Awls: museum 2x, notebooks 5x, both 1x1 Borers: museum 3x, notebooks 11x Bone points: museum 20x
Material	Animal bone
Measurements	The length of the bone points measures between 5 and 14cm, with an average of 9cm. The borers' length varies between 7 and 14cm. One awl measures only 4cm. Remarkably, one specific awl that can be identified in both datasets is exceptionally long: it measures nearly 23cm (22,9cm).
Description	The objects are all pointed while some are also polished. Most of them are made from a bone splinter, while some are made from a (hollow) long bone that is cut transversely or diagonally and then sharpened and filed into a point.
Interpretation	Without distinguishing between the two different typologies (Zammit and the museum), this group of artefacts can be more neutrally classified as 'bone points' which could have been used as awls or borers.
Special notes	One exceptional long awl (Zammit typology) has been matched to a bone point from the museums assemblage. This was possible because of Zammit's detailed description of the artefact. His specific measurements matched the measurements obtained in the museum. It is very plausible that more bone points (museum typology) represent the awls and borers mentioned by Zammit.
Related activity	Perforation

Photographs

Figure 10: Bone points (museum numbers 7060, 9097, 9118, 9257, 9258)

Figure 11: Borers (museum numbers 9096, 9108)

Needles	
General	-
Quantity	Museum: 5, notebooks: 5
Material	Animal bone and ivory
Measurements	The objects vary in length between 6 and 8 cm.
Description	The needles found at Tarxien are all curved and have well finished heads with an eye. Their points are sharp and smoothly polished. Two needles are of ivory.
Interpretation	While they could very well be needles, it is also possible that these implements could have been pendants or other personal ornaments.
Special notes	Because of the typical curved element of these find group, some broken needles could be identified as well.
Related activity	Perforation

Photographs

Figure 12: Needles (museum numbers 9119, 9261, 9262)

Burnishers	
General	-
Quantity	Museum: 2, notebooks: 2
Material	Animal bone
Measurements	Three of the objects have the following length: 5,9cm, 8,9cm and 9,2cm. One of the objects was not measured.
Description	The burnishers are made of small long-bones and show clear signs of polishing or rubbing at one end or side of the bone.
Interpretation	The signs of polishing or rubbing indicate that these objects might have been used as burnishers
Special notes	Two of the burnishers are very flat and could, according to Zammit, also be spatulas.
Related activity	Polishing
Photographs	

Figure 13: Burnisher (museum number 9248)

Teeth	
General	-
Quantity	Museum: 6, notebooks: 22
Material	Teeth of rodents, boars and unknown animals
Measurements	-
Description	Small teeth and larger tusks. Not much is known about the teeth.
Interpretation	Six of the teeth were identified as teeth of rodents. Although most are fragmented, the museum was able to interpret them as possible chisels. Another tooth, a particular long specimen from an unknown animal, was identified as a burnisher by Zammit. Two other teeth suggest that they were used as needles (or pendants). One of these is broken, but still identified by Zammit as a boar's tusk. The other one is from an unknown animal. All other teeth are boar tusks, but it remains unknown whether these were used as implements, personal ornaments or held other functions.
Special notes	Some teeth might have been part of composite tools, but it is also very plausible that the objects were used in their own right.
Related activity	Engraving, perforation or other

Photographs

Figure 14: Teeth of rodents, possible chisels (museum numbers 9264, 9266, 9268, 9269)

5.2.2 Knapped stone implements

The knapped stone assemblage includes objects as basic flakes and blades, but also identifiable scrapers and some knives. In addition, arrowheads, a flint awl, flint borers, and other (undefined) tools, objects and implements form part of the lithic assemblage of Neolithic Tarxien. The knapped stone implements are made of local chert and foreign flint and obsidian.

While flint and obsidian are excellent and razor sharp raw materials, the local grey chert is of much less good quality. In fact, Zammit even mentions that it is not even hard enough to cut the local soft globigerina limestone, let alone the harder coralline limestone that is used in many of the megalith sites on Malta (Zammit 1930, 121). Both in his records of the excavations (1915-1919) and in his publication about Tarxien (1930, 90) he explains that a lot of chert implements were still found at the site. He also notes that these tools appear to be harder and of a finer texture than the local material. Consequently, he concludes that the 'heaps of flint in the shape of chippings, tools, and ornaments, collected from the debris of the prehistoric ruins, are all imported' (Zammit 1930, 121). However, it is unknown whether the chert was indeed imported and from which source it came. Moreover, the importation of chert has only been mentioned by Zammit. Other scholars (including lithic scholar C. Vella) keep mentioning that the chert implements found in Malta's megaliths are of local material. Therefore, during this research it is assumed too that the chert tools are of local raw material.

Furthermore, neither the notebooks nor Zammit's publication give clear information on whether Zammit meant also chert flakes while using the word flint. Many times he just mentions 'flints'. Even Evans (1971) makes no clear distinction between flint and chert, and also the museum database contains records with objects made of 'flint or chert'. Therefore this research used a third category next to flint and chert, named: flint/chert.

Small blades and flakes	
General	These implements represent the largest group of the lithics from Tarxien.
Quantity	Small blades: museum 4x, notebooks 3x Flakes: museum 49x, notebooks 96x Flakes or blades [20] : museum 19x
Material	Chert, flint and obsidian
Measurements	The implements vary in length between 2 and 9cm, with an average of 4,2 cm. Their width varies between 1 and 7cm, with an average of nearly 3cm. However, their thickness almost never reaches over 1cm and most flakes and blades are rather thin.
Description	Most of them are made of flint or obsidian; there are some chert flakes present as well. Most flakes show small signs of retouching, while others show no signs of re-working. Some flakes show signs that they might have been part of a larger tool, for example a knife.
Interpretation	See chapter 6.1.1
Special notes	-
Related activity	Various

Photographs

Figure 15: Selection of flint/chert and obsidian flakes form the two bags of flakes, present at the museum (museum numbers 7945, 7946)

[20] This number includes all records that are called 'flake or blade'.

Figure 16: Flakes and small blades, some might have originally been larger implements (museum numbers 7058, 7059, 7313, 7922, 7924, 7925, 9570)

Knives	
General	Relatively uncommon, but not rare.
Quantity	Museum: 8, notebooks: 10, both: 3
Material	Chert, flint and obsidian
Measurements	The knives measure between 7,8 and 11,5cm in length with an average of 9,9cm.
Description	Nine knives are made of flint, while only four are made of obsidian and another four are made of chert. One other knife could be of flint or chert and is labelled as made of "flint/chert". There are signs of retouch.
Interpretation	Knives might have been used for various purposes: sacrificing animals, cut meat, grasses, yarn or other materials.
Special notes	The knives (Zammit and museum typology) can more neutrally be called 'large blades'. The reason that they have been called 'knives' is that they are much larger than the small blades and, most importantly, almost all show considerable signs of retouching.
Related activity	Cutting/serration

Photographs

Figure 17: Knives of chert, flint and obsidian (museum numbers 7136, 9098, 9100, 9111, 9188)

