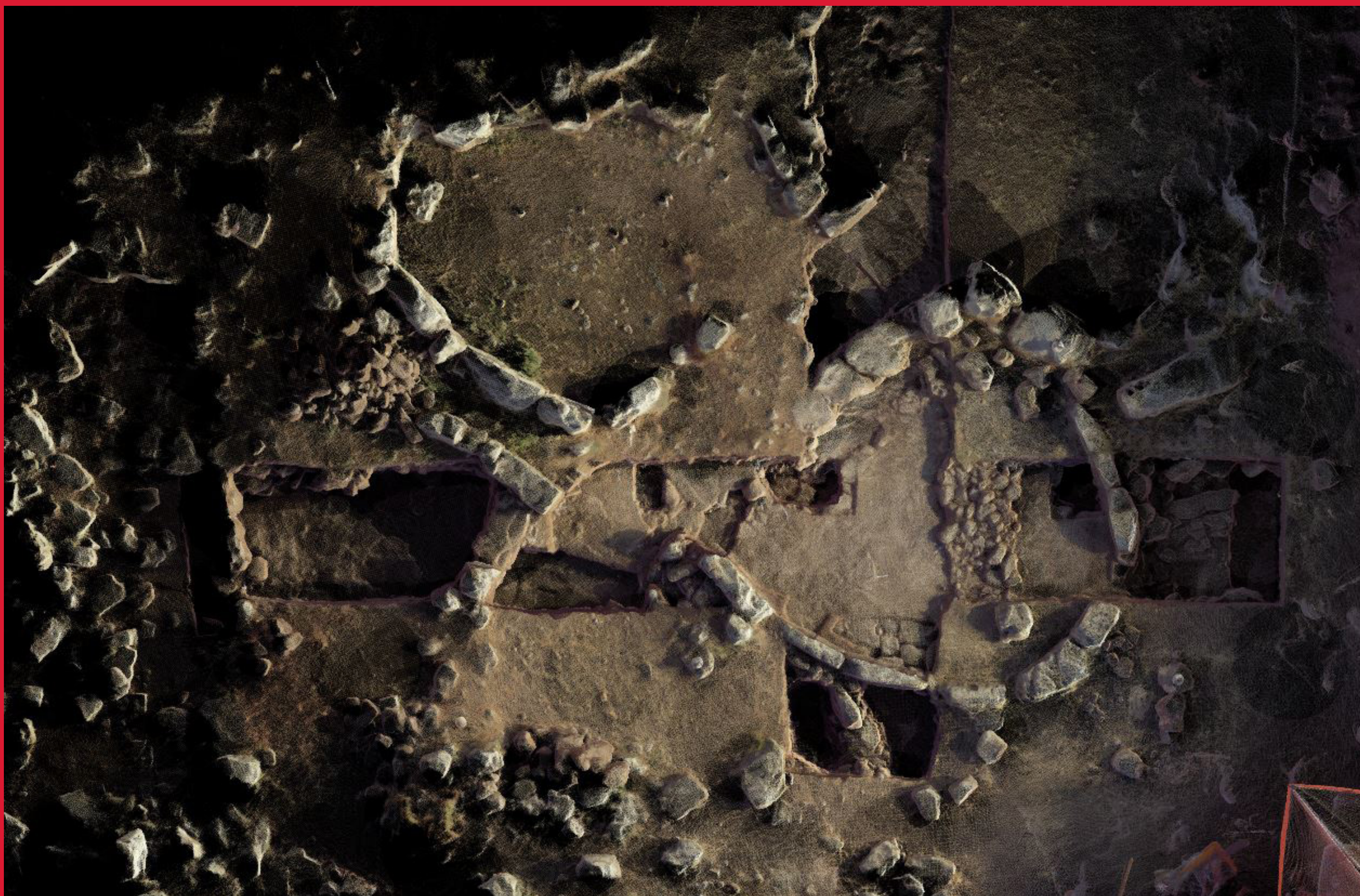
McDONALD INSTITUTE MONOGRAPHS

Temple places

Excavating cultural sustainability in prehistoric Malta

By Caroline Malone, Reuben Grima, Rowan McLaughlin,
Eóin W. Parkinson, Simon Stoddart & Nicholas Vella



Volume 2 of Fragility and Sustainability – Studies on Early Malta,
the ERC-funded *FRAGSUS Project*

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With contributions by
Stephen Armstrong, Jennifer Bates, Jeremy Bennett, Anthony Bonanno,
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Nathaniel Cutajar, Michelle Farrell, Katrin Fenech, Charles French, Christopher O. Hunt,
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Alastair Ruffell, Georgia Vince & Nathan Wright

FRAGSUS

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the ERC-funded *FRAGSUS Project*

SEVENTH FRAMEWORK PROGRAMME

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On the cover: *Digital scan of the Kordin III excavation in 2015, by John Meneely.*

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Appendices (online only)

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Dedication – in memoriam
John Davies Evans   David Hilary Trump

Malta may be small in scale but it has had a rich and important archaeological past which has been explored and enjoyed by many past scholars. A visit to the Archaeology Museums of Malta and Gozo testifies to a long history of collecting, scholarship and passion dating back to the early to mid-nineteenth century. It is a heritage that is beloved by Malta and its visitors alike.

The editors of this volume wish to pay tribute to two remarkable 'visitors' to Malta, each of whom, in their own way, made great contributions to our present appreciation of the islands' ancient past and supported our early researches, teams and ideas. Now we want to record our debt as some of the continuing scholars of Maltese prehistory, since we cannot imagine where we could have begun our current quest to take the story onwards and deeper without their prior work.

On behalf of the whole *FRAGSUS* team, we wish to dedicate this volume to their enduring memory.

Professor John Davies Evans (OBE) (1925–2011) arrived in Malta in 1952 from Cambridge to commence the task of organizing the war-damaged museum collections in preparation for a synthesis of Maltese prehistory. His task was enormous, and involved a new assessment of the pottery and material culture sequence of Maltese prehistory. He prepared his now classic study *The Prehistoric Antiquities of the Maltese Islands*, published in 1971, which has remained the primary compendium of reference to this day. Together with carefully targeted excavations, John Evans set in train the many questions that inspired not only David Trump, his successor, to explore and challenge the complex story of Malta's prehistoric past, but also ourselves over the last 35 years. John noted important aspects of sequence, material connectivity and, of course, the temples. These he recorded and described in such detail that his work remains vitally important today.

David Hilary Trump (OM) (1931–2016) succeeded John Evans, having already experienced Maltese prehistory in the field with him, and became the Curator of the Museum of Archaeology for five years until 1963. In that short time, he too made an enormous impression on the understanding of prehistoric Malta. His work at Skorba (as we discuss in Chapter 7) was inspired and informed, and it too set the direction for the future explorations of prehistory in the islands. David Trump maintained his interest in Malta throughout his career, leading regular study tours to the island and latterly, with ourselves, undertaking the sustained programme of fieldwork at the Xagħra Brochtorff Circle (1987–9). He wrote numerous books and papers on Malta's prehistory, popular and academic; and his contribution has been widely acknowledged through museum displays, the award of the Order of Merit of Malta and an Honorary Degree from the University of Malta for which he felt hugely honoured. But back in the United Kingdom, from whence both these scholars came, there has been less mention of their work on Malta. Evans moved eastwards to Crete in his research interests, and has been identified mainly with that work; whilst Trump, a retiring and extremely modest individual, did not promote his achievements on Malta during his teaching years at Cambridge, which was arguably too theoretical to fully appreciate his remarkable contribution.

Figure 0.1. *David Trump and John Evans together at the Deya Conference, Mallorca (*c. *1983) (reproduced with permission of Judith Conway, niece of John Evans).*

Acknowledgements

Firstly, the *FRAGSUS Project* is the result of a very generous research grant from the European Research Council (Advanced Grant no. 323727), without which this and two partner volumes and the research undertaken could not have taken place. We heartily thank the ERC for its award and the many administrators in Brussels who monitored our use of the grant. The research team also wants to record our indebtedness to the administrators of the grant within our own institutions, since this work required detailed and dedicated attention. In particular we thank Rory Jordan in the Research Support Office (Queen's University Belfast – QUB), Laura Cousens (Cambridge University – UoC), Glen Farrugia and Cora Magri (University of Malta – UM), the Curatorial, Finance and Designs & Exhibitions Departments in Heritage Malta (HM) and Stephen Borg at the Superintendence of Cultural Heritage (SCH).

All archaeological excavations described in this volume were carried out using standard methods, in accordance with the policies of the SCH, in particular the guidance given in the document *Operating Procedures and Standards for Archaeology Services – February 2013*. Permits to enable excavation, survey, sampling and study were granted through the SCH and we are especially grateful to Anthony Pace and Nathaniel Cutajar for their unstinting efforts to ensure fieldwork was enabled.

Taċ-Ċawla

The Taċ-Ċawla excavations were directed by Prof. Caroline Malone, and the crew consisted primarily of students and staff from UoC, UM and QUB, supervised by Stephen Armstrong, Jeremy Bennett and Conor McAdams, with additional supervision from Dr Simon Stoddart, Dr Sara Boyle and Dr Emily Murray. We are also very grateful for Dr George Azzopardi who sought out accommodation for the project, assisted on site, and with his colleagues in HM enabled access to space for storage, environmental sampling and finds processing in Rabat. John Cremona and his colleagues in the Ministry for Gozo also played an important role in enabling site clearance and facilities at Taċ-Ċawla, and in securing the site following our work, with the long-promised surrounding wall. We also acknowledge a great number of local Gozitan businesses, hardware stockists, JCB drivers and cafe and restaurant owners, who supported our work in so many ways.

Santa Verna

The Santa Verna excavations were directed by Prof. Caroline Malone, assisted by Dr Simon Stoddart and Dr Rowan McLaughlin. The crew consisted primarily of a number of students and staff from UoC, QUB and UM, supervised by Stephen Armstrong, Jeremy Bennett, Dr Catriona Brogan and Eóin Parkinson. Dr Evan Hill wet-sieved the soil samples using flotation and the site was sampled for soil micromorphology and geochemistry by Prof. Charles French, Dr Sean Taylor and Conor McAdams. During the excavation, our understanding of the extant megalithic structure was improved by the superb plan produced by Stephen Ashley. Tiomoid Foley conducted a condition survey of the megalithic remains, the results of which were incorporated into an MSc project. Rupert Barker made a short film of the excavations – *A Day on a Dig* (https://youtu.be/cGNOGpq746I). Digital laser scanning was undertaken by John Meneely. Individuals whose efforts are warmly acknowledged include Stephen Armstrong, Dr Catriona Brogan, Dr Bela Dimova, Dr Paola Filippucci, Dr Reuben Grima, Laura James, Lottie Stoddart and Dr Sean Taylor, who supervised trenches, organized field assistants and gave logistical support to the running of the project. At Santa Verna, we particularly thank Dr George Azzopardi (HM) for his invaluable logistical help at the start of the excavations and insightful comments made throughout, and Ella Samut-Tagliaferro, Cristian Mifsud, Mevrik Spiteri and Daphne M Sant Caruana, who accommodated the wet-sieving and flotation operations at the Ġgantija World Heritage site visitor centre. This was facilitated by Prof. Nick Vella and Chris Gemmell (UM), who organized and set up the sieving system. We acknowledge the interest taken in our work by other organizations including Xagħra parish council, Wirt Għawdex, and the staff and pupils at Gozo College. Indeed, the *FRAGSUS* team was delighted by the level of interest in the excavations shown by local residents and other visitors to the site. We particularly acknowledge the help, understanding and patience of the residents who offered us the use of their garage to store tools and equipment overnight, and the local farmer who provided gifts of bananas and kindly offered the use of his pumphouse as a tool shed. We especially thank Joseph Attard Tabone for his interest in and support of all our work, especially at Santa Verna.

Ġgantija

The Ġgantija excavations in 2015 were directed by Prof. Charles French, Dr Simon Stoddart, Dr Sean Taylor and David Redhouse, assisted by Stephen Armstrong, Jeremy Bennett, Dr Catriona Brogan, Conor McAdams, Aran McMahon, Eóin Parkinson, Jacob Pockney and Mariele Valci. Flotation of soil samples was undertaken by Dr Evan Hill. Digital laser scanning was undertaken by John Meneely. The field researchers comprised the geophysical survey team in 2014 under the supervision of David Redhouse and Dr Alistair Ruffell with assistance from Jeremy Bennett. Dr Sara Boyle and Jeremy Bennett undertook initial survey of the WC section area in 2014.

We thank especially HM and its staff on Gozo, who enabled access and provided much assistance at this busy World Heritage Site (the most visited ancient site in the islands), namely George Azzopardi, Daphne M Sant Caruana and Nicolene Sagona.

