

From Concept to Monument:
Time and Costs of Construction in the Ancient World



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Ancient World

Papers in Honour of Janet DeLaine

Edited by

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Francesca Caprioli's research looks at Roman architecture, with a special focus on the stylistic and typological characteristics of architectural decoration. Her work on Roman architecture began with the analysis of the architectural decoration of the *Aedes Vestae* in Rome, which was published as a monograph in 2007. Her PhD thesis in Classical Archeology, completed in 2009, focused on the history of Temple B of Largo Argentina in Rome and will be published in 2023. Her work has included a number of collaborations, such as the international conference *DECOR Il Linguaggio architettonico romano*, which she co-organised with Marina Milella, Javier Á. Domingo, and Patrizio Pensabene. She also started an educational program with Patrizio Pensabene at Università degli Studi di Roma 'La Sapienza' that focuses on Roman architectural decoration. Over the last 10 years, her work has mainly been dedicated to the architectural decoration of the imperial palaces on the Palatine Hill in Rome.

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Javier Á. Domingo is Professor of Christian Archaeology at the Pontifical University of the Holy Cross. Through several post-doctoral fellowships, he has undertaken various research activities at the University of Rome 'La Sapienza' and the Escuela Española de Historia y Arqueología in Rome. His studies are focused on Roman and late Roman architectural decoration, a subject to which he has dedicated a wide range of research in collaboration with Patrizio Pensabene, in addition to developing a methodology for calculating the economic costs of construction in the ancient world.

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Anna Gutiérrez García-M. holds an MA in Lithic and Ceramic Analysis for Archaeologists (University of Southampton) and a PhD in Archaeology (Autonomous University of Barcelona). She has developed her research at the Laboratory for the Study of Stones in Antiquity (LEMLA) of the Autonomous University of Barcelona, the Catalan Institute of Classical Archaeology (Tarragona, Spain), and at IRAMAT-CRP2A (UMR 5060 CNRS-UBM, Bordeaux, France) as Chaire Junior of the Laboratoire d'Excellence LaScArBx. Currently she is a Ramón y Cajal researcher at ICAC, director of the Archaeometric Studies Unit (UEA), and coordinator of the Archaeometry and Artistic Productions (ArPA) research group. She focuses on the interdisciplinary study of the stone industry in Antiquity, with a long publishing record in both archaeometry and archaeology. She has also taught in several MA degrees and acts as MA, PhD, and MSCA-IF supervisor.

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Dominik Maschek is Professor of Roman Archaeology at the University of Trier and Head of the Department of Roman Archaeology at the Leibniz-Zentrum für Archäologie in Mainz. A trained Classical archaeologist, his research covers a wide array of topics from Archaic Greece to the Roman Empire, with a special focus on late Republican architecture and material culture in Rome and central Italy. He has been a Rome Fellow of the Austrian Academy of Sciences and currently conducts archaeological fieldwork at Fregellae (Lazio) and Carnuntum (Austria).

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Here he also attended the ‘Scuola di Specializzazione in Beni Archeologici’, graduating in 2018. He has taken part in several archaeological excavations in Rome (*Templum Pacis*, Circus Maximus, Colosseum, *Horrea Piperataria*) and Ostia.

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Patrizio Pensabene is Emeritus Professor of Classical Archeology at the University of Rome ‘La Sapienza’ where, from 1991 to 2012, he coordinated the PhD in Classical Archaeology. He directed the excavations of the Sanctuary of Magna Mater from 1977 to 2003 and of the late Roman and medieval settlement on the Villa del Casale in Piazza Armerina from 2004 to 2014. He has worked mainly on architecture, marble, and architectural decoration of the Roman period and the use of architectural remains in Late Antiquity and the Middle Ages. He has published widely and on key monuments, such as the Temple of Saturn, the Arch of Constantine, the Arch of Janus, and the theatres of Ferento, Cassimo, Taormina, and Catania. In other publications, he has dealt with the use of *spolia* in late-antique and medieval churches in Rome, the Norman architecture of southern Italy and Sicily, the basilica of S. Salvatore at Spoleto, and the cathedral of Aquileia. His more recent publications are dedicated to his excavations in Rome (Palatine) and Piazza Armerina, to the phenomenon of reuse in Lombard architecture, and to architectural decoration in local stones in *Gallia* and *Hispania*. Currently he works with a Polish-Cypriot archaeological mission on the architecture of the house of Orpheus at Paphos (Cyprus).