Scrapers	
General	These implements can be roughly divided into side scrapers with one working edge and oval or round scrapers with a working edge all around.
Quantity	Museum: 36, notebooks: 6
Material	Chert and flint
Measurements	Most of the scrapers measure 2,5 – 4,5cm in length and in width, however, about one third of the scrapers (most of them side scrapers) are somewhat larger (max 5 – 7cm). This brings the average length of all scrapers to 4,4cm and the average width to 3,4cm.
Description	Most of the scrapers are made from local chert (26 individual objects), but some are made from flint as well (8+3* objects). For eight scrapers the raw material is unknown. It can either be chert or flint.
Interpretation	Scrapers might have been used to process hides and create leather.
Special notes	-
Related activity	Scraping

Photographs

Figure 18: Oval and side scrapers (museum numbers 7134, 7135, 7139, 7903, 7907)

5.2.3 Stone tools

Since stone is a local resource, there is a great variety in the types of objects made from stone. Next to the group of knapped stone implements, stone tools are the most common material group within the Neolithic assemblage. This is no surprise since the material is abundantly available, easy to work and does not perish as fast as bone or other organic materials such as timber.

For about half of the stone objects the type they are made of has not been determined by Zammit or the museum. In the notebooks, most of them are simply referred to as 'stone' or 'hardstone', and the museum's database too did not add further specification to every object. These unknown stone materials can be from a local source, for example a cobble found on the island or at the coast, or they can be imported as raw materials or as complete objects.

From the other half of stone objects, 70 objects are made from local globigerina limestone, which is a relatively soft material, and local coralline limestone (24 objects), which is much harder. There are also four small pumice stones present in the assemblage. Pumice is not a local source and had to be imported or was washed ashore.

The artefacts present in this category can be identified as axes, hammer stones, burnishers, grinding stones, querns or whetstones. Also 'sling-stones' and other stone objects such as a weight, a roller, rings and undefined implements and pebbles form part of the assemblage.

Grinding stones, querns, rubbers and pebbles used for grinding	
General	Fairly common at Tarxien.
Quantity	Grinding stones: museum 12x, notebooks 7x Querns: museum 2x Rubbers: museum 10x, notebooks 4x Flattened pebbles: museum 16x
Material	Coralline limestone, undefined (hard)stone
Measurements	Ranging from very large (Zammit (1930) even notes 50x37x20cm, this one is not found in the museum) to smaller (less than 10cm).
Description	Most of the grinding stones and querns are heavy and quite large while the pebbles and rubbers are only hand sized, but still heavy. These pebbles and rubbers are flattened on one side by use. The larger querns and grinding stones are made from local coralline limestone. This material is relatively hard. Some grinding stones are made from an unknown material or a material referred to as 'hard stone' (by Zammit, *notebooks*). The working surface of some of the grinding stones has been pitted in order to create a rough surface. Just a few of these heavy stones are complete, most of them are found broken and incomplete.
Interpretation	The flattened pebbles and rubbers might have been used as pestle of hand stone to crush or pound grains or other material in combination with the heavy and large but flat querns and grinding stones.
Special notes	Zammit (1930, 85) mentions the following about querns and grinders: "The grinders made of a local coralline limestone are usually flat and circular. The rest, made of a dark grey volcanic lava, are almond-shaped, with a flat oval surface. They went usually in pairs, a heavy stone that could be set firmly on the floor, and a smaller one that had to be moved by hand over the grains to be ground. Fourteen pairs of the grinders are in good preservation. The largest stones measure on the average 50cm in length, 37cm in breadth, and 20cm in thickness."
Related activity	Grinding activities

Photographs

Figure 19: Large grinding stones, querns and a smaller rubber (museum numbers 7102, 7105, 7106, 7330, 7350)

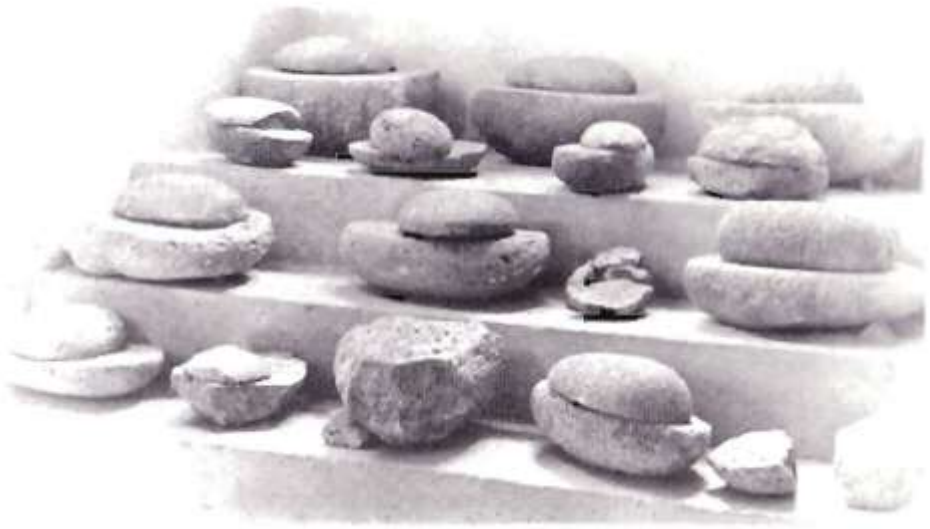

Figure 20: Saddle querns found at Tarxien (from: Zammit 1930, 81)

Hammer stones and mallet	
General	Hammer stones of all shapes and materials are numerous.
Quantity	Hammer stones: museum 15x, notebooks 4x Mallet: notebooks 1x
Material	Coralline limestone, globigerina limestone, undefined (hard)stone
Measurements	The larges hammer stone is 18cm, while the smallest is only 5cm. Their average length is 9cm and their average diameter is 6,5cm. Their average weight is 550 grams.
Description	Most of the hammer stones are near-spherical and show signs of battering at least at one side of the object. Some of the objects are slightly flattened. One hammer stone has a horizontal central groove for the attachment of a handle and one is pierced at the centre by an egg shaped hole, but this hole is not large enough to admit a string handle.
Interpretation	Zammit (1930,91) interprets the hammer stones as follows: "Most of them appear to be small boulders and large pebbles from the sea-beaches, but many are made of a heavy foreign material. A kind of fine-grained light-grey granite is fairly common, but there are good hammers of red, green and dark-grey stone which have been for a long time in use, judging by the scratches and dented areas at one of their ends. Only a few of those hammer-stones show grooves or holes for their attachment to a haft, the rest being used as hand implements, often furnished with lateral depressions, as if to allow a better grip for the fingers and palm on the hand."
Special notes	-
Related activity	Dynamic activities: hitting

Photographs

Figure 21: Different types of hammer stones found at Tarxien, some were probably attached to handles, others were held in the hand. Signs of hitting are still visible (museum numbers 9057, 9115, 9116, 9194)