Kordin III

The excavations were directed jointly by Prof. Caroline Malone and Prof. Nicholas Vella, assisted by Dr Reuben Grima, Dr Rowan McLaughlin, Ella Samut-Tagliaferro and Dr Simon Stoddart. The crew consisted mainly of students from UM, who participated as part of their annual training excavation. They were supervised by Jeremy Bennett, Dr Catriona Brogan, Rebecca Farrugia, Dr Reuben Grima, Tore Lumsdalen and Eóin Parkinson. Flotation of soil samples was undertaken by Dr Evan Hill. Digital laser scanning was undertaken by John Meneely and Jeremy Bennett. We also acknowledge the kind assistance of Fondazzjoni Wirt Artna, the Malta Heritage Trust, who granted access to the site.

Skorba

The excavations were directed by Prof. Caroline Malone and Dr Rowan McLaughlin, who were assisted by Stephen Armstrong, Jeremy Bennett, Dr Catriona Brogan, Emma Hannah and Eóin Parkinson. OSL profiling and geoarchaeological sampling was performed by Prof. Charles French, Dr Timothy Kinnaird (University of St Andrews), Dr Simon Stoddart and Dr Sean Taylor. The site was laser scanned by Jeremy Bennett. We thank HM for enabling access to the site and Dr Josef Caruana and Katya Stroud for supporting the work.

In-Nuffara

The excavations were directed by Dr Simon Stoddart and Dr Rowan McLaughlin, who were assisted by Stephen Armstrong, Stephen Ashley, Robert Barratt, Donald Horne, Katie Hutton, Christina O'Regan and Leslie Torwie. Many thanks to Dr George Azzopardi (HM) and Ella Samut-Tagliaferro (SCH) for their logistical support. John Meneely laser scanned the silos and analysed the volumetric data. We thank Dr Anthony Pace and Nathaniel Cutajar and their staff from the SCH for enabling access to the site.

Post-excavation

The Department of Classics and Archaeology, UM, kindly offered storage space during the project and accommodated the post-excavation team in the sunny courtyard where pottery and finds were studied. We thank Chris Gemmell in particular for his invaluable help throughout the project, but especially in enabling storage of material and access to it for the project team and the logistics on various sites and for his skilled assistance in setting up the flotation processing. In Belfast, Emma Hannah undertook data entry, sample sorting and volume indexing, and Georgia Vince assisted with data entry and logistics and produced many of the excavation plans and section drawings used throughout this volume. She also archived and scanned the project records along with the original Cambridge Gozo Project, and these are now housed in the National Museum of Archaeology, Valletta. In Malta, pottery was studied by Stephen Armstrong, Stephen Ashley, Prof. Anthony Bonanno, Dr Catriona Brogan, Prof. Caroline Malone, Lisa Coyle McClung,

Rowan McLaughlin, Eóin Parkinson and Dr Simon Stoddart. We thank Prof. Nicki Whitehouse for her enthusiastic support and advice on environmental matters. Thin section slides were produced by Dr Tonko Rajkovača of the McBurney Laboratory, Department of Archaeology, University of Cambridge. We are very grateful to Sharon Sultana (Curator) of the Museum of Archaeology for not only housing the study material but also providing access to it in 2017. Stephen Ashley and Prof. Caroline Malone illustrated the pottery and small finds. Dr Catriona Brogan assisted in the production and editing of this volume. We also wish to thank Ben Plumridge, Production Editor, for seeing this and the two companion volumes through the arduous process of publication. Thanks too, to Jason Hawkes (copy editing), Olivia Shelton (references) and Emma Hannah (indexing) for their careful work on the volume.

Permits and access

The *FRAGSUS* team is very grateful to the heritage bodies of Malta, namely HM and the SCH and their officers, who enabled access to sites and provided the permissions and opportunities to study the buried archaeology. It cannot be over-emphasized just how privileged the *Project* has been in having access to excavate and examine the exceptional sites of prehistoric Malta. Not only is the entire category 'Maltese Temple' protected, but most sites are also inscribed within the UNESCO World Heritage Site listing for Malta. Some readers may wonder why very small trenches and sondages were permitted at all, whilst others may query the value of small investigations. This volume presents a range of scales of study from the small to the large across prehistoric sites and assesses the value of particular data sets that have been collected. Together with Volume 1, which examines the wider landscapes and environments of early Malta, and Volume 3, which examines the bones and lives of the ancient individuals, this volume fills the middle ground – the sites themselves, and we thank all our collaborators and volunteers in this venture. In particular, we thank the willing site assistants, volunteers, surveyors, cooks and illustrators who gave their time and energy to the archaeological work, and we list them below:

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Foreword

Joseph Magro Conti

Consider, 5000 years ago you are on one of the smallest islands in the Mediterranean, which has no water sources, dependent on brief winter rain showers, shallow soil patches, with only stone, clay and salt as natural resources, perhaps a few trees and shrubs. How would you live in such environment? This second volume of the *FRAGSUS Project* (2013–18) provides readers with fresh information achieved through high quality scientific research on palaeoenvironmental analysis, radiocarbon dating, human and faunal bone studies as well as on ceramics, lithics, domestic contexts and monuments, fully addressing five main questions targeted by the project. The support of the European Research Council has been transformative in making this new knowledge about Maltese prehistory more understandable and accessible, as a reader will discover throughout this and the other two volumes.

The coming of *FRAGSUS* was a long journey. Twenty-seven years passed since I first met the main protagonists of this project, Prof. Caroline Malone and Dr Simon Stoddart. They left a long-lasting positive impression on me. I was an archaeology undergraduate at the University of Malta in 1993, under the academic guidance of Prof. Anthony Bonanno, with colleagues Nicholas Vella (now Professor, and former Head of the Archaeology Department at the University of Malta) and Dr Anthony Pace (my predecessor as Superintendent of Cultural Heritage). I was on my first archaeological research excavation by an Anglo-Maltese mission at the unique Neolithic mass burial site of the Xagħra Brochtorff Circle in Malta's sister island of Gozo. A couple of decades later I had the opportunity to participate on other research digs in Malta with Malone-Stoddart, this time as part of *FRAGSUS* at Kordin III Neolithic temples in Malta, a site about which I had long endeavoured to raise awareness for its better understanding and management.

The Temple Period is renowned for the monumental megalithic structures (presumed temples) and the associated underground mass burial places, which offer an aura about the Neolithic mindset, belief system, organisation, ritual and physical capabilities in engineering and art. But what should be further intriguing to the reader is another aspect of human life – how the early people lived? What evidence is there for this aspect from the Temple Period? Previously, such questions were largely without much evidence except sporadic discoveries of typical deposits and material culture, but which were very lacking in data to advance site prediction and environmental data collection. The very few huts so far discovered and interpreted as domestic were ephemeral and thus prone to unrecorded destruction during building construction. I was pleased to contribute my knowledge of domestic sites to the publication of the Gozo study in 2009, and delighted to write this Foreword. This work records the next stages of discovery of the inhabitation record of the Maltese islands, most notably at Taċ-Ċawla, a site preserved from development by the action of the Superintendence.

In the past fifty years, the Maltese Islands have undergone successive building booms, each significantly endangering Malta's historic environment. In my quest as an applied archaeologist/heritage manager for over two decades at the Planning Authority and for the past two years as Superintendent of Cultural Heritage, I have endeavoured to collaborate with disparate stakeholders to save or mitigate impacts on the fragile remains of the past, and to raise awareness. The findings from *FRAGSUS* will be an especially useful source of information for policy makers, heritage managers, regulatory agencies and conservation scientists in their quest to preserve and understand Malta's past. The study enables them to make informed decisions about future human impacts on the archaeological heritage, mainly caused by

Figure 0.2. *Joseph Magro Conti at Kordin.*

building development on the small island environment and its island society and economy.

This volume is a seminal interdisciplinary study, not only for Maltese prehistory but also a milestone in world prehistory more generally. As prehistory pre-dates the invention of writing, the approach of *FRAGSUS*'s research agenda turns archaeo-environmental data into 'words' by digging deep into the embryonic matrix of garden soils on which the temples builders sustained themselves. The project can now explain queries about this sustainability, a theme that is still relevant to modern generations. With the use of multidisciplinary and multinational teams of specialists, the study placed innovative scientific approaches at the fore, and addressed silent aspects that go beyond the traditional art-historical basics of Grand Traditions. The investigations into the core essence of life five millennia ago belong to new scientific approaches.

The *FRAGSUS Project* has addressed lacunae and used unconventional approaches in theory and method to obtain robust scientifically-backed results that have filled in significant gaps in the research agenda of Maltese prehistory and beyond. Equally, the results have surely raised many questions for future research agendas. I look forward to further collaboration, and I am eager to see more collaborative projects between Maltese veterans and upcoming academics and our overseas colleagues.

Joseph Magro Conti
Superintendent of Cultural Heritage, Malta
September 2020

Chapter 1

Archaeological studies of Maltese prehistory for the *FRAGSUS Project* 2013–18

Caroline Malone, Simon Stoddart,
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1.1. Introduction

The *FRAGSUS Project* ('Fragility and Sustainability in small island environments: adaptation, cultural change and collapse in prehistory') was devised to explore issues of prehistoric island sustainability set against the background of environmental change and instability. The Project set out with four explicit objectives. These aimed to establish the factors that led to the growth, sustainability and apparent demise of the Neolithic Temple Culture civilization of Malta. The scenario set by previous research (Malone & Stoddart 2013; Trump 1976) identified that the collapse of this long-lived civilization was caused perhaps by isolation and a deteriorating unstable ecosystem amongst other possible factors. The objectives designed to explore the socio-economic changes that took place were to:

1) Reconstruct the past environment to investigate the environmental context of and human impact on ancient Malta. This would be achieved through an assessment of vegetation and landscape stability before, during and after the establishment, maintenance and collapse of the Neolithic civilization; and gathering data for comparisons with the later protohistoric and historical periods.
2) Improve the existing chronological framework by developing a reliable, precise and accurate time frame that would integrate events and trends determined from environmental, landscape and human-archaeological records. The chronology was to be achieved through the implementation of Accelerator Mass Spectrometry (AMS) radiocarbon, isotopic and Optically Stimulated Luminescence (OSL) dating methods (tephra analysis was undertaken in order to enable cross-dating with the AMS-dated pollen sequence, within which sparse tephra shards were found). The resulting determinations would give precision to the already unusually detailed artefactual framework, and all results would then be assessed using a Bayesian approach.
3) Establish the population history of early Malta by applying multi-disciplinary approaches to the study of the ancient population using previously excavated human remains from Xagħra. These remains were to be sampled to establish population structure, chronology, diet, stress, activity, disease, taphonomy and external origins.
4) Reconstruct the settlement, subsistence and landscape history of early Malta through study of the changing socio-economic patterns of early settlement, landuse and resource exploitation in prehistory. This would be combined with understanding the impact of deforestation, soil erosion and climate instability on early farming societies by sampling 'time capsules' of settlement and palaeoeconomic activity.

These four themes underpin the work of *FRAGSUS*, and the outcomes are recorded in three monographs of which this is the second. The first volume deals with the first two objectives, namely the environmental aspects and the chronology associated with soil, cores, pollen and climate. The third volume deals with the third objective, the human population and its physical remains, making reference to the other objects. Finally, this volume deals with the fourth objective, in particular settlement and archaeological evidence, but is closely linked throughout with the other objectives.

A principal goal for the *FRAGSUS Project* has been to detect and sample environmental data, which when combined with archaeological evidence, can inform on the impact of human activity on the natural environment. In the Maltese context we specifically wanted to identify how humans managed to cope when the natural world began to fail their needs, a failure that appears to have occurred at intervals over the long time frame of later prehistory. The *FRAGSUS Project* was designed to explore and record this long human sequence, one that had defined cultural identity throughout its evolution, and that had human subjects at its heart. By incorporating many datasets, the goal was to establish theories and interpretations about how we, the human species, both controlled, and were controlled by the natural environment we chose to exploit. The outcomes are recorded in three *FRAGSUS* volumes, of which this is the second (see also French *et al.* 2020; Stoddart *et al.* in press).

In Volume 1, we discuss at length the importance of islands as units for study. In this volume we focus on the archaeology and ecological aspects of islands. An island represents a conveniently circumscribed landscape of a known size, surrounded by water, and thus remote from larger landmasses and their biological and cultural stimuli. From the seminal ecological studies of Charles Darwin (Jones 2009) and Alfred Wallace (1892) in the nineteenth century, to the rich theoretical literature on biogeography and equilibrium theory in islands first initiated by MacArthur and Wilson (1963, 1967), an entire sub-discipline of island studies has developed. The studies range from Simberloff's equilibrium theory (1974), the ecology models of Gorman (1979), the ecological anthropology of Vayda & Rappaport (1963) to current ideas of evolution and equilibrium (Lomolino *et al.* 2010), and colonization (Cox *et al*. 2016). Generally, the bulk of research has been focused on non-human subjects, with issues of extinctions and conservation foremost. But nevertheless, a number of important theories and models from these island studies are relevant to archaeology.

