



McDONALD INSTITUTE MONOGRAPHS

Temple landscapes

Fragility, change and resilience of Holocene environments in the Maltese Islands

By Charles French, Chris O. Hunt, Reuben Grima,
Rowan McLaughlin, Simon Stoddart & Caroline Malone



Volume 1 of Fragility and Sustainability – Studies on Early Malta,
the ERC-funded *FRAGSUS Project*

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On the cover: *View towards Nadur lighthouse and Ghajnsielem church
with the Gozo Channel to Malta beyond, from In-Nuffara (Caroline Malone).*

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Preface and dedication

Caroline Malone

The *FRAGSUS Project* emerged as the direct result of an invitation to undertake new archaeological fieldwork in Malta in 1985. Anthony Bonanno of the University of Malta organized a conference on ‘The Mother Goddess of the Mediterranean’ in which Colin Renfrew was a participant. The discussions that resulted prompted an invitation that made its way to David Trump (Tutor in Continuing Education, Cambridge University), Caroline Malone (then Curator of the Avebury Keiller Museum) and Simon Stoddart (then a post-graduate researcher in Cambridge). We eagerly took up the invitation to devise a new collaborative, scientifically based programme of research on prehistoric Malta.

What resulted was the original Cambridge Gozo Project (1987–94) and the excavations of the Xagħra Brochtorff Circle and the Ġhajnsielem Road Neolithic house. Both those sites had been found by local antiquarian, Joseph Attard-Tabone, a long-established figure in the island for his work on conservation and site identification.

As this and the two other volumes in this series report, the original Cambridge Gozo Project was the germ of a rich and fruitful academic collaboration that has had international impact, and has influenced successive generations of young archaeologists in Malta and beyond.

As the Principal Investigator of the *FRAGSUS Project*, on behalf of the very extensive *FRAGSUS* team I want to dedicate this the first volume of the series to the enlightened scholars who set up this now 35 year-long collaboration of prehistoric inquiry with our heartfelt thanks for their role in our studies.

We dedicate this volume to:

Joseph Attard Tabone
Professor Anthony Bonanno
Professor Lord Colin Renfrew

and offer our profound thanks for their continuing role in promoting the prehistory of Malta.

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For Chapter 2, we extend warm thanks to the staff of the ¹⁴CHRONO centre at QUB, especially Stephen Hoper, Jim McDonald, Michelle Thompson and Ron Reimer, all of whom took a keen interest in the *FRAGSUS Project*. The success of the *FRAGSUS Project* in general and the radiocarbon dating exercise has depended on their work. We thank the Physical Geography Laboratory staff at the School of Geography, University College Dublin, for the use of their ITRAX XRF core scanner. In particular, we would like to thank Dr Steve McCarron, Department of Geography, National University of Ireland, Maynooth and Dr Jonathan Turner, Department of Geography, National University of Ireland, University College, Dublin. We thank Prof. Patrick Schembri for sourcing and collecting the *Acanthocardia* samples from the Natural Museum of Natural History. Sean Pyne O'Donnell thanks Dr Chris Hayward at the Tephrochronology Analytical Unit (TAU), University of Edinburgh, for help and advice during microprobe work. Dr Maxine Anastasi, Department of Classics and Archaeology, University of Malta, helped identify the pottery from the settlement cores. Dr Frank Carroll helped show us the way forward; but sadly is no longer with us. Chris Hunt, Rory Flood, Michell Farrell, Sean Pyne O'Donnell and Mevrick Spiteri were the coring team.

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Foreword

Anthony Pace

Sustainability, as applied in archaeological research and heritage management, provides a useful perspective for understanding the past as well as the modern conditions of archaeological sites themselves. As often happens in archaeological thought, the idea of sustainability was borrowed from other areas of concern, particularly from the modern construct of development and its bearing on the environment and resource exploitation. The term sustainability entered common usage as a result of the unstoppable surge in resource exploitation, economic development, demographic growth and the human impacts on the environment that has gripped the World since 1500. Irrespective of scale and technology, most human activity of an economic nature has not spared resources from impacts, transformations or loss irrespective of historical and geographic contexts. Theories of sustainability may provide new narratives on the archaeology of Malta and Gozo, but they are equally important and of central relevance to contemporary issues of cultural heritage conservation and care. Though the archaeological resources of the Maltese islands can throw light on the past, one has to recognize that such resources are limited, finite and non-renewable. The sense of urgency with which these resources have to be identified, listed, studied, archived and valued is akin to that same urgency with which objects of value and all fragile forms of natural and cultural resources require constant stewardship and protection. The idea of sustainability therefore, follows a common thread across millennia.