Sling-stones	
General	Very common.
Quantity	Museum: 66, notebooks: 3
Material	Globigerina limestone (66), coralline limestone (1), undefined stone (2)
Measurements	The objects vary between 4 and 16cm, with an average of 11,3cm. Their average diameter is 6,1cm. Their average weight is 420 grams.
Description	Biconical carved objects (marks are still visible) of globigerina limestone. One has a raised band in the middle and is quite large.
Interpretation	Some might have been too large to have been suitable to throw.
Special notes	Zammit (1930, 83) notes: "A good number of biconical stones, varying in length between seven and three inches, were found among the debris. Some are elliptical in shape, made invariably Of the soft globigerina limestone. One of them is pierced near one of its ends for the insertion of a cord. [...] They may not be slingstones, but it is difficult to assign them to any other purpose."
Related activity	Throwing

Photographs

Figure 22: Very large sling-stone with raised band in the middle. Too large to have functioned as sling-stone, but is not classified as something else yet. Might be a mortar or ritual object (museum number 6965)

Figure 23: Various types of sling-stones. On some, marks of production are still visible (carved lines towards the points) (museum numbers 6964, 6978, 6979, 7196, 7197, 7209, 7210, 7214, 7219, 7336, 9094, 9052, 9190)

5.3 Activities

Based on the find assemblage a variety of activities has been identified and linked to these objects (see descriptions above). These 'related activities' partially follow Vella's classification of the lithic implements from Borg in-Nadur and Ta' Hagrat, Malta. His classifications are based on the perceived action/motion that relates to the finds (Vella 2009, 2011), which makes these classifications more objective and less subject to interpretation and have therefore been applied by this study. The activities are: dynamic activities, cutting/serration, crushing, perforating, polishing, scraping, throwing, and various activities. A category of 'other activities' is also included, as well as a category to accommodate waste or raw materials and a category with unknown activities.

Since this analysis applies a statistical approach, only one activity can be attributed to the objects. It is possibly that a number of objects were used for different kinds of activities, but they cannot appear in more than one activity group. Therefore, the following association between finds and activities have been made and are specified in table 2 (tab. 2):

Table 2: Tools and implement and their related activities as is assumed in this thesis

Activity	Objects and description
Crushing or grinding	Grinding stones, rubbers, mortars, querns, pebbles that might have been used for grinding. *Note: these activities concern tools to pound or crush for example grain and other materials; they do not include any tools used for polishing other objects.*
Cutting or serration	Knives
Dynamic activities (e.g. hitting, chopping)	Axes, hammer stones, mallets
Perforation	Awls, borers, bone points, needles
Polishing	Burnishers, pumice and whetstones
Scraping	Scrapers
Throwing	Sling-stones
Various activities	Flakes and small blades, objects referred to as 'tool' or 'implement'
Other activities, e.g. hunting, engraving (decoration), weaving or spinning	Arrowheads, a flint point, chisels, funnels, a reel, rings, spatula, spindle whorls, all teeth objects and a weight. *Note: these objects cannot be grouped into one of the listed categories and are too small in number to form their own category*.
Waste or raw materials	Cores, lumps, pebbles
Unknown	Undefined or unknown objects

6. Results, Evaluation and Interpretation

In the following part the results of the analyses and interpretations based on these findings will be presented. The information gained will be used to answer the research questions which are central to this study: what types of finds are present? Can we identify patterns concerning the specific types or numbers of particular find groups? What kind of information can be obtained from the finds to answer questions about the activities which took place on the site? And most importantly, what do these activities tell us about the purpose of the temples and the daily life of the Neolithic society which populated the Maltese islands during this period?

This chapter starts by explaining the significance of the 'peaks and odds' within the numbers of finds and the types of material. In the next step the activities related to these finds will be discussed and interpretations of their meaning will be offered.

6.1 Observations and first interpretations

Above all, this study was able to demonstrate that there was a large amount and a great variety of artefacts (tools and implements) present at Neolithic Tarxien. The set of tools contains everything a household would need to operate, and this allows us to suggest that next to being a ritual or religious centre, the temples included space for domestic activities and could have possibly functioned as a centre for the production and (re)distribution of food and other goods.

The following sections discuss the finds in relation to the activities associated with them. The systematic analysis of finds produced a few unexpected results which deserve a more detailed discussion.

6.1.1 Find categories with 'Odds and Peaks'

First, the find group of small blades and flakes is worth mentioning (fig. 24). Flint emerged as the most common material within this group, followed by obsidian. As far as the types of tools are concerned, flakes and blades dominate both the flint and obsidian assemblages. Especially the obsidian assemblage contains a relatively high number of flakes in comparison to other obsidian artefacts. Interestingly enough, chert flakes appear in low numbers within the group.

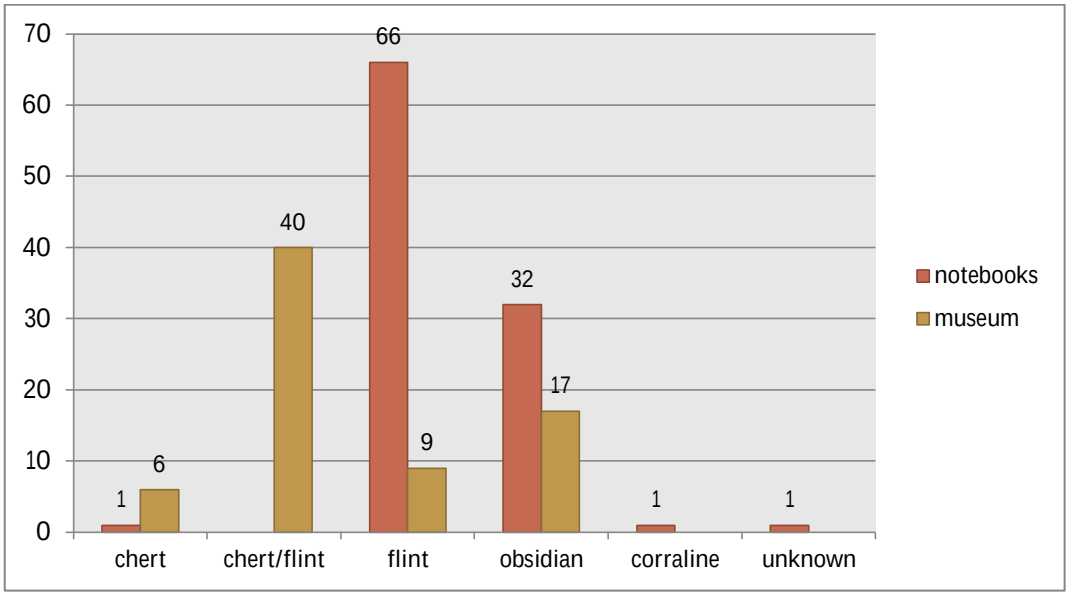

Figure 24: The number of flakes compared to their raw materials.