1.1.1. Island studies

In the *FRAGSUS Project* we have sought to examine the particular impact made by humans on an environment and its natural resources in the prehistoric island context, and in this case, the archipelago of Malta and Gozo. There have been a number of useful studies on island colonization patterns and case studies of the Mediterranean and the Caribbean in particular, that extract some key ideas from the ecological models and apply them to the anthropic context. Evans (1973) was amongst the first to present the 'island' as the laboratory case study of an ancient society, and in particular in the Mediterranean context. Cherry (1981, 1990) further demonstrated the more quantitative outcomes of these ideas. Such work has generated a succession of useful, relevant studies and some focus specifically on Malta (Broodbank 2013; Dawson 2014; Kirsch 1986, 1996; Kolb 2005; Malone 1997–8; Patton 1996; Rainbird 2007; Renfrew 1973; Stoddart 1997–8). Collectively, these have worked to develop theory and demonstrate the archaeological relevance of the application of island ecology models. As time has progressed, increasingly detailed complementary information has been added, especially chronology. Now with fifty years or so of growing ^{14}C dating estimations, the tempo of island colonization, consolidation and desertion can be interrogated and the archaeological record better understood. We can now present an understanding of chronology as human time, rather than speculate about when and which groups of humans arrived on particular islands. This scientifically determined chronology, combined with traditional culture sequence studies allows discussion of when distinctive socio-cultural evidence appeared and disappeared in the sequence of social and environmental evolution. When Cherry (1981, 1990, 2004) was estimating island colonization patterns in the Mediterranean, far fewer, uncalibrated dates were available. Whilst he and Patton (1996) identified the sixth millennium BC as the first major episode of Mediterranean colonization associated with the spread of farming, there was little chance then to break the key 'sixth' millennium down into detailed episodes that might enable us to trace the dynamics of what was an extended process across the Mediterranean and Europe. Dawson, in a number of papers (Dawson 2004–6, 2008, 2010, 2014), identified Malta and Gozo as an archipelago likely to have been colonized just once, on the basis of data available. This notion was largely supported by Trump (1995–6) who had pioneered understanding of Malta's Neolithic. Even though there were insufficient date estimations available during his studies, he did speculate about possible breaks in the sequence of settlement and cultural evolution. But, without detailed chronology, the momentary episodes of cultural activity are impossible to pin down in a time sequence extending over millennia, often without much apparent cultural change. Accurate time measurement is also fundamental in measuring the relationship of human activity against episodes of environmental change and climate fluctuation.

1.1.2. Chronology and new scientific studies

The growing field of palaeoecology, combined with increased knowledge of past climates and catastrophic events demands chronological precision that can tally with human timescales. Increasingly accurate chronologies measure the small fluctuations of change and currently we are fortunate to have AMS dating that enables individual lifetimes to be identified, not simply great swathes of 'time'. Indeed, the increasing accuracy allows current archaeo-environmental studies to identify distinct events in the past, signalled by data that demonstrate downturns, climaxes, catastrophes (Baillie 1999). These events are not always clear cut or easy to distinguish, but nevertheless had an impact on the natural environment and, in turn, the world in which prehistoric communities lived. *FRAGSUS*'s work has, therefore, focused on trying to identify trends in the environmental and economic data for early Malta that may highlight instances of variation in the past and be investigated to address the research questions below (§1.5).

Shortcomings of all previous work on the prehistory of Malta (and indeed, in much of the southern Mediterranean) have been the lack of coordinated scientific fieldwork and data collection. All too often, 'research' has been content to simply identify sites and pottery, with little broader work on 'landscape' and 'monuments'. All too rarely have soils and the environment been considered as archaeological components, other than in the general sense of a covering over buried sites. Never had a soil history been undertaken of Malta that investigated the changing nature of soil over time (Volume 1). Geographers had undertaken some excellent work in preparation for independence (Bowen-Jones *et al.* 1961) and observed a much more accessible and visible landscape than is possible today. That work, however, was centred on the present and not aimed at environmental reconstruction. Consequently, environmental work was not attempted until the Xagħra Brochtorff Circle study of the late 1980s and early 1990s. Yet, that site had limited potential for soil study, as it was a particular cave environment. Samples from buried cave soils found no pollen preserved, whilst the funerary context was, by definition, some distance from the sites of the living. Instead, landsnails became the main focus of environmental study as they were well preserved (Schembri *et al*. 2009, 19–22). The question of landscape reconstruction, nevertheless remained. Over the next two decades, one member of the original Xagħra team (Hunt) continued in the quest to obtain suitable environmental material. He obtained meaningful pollen samples, but considerations of cost and experience limited the scope of their sampling and dating (Hunt 2015; Hunt & Vella 2004–5). The initial history of vegetation change was indicative (Carroll *et al.* 2012; Fenech 2007; Hunt *et al.* 1995), but inconclusive, with substantial gaps in the sequence for Malta at the crucial time of later prehistory. Similarly, other environmental work over the decades had not investigated animal bone and the settlement and economy of prehistoric Malta in early sites in detail (Fiorentino *et al*. 2012; Stoddart *et al*. 2009a).

The rise and florescence of the extraordinary Maltese Temple Culture lies at the centre of prehistoric study in Malta. But it could not be explained in socio-economic terms with any level of reliability. Consequently, predictions of population levels and density in prehistory remained speculative (Stoddart & Malone 2015). Neither was it possible to measure changes in socioeconomic conditions in prehistory without better data and a more extensive chronology. Thus, without a deeper understanding of the environmental or economic base, Malta's Neolithic World Heritage Sites remained 'mysterious' and sometimes liable to excessive interpretation based more on a fantasy goddess culture than on archaeological facts.

In the absence of new scientific study, useful work took place over the last two decades that advanced knowledge and interest in phenomenological and landscape approaches to the monuments (Barrowclough & Malone 2007; Grima 2004, 2005, 2007; Malone & Stoddart 2009; Pace 2000, 2004a, 2004b, 2004c; Skeates 2010; Stoddart & Malone 2010, 2013; Tilley 2004,). There was, nevertheless, a solid case for new research on the environment which the ERC assessors generously recognized. We consider their trust to have been well founded.

1.1.3. Island criteria

Small islands can make excellent subjects against which to challenge ideas about social resilience and isolation. But they also have drawbacks for archaeological study because of limited sample scope, lack of comparators

Table 1.1. *Research potential for island study and Malta.*

Characteristics	The Malta opportunities
1. A relatively isolated island group of small size (*i.e.* less than 500 km^2)	Malta has a maximum size of 316 km^2, and is over 80 km from Sicily
2. Surviving settlement, ceremonial and funerary sites of prehistoric date available for sampling and gathering chronological and environmental materials	Numerous ceremonial megalithic sites (temples), knowledge of tombs, hypogea and some settlements. The extensive Xagħra Brochtorff Circle population
3. Environmental data (pollen, soil, human/animal/ plant remains) to reconstruct vegetation, soils, climate and dietary/climatic isotopic information	Coastal valley inlets and valleys with deep sedimentation and good soil formations. Preservation of environmental materials in limestone environment and within prehistoric site stratigraphies
4. Samples of ancient human, animal and molluscan remains to enable dietary, isotopic and genetic investigation	Huge human remains archive (Xagħra) that has been partly studied and dated. The potential to sample new animal bone and plant rich deposits on habitation sites
5. A distinctive, dynamic and dated archaeological sequence of human activity and material culture	A rich ceramic and artefact tradition from a reasonably dated sequence, with preliminary typological and material study in place
6. Access to sites, museum collections and opportunities for collaborative research	Well established collaboration between Malta and the Cambridge-Belfast teams since 1987

and eroded environments with sparse potential to yield suitable materials. In the case of Malta and Gozo, the positive island characteristics we identified for study are listed in Table 1.1.

1.2. Background to *FRAGSUS* as an archaeological project

The richness of Maltese prehistoric archaeology has attracted a range of key figures who have explored its unusual qualities. Before the twentieth century, Maltese antiquities were a curiosity noted by travellers and administrators, but this work lacked much coherent scholarship. Later nineteenth century scholars sought to identify and protect sites (e.g. Antonio Annetto Caruana; Fig. 1.15) and a significant number were described and partly published (although these were always interpreted as Punic in date). It was only from the first decade of the twentieth century that the outstanding partnership of Themistocles Zammit (an established scientist and archaeologist; Fig. 1.15) and Thomas Ashby (a stratigraphic excavator whose skills were honed on the Roman monuments of Caerwent; Fig. 1.15), projected the riches of prehistoric Malta onto the world stage. This followed the detailed published study of the German scholar Albert Mayr (Mayr 1901; Fig. 1.15), who likewise had recognized the extraordinary prehistory of the Maltese Temple culture. Ashby contributed to knowledge of Santa Verna, Kordin, Mnajdra and Ħaġar Qim (Ashby *et al.* 1913). While independently and more dramatically, the work of Zammit led to the completion of work at Ħal Saflieni and the discovery of Tarxien (Zammit 1930), collectively demonstrated the creativity of the inhabitants of the Maltese Islands from an antiquity that had not previously been accepted. Together with scholars and excavators Napoleon Tagliaferro (Fig. 1.15) and Giuseppe Despott, Zammit also developed a powerful understanding of the structure and diversity of the elaborate material culture that came from the impressive monuments he examined. Above all, he realized the importance of reconstructions *in situ*, coupled with rapid publication and dissemination of information in written and museological form. A less well-known figure until recently is Luigi Maria Ugolini (Ugolini 1934; Pessina & Vella 2005) who was one of the first scholars to appreciate the significance of these earlier discoveries. He stresssed their importance, over and above the Roman-inspired wisdom of the time (Ceschi 1939). His work (Ugolini 1934) was amongst the first to try to interpret the discoveries in terms of the living people who created the monuments. As a synthesis, it is probably fair to state that these pioneers developed a broad understanding of the major monuments, most notably of the so-called temples, but also of the underground burial chambers of Ħal Saflieni. However, other potential questions (principally those concerned with landscapes, environment and subsistence) were still under-investigated.

After WWII, two archaeologists, John Evans and David Trump (Fig. 1.15), built on the achievements of these pioneers. John Evans, like many significant figures of his generation honed his forensic skills at Bletchley Park (WWII intelligence) and applied them through his training in Archaeology and Anthropology at Cambridge to the early archaeology of the Mediterranean. In 1952, he was appointed by a committee headed by the Royal University of Malta to systematize the unpublished and outstanding discoveries of the pioneers in a survey of the state of knowledge of the Maltese islands. He combined this systematization with a series of surgical strikes on key monuments to attempt a chronological resolution to the rich material culture. Evans focused on sites where stratigraphy was clearly preserved by the sealed packed limestone (*torba*) floors, and where uncontrovertible sequence could be extracted. In the tradition of Zammit, he also developed an early synthesis of these results (Evans 1953, 1956, 1959). Even if publication of the full dataset took time (Evans 1971), this delay allowed for the inclusion of new and significant information, notably from David Trump's work (see below). At the same time, Evans paralleled the footsteps of Ugolini by developing an interpretative framework, albeit in a rather different direction and tradition; he both posited the ideas of island archaeology (Evans 1973a; 1977) and considered the role of key actors, such as the 'priest' in some of the monuments that he was synthesizing (Evans 1973b). David Trump accompanied Evans on his exploratory fieldwork and, following his appointment as Curator of the Museum of Archaeology in 1958, developed the subtleties of the prehistoric timetable much further. Most significantly, he excavated the site of Skorba, uncovering new phases in the Maltese sequence, named by him after the same site, and provided the radiocarbon dates that, at last, were available to archaeologists to accompany this material (Trump 1961; 1966). The results were that the chronology was no longer relative, but increasingly precise, even if based on remarkably few samples. Trump was also instrumental with Charles Zammit, the museum director and the son of Themistocles, in displaying these achievements in the newly established National Museum of Archaeology in the centre of Valletta. In fact, David Trump developed a natural, albeit idiosyncratic, talent and strong following in the popularization of the importance of the Maltese islands in prehistory (Trump 1972; 2002; 2010). The reward was a celebration of his achievements by the Maltese nation to a level never recognized in his country