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Ben Russell is Senior Lecturer in Classical Archaeology at the University of Edinburgh. His research focuses on Roman building materials, urbanism, trade, and craft production. He is the Principal Investigator of the *Earthen Empire* project, funded by the Leverhulme Trust, which investigates earth and turf building in the Roman North-West.

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Participants of the international conference ‘From Concept to Monument: Time and Cost of Construction in the Ancient World’ at Wolfson College, 16-18 January 2020; photo: Alice Poletto.

Preface

Visionary and Pragmatic: Studying the Nuts and Bolts of Roman Architecture

Simon J. Barker and Dominik Maschek

Writing the preface to this edited volume gives us special pleasure. The book originates from an Oxford conference, held at Wolfson College in January 2020, right before the Covid-pandemic forcefully interrupted what used to be called ‘normality’. In hindsight it thus feels even more gratifying that, in the very last moments before international travel came to a standstill, we were able to convene in person in order to celebrate one of the most distinguished scholars of Roman architecture, Janet DeLaine.

Through her work on Rome and Ostia, Janet is widely recognised as an expert on ancient building technologies, materials, and principles of design. Now an Emertius Fellow at Wolfson College, Oxford, and a Fellow of the Society of Antiquaries of London (from 1999 onwards), Janet’s career began studying Civil Engineering followed by Classical Studies. She received her BA and PhD from the University of Adelaide, where she worked under the supervision of Frank Sear. During her MA and the first years of her doctorate, she worked in the field as part of the Australian Expedition to Pompeii. From 1981 to 1986, Janet continued at the Classics Department of the University of Adelaide, both as a postgraduate student and as a Tutor in Classics. Between 1980 and 1988, Janet was also a frequent visitor to the British School at Rome (BSR), where she was a Rome Scholar in Ancient, Medieval and Later Italian Studies in 1986–1987. Her association with the University of Oxford began in 1988 when she was awarded a Junior Research Fellowship at St John’s College Oxford. It was during this time that Janet completed her PhD, *Design and construction in Roman imperial architecture: the Baths of Caracalla in Rome* (1992), which she later revised while at the University of Reading and which found a home in the Supplements volume of the *Journal of Roman Archaeology*. The volume would go on to win the Archaeological Institute of America’s James R. Wiseman Award for the most important work in archaeology in 1998.

Janet’s time at St John’s College also marked an event that would have far reaching consequence for those following in her footsteps, studying the quantification of manpower and the cost of construction: the discovery of Giovanni Pegoretti’s *Manuale pratico per l’estimazione dei*

lavori architettonici, stradali, idraulici e di fortificazione, which has become the most cited of the numerous nineteenth-century building manuals detailing pre-industrial construction and labour times. Janet’s seminal work, which revised her thesis using this manual, provided a radical new foundation for studies of the ‘real’ costs of Roman building in a wider, socio-economic context.

Janet was the AIA’s Samuel Kress Lecturer in Ancient Art in 1994, and she went on to hold the positions of Lecturer and Senior Lecturer in Archaeology at the University of Reading, during which time she helped to create the MA in the City of Rome. While Janet quickly established herself as a notable expert on Roman baths and the building industry of ancient Rome, her interests in Roman urbanism led her to Roman Ostia, where she undertook the survey of I.IV.2-4. This was later extended to the study (with some excavations) of the whole Insula of the Paintings (I.IV.1-5) with David Wilkinson. Her work on Ostia maintained her long (and continuing) association with the BSR, where she returned as a Hugh Last Fellow 1999–2000, working on the re-examination of the urban development of Roman Ostia.