The conspicuously large amount of flint and obsidian flakes needs to be explained. It was already stated (chapter 3) that these materials are not found on Malta or Gozo and had to be imported from Lipari or Pantelleria. As discussed before, many scholars draw on the absence or presence of imported flint and obsidian to formulate hypotheses about Malta's society. Stoddart *et al*. (1993) used the decrease in flint and obsidian objects at the end of the Neolithic to argue for a growing isolation of the Maltese islands. In contrast, Vella (2001) claimed that Malta was not necessarily suffering from isolation since the import of these objects could have been restricted to only a small (elite) group. Both hypotheses indicate that objects of flint or obsidian were of very high value and hence justify the relatively low numbers of tools and implements found in Malta. However, these hypotheses do not explain the high quantity of flint and obsidian flakes found at Tarxien. This is even more interesting when compared to the low numbers of chert flakes which were found, while there were many chert tools present.

One possible explanation could be that flint and obsidian knapping was carried out within the temples since they were precious imported materials. This would not apply to chert, being a local material; knapping would have taken place elsewhere on the islands. Another 'side effect' of the presumed high value of flint and obsidian could have been that the objects were used and reused until they were no longer functional. In fact, the flake assemblage provides us with a few examples, in particular flint, which originally could have been larger implements (fig. 16 and fig. 16 in catalogue, section 5.2.2). However, there is not enough evidence to suggest that this was the main explanation for

the high quantity of the flakes. In addition, if flint and obsidian were imported as raw materials and knapped inside the temple complex, one would expect to find a couple of cores and lumps. The assemblage presented here contains only one small core and one small lump, both of obsidian; no flint cores were found. All in all it seems very unlikely that the flakes found at Tarxien could have been merely discarded wasters from knapping activities.

Experimental archaeology has demonstrated that simple flakes are useful tools for various small, immediate tasks during activities such as weaving, cooking, stitching, and more (Verbaas 2013, personal communication). As these implements have sharp edges they could have been used to perforate or cut materials (e.g. leather or cloth). They might have been part of composite tools, or could even have been even used to carve and sculpt limestone or ceramics. This would however require visible signs of rounding. These suggestions require further studies and would need to be supported by positive evidence from use wear analysis.

One possible explanation for the high presence of flakes might be related to the religious or ritual function of Tarxien. If flint and obsidian were indeed favoured materials because of their high value, they might have been donated to the temples or the deity. The high value of the flakes would have compensated for their small size, and together with other offerings (e.g. food) they might have been adequate donations to the temple.

Another find category which requires a more detailed discussion is the group of scrapers. The presence of these objects at Tarxien can only mean that scraping activities took place inside the temples. These tools were probably used for processing animal hides to produce leather. It is unlikely that the scrapers were offerings since they were mainly made from chert (fig. 25). Chert is readily available and hence less precious and less likely to be donated as offerings. At the same time chert is considered to be of inferior functional quality to flint and obsidian. Therefore the dominance of chert within the assemblage remains an "odd"

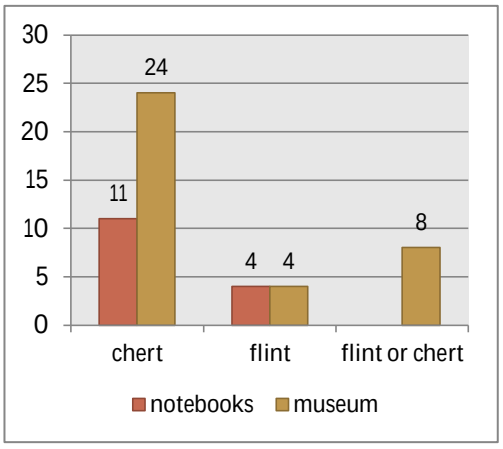

Figure 25: The number of chert, flint or flint/chert as raw material for the scrapers.

which needs to be explained. The most likely reason is that the particular properties of chert might have suited a specific activity. The fact that chert is not as sharp as obsidian might have prevented that leather was accidentally cut or damaged, making chert scrapers the perfect tool for particular tasks.

Another special case is the category of sling-stones. Although hardly mentioned in Zammit's notebooks, these objects are found in large numbers in the museum's repository (66 biconical sling-stones have been counted at the museum while only two are referred to in the notebooks) and have been mentioned in Zammit's publication on Tarxien (1930). Nevertheless, they have hardly been studied in the contexts of the Maltese temples; therefore this research will offer some ideas about their potential function.

Generally sling-stones are used by herders and hunters of small game (Magro Conti 1999, 197). Their high presence at Tarxien might thus imply that small game hunting could have played an important role for the temples and the Neolithic society. It is possible that the usual food supplies (grains and domestic animals) were supplemented by hunted animal meat. If so, this could indicate that the temples might have held a significant function in the gathering and the control of food.

Furthermore, the hunting of small game could have been related to rituals. During repeated cycles of hunting seasons the temples might have supervised the process to ensure that enough game was brought back to the temples, where the hunted game could have been a part of ritual slaughters and offerings. However, as it was already stated not much game was present on the islands (Trump 2002, 35, 52), and since hunting was no easy task, these sling-stones could have had a votive significance. They could have been offerings made by hunters to ask for a good prey. In addition, the sling-stones might have symbolized the importance of hunting, and could have been objects pertaining to high status. To increase the chance for a successful hunt, it is likely that only specialised hunters were allowed to use these tools. It might also be that the temples played a role in the manufacturing process of the sling-stones.

Several suggestions about the potential function of these sling stones can be made: these range from hunting instruments to ritual objects and finally to weapons in conflict. The latter would make them the first evidence of violent warfare (Magro Conti 1999, 197; Trump 2002, 52, 233). Since all of these suggested functions remain hypothetical, we should conclude the discussion by referring to Zammit who said that it

was not even certain whether these objects were really used as sling-stones at all, although it is difficult to assign them to any other purpose (Zammit 1930, 83).

6.1.2 Results on the activity analysis

The following results and interpretations concern the different activities mentioned in chapter 5.3. The diagram below (fig. 26) illustrates the different activities and the number of objects related to them.