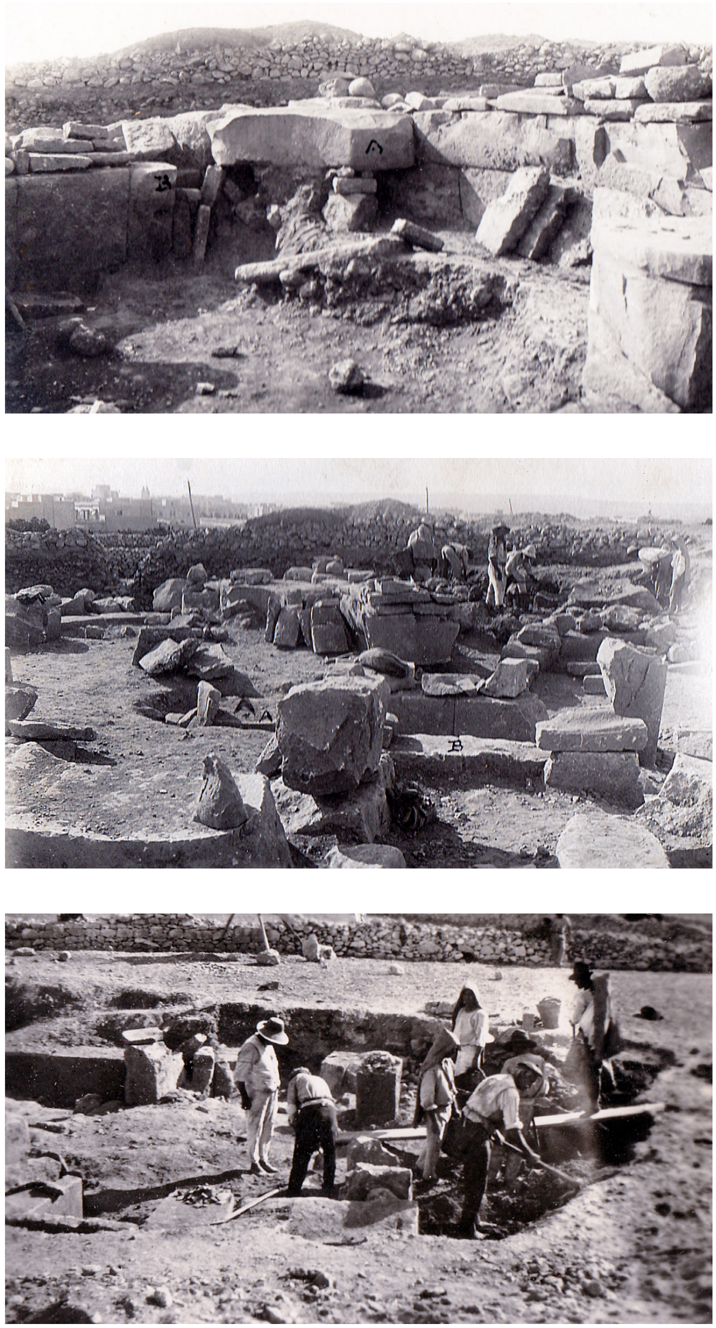

Figure 1.1. *Early excavation images of Tarxien in 1915 during the superficial clearance of masonry and deposit (Zammit) courtesy of the National Museum of Archaeology, Malta.*

of birth – an honorary degree from the University of Malta and the Order of Merit of Malta.

Two further figures are connected to the *FRAGSUS Project*. Colin Renfrew (1973) advanced the implications of the new radiocarbon dates that had been produced largely by David Trump, but also supplemented by himself. He highlighted the broader setting of calibration, and thus firmly established the claim that these monuments were the oldest free-standing stone monuments in the world. This is a claim that still stands today for roofed stone monuments, in spite of the relatively recent discovery of the much older, but open air, stone monuments of Gobekli Tëpe (Schmidt 2007). At the same time, Renfrew took their theoretical understanding forward by proposing theories of societies and their territories in an island setting, and how they might have developed over time (Renfrew 1973; Renfrew & Level 1979). Anthony Bonanno, the long-standing head of the Department of Classics and Archaeology that he founded at the University of Malta, also made his own very real contribution to the debate. He synthesized the available information (Bonanno 1986a) and, with Colin Renfrew, jointly proposed an Anglo-Maltese collaboration during a seminal conference that he organized in 1985 (Bonanno 1986b).

1.3. The Cambridge Gozo Project 1987–95

The collaboration that followed (1987–95) between the Universities of Malta and Cambridge and the then Museums Department took stock of the current state of knowledge based on Anthony Bonanno's 1986 synthesis. It was clear that study of the so-called 'temples', mainly on the island of Malta, had dominated previous research. Questions of death, domestic life, economy, the human and physical landscape had been under-researched. The Cambridge Gozo project under the direction of Anthony Bonanno, Tancred Gouder, David Trump, Caroline Malone and Simon Stoddart sought to investigate these remaining gaps. A single phase Temple Period settlement structure at Għajnsielem on Gozo was investigated in the first 1987 season (Malone *et al.* 1988, 2009, Ch 4.). The Xagħra Brochtorff Circle was researched over all seven field seasons, and a field survey was undertaken in those moments when the great investment of work on the Circle permitted. The most successful feature of the project was a deeper understanding of Maltese death ritual (Malone *et al.* 2009). Some major strides were made towards appreciating principal changes in settlement distributions between the ceramic phases of Għar Dalam to Baħrija in the central part of Gozo through a systematic site and off-site landscape survey (Boyle 2013, 2014; Malone *et al.* 2009; Volume 1, Chapter 6). Some new data were gleaned as proxies for domestic life and several likely settlement sites were located, although the one excavated Għajnsielem Road structure was largely devoid of refuse (Malone *et al.* 1988, 2009). Very few advances were made in understanding the changes in the physical and natural landscape. Several specialist scholars, however, were invited and they attempted to identify the means to extract knowledge from a challenging environment at a time before many of the current methods used in the current project became available. The most successful work came indirectly from the study of land snails from the Xagħra Brochtorff Circle (Schembri *et al.* 2009). The scientific goals of the Cambridge Gozo Project (1987–95) were significant on a number of fronts. In particular, it achieved knowledge of prehistoric funerary ritual and an initial study of the prehistoric population, and accompanying animal remains. Inadequate funding meant that the osteological study was preliminary. Nevertheless, that work revolutionized approaches to the bioanthropology of the prehistoric population. It represented only the second discovery of a Temple Period funerary complex (rather than individual tombs) in Malta, and the only example of a fully recorded burial assemblage. Chronological progress included a suite of AMS radiocarbon dates on human bone, which fixed the episodes of burial for the first time. Other major achievements included the systematic study of molluscan evidence in environmental reconstruction, the identification of hard stone sources from outside Malta, and preliminary work on diet and the exploitation of animals. The post-excavation research (between 1996 and 2009) also identified a number of directions for future research. In particular, we (Malone *et al*. 2009, 383–4) specified the need for: more scientific analysis of the human remains; a better understanding of diet, disease and changing life patterns; more AMS dating; and the application of (the then) new and promising aDNA methods on the enormous assemblage of human bones (*c*. 220,000 individual parts). As with many burial sites, it is vital to establish the composition of the buried community, both social and biological; aDNA can offer new insights into the latter and by implication the former. In conjunction with excavated materials, we also suggested that sedimentological and environmental research might interrogate the question of climatic downturns to address an overriding question, 'why did the Temple Culture collapse and disappear'? The work of the late Frank Carroll at Huddersfield University (Carroll 2007; Carroll *et al.* 2012) showed that these methods were viable in the Maltese contexts.

In the years immediately following the 2009 publication, while other fieldwork was developed in Etruria, these various issues became a discussion point for some of us (especially Hunt and Malone in the palaeocology labs of Queen's University Belfast – QUB, colleagues in the Universities of Malta and Cambridge – UM and UoC, and the newly established bodies of Heritage Malta – HM – and the Superintendence of Cultural Heritage – SCH), to develop a project that was resolutely designed to solve these remaining questions, and extend research activity towards Malta as well as the smaller island of Gozo. Pollen, soils and sediment thus became central concerns for the new project together with investigation of food, subsistence and domestic life in prehistoric times. It was also realized that the chronology of the Maltese islands, although established in its broad outlines, was based on all too few samples, too much on pottery, and, where available,

Figure 1.2. *Xagħra Brochtorff Circle excavations from 1987–94 (Malone and Stoddart, the Cambridge Gozo Project).*

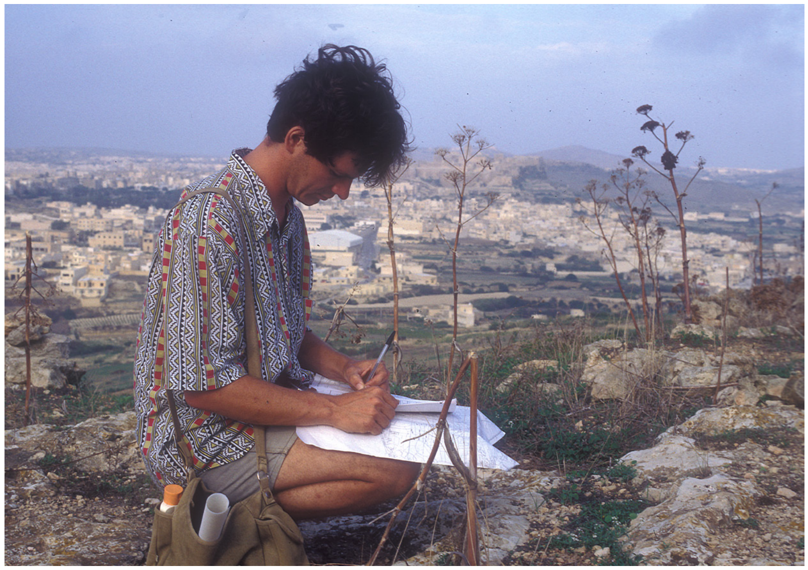

Figure 1.3. *The Cambridge Gozo Survey 1987–95, recording landscape features and surface scatters: Duncan Brown (above), Barry Kemp and Duncan Brown (below). (Simon Stoddart).*

had used older methodologies that paid less attention to socio-economic and environmental evidence. If the understanding of the tempo of island life from prehistory to more recent times was to be established, it was considered vital to invest heavily in cutting edge chronometric techniques that included AMS as well as OSL dating. It was evident that only a major, very well-funded, project could apply the necessary levels of interdisciplinary scientific analysis to test these questions, and potentially make an advance in understanding. A period of collaborative discussion in 2011–12 led to the application, headed by Malone, for funding from the European Research Council, and *'FRAGSUS'* as a project was developed. The application was submitted in April 2012, and the team were notified in November 2012 of its success, enabling the five-year programme of research to commence on 1 May 2013. A large team was assembled comprising nineteen scholars (see Acknowledgements), spread between Britain and Malta, and initially from QUB, UoC, UM, HM and the SCH. Later some colleagues moved to the Universities of Plymouth and Liverpool John Moores. In addition, new research staff attached to the main partner institutions were engaged to undertake specific sub-programmes of specialist work, and over the years a number of post-graduate students also joined the project to undertake Ph.D. and Masters dissertations based around the project's work.

1.4. The *FRAGSUS Project* 2013–18

The *FRAGSUS Project* attempts to address the many issues identified above in the broader framework of resilience theory within a restricted island community. It necessarily draws on the work of our predecessors, Zammit, Ugolini, Evans, Trump and Renfrew, who had in their various ways laid the foundations for this continuing study. The *FRAGSUS Project* was born out of the combination of previous archaeological fieldwork undertaken between 1987–94 (the Cambridge Gozo Project – excavations at the Xagħra Brochtorff Circle), and the complementary studies in environmental change (Carroll *et al.* 2012; Fenech 2007; Hunt & Schembri 1999; Schembri *et al.* 2009) coupled with the many questions that still remained to be addressed. New studies demanded the investment of modern scientific infrastructure and expensive specialist analyses, and *FRAGSUS* could never have been achieved without the availability of substantial funds from the European Research Council, provided through the award of an Advanced Researchers Grant. We are very grateful for the support provided and trust that this, and its partner volumes, provide a suitable acknowledgement as well as justification for an investment that has implications for understanding both the past and the present (see Volume 1 Conclusions and this volume).

1.4.1. Archaeological concerns in Maltese prehistory and the FRAGSUS Project

The summary above highlights the main strands of intellectual development of the project. This section adds detail to some archaeological themes that are central to the *FRAGSUS* study, which we aim to address through the field research undertaken during the project.