It is all the more reason why cultural resource management requires particular attention through research, valorization and protection. The *FRAGSUS Project* (Fragility and sustainability in small island environments: adaptation, cultural change and collapse in prehistory) was intended to further explore and enhance existing knowledge on the prehistory of Malta and Gozo. The objective of the project as

designed by the participating institutional partners and scholars, was to explore untapped field resources and archived archaeological material from a number of sites and their landscape to answer questions that could be approached with new techniques and methods. The results of the *FRAGSUS Project* will serve to advance our knowledge of certain areas of Maltese prehistory and to better contextualize the archipelago's importance as a model for understanding island archaeology in the central Mediterranean. The work that has been invested in *FRAGSUS* lays the foundation for future research.

Malta and Gozo are among the Mediterranean islands whose prehistoric archaeology has been intensely studied over a number of decades. This factor is important, yet more needs to be done in the field of Maltese archaeology and its valorization. Research is not the preserve of academic specialists. It serves to enhance not only what we know about the Maltese islands, but more importantly, why the archipelago's cultural landscape and its contents deserve care and protection especially at a time of extensive construction development. Strict rules and guidelines established by the Superintendence of Cultural Heritage have meant that during the last two decades more archaeological sites and deposits have been protected in situ or rescue-excavated through a statutory watching regime. This supervision has been applied successfully in a wide range of sites located in urban areas, rural locations and the landscape, as well as at the World Heritage Sites of Valletta, Ġgantija, Haġar Qim and Mnajdra and Tarxien. This activity has been instrumental in understanding ancient and historical land use, and the making of the Maltese historic centres and landscape.

Though the cumulative effect of archaeological research is being felt more strongly, new areas of interest still need to be addressed. Most pressing are those areas of landscape studies which often become

peripheral to the attention that is garnered by prominent megalithic monuments. *FRAGSUS* has once again confirmed that there is a great deal of value in studying field systems, terraces and geological settings which, after all, were the material media in which modern Malta and Gozo ultimately developed. There is, therefore, an interplay in the use of the term sustainability, an interplay between what we can learn from the way ancient communities tested and used the very same island landscape which we occupy today, and the manner in which this landscape is treated in contested economic realities. If we are to seek factors of sustainability in the past, we must first protect its relics and study them using the best available methods in our times. On the other hand, the study of the past using the materiality of ancient peoples requires strong research agendas and thoughtful stewardship. The *FRAGSUS Project* has shown us how even small fragile deposits, nursed through protective legislation and guardianship, can yield significant information which the methods of pioneering scholars of Maltese archaeology would not have enabled access to. As already outlined by the Superintendence of Cultural Heritage, a national research agenda for cultural heritage and the humanities is a desideratum. Such a framework, reflected in the institutional partnership of the

FRAGSUS Project, will bear valuable results that will only advance Malta's interests especially in today's world of instant e-knowledge that was not available on such a global scale a mere two decades ago.

FRAGSUS also underlines the relevance of studying the achievements and predicaments of past societies to understand certain, though not all, aspects of present environmental challenges. The twentieth century saw unprecedented environmental changes as a result of modern political-economic constructs. Admittedly, twentieth century developments cannot be equated with those of antiquity in terms of demography, technology, food production and consumption or the use of natural resources including the uptake of land. However, there are certain aspects, such as climate change, changing sea levels, significant environmental degradation, soil erosion, the exploitation and abandonment of land resources, the building and maintenance of field terraces, the rate and scale of human demographic growth, movement of peoples, access to scarce resources, which to a certain extent reflect impacts that seem to recur in time, irrespectively of scale and historic context.

Anthony Pace
Superintendent of Cultural Heritage (2003–18).

Appendix 9

The charcoal data

Nathan Wright

Table A9.1. The charcoal data from the Skorba (SV15), Kordin (KRD15), In-Nuffara (NUF15) and Salina Deep Core SDC.