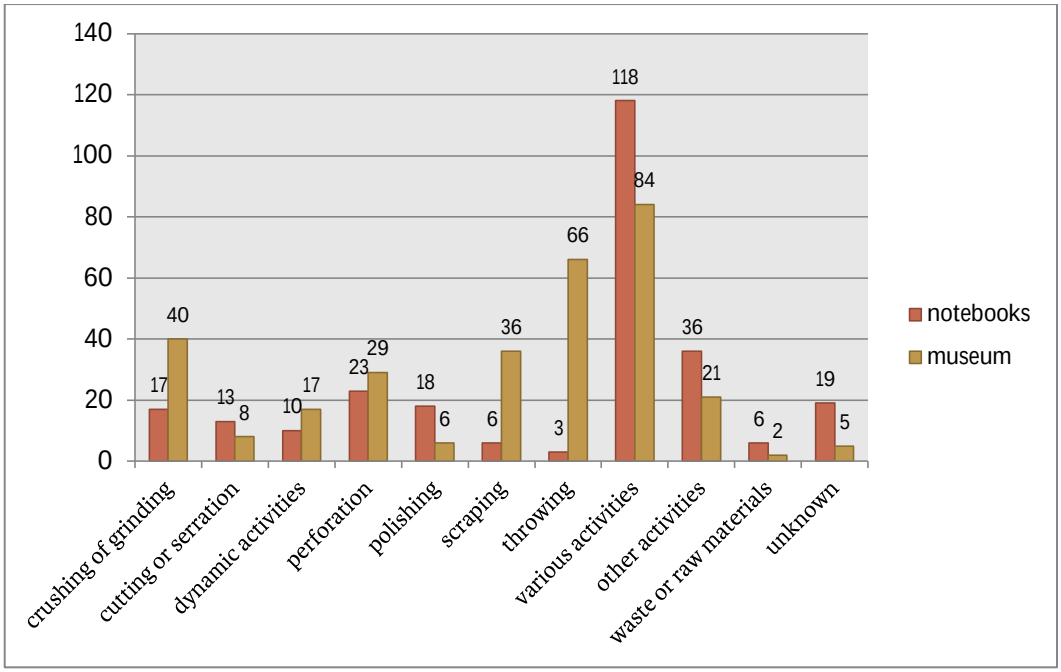

Figure 26: The number of finds per activity. The objects from the notebooks and at the museum are separated.

As can be seen in the diagram the tools and implements which have been grouped into the category of 'various functions' clearly emerges as the strongest group. Over 90 percent of this group consists of only one find category: small flakes and blades of flint, obsidian and chert, while the remaining artefacts are small obsidian, flint and chert implements. Flakes and their significance have already been discussed in the section above.

Other large categories are the activities of throwing (sling-stones only), scraping (scrapers only) and grinding. Since the sling-stones and the scrapers have been discussed above, the focus will be on the remaining groups of activities, starting with grinding activities.

The grinding category is also very strong represented at Tarxien. It consists of grinding stones, flattened pebbles and rubbers, all used for grinding activities.

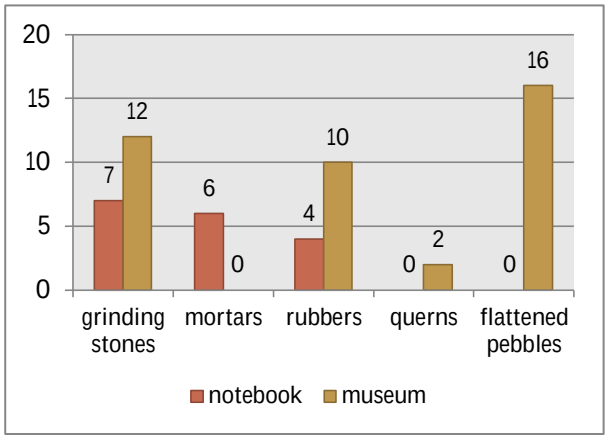

Figure 27: The number of object types associated with crushing and grinding activities.

Furthermore, two quern stones and six mortars were found (fig. 27). These tools suggest that they have been used for the crushing or pounding of food and other materials, however, without a microscopic or use wear analysis final conclusions cannot be made at this stage. Their presence at the site suggests that processing of food must have been a fairly common activity within Tarxien. In addition, ochre might have been pounded by using these tools and if so, this would suggest that painting and decoration activities occurred inside the temples.

The next activities are perforation activities, dynamic activities (hitting or chopping) and cutting. The low numbers of tools and implements suggest that these activities were less common at Neolithic Tarxien.

The activity of perforation is predominantly represented by bone points, followed by borers, needles and awls (fig. 28). Two flint borers and a flint awl are also included in this activity. Some sharp pointed flakes or small blades might have functioned as perforation tools too, but these are not included here.

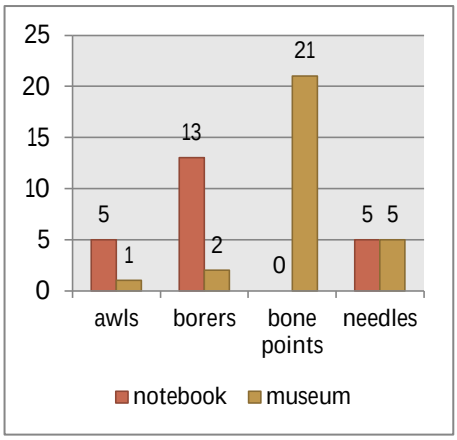

Figure 28: The number of object types associated with perforation activities.

Most of these objects are probably used to make small holes in other materials in preparation for stitching activities or to create pendants. Eight bone and two ivory needles suggest that they might have functioned as stitching tools to make clothes. Alternatively they could have been used as personal ornaments or status symbols. This is supported by the fact that they could have been worn as a pendant and might even be associated with burials (from either the Neolithic or the Bronze Age period). Both Zammit (notebooks, 1930) and Evans (1970) are not clear about this, and neither does the museum's database offer more information on this issue.

Polishing activities include instruments to smoothen, polish or sharpen other objects or tools (fig. 29). In this category, predominant finds are burnishers made from bone or stone. Zammit mentioned that these objects were probably used to burnish pottery. The other objects in this category include whetstones and pumice which might have been used for the production or preparation of other tools.

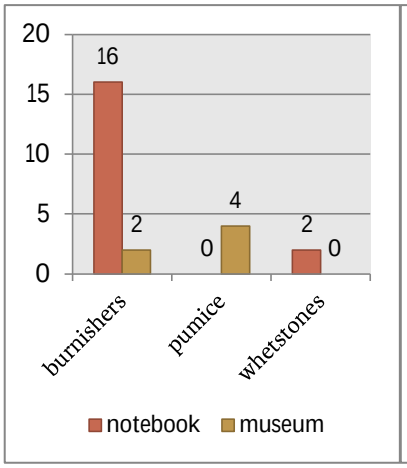

Figure 29: The number of object types associated with polishing activities.

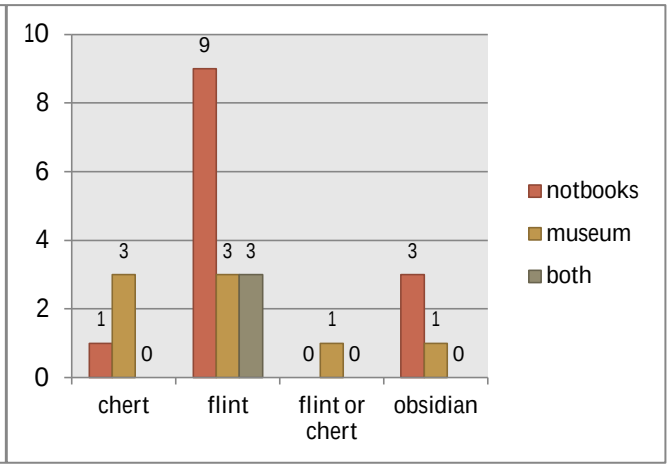

Figure 30: The number of knives compared to their raw materials. The three flint knives at the museum are matched to three knives in the notebooks.

The activity of cutting includes only the so-called knives of flint, chert and obsidian (fig. 30). It must be stressed that these knives should more correctly be referred to as large blades, since they have not been properly studied (as yet) and it is therefore not known with certainty whether these objects were indeed used as knives. If they functioned as knives a number of activities could be attributed to them including the production of food and clothing, ritual slaughter, hunting and even warfare (Magro Conti 1999, 196).