1.4.2. Time and artefacts

From Zammit onwards, the megalithic structures and the remarkable 'art' and artefacts of the Neolithic 'Temple' culture provoked an ongoing interest in Mediterranean prehistory and the relationship between that area and the better known west European megalithic sites (Piggott 1965; Daniel 1963). By the mid-twentieth century, it was generally agreed that the cultures of Malta were of Neolithic and 'Copper' Age date, but beyond that notion, chronology was vague. The synthesis and record of the prehistory of Malta by Evans in the mid-1950s represented the first stage of a full evaluation of the material culture and sites of Malta's prehistory. That project was a major step forward in organizing the cultural sequence and assigning the rich archaeological assemblages stored in the National Museum of Archaeology to separate phases. Evans' small exploratory excavations were designed to demonstrate the chronological-archaeological sequence, and he presented his ideas in a number of publications that remain relevant today (Evans 1953, 1956, 1971). In 1958, David Trump, from his position as curator of the Museum, followed in Evans' path and organized further excavations to test the archaeological sequence, which spanned from the earlier Neolithic to the Bronze Age. Now armed with the powerful new tool of radiocarbon dating, Trump obtained a modest selection of samples tied to ceramic types that collectively demonstrated the very long archaeological occupation of Malta. The key site of Skorba Temple (Mġarr) formed the core of the dating programme, but it was supplemented by key-hole excavations at Santa Verna, Kordin III, Ġgantija, Tarxien and Ħaġar Qim that extracted distinctive ceramics often in defined stratigraphic layers. Linked to the few dated pottery levels, Trump was able to assert a new and unexpectedly ancient sequence. The achievement of the work was published in 1966 (Trump 1966), and its impact was deftly identified by Colin Renfrew in a chapter in *Before Civilization* (1973). There, Renfrew argued for the independent development of the Maltese island culture and their early dates, long before later Mycenean or Egyptian influence, which had, hitherto, been the chronological reference point in the Mediterranean and west European Megalith debate.

The Skorba sequence revolutionized both theoretical thinking and chronological understanding. It was, therefore, unfortunate that after the declaration of the independence of Malta in 1964, international collaboration or any ongoing scientific research in prehistoric archaeology all but ceased for many years. For over two decades, the sequence and the interpretations proposed by Evans and Trump were unchallenged, with no new fieldwork of significance being reported. In that time, theoretical studies filled the gap; for example, the modelling proposed by Renfrew that tested ideas on territories (Renfrew & Level 1979), or work that attempted to integrate and synthesize Maltese sites with other megalith building societies (Joussaume 1985). The period also saw the rise of Mother Goddess studies and other weird, wonderful and entirely unsupported proposals to interpret the Temple Culture (Gimbutas 1991). The need to provide counter evidence for these theories of a Greater Balkan Civilization, also drove the demand for new field research forward. The most recent studies (Tas-Silġ – Bonanno & Vella 2015; Cazzella & Recchia 2012; the Cambridge Gozo Project – Malone *et al.* 2009, and work by the emerging government agencies HM/SCH – Grima 2011; Pace 2000) have been constrained by the legacy of an earlier history of rather rigid material culture designations and typological systems. Given the effectiveness of Evans' and Trump's work in describing the archaeological sequence in material terms, almost no attempt has been made to revise the system. In contrast, later periods have benefitted from work that necessarily takes account of broader Mediterranean systems (Anastasi 2013, 2016; Bonanno 2005; Quinn & Vella 2014; Sagona 2002), whilst the ceramic chronology of prehistoric Malta has largely remained a silo in its own insular world. In this volume, we assemble a large new collection of excavated material and subject it to detailed analysis (Chapter 10) with the intention of clarifying the present scheme and shaping it into one that is current and linked to a new chronology and science.

1.4.3. Architecture

The *FRAGSUS Project* also addresses the issue of temple architectural development. This theme commenced, in some respects, with the work of David Trump, who sought to identify an evolutionary scheme for the structural development of Maltese temples (Trump 1972; 2000, 2002). The opportunity to excavate beneath and around early temple structures has enabled us to examine architectural development in a limited way. In particular, the work at Santa Verna (Chapter 4 this volume) provides an important insight into early temple development supported by detailed dating. Likewise, the exploration at Kordin III (Chapter 6 this volume) has revealed details of construction at another early site. Architecture, however, is only dealt with briefly here, and forms the subject, we hope, of future studies.

1.5. Five research questions

The *Project*, as summarized above, was devised to tackle the all of outstanding issues highlighted above by posing five specific questions that attacked the central problem of the end of the Maltese Temple Culture. These interlinked questions focused on the fragility and resilience of island life. As is so often the case in such an intensive project, not only have many questions been answered, but the answers demonstrate enormous complexity and themselves raise new questions. A central feature of the project was to bring to bear multiple techniques in addressing the same questions, thus strengthening the validity of many of the conclusions.

1. *What was the impact of human settlement on Malta, and how rapid was the process of deforestation, erosion and degradation? When did technical mechanisms to manage the environment develop – such as terracing, water and food storage? Were such mechanisms in place before or after the Temple Culture collapsed?*

Enormous advances have been made by interlinking proxy samples from seven new pollen locations (with a corresponding sevenfold increase in catchment) and six new archaeological stratigraphies. As both this and Volume 1 show, a highly complex and fragile turbiditic landscape has been uncovered. Questions about early terracing, water and food storage have been less effectively addressed and remain issues to be solved by the next generation of archaeologists.

2. *How did a very small island community in prehistoric times manage to sustain dense, complex life over millennia, and what specific social, economic and ritual controls emerged to enable this? Were the monumental temples instrumental in the process of sustaining cultural life?*

For the answer to this question, we necessarily draw on the information provided by Zammit, Evans and Trump. It was these scholars who investigated the temples when they were best preserved. However, the *FRAGSUS Project* has supplemented this work by investigating parts of four temples (Ġgantija, Santa Verna, Skorba and Kordin III). In addition, the evidence from the settlement area of Taċ-Ċawla, despite being a complex multi-period site, has permitted the elucidation of some of the essential differences between the communal activities of the temples and the smaller scale activities of the living sites.

3. *What sort of agriculture was used, and what did people eat, especially as the landscape became increasingly degraded and the environment more unpredictable? Were there failures in the food supply? What impact did diet, disease and stress have on the population?*

A three-pronged approach has been delivered successfully, drawing on the refuse of the living, the remains of the dead and palynological evidence. The settlement site of Taċ-Ċawla has, for the first time, delivered a series of refuse samples that give a measured development of the food resources (carbonized seed and bone) from the Maltese islands. These can now be compared with the evidence from the bodily remains of their near neighbours and contemporaries interred in the Xagħra Brochtorff Circle. The latter have provided samples for both isotopic and dental analyses, which have revealed invaluable information on dietary trends in the fourth and third millennia BC (see Volume 3). The presence of livestock and domesticated plants, while shifting in locational focus, were shown to be uninterrupted from their inception at the beginning of the sixth millennium BC until their major decline in the final stages of the Temple Period.

4. *What was the size and nature of the early Maltese population and what role had demographic connectivity (immigration) in maintaining island sustainability?*

Our insights into the changing demography of the Maltese islands remain indirect. The Cambridge Gozo survey (undertaken in the late 80s and early 90s, but presented in these volumes) has given some sense of the relative and changing density of a small part of the landscape. The pollen record has provided an important idea of the impact of these populations on the islands at a date even earlier than the settlement record. aDNA, isotopes and the physical anthropology have given different degrees of understanding of the connectivity of humans with the outside world and their genetic variation. These can be measured against the import and circulation of non-organic materials, as well as crops, trees, animals and other resources. A deeper understanding of demography remains a substantial challenge, and one that future generations can continue to tackle.

5. *Was there social, economic or environmental failure at the end of the Temple Culture, and what may have caused society to collapse or change so drastically? Was there a hiatus between the Temple Culture and later Bronze Age settlers? Can a hiatus be identified during the earlier settlement of Malta, between* c. *5000 and 3800 BC?*

A number of proxies have been combined to investigate the situation at the end of the Temple Period: pollen, sediments, human remains and the distribution of radiocarbon dates. These do support the evidence for important changes at about 2340 BC, but similar analyses have also detected a similar downturn in the fifth millennium BC, which extended over a longer period. The focus on dating has revealed a long and apparently culturally empty episode between the Skorba Neolithic and the Zebbug. The definition and narrowing of these windows of change is one of the exciting results of the current work, and presents stimulating prospects for further analysis by future generations of archaeologists.

These questions were designed to provoke interdisciplinary approaches that employed fieldwork, fresh data collection, various analyses and a range of new scientific approaches. Some questions were simple, provoked and supported by the outcomes of previous study, and they had superficially obvious answers. Yet, when tackled through new and demanding methodologies, these same questions invariably opened doors to entirely new territories. Other questions were more speculative and designed to test new methodologies such as isotopic science and aDNA. It was the intention of the project to explore and tackle the unknown, to take risks and move the fields of study forward. As the reviewers of the grant application commented, the *Project* aspirations were admirable, but although many might not fully succeed, the journey was worthwhile in itself. It was thus that the team set out in May 2013 to start a demanding programme of research into past climate, landscapes, people and their cultures and to explore what enabled or hindered human sustainability in small islands in the past. Our focus was the Maltese islands, of which we had previous knowledge, but that were also chosen because their size and scale presented opportunities to examine the 'rise and fall' of a distinct civilization. In other parts of the Mediterranean or Aegean, it might have proven harder to distinguish such distinctiveness, but Malta – with its remarkable 'Temple' Culture – presented the greatest potential to test our questions. Malta was also chosen because of the long-standing collaborative relationship between the team members extending over decades, and our shared sense of affinity with a remarkable ancient people whose world we had begun to observe at ever closer quarters.

The outcome of the *FRAGSUS* research was always envisaged as being complex, incomplete and difficult to interpret. Nevertheless, the goal has been to go beyond simply gathering data about time, plants, soils, pots and people. We aimed to model aspects of how the ancient communities of Malta lived and died, how they organized their existence on a small and crowded island, and how they managed to maintain apparently placid social relations between the islands and their communities. One intriguing aspect of the Temple Culture and its remarkable architecture is that is appears to have emerged as a response to the local conditions of intense competition. The team have long debated the problem of how to interpret the temple evolution and its role in society, just as preceding scholars have for the last century and more. Now, with the benefit of detailed time control, set against a much deeper understanding of economic variability and the physical impact of that productivity on the human skeleton, we can begin to see how the early Maltese coped with their world (see Volume 3). At times it was a productive place, whilst at others, life probably hung in the balance between dry seasons, disease and economic failure. The temples seem to have been the places where the action of daily, seasonal and ceremonial life took place, but just what were the 'temples' in the minds of their makers? We have found evidence for ceremonial activity, fires, pots, animal bones, grinding feasting, grain processing, storage, display, sacrifice, theatre and aesthetics. The structures were large enough to live in, but evidence is not apparent that anyone did inhabit these places. This question of the function of the temples will be revisited in the Conclusions, Chapter 13.

1.6. The field research programme, 2014–16: the selection of sites for excavation and sampling and the goals for each site

The *FRAGSUS* research programme in archaeology was enabled by close collaboration between the team members, in particular those working in HM and the SCH, who were able to identify suitable and accessible sites for analysis. Although Malta is extraordinarily rich in prehistoric sites, most of them are inaccessible for excavation for one reason or another. Some are public 'heritage' sites, others are on private land, and there is a clear understanding that disturbance of sites should be avoided unless there are overwhelming reasons to intervene. Research archaeology has to make a strong case, and *FRAGSUS* was able to do this, since it brought new, and rather urgent opportunities to undertake diagnostic work that had potential to improve understanding and conservation. Most of the 'Temple' sites are inscribed as World Heritage Sites on the UNESCO list, and protected by national legislation. But that protection is only as good as planning, environmental pressures and erosion allow. The protective legislation covering Heritage and Antiquities has been greatly enhanced in recent years, and there is a general discouragement of any excavation or intervention that could cause damage or destruction. The team is therefore very grateful to the SCH and to HM (the two agencies responsible for protection of archaeological sites in Malta), for allowing and enabling *FRAGSUS* to work on the sites reported on in this volume. Two sites formed quite large excavation trenches (Taċ-Ċawla and Santa Verna) and both had the advantage of earlier archaeological work, with the *FRAGSUS* trenches comprising in part, interventions in areas of earlier backfill. The other sites were examined by small sondages (Skorba, Ġgantija), with larger slot trenches at Kordin III and two rock-cut silos at In-Nuffara. These excavations were precisely located, on the instruction of the authorities, and could not be expanded, regardless of the emerging deposits found. Future opportunities may arise for other scholars to expand these small sondages to explore and interpret the often limited evidence that was uncovered.