| Taxon/Site | SV15 (95) | SV15 (95) | SV15 (90) | SV15 (90) | KRD15 (77) | KRD15 (77) | KRD15 (99) | KRD15 (99) | NUF15 (41) | NUF15 (41) | SDC | SDC | Total* | |
|--|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|------------|------------|-------------|
| | Af | %f | Af | %f | Af | %f | Af | %f | Af | %f | Af | %f | Af | %f |
| <i>Quercus deciduous</i> spp. | 11 | 10.6 | 10 | 23.3 | 4 | 3.6 | | | 14 | 9.0 | | | 59 | 13.5 |
| <i>Quercus evergreen</i> cf. <i>ilex</i> | 16 | 15.4 | 6 | 14.0 | 20 | 17.9 | | | 33 | 21.3 | | | 55 | 15.2 |
| ↑ Woodland Total | 27 | 26.0 | 16 | 37.2 | 24 | 21.4 | | | 47 | 30.3 | | | 114 | 28.7 |
| <i>Pistacia</i> cf. <i>lentiscus</i> | 31 | 29.8 | 4 | 9.3 | 21 | 18.8 | | | 39 | 25.2 | | | 95 | 20.8 |
| <i>Olea</i> cf. <i>europaea</i> | 21 | 20.2 | 5 | 11.6 | 19 | 17.0 | 2 | 100.0 | 32 | 20.6 | | | 77 | 17.4 |
| Rosaceae family | 1 | 1.0 | | | 11 | 9.8 | | | 20 | 12.9 | | | 32 | 5.9 |
| <i>Ceratonia siliqua</i> | | | | | 2 | 1.8 | | | | | | | 2 | 0.4 |
| <i>Cistus</i> sp. | 3 | 2.9 | | | | | | | 4 | 2.6 | | | 7 | 1.4 |
| <i>Rhamnus</i> cf. <i>oleioides</i> | 12 | 11.5 | 3 | 7.0 | 3 | 2.7 | | | 4 | 2.6 | | | 22 | 5.9 |
| <i>Crataegus</i> sp. | 3 | 2.9 | 1 | 2.3 | 5 | 4.5 | | | 2 | 1.3 | | | 11 | 2.7 |
| <i>Cercis</i> cf. <i>siliquastrum</i> | 1 | 1.0 | | | | | | | 1 | 0.6 | | | 2 | 0.4 |
| <i>Ostrya carpinifolia</i> | | | | | 2 | 1.8 | | | | | | | 2 | 0.4 |
| <i>Carpinus</i> spp. | | | 1 | 2.3 | 1 | 0.9 | | | 1 | 0.6 | | | 3 | 1.0 |
| ↑ Woodland sub-dominant and marquis | 72 | 69.2 | 14 | 32.6 | 64 | 57.1 | 2 | 100.0 | 103 | 66.5 | | | 253 | 56.3 |
| <i>Tetraclinis articulata</i> | 2 | 1.9 | | | 1 | 0.9 | | | | | | | 3 | 0.7 |
| <i>Abies</i> sp. | | | | | 2 | 1.8 | | | 1 | 0.6 | 5 | 100.0 | 3 | 0.6 |
| ↑ Conifers Total | 2 | 1.9 | | | 3 | 2.7 | | | 1 | 0.6 | 5 | 100 | 6 | 1.3 |
| <i>Salix/Populus</i> | 3 | 2.9 | 9 | 20.9 | 14 | 12.5 | | | 3 | 1.9 | | | 29 | 9.6 |
| <i>Ulmus</i> cf. <i>canescens</i> | | | 1 | 2.3 | 4 | 3.6 | | | | | | | 5 | 1.5 |
| <i>Fraxinus angustifolia</i> | | | 1 | 2.3 | | | | | | | | | 1 | 0.6 |
| <i>Myrtus</i> cf. <i>communis</i> | | | | | 1 | 0.9 | | | | | | | 1 | 0.2 |
| <i>Tamarix</i> sp. | | | 1 | 2.3 | | | | | | | | | 1 | 0.6 |
| <i>Betula</i> spp. | | | | | 2 | 1.8 | | | 1 | 0.6 | | | 3 | 0.4 |
| <i>Laurus nobilis</i> ** | | | 1 | 2.3 | | | | | | | | | 1 | 0.6 |
| ↑ Riparian Total | 3 | 2.9 | 13 | 30.2 | 21 | 18.8 | | | 4 | 1.9 | | | 41 | 13.5 |
| NTAXA | 11 | | 12 | | 16 | | 2 | | 13 | | 5 | | 21 | |

Taxonomic identifications from four sites in Malta. (*Totals exclude KRD15 (99) and SDC data. ***Laurus nobilis* can also be considered a marquis taxa.

Temple landscapes

The ERC-funded *FRAGSUS Project* (*Fragility and sustainability in small island environments: adaptation, cultural change and collapse in prehistory, 2013–18*), led by Caroline Malone (Queens University Belfast) has explored issues of environmental fragility and Neolithic social resilience and sustainability during the Holocene period in the Maltese Islands. This, the first volume of three, presents the palaeo-environmental story of early Maltese landscapes.

The project employed a programme of high-resolution chronological and stratigraphic investigations of the valley systems on Malta and Gozo. Buried deposits extracted through coring and geoarchaeological study yielded rich and chronologically controlled data that allow an important new understanding of environmental change in the islands. The study combined AMS radiocarbon and OSL chronologies with detailed palynological, molluscan and geoarchaeological analyses. These enable environmental reconstruction of prehistoric landscapes and the changing resources exploited by the islanders between the seventh and second millennia BC. The interdisciplinary studies combined with excavated economic and environmental materials from archaeological sites allows *Temple landscapes* to examine the dramatic and damaging impacts made by the first farming communities on the islands' soil and resources. The project reveals the remarkable resilience of the soil-vegetational system of the island landscapes, as well as the adaptations made by Neolithic communities to harness their productivity, in the face of climatic change and inexorable soil erosion. Neolithic people evidently understood how to maintain soil fertility and cope with the inherently unstable changing landscapes of Malta. In contrast, second millennium BC Bronze Age societies failed to adapt effectively to the long-term aridifying trend so clearly highlighted in the soil and vegetation record. This failure led to severe and irreversible erosion and very different and short-lived socio-economic systems across the Maltese islands.

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