The dynamic activities include hammer stones, a mallet and axes (fig. 31). Hammer stones and mallets are generally associated with the process of lithic reduction, but can also be associated with cracking bone or crushing various materials. Furthermore, hammers could have been used to hit on thin

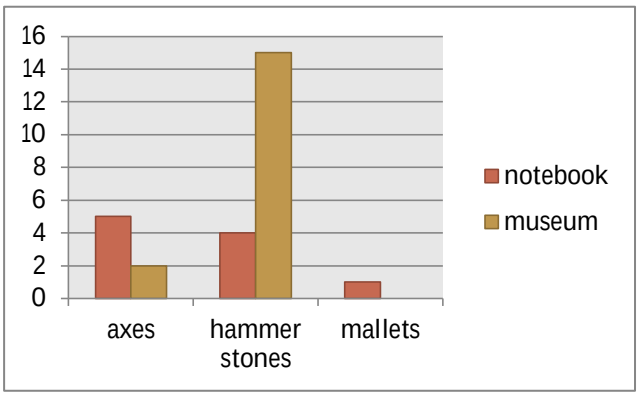

Figure 31: The number of object types associated with dynamic activities.

sharp objects (e.g. chisels) to make pitted decorations or engravings in stone slabs or sculpture statues. Axes can be used for chopping bone, wood or even stone. They can also be interpreted as weapons and might have been attached to a handle of antler, bone or wood with the help of leather strings (Magro Conti 1999, 197). Also the hammer stones might have been attached to a handle to increase the force needed for hitting on surfaces.

As mentioned earlier, the category called 'other activities' includes many different tools and implements used for very diverse activities (fig. 32). These tools are too small in numbers to form their own activity category, hence they are lumped together. Twenty seven single teeth make up the majority of this category. Only six of them have been identified as possible chisels, while the other teeth have not been identified as tools. They could have been ritual objects, status symbols or personal ornaments and might have been part of a necklace. Another option is that they formed parts of composite tools. As such they could have been attached to wooden handles or bone tubes which might not have survived or were not interpreted as part of a tool by the excavator. So far these objects have never been properly studied and therefore their possible function cannot be confirmed.

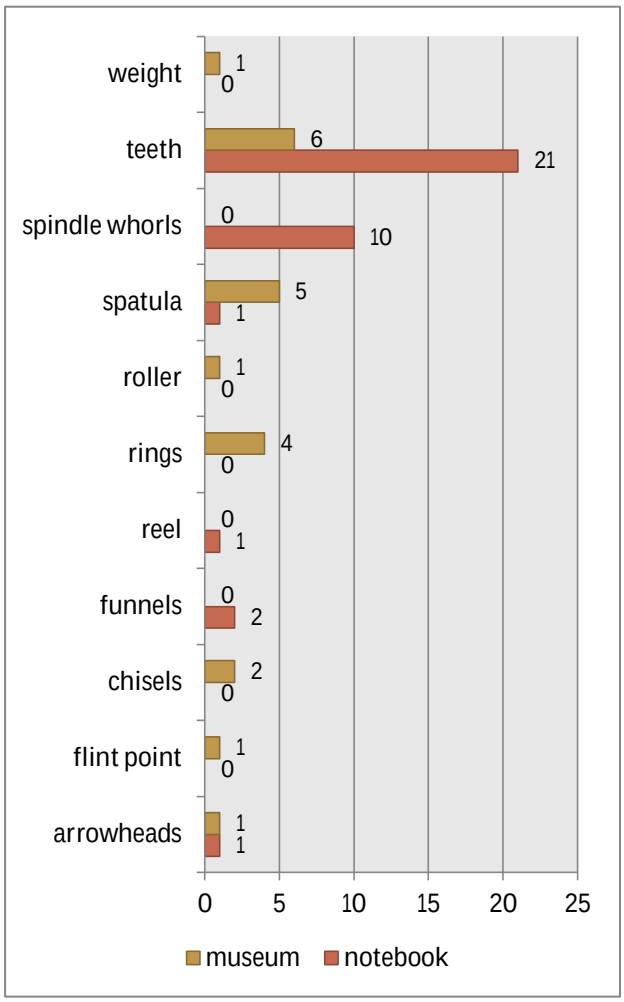

Figure 32: The number of objects within the other activities category.

Another substantial group of objects placed within the category of 'other activities' concerns a group of ten ceramic spindle whorls. These artefacts seem to

indicate that some kind of rope or yarn was produced, probably from animal hair (wool) or natural plant fibres (grasses or flax). The presence of a reel and a (loom) weight add further evidence for activities related to wool and yarn production.

The two arrowheads and the flint point (probably also an arrowhead) could relate to hunting activities. It is also possible that these objects were status symbols or offerings to the temples and were never used as tools. The spatulas and funnel might suggest food production, while the stone roller and the rings make it difficult to attribute any category of activity.

6.2 Interpretation and discussion

Having presented the data and the results of the analyses, the next step is to offer interpretations of the activity patterns that may have occurred in the Neolithic temple complex of Tarxien. With this, it is hoped to contribute to the discussion concerning the purpose of the megalithic structures and their meaning for the society which built and used them.

The great variety of artefacts as well as the substantial numbers of tools and implements found seem to indicate that the temples accommodated various 'lifeworlds' and were used in different contexts. This implies that they were not exclusively serving a ritual purpose. A number of interpretations have already been presented in section 6.1. To take these observations and interpretations somewhat further, various aspects of the temple organisation related to different activity patterns can be suggested. These scenarios are: *producing and processing food in combination with a storage centre; producing hides, leather or clothes and other tools and implements; production of art by processing and decorating different materials; and finally feasting, offerings and other rituals.*

It is possible that gathering and producing food were important activities that might have taken place in and around the Tarxien temple complex. Objects related to grinding, crushing and pounding are represented in good numbers, which suggests that grains and other cereals might have been processed. Also the knives, arrowheads and sling-stones might be linked to food-related activities. As weapons they might have been used for hunting activities to supplement the food resources with game. Knives and presumably also some flakes could have been used to cut meat and other food.

If food was indeed produced (and gathered) at the temples, it seems likely that it was also stored inside the complex. Large storage vessels found on the site seem to

substantiate this hypothesis. To further expand on this hypothesis one could argue that the temples were able to regulate the processing, gathering and (re)distribution of food, and depending on the social context of the temples, control over food might have had different purposes.

In times of crop failure earlier produced food resources might have come handy. The islands of Malta may have suffered from occasional droughts in summer or floods during rainy periods. These factors affected the agricultural possibilities on the islands and Malta's inhabitants must have dealt with it by hoarding food during prosperous periods. The temples might have served as a safe place to store this food, while it regulated the distribution when it was necessary in times of bad harvests. If the temples were easily accessible to everyone, this kind of regulation could be an indication of a society that tried to deal with fluctuating food resources. According to the tools and implements found, the Neolithic society made use of different food sources and probably combined every available source (animal and plant) to fill their supplies.