Over recent years, efforts have been made by HM to research the management and stone erosion of the monuments (Cassar *et al.* 2018; Grima 2011; Stroud 2003, 2004–5, 2007; Zammit & Mallia 2008). The issue, however, of the eroding surrounding landscape had not been included in this work, although it is the subject of several other conservation and heritage programmes (Gigli *et al.* 2012). Areas of bare rock caused by erosion of covering soil and vegetation are encountered while visiting any one of the 'temple' sites, and this erosion is seen across the entire landscape. As Volume 1 describes, the erosion process has been ongoing for millennia, and was exacerbated by human activity, agricultural regimes, heavy rainfall and the very nature of the landscape itself. Short of covering over entire sites, there is little chance of preserving them in an intact form. Although conservation issues were prominent in

Table 1.2. *Timetable of fieldwork.*

Taċ-Ċawla	2014	March–July	Neolithic settlement open area excavation Post-excavation processing and recording of material culture Environmental sample processing
Ġgantija	2014 2015	May–July March–April	Survey and recording of WC Section Excavation of sample sondages and large trench over ramp area
In-Nuffara	2014 2015	May March–April	Digital survey of plateau Silo Excavation Environmental sample processing
Santa Verna	2014 2015	March–April April–May	Digital and surface survey Large trench excavation of Temple site Environmental sample processing
Kordin III	2015	June–July	Trench excavation of Temple site Post-excavation environmental processing and recording of material culture
Skorba	2016	March–April	Sondage excavation of Temple site Environmental sample processing Lithic survey and analysis
In-Nuffara, Santa Verna	2015	June–July	Post-excavation processing and recording of material culture
Santa Verna, Ġgantija, Kordin III, In-Nuffara	2016	June	Post-excavation processing and recording of material culture
Taċ-Ċawla, Ġgantija	2017	June	Post-excavation processing/recording of material culture

the selection of sites studied by *FRAGSUS*, they were not the only concerns. As the research questions above specify, the goals were to obtain samples from periods of prehistory that might inform on particular aspects of the environment, the economy, the diet, and the general lifestyle and development of prehistoric communities. Such samples needed to be of sufficient quantity and quality and be subjected to rigorous quantitative and scientific scrutiny. They mostly had to be freshly obtained through new excavation and coring, since little suitable sampling had been done in the past. Samples needed intact stratigraphic levels in reliable and meaningful locations containing undisturbed deposits. Careful prior research identified likely spots for sample collection. Only reconnaissance and subsequent investigation could reveal the detail of time and environment, and given the level of previous intervention and erosion, such places are difficult to locate or even recognize. When found, they offered spectacular windows (e.g. Santa Verna and Skorba) into the hidden. This was a parallel experience to that encountered by the same team in much larger island contexts such Sicily (Malone & Stoddart 2000), where pockets of deposition could be readily accessed. The *Project* was correspondingly ambitious regarding the number of sites it investigated, and only pursued those deemed to have appropriate intact windows into the past that covered the necessarily extensive time range. The chosen sites, described below, had particular attributes capable of contributing new knowledge that could justify intervention in the UNESCO World Heritage Sites and the expenditure of time and resources required.

By the end of the *Project*, the excavations resulted in one settlement zone around a probable water hole (Taċ-Ċawla), four temple sites (Ġgantija and Kordin III, where only one phase was examined; and Santa Verna and Skorba, which had deeper stratigraphies) and a Bronze Age settlement (In-Nuffara). Already collected samples were analysed from a further two prehistoric sites (Xagħra Brochtorff Circle and Tarxien) and one medieval site (Mdina). The sites of Taċ-Ċawla, Santa Verna and Skorba provided the most chronologically wide-ranging information; whereas Taċ-Ċawla, Santa Verna and Kordin III provided the most spatially informative data over the area of a single site.

The programme of work engaged substantial field teams at Taċ-Ċawla, Santa Verna and Kordin III. The main personnel at each of these sites were recruited from Queen's University Belfast, the University of Cambridge and the University of Malta respectively (see Acknowledgements for staff list).

The choice of site was designed to map on the *FRAGSUS* questions by contributing to understanding of the:

1a. Impact of human settlement on Malta
1b. Rate of deforestation, erosion, degradation
1c. Technical management of environment

2a. Socio-economic sustainability
2b. Role of temples in sustaining cultural-economic life

3a. Nature of agriculture
3b. Failure of agriculture
3c. Impact of diet, disease and stress on population

4a. Size and nature of the prehistoric population
4b. Role of demographic connectivity in maintaining sustainable life

5a. Socio-economic failure at the end of the Temple Culture
5b. Evidence for a hiatus between the Temple Culture and the Bronze Age, or at other times

As Table 1.3 shows, the sites each spanned slightly different time ranges, enabling the project to sample materials covering almost 5000 years which could address the five main questions and their sub-questions. (This table and the questions is revisited in the Conclusions, Chapter 14). Linking all of these questions and sites is the programme of AMS radiocarbon dating that was applied to all suitable material from the excavations. Table 1.3 also includes the previously excavated Xagħra Brochtorff Circle, the remains from which form the focus of Volume 3, and the manner by which those materials contribute to the *FRAGSUS* questions.

A number of other sites were considered for investigation, but were not included on the grounds of time, scope, access and uncertainty of their contribution to the *FRAGSUS* questions. These sites, nevertheless, continue to offer the potential for study by future generations of archaeologists. Ta' Marżiena (Fig. 12.1), a probable temple site with a reasonable stratigraphy, was laser scanned, but its access would have required separate negotiation with a private land-owner. The main Bronze Age fortifications of Borġ in-Nadur on Malta were scanned (Fig. 12.2) , but some work had already recently been undertaken (Tanasi & Vella 2011; 2015) and further work was logistically difficult. Xrobb l-Għaġin, a temple site on Malta that is threatened by cliff collapse, was considered too dangerous to investigate. But this site has been scanned subsequently by members of the *FRAGSUS* team using drone facilitated technology. Għar ta' Għejżu on Gozo was scanned, but had already been badly damaged and contained no deposits. The Xemxija burial chambers were scanned (Volume 3) and the skeletal remains recovered by Evans

Table 1.3. *Chronological range of* FRAGSUS *sites and their contribution to the project questions.*

	Early Neolithic	Temple Period	Bronze Age	Later contexts	Q 1			Q2		Q3			Q4		Q5	
					a	b	c	a	b	a	b	c	a	b	a	b
Taċ-Ċawla	5400–5000 BC	3700–2400 BC	2400–2300 BC	Punic, Roman	√		√	√	√	√	√	√	√	√	√	
Ġgantija		2600–2500 BC			√	√	√	√	√	√		√		√	√	
Santa Verna	5400–5100 BC	3800–3100 BC		Medieval	√	√	√	√	√	√	√	√		√		√
In-Nuffara			1100–1000 BC		√	√	√			√	√			√		
Kordin		3600–3100 BC				√		√	√	√		√		√		
Skorba	5400–4800 BC	3600–3300 BC			√	√		√	√	√	√	√		√		√
Xagħra Brochtorff Circle		3800–2350 BC	2000–1600 BC					√	√	√	√	√	√	√	√	√

are considered by Jess Thompson in Volume 3, Chapter 13. Għar Dalam was scanned, but the deposits were considered too precious for further excavation. The south temple of Ġgantija was scanned but not considered for excavation, except on its margins, where excavation was undertaken as part of the project. The current state of the Xagħra Brochtorff Circle was scanned, but permission was not received for further limited excavation and conservation assessment. Finally, the Skorba phase site of Ta' Kuljat detected through the original Cambridge Gozo survey was identified for excavation, but considered logistically too problematic because of its relative inaccessibility and private ownership.

1.6.1. Taċ-Ċawla

The site of Taċ-Ċawla (Fig. 1.4) was selected because it was the only extensive known settlement site of the Neolithic that was accessible for study. Initial assessment in the 1990s had shown that structures were present, and that quantities of pottery and artefacts had been recorded that spanned from the earlier Neolithic to the Bronze Age. The land was in government ownership and the site was readily accessible by vehicles and available for new study, and importantly, it had demonstrated deep stratigraphy over parts of the site. The site was a remarkable survival within an urban area and could also be readily protected by the constant observation of local people. Its topographic position was interesting, overlooking a valley and a small temple (Ta' Marżiena) on a nearby ridge. Excavation trenches were permitted over areas previously exposed in the 1990s, and where backfill covered known archaeological levels. The extent of the site was expanded to limits agreed with the SCH.

1.6.2. Santa Verna

Santa Verna (Fig. 1.5) was selected because it is one of the few ruined 'temple' sites that is not a World Heritage Site, is not much visited by the public, and is located on accessible and undeveloped church land. The landscape surveys undertaken in the 1980s, 1990s and in 2014 demonstrated the existence of extensive archaeological material far beyond the few visible megalithic stones. This indicated a large and important complex of archaeological potential. Trump's work in the 1960s and the earlier study by Ashby and Bradley in 1911 (Ashby *et al.* 1913) offered promising insights to a long duration of Neolithic activity on the site, mirroring the discoveries by Trump at Skorba on Malta. Its topographic position at one of the highest points of the Xagħra plateau also pointed to its importance. The excavation trenches were permitted because areas external to the temple site had produced significant densities of surface pottery, or were located in the area previously excavated in the 1900s.

1.6.3. Kordin III

Kordin III (Fig. 1.6) was selected because it too had not received inscribed World Heritage Site status (although the status is now under review), was not much visited by the public (Borg 2007) and had considerable areas within the enclosed precinct that had not been excavated in the past. Early work at the site by Ashby had been promising (Vella 2004), but no work had been undertaken at the site since the 1950s, and no absolute dating had been done at all. Its tantalizing early 'temple' phases (identified by pottery at the site and its relatively simple architecture) indicated that a key-hole investigation could advance knowledge and demonstrate the site's value, date and history. In particular, work at this site was deemed to have the potential to fill in the elusive Mġarr phase. Excavation trenches were permitted only as determined by the SCH, and did not necessarily enable exposure of the logical extents of the temple structure.

1.6.4. Skorba

The temple site of Skorba (Fig. 1.7) was selected because it was the original chronological control site for absolute dating on Malta. With the massive advances in calibration and AMS methods of dating that have since taken place, it was felt that the chronology of the site should be tested, and the entire Maltese prehistoric

Figure 1.4. *a) General view of Taċ-Ċawla in 2014, at the end of excavation, looking north-northeast; b) members of the 2014 team (McAdams, Malone, Hannah, Armstrong, Parkinson (all QUB) and Kay Mallia (UM)).*

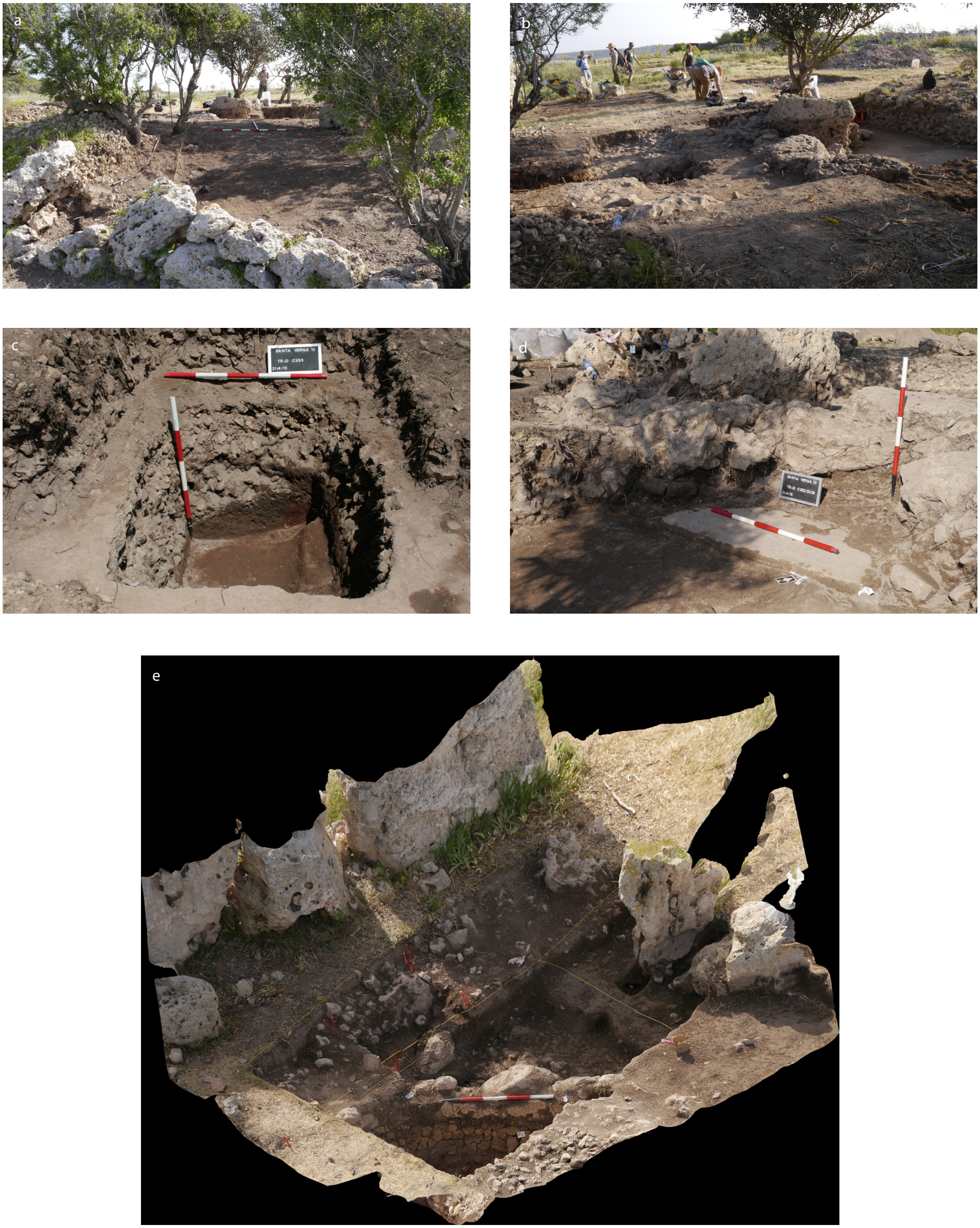

Figure 1.5. *a, b) General views of work at Santa Verna, 2015; c) Trump sondage, reopened in 2015; d) threshold slab within destroyed temple structure; e) Structure from Motion model of the south lobe of the temple under excavation.*

Figure 1.6. *General views of work at Kordin III, 2015: a) excavation in Trench 1; b) Trenches 1 and 2 under excavation; c) some of the QUB/Cambridge Kordin III team preparing for work.*

Figure 1.7. *General views of work at Skorba, 2016, and some of the team: a) the deep trench under excavation; b) the southern trench with the team at work; c) view over the 2016 trench with the enclosed Skorba temple monument beyond and the two early walls visible in the excavation trench.*

sequence calibrated accordingly. A very small trench, outside the fenced and protected World Heritage Site, was identified as the most suitable location to test the many early phases that Trump had identified in his work (1966). This work was permitted as it reopened previously studied areas and was external to the fenced area of the protected site (see Fig. 1.7). The opportunity to test three forms of chronological control were adopted. These were: ceramics from stratified deposits, AMS radiocarbon dates and a geoarchaeological OSL sequence from the same stratigraphy that promised to allow important comparison.

1.6.5. Ġgantija

The area surrounding Ġgantija (Fig. 1.8) had already shown its promise not only during excavations by Evans and Trump, but also during the 1980s surveys of the Cambridge Gozo project, which showed the presence of several ceramic phases. The detection of a faultline, a spring line and intact well-formed soils during the

Figure 1.8. *General views of work at Ġgantija, 2015: a) view of the terrace walls below Ġgantija and the site of the spring (visible at left, below palm trees); b) sondage at south end of the temple facade; c) section exposed beneath former office and WC under recording; d) commencement of excavation in 2015, temple facade in background; e) the trench at the end of investigation.*

Figure 1.9. *a) General view of In-Nuffara, 2015; b) initial exposure and excavation of the silo pits; c) Bronze Age pottery under study from the In-Nuffara silo; d) the excavation team at the completion of work at In-Nuffara; e) pot washing of the Bronze Age pottery.*

FRAGSUS Project added considerable interest to the location. Four areas were targeted for small stratigraphic sondages at the edge of the megalithic terrace-forecourt. One test hole was placed to assess the depth of the twentieth century garden forecourt and terrace of the monument when it was planned to move a decorative palm tree from the monumental garden. A second sondage was placed where intact soils had been detected by augering. The third sondage arose from additional opportunities provided by the removal of the block-built custodian's office and public conveniences, which had both been erected around 1960. This exposed an extent of stratified deposit, over a metre in depth with significant stratified levels extending below modern material. Additional work included a geo-radar survey of the forecourt and the adjacent olive grove, where the excavation of a fourth small test trench was permitted. The interventions by *FRAGSUS* are extensively reported in Chapter 5, but it is important to note that the exposed deposits presented a serendipitous opportunity to test a number of hypotheses. These hypotheses included the age of Ġgantija, which was always supposed to be one of the 'earliest' temples because of its massive and crude stones and diagnostic pottery; the nature and age of the constructed forecourt; and the lost entrance ramp and megalithic entry to the site from downslope. Additional questions included the nature of the buried deposits, ancient soils and their contents. Permits for excavation were granted since either the trenches were in areas that had already been disturbed or reopened through management interventions, or they were particularly small (i.e. the deep sondage).

1.6.6. In-Nuffara

The selection of In-Nuffara (Fig. 1.9) the Middle Bronze Age fortified plateau site immediately south of Ġgantija, enabled the project to extend the study to the Middle and Later Bronze Age. This location was abandoned agricultural land, which was not difficult to access, provided that the bird hunting and trapping season was avoided. This work enabled assessment of environmental and economic change after the 'Temple Period', and also offered the opportunity to obtain absolute dating samples that would place those changes in a reliable chronology. No radiocarbon dates had ever been obtained for the Borġ in-Nadur phase before. As such, it was unknown when the Tarxien Cemetery phase ended or for how long the Bronze Age persisted in Malta. Such questions are valid, given the quite large number of Bronze Age sites across the islands, some of which have only come to light during the period of the *FRAGSUS Project*, such as the silos on the Citadella of Gozo that were found during conservation works. The permit was given to examine just two visible silos and their immediate surrounding area.

1.7. Additional studies

Maltese prehistory cannot be complete without a thorough and increasingly scientific assessment of its distinctive material culture. Pottery (Fig. 1.10), lithic tools and waste, stone objects such as querns and weights, personal ornaments, worked animal bone and shell occur on most prehistoric sites, and it was the aim of the *FRAGSUS Project* to integrate cultural materials with the contexts from which they came. Not only was there potential to use material culture in interpreting its function, but also of identifying and interpreting chronology, style, external interactions, and possibly notions of value, aesthetic and ritual. Previous studies (e.g. Bonanno 1986a; Grima 2007; Malone 2007, 2008; Malone *et al.* 2009; Vella 2007) have long sought to make sense of the material record of Malta. But unless this material is linked to secure archaeological contexts, such work is inevitably of less value than when the original context is fully understood. It was the aim of *FRAGSUS* to undertake detailed scientific analysis of material culture (technology, style, raw material, connectivity, chronology and function) to explore links between the environment of the sites, time and natural resources. This approach has the potential to advance understanding of how an island culture responded to changes in the wider environment. The study of interaction through sourcing materials can reflect connectivity, which in turn may reflect on a society and its cultural practices and tastes. Such studies could dominate the project, and there is much ongoing potential for far more research in the future. Yet, here material culture is but a small element of the research. Our main focus falls on ceramics and the development of the existing typological scheme and on lithics and their materials. Other artefacts are recorded and reviewed more briefly. The main goal was to improve and advance chronological understanding between absolute dating estimates and material things. Nevertheless, these monograph reports aspire to advance our knowledge, to add to the collected archives of the past, and add a small step on the long route to better understanding of ancient Malta and its changing worlds.

1.8. Environmental and economic archaeology

A principal goal of the project was to extract economic data from the excavated sites. It is almost impossible to locate reliable samples of animal bones or plant remains without breaking the surface of the ground, and thus excavation was targeted towards locations that had potential to yield economic material in stratified ancient rubbish. The ideal location would be a pit full of organic remains that painted the complete picture of Maltese economic life over millennia. Unfortunately, such contexts only occur in the Bronze Age, hence the work at In-Nuffara to extract one such sample. Earlier prehistoric sites are far more challenging, because, although there are remarkable plaster floors and sealed deposits, Temple Period people were too tidy and too clean! They removed their rubbish, swept their floors, and seem to have undertaken their food processing activities mainly off-site, with the result that samples are rarely large or very promising. What remains of carbonized seeds or broken bones tend to be eroded, gnawed, crushed and trampled, suggesting they were

Figure 1.10. *Ceramic processing and finds work: a) Parkinson and Brogan sorting pottery in the courtyard of the Auberge de Provence; b) Coyle McLung recording pottery; c) pottery processing in the Auberge de Provence; d) Bates and Armstrong undertaking flotation in Gozo; e) sieving at Santa Verna; f) Ashley drawing artefacts in the University of Malta.*

Table 1.4. *Summary table of the archaeological discoveries made by* FRAGSUS.

	Context sheets	Site photos	Site drawings	No. bulk Soil samples processed	Volume soil processed (litres)	Micromorphology samples	Special finds	Animal bones identified	Pottery sherds	Pottery weight (kg)	Finds photos	Pottery drawings	Other drawings	Radiocarbon dates
Taċ-Ċawla	306	798	107	122	1255	20	528	1430	50,679	392	2034	293	41	33
Ġgantija	40	119	10	26	292	15	10	82	6466	67	108	126	2	11
Santa Verna	122	905	50	49	863	6	161	547	21,546	185	1046	247	84	23
In-Nuffara	46	213	4	23	763	3	16	321	6000	150	152	26	0	5
Kordin	203	1696	92	124	1226	2	196	193	18,766	115	508	96	64	15
Skorba	30	205	9	27	223	3	6	*c.* 100	5859	53	180	54	13	6
Other sites														95
Totals	747	3936	263	344	4399	46	911	*c.* 2700	*c.* 110,000	962	4028	842	204	188

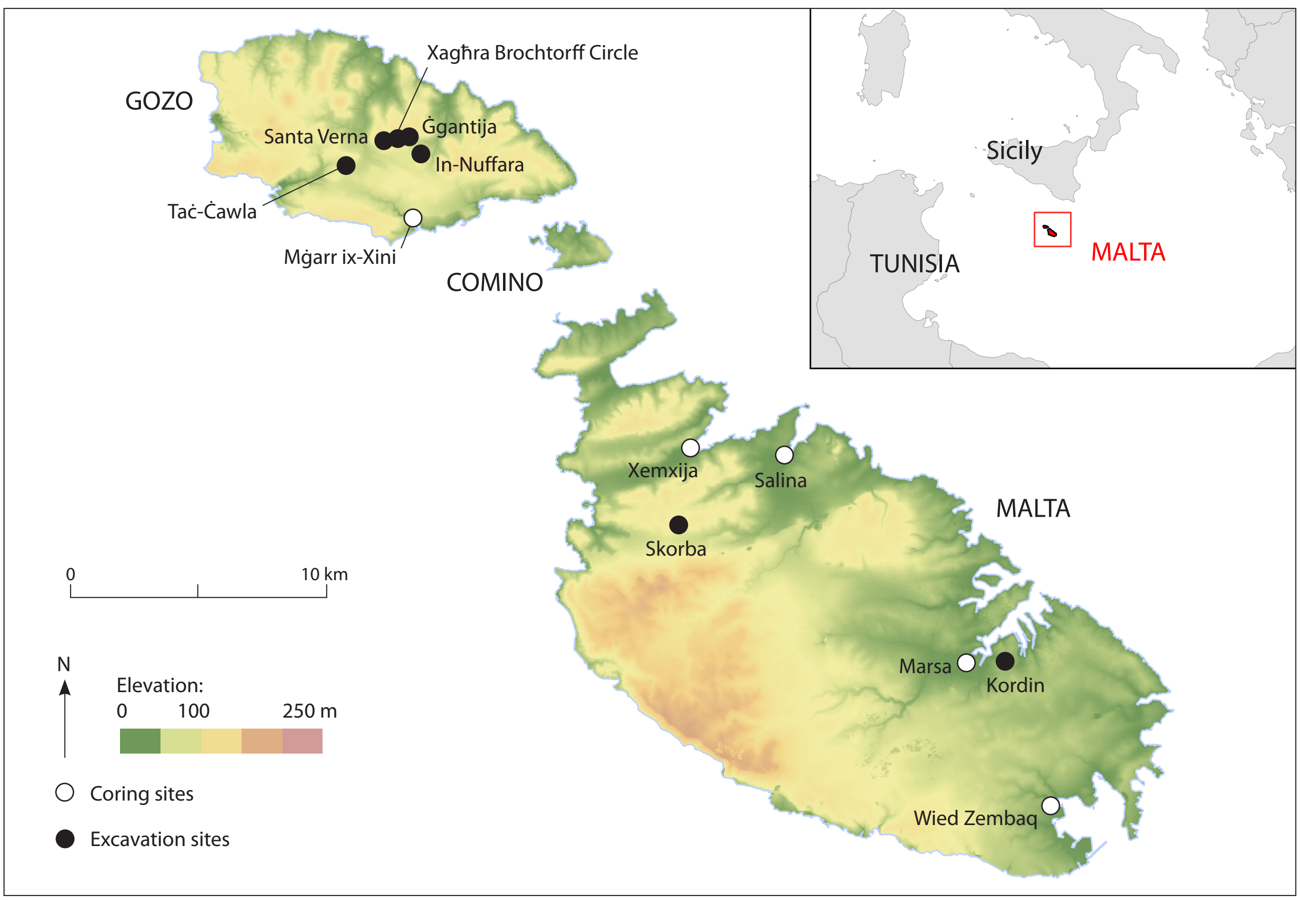

Figure 1.11. *Location map of sites investigated by the* FRAGSUS Project.