The current consensus is that the temples might not have been very accessible, since the separation between private and public spaces increased over time (see chapter 3). It was argued that they were probably only open to a select part of society (Stoddart *et al.* 1993; Trump 2002). If this was the case, the distribution of food controlled by the temple could have been a further indication of a vertical stratification within society. Elites or priests who were in charge of the temples, or live in it, would have been able to control the food distribution among the rest of society. It is possible that the temples ensured an equal distribution among the community, or privileged certain parts of society. To make such a statement, many other aspects of the society need to be taking into account.

If the temples are viewed mainly as a ritual or religious centre, producing, gathering, processing and storage of food can be linked to the preparations of offerings to the deity of the temple. These offerings could have included meals consisting of bread and meat. In fact, bones of sheep and ox were found in Niche Q (chapter 3.2, fig. 6.) are have been interpreted as offerings. Their presences gives strength to this hypothesis since these bones have been found together with marine shells, flint flakes, a bone spatula and a chert or flint knife. Even more confirming seem the flakes, knife and implements that were found in front of the statue in the same apse as the altar in the southern temple (Zammit 1915-1919, *unpublished notebooks*). But to strengthen this hypothesis, further research is still needed.

Feasting rituals might also explain the high quantity of food related tools and implements. This hypothesis is however still in need of approving research to make it an acceptable option, but if feasting occurred near or at Tarxien, this would have required a lot of preparation and a surplus.[21] Preparation connected to feasting would explain the presence of the many tools and implements needed for the gathering and processing of food. Provided that temple clusters might have been rivalling (elite) communities, as supported by Renfrew (1975) and Stoddart *et al.* (1993), feasts and similar events of conspicuous consumptions could have been a means to create and reinforce dependency and inequality between the individual temple centres.[22] Whether feasting actually occurred at Tarxien or not, the assemblage of tools and implements at Neolithic Tarxien proves that food was essential within the complex.

A number of other activities which have occurred at Tarxien, possibly on a regular basis, are the production of leather or clothes and other goods. The high amounts of scrapers present at the museum suggest that the processing of hides and or even leather production was a relatively common activity at Tarxien. The awls, borers and bone points would have been the tools to perforate the leather and prepare it for sewing; large leather cloths could have been used to close off various parts of the temples by hanging them in doorways or openings between public, private and even more secluded rooms. The presence of tools such as spindle whorls and a reel indicate that rope (or yarn) was also produced at Tarxien. This could have been made from either wool or flax, and it probably allowed many smaller parts of leather or other material to be stitched or tied together. Also strips of leather might have been made to serve similar functions.

Although the quantity of artefacts related to this kind of activities is not high enough to suggest that the products were primarily produced for trade or exchange, the substantial amount of scrapers and perforation tools present at Tarxien confirms that specialized crafts (i.e. leather production) were performed at Tarxien. The same argument could be brought up for the sling stones, if they were produced at the temples;

[21] Neolithic feasts are defined as 'any sharing between two or more people of special foods (i.e., foods not generally served at daily meals) in a meal for a special purpose or occasion' (Hayden 2001, 28). They are explained as an important social phenomenon, since they create and maintain relations within and between the participating communities and have many other benefits (Hayden 2001, 29-30).

[22] Feasts are characterized by their ability to unite (groups of) people, but also to disunite them: if hierarchy is absent, feasts offer the opportunity to gain status, create identities and encourage socio-political inequality (Hayden 2001, 58-59; Nieuwenhuyse 2008, 225-226).

this would be a further reason to consider the temples as a limited form of production centre.

Whether Tarxien can be considered to have functioned as a central place for specialised crafts would however require new evidence from domestic dwellings to allow for a comparison. This would mean that crafts were not carried out in households but by trained craftsmen working inside the temples and being part of the temple economy. As a result of incorporating a crafts centre, the temples might not have been completely private or secluded from the rest of the society. Instead, the distinction of spaces could relate to the different crafts and activities that took place. To develop these ideas further, a spatial analysis combining the temple spaces and the find distribution would be required, while until now these ideas are purely speculative. Evans (1996, 44) had already suggested that a kind of 'art school' might have been part of the temple organisation. The burnishers found at Tarxien suggest that pottery was smoothed and burnished, while flakes and chisels might have served to decorate or incise pottery and stone surfaces. Hammer stones and chisels could have been used for working and embellishing limestone. However, drawing on the Neolithic tools and implements only, there is not enough evidence to support Evans' art school theory. Chisels are for example very poorly represented, even when six teeth are interpreted as possible chisels. They might not even relate to decoration methods in the first place. The same applies to tools linked to the decoration of pottery; these too could have been just the normal tools used in pottery production.

To conclude this chapter, the substantial amount of tools and implements suggests that the temples were probably used by more than a few people. It is likely that a small group of people, and possibly together with some livestock, inhabited the temples to maintain them. The artefacts compose a complete set that would have been needed for a household to operate well. Moreover, the implements are probably used on a daily or weekly, or at seasonal basis the years. Some of their quantities suggest that at least a couple of people have worked on crafts inside the temples. This implies that, at least during some periods a year, the temples must have been open to more people.

7. CONCLUSION

The research questions central to this thesis concern the group of Neolithic tools and implements from Tarxien and the activities related to them. By way of a systematic examination of the archaeological evidence this thesis was able to identify possible patterns of activities within the temples. In addition, by comparing two datasets, the actual finds and the excavation notes, new insights into the working practice of the excavator Sir Temi Zammit have been offered.

This thesis was set out to examine the activities which took place within the temples and aimed to explore what they tell us about the possible role of the temples within Neolithic society. In the previous chapters the research questions posited by this thesis have been answered and will be summarized here to provide an overview of the general conclusions and the insights gained by this study. Finally, suggestions for further research will be proposed.

The type of tools and implements present in the Neolithic assemblage from Tarxien comprise grinding stones, mortars, querns, rubbers, knives, axes, hammer stones, awls, borers, needles, burnishers, whetstones, scrapers, sling-stones, flakes and small blades, arrowheads, chisels, spatulas, spindle whorls and some more objects such as funnels, rings, a weight, pumice, pebbles, teeth and cores.

A number of significant pattern emerged from the examination of the assemblage. These concern the groups of flakes, scrapers and sling-stones, but also bone points, knives and pebbles used for grinding. Flakes of flint and obsidian are represented in high numbers at Tarxien, while chert flakes are less frequent. In contrast, chert scrapers are very common, while flint and obsidian are materials that are more restricted to knives and flakes. Knives are interesting since they are excellent tools to use for various purposes. The number of knives is however low (8 at the museum, 13 mentioned by Zammit), but might have been compensated by the numerous flakes. In contrast, pebbles used for grinding are, together with the grinding stones, very common in the assemblage, and also bone points are relatively frequent.