Table 1.5. *Chronological range of prehistoric and later sites in the* FRAGSUS *study as revealed by the dating campaign of the project.*

Period	Phase	Start	End
Neolithic	Pre-Skorba	6000 BC	5400 BC
	Early Neolithic	5400 BC	4600 BC
	Fifth millennium hiatus	4600 BC	3800 BC
Temple Period	Żebbuġ	3800 BC	3600 BC
	Mġarr transitionary phase	3600 BC	3400 BC
	Ġgantija	3400 BC	3200 BC
	Saflieni	3200 BC	2850 BC
	Tarxien	2850 BC	2350 BC
	Thermi	2350 BC	2100 BC
Bronze Age	Tarxien Cemetery	2350 BC	1600 BC
	Borġ in-Nadur / Baħrija	1600 BC	750 BC
Historic	Phoenician / Punic	750 BC	250 BC
	Roman / Byzantine	250 BC	AD 870
	Arab / Norman	AD 870	AD 1530
	Knights	AD 1530	AD 1798
	Modern	AD 1798	Present

probably exposed in a dusty domestic yard or rubbish heap before being finally buried in a deposit. The best means to sample such unpromising material is an effective sampling strategy that ensures sufficient diagnostic pieces are collected through a programme of systematic sediment sampling for small items, and, in the case of bone, very careful excavation. The *FRAGSUS Project* invested in such sampling, collecting a total of 4399 litres of soil from secure deposits for flotation, and retained every fragment of recognizable bone during excavation. Below, Table 1.4 records the statistics of activities, samples, photos, sherds and so on that accumulated as samples were processed during the three years of *Project* fieldwork (Fig. 1.10). Such figures are remarkable for the Maltese context, and demonstrate the intensive level of labour and dedication shown by the project participants.

1.9. Conclusions

This volume addresses many of the themes posed by the original research questions by examining each site and its particular period and past history through interdisciplinary approaches. The methodologies applied were relatively well tested, and excavation methods inevitably are standardized and rigorous with little room for much innovation. Some scientific applications and digital scanning approaches were relatively new when the project was conceived in 2012. Now, eight years later, many other opportunities have emerged that, in hindsight, may have presented different ways of analysing and thinking about the discoveries that were made, and indeed, posed different types of research

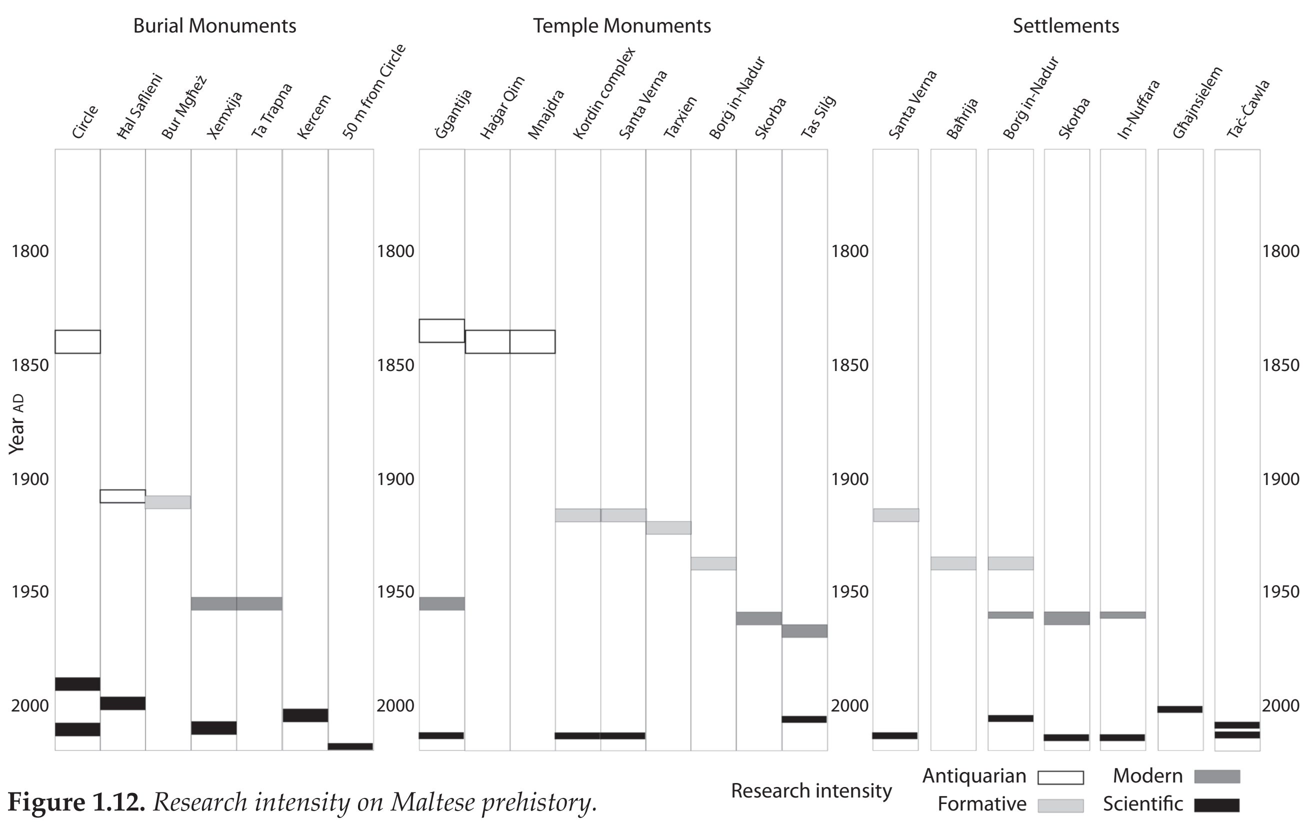

Figure 1.12. *Research intensity on Maltese prehistory.*

Figure 1.13. *Images of scholars and fieldworkers of Maltese prehistory: a) Renfrew and Malone at Ħaġar Qim in front of display, 2018; b) Bonanno and Gouder, 1994; c) visit to Ħaġar Qim, from left to right: Hunt, Keefe, Renfrew, Malone and Stoddart.*

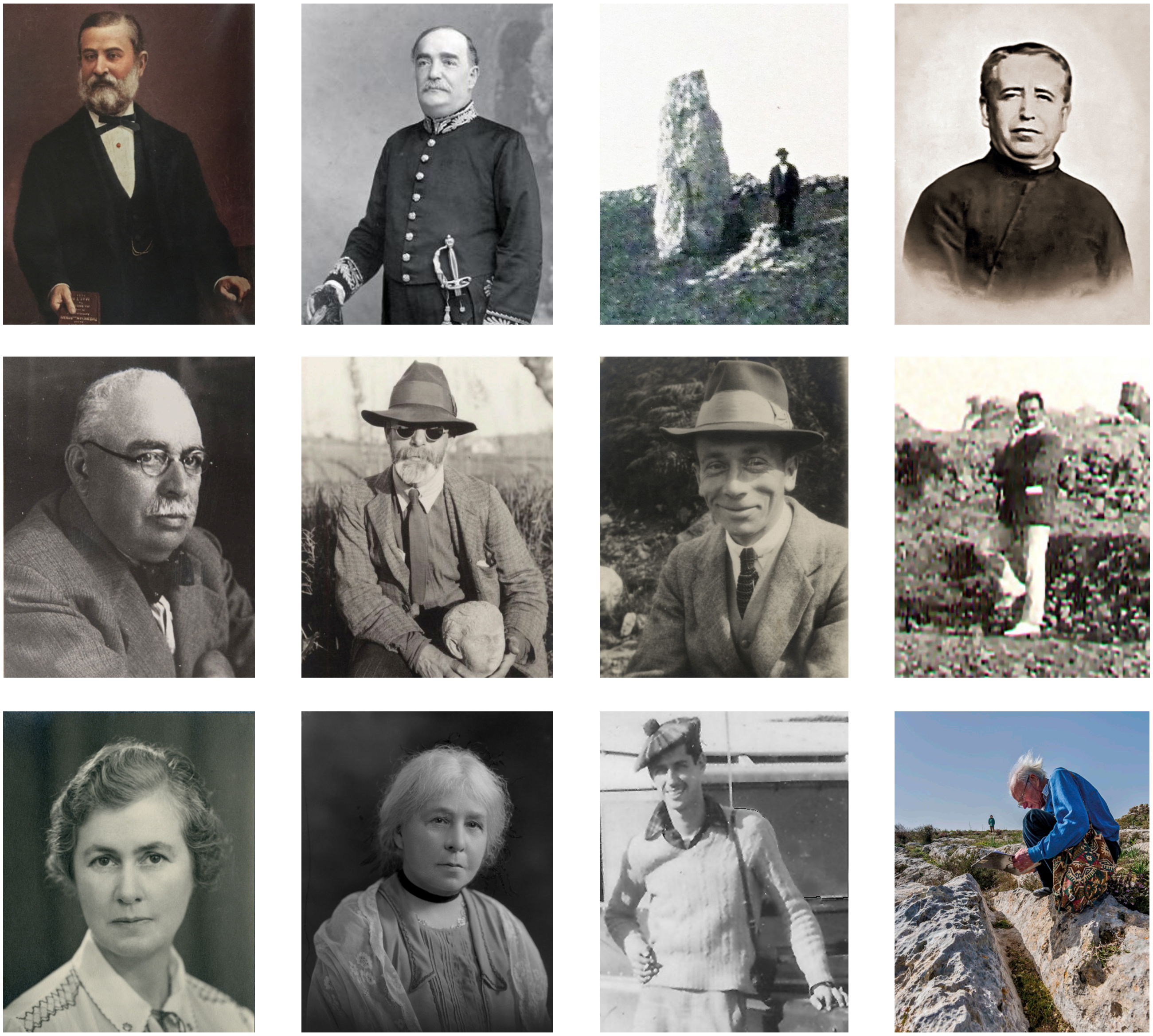

Figure 1.14. *Research pioneers of prehistoric Malta, from top left: A.A. Caruana (University of Malta); N. Tagliaferro; A. Mayr; Father E. Magri (with permission from 'the Jesuit Delegate for Malta, Society of Jesus'; photo Daniel Cilia); T. Zammit (reproduced with permission, National Museum of Archaeology, Malta); T. Ashby (BSR Photographic Archive, BS collection, bs-0143); E.T. Peet (reproduced with permission: Griffith Institute Photograph 101.141; © Griffith Institute, University of Oxford); R.N Bradley; G. Caton-Thompson (photographed by Ramsey & Muspratt, Cambridge, 1938; © courtesy of the RAI); M. Murray (reproduced with permission, NPG London); J.D. Evans (reproduced with thanks to his family); and D.H. Trump (photo Daniel Cilia).*

questions too. Nevertheless, the collected data and wealth of ideas that have resulted from this collaborative and interdisciplinary work provide a point of reference for ongoing and future investigations into the rich prehistory of Malta. The goal – as set out in the many questions listed above – is to interrogate the nature of the world in which the Temple People lived, and the manner by which it emerged, was sustained and changed. The three volumes collectively have achieved an important exercise in cross-disciplinary research to tackle these questions. They also pay homage to the scholars who went before and who developed the understanding of cultural sequence and the many questions that emerge; and we illustrate some of the fieldworkers and scholars who have formed the study and data collection of prehistoric Malta (Figs. 1.13 & 1.14).

Temple places

The ERC-funded *FRAGSUS Project* (*Fragility and sustainability in small island environments: adaptation, culture change and collapse in prehistory, 2013–18*) led by Caroline Malone (Queen's University Belfast) has focused on the unique Temple Culture of Neolithic Malta, and its antecedents and successors through investigation of archaeological sites and monuments. This, the second volume of three, presents the results of excavations at four temple sites and two settlements, together with analysis of chronology, economy and material culture.

The project focused on the integration of three key strands of Malta's early human history (environmental change, human settlement and population) set against a series of questions that interrogated how human activity impacted on the changing natural environment and resources, which in turn impacted on the Neolithic populations. The evidence from early sites together with the human story preserved in burial remains reveals a dynamic and creative response over millennia. The scenario that emerges implies settlement from at least the mid-sixth millennium BC, with extended breaks in occupation, depopulation and environmental stress coupled with episodes of recolonization in response to changing economic, social and environmental opportunities.

Excavation at the temple site of Santa Verna (Gozo) revealed an occupation earlier than any previously dated site on the islands, whilst geophysical and geoarchaeological study at the nearby temple of Ġgantija revealed a close relationship with a spring, Neolithic soil management, and evidence for domestic and economic activities within the temple area. A targeted excavation at the temple of Skorba (Malta) revisited the chronological questions that were first revealed at the site over 50 years ago, with additional OSL and AMS sampling. The temple site of Kordin III (Malta) was explored to identify the major phases of occupation and to establish the chronology, a century after excavations first revealed the site. Settlement archaeology has long been problematic in Malta, overshadowed by the megalithic temples, but new work at the site of Taċ-Ċawla (Gozo) has gathered significant economic and structural evidence revealing how subsistence strategies supported agricultural communities in early Malta. A study of the second millennium BC Bronze Age site of In-Nuffara (Gozo) likewise has yielded significant economic and chronological information that charts the declining and changing environment of Malta in late prehistory.

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