The activities that can be identified from the assemblage are: grinding, perforating, cutting, polishing, scraping, spinning and dynamic activities. The patterns suggested by these tools are:

- Grinding or crushing cereals and possibly also other objects like ochre was common at Tarxien, suggesting that the tools attributed to this activity were relatively often uses.
- Scraping activities are very common, signifying that processing hides to produce leather was a normal activity at Tarxien.
- Perforation tools suggest the production of cloths and clothes, and presumably also pendants. These tools are well represented in the assemblage.
- The knives and numerous flakes were probably used to cut food and organic material related to food production. These tools also support other activities since they are easy to use for a great number of small immediate tasks (i.e., cutting, perforating, scraping, and engraving).
- Tools to polish or burnish ceramics and other materials are present, but in low numbers, suggesting that this activity was performed, but maybe not on a daily basis. Tools for sharpening other objects are even less frequently.
- The relative small amount of axes and hammer stones suggest that dynamic activities such as chopping wood or hitting (hammer stones) were little practiced at Tarxien.
- Spindle whorls and some other tools which are only represented in small numbers suggest spinning activities and the production of rope or yarn, which would have been needed to stich or tie objects and materials together and create for example cloths or composite tools.
- Teeth, chisels and hammer stones might suggest that objects or materials were being shaped or carved in, possibly to create new objects, pitted ornaments and other decorative elements. Flakes might also have been used in various activities involving carving and incising. Chisels are relatively rare tools within Tarxien's assemblage.
- Sling-stones, arrowheads and possibly also knives might relate to hunting activities. This is however very uncertain since hypotheses about sling-stones not supported by any evidence.
- Various tools and implements might also relate to rituals or activities related to worship (i.e., knives and axes can be used to sacrifice animals, flakes and sling-stones might have been offerings).

The database of all Neolithic tools and implements from Tarxien which forms the basis upon which this thesis has been built is a small but solid step towards a better understanding of Malta's Neolithic past.

Drawing on these numerous and various tools and activities, it can be established that the temples were not only places of worship, but held additional functions. First of all, the assemblage provides a more or less complete set of tools to serve a household's basic needs. It is therefore possible that a group of people had lived at the complex and was responsible for the maintenance of the temples. If so, the tools and implements provided the necessary means to produce food, repair materials and even create new objects and materials. Secondly, processing food might have been a crucial aspect of the temple economy. It cannot be excluded that the temples served as a storage and distribution centre for the nearby region. This would imply that the temple held a central role regulating more aspects of society than only worship and rituals. Thirdly, the temples might even have been a place for craftsmen to gather and produce different kinds of goods and products to serve the needs of the society. This implies a community in which labour was divided and specialized professions had developed (i.e., stonemason, ceramist, hunter, leather craft, etc.). Consequently, more specialized products could be made.

In terms of what has been achieved and argued for in this thesis, in any case more (specialized) research is needed to offer further evidence and insights to confirm the hypotheses proposed. For example, the addition of a microscopic use wear analysis might confirm the functions of the objects or provide new insights into these functions. A detailed spatial analysis (GIS) based on the description of the context of the finds, as has been provided by Zammit, can possibly enhance our understanding of the daily practices and activities inside the temples. It might reveal new information on the context of the finds and could lead to new theories about some find categories and their presence at Tarxien. This might shed new light on a number of open questions regarding the specific location of activities and how they relate to the organisation of the temple. New research into Neolithic houses is also highly desirable since the existing evidence is extremely scarce. New insights from domestic sites together with investigations of the assemblages of Malta's other megalith sites (possibly Skorba) would be helpful to establish comparable datasets. A comparative approach might be able to define a 'normal' assemblage of a temple site which can be confirmed and compared to the assemblage from a domestic site. This would add important aspects of research which

need to be considered in order to formulate and confirm any theories about the role of the temples in Malta's Neolithic society and the related social, cultural and political development.

SUMMARY

This thesis presents a study of the Neolithic assemblage of tools and implements from the megalithic temple complex of Tarxien, Malta. This complex was built and used by a Neolithic society between 3600-2400 BC. The Maltese archipelago boasts over 30 similar megalithic complexes, spread across the islands. For over a century, these megalith complexes have been intensively studied, but while there is a general consensus that these so-called temples held ritual or religious functions, many contradicting hypotheses about the origin of the complexes and their societal significance have been formulated by various scholars.

These theories have been discussed to create a referential framework for this thesis and to emphasise how little attention has been paid to Neolithic tools and implements in earlier studies. In order to make a contribution to this debate, this study concentrated on this neglected group of artefacts: the Neolithic tools and implements from Tarxien. By means of a systematic analysis of these tools and implements this thesis was able to identify a number of activity patterns that might have played a role inside Tarxien.

Based on the results achieved in the process of this thesis, it can be claimed that the temples did not only fulfilled ritual and/or religious purposes, but a number of other activities can be associated with the Temple complex. Various activities, such as preparing food and the production of materials and other goods have been present at the site and it seems very likely that the complex was inhabited by a (small) group of people. Furthermore, based on the archaeological evidence examined by this study, it seems possible that the complex held a central function concerning the storage and (re)distribution of food (and/or other goods).

Samenvatting

Deze bachelor scriptie behandelt de collectie neolithische werktuigen en gereedschappen die zijn gevonden in het megalithische tempelcomplex van Tarxien, Malta. Tarxien is gebouwd en gebruikt door een neolithische samenleving tussen 3600-2400 v. Chr. Malta en Gozo kennen gezamenlijk, en verspreid over de eilanden, meer dan 30 gelijksoortige complexen. Deze zijn voor meer dan een eeuw intensief bestudeerd, en hoewel de meeste onderzoekers stellen dat ze rituele of religieuze functies hadden, worden er nog steeds veel tegenstrijdige theorieën gegeven over hun oorsprong en hun betekenis in de samenleving.

In deze scriptie zijn de theorieën besproken om een beeld te geven van een aantal belangrijke opvattingen over de tempels en om te benadrukken dat de Neolithische gebruiksvoorwerpen en gereedschappen eerder weinig aandacht hebben gekregen. Om deel te nemen aan de theorievorming, en om de bestaande theorieën aan te vullen met interpretaties over deze belangrijke groep artefacten, heeft deze studie zich gefocust op de Neolithische gebruiksvoorwerpen van de tempels van Tarxien. Met behulp van een systematische analyse van deze artefacten, was het mogelijk om verschillende soorten activiteiten vast te stellen die zich mogelijk in en rond Tarxien hebben afgespeeld. Met behulp van deze activiteiten is vervolgens getracht om een impressie te krijgen van de context van de tempels en hun betekenis in de samenleving.

Op basis van de verkregen resultaten kan worden verondersteld dat de tempels niet alleen plaats boden voor rituele en/of religieuze activiteiten. Verschillende andere activiteiten kunnen gerelateerd worden aan de tempels, waaronder voedselbereiding en de productie van diverse producten, en het is aannemelijk dat Tarxien door een (kleine) groep mensen bewoond is geweest. Op basis van het aanwezige assemblage lijkt het bovendien ook mogelijk dat het megalithische complex een centrale functie had bij de opslag en (re)distributie van voedsel (en/of andere objecten).

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LIST OF FIGURES

List of Tables

Appendices

For appendices see attached book of appendices