In 2005, Janet moved to the University of Oxford as lecturer at the Institute of Archaeology, later becoming an Associate Professor in Roman Archaeology and faculty member of the Ioannou Centre for Classical and Byzantine Studies. During her time at Oxford, Janet’s profound contribution to the field was recognised in numerous ways: for example, she was elected as Corresponding Member of the Archaeological Institute of America (2010), and she held the Japan Society for the Promotion of Science Senior Research Fellowship at Kyushu University in the Department of Architecture and Urban Design (2014). She has also lectured widely in a number of countries, acted as reviewer for articles and grant applications, and sat on editorial boards for numerous journals. In more recent years, Janet was appointed an architectural specialist on the British School at Rome’s major project at Portus. After retiring from the University of Oxford in 2018, Janet became the Director of the Ancient World Research Cluster at Wolfson College.

This brief overview outlines only the bare bones of Janet's impressive career. Anyone working on Roman architecture during the last few decades is greatly indebted to her work. Her landmark study on the Baths of Caracalla is complemented by a number of incisive contributions which deal with all aspects of Roman construction, from the extraction and transport of raw materials to the organisation of the building site and the nature of the workforce. From the perspective of a civil engineer, Janet's take on the subject shuns mere aestheticism and abstract reflections; rather, she studies the nuts and bolts of Roman architecture. She always aims to ground her ideas in practice, asking the questions that really matter but are rarely asked: How was this done? Who were the people who did it? What obstacles did they have to overcome, how demanding and exhausting was their work, and how did they make a living from it? In doing so, she accomplishes a rare feat, producing scholarship that is both visionary and extremely pragmatic.

Janet's impressive list of publications, however, does not convey the full story. Her leading role as a teacher and mentor, in particular during her time at Oxford, is at least as important for the field as her published work. She has taught countless undergraduates in lectures and tutorials on Roman archaeology, architecture, and art, and she has fostered a most lively community of postgraduate students who took her papers on Pompeii and Ostia, the City of Rome, and Roman architecture. Pursuing a doctorate with Janet was always set to be an exciting academic journey, both demanding and extremely rewarding (as Simon Barker knows from first-hand experience!). As many of her current and former students and colleagues will confirm, Janet is astute and probing in her criticism but always most generous with advice and comments. Janet's name is to be found in many a preface to some of the most important volumes on Roman architecture of the recent decades, with many a distinguished author offering their thanks for clarifying aspects of the subject.

Through her energy and enthusiasm in teaching and research, Janet established Oxford as an Anglophone powerhouse of Roman architectural history. Those who know her will not be surprised to hear that, as co-organiser of the fifth international workshop on 'The Archaeology of Roman Construction', held in Oxford in April 2015, Janet hugely impressed the attendants by her meticulous planning and organisation and her strict punctuality. She paired these virtues with an unfailingly English sense of courtesy by which she made her speakers feel welcome and valued, in particular during the magnificent conference dinner at Wolfson. Organised along similar lines of enthusiasm and congeniality, the Roman Architecture Discussion Group, even in times of Covid, brings together students and distinguished speakers from across the globe, not

least because they can be sure to get Janet's unerring advice in all matters related to the construction and design of Roman buildings.

Overall, our knowledge of Roman architecture owes a great deal to Janet's work and commitment. She constantly reminds us that the most important questions quite often fly under the radar of academic intellectualism and fashionable theory. They might even lurk behind statements which are so obvious that most people have not yet thought about their implications. Everyone knows that Rome wasn't built in a day – but how long did it actually take to build it?

Such questions are at the core of many of the papers packaged into the present volume in honour of Janet DeLaine. The papers not only cover a wide chronological and geographical area of the ancient world but also take up many of the themes explored by Janet throughout her career on Roman architecture, urbanism, building technologies, materials, and principles of design. The wide range of papers reflects the scope and vibrancy of Janet's scholarship on Roman architecture and her enormous contribution to the discipline. Many of the contributions are provided by scholars for which Janet's work has served as a direct catalyst, both in their own research more generally and in the work presented here. Likewise, papers from former students as well as distinguished colleagues correspondingly reflect the impact of Janet's mentorship and scholarship. The common factor throughout is of course the undeniable influence of Janet's pioneering work in the field.

Dominik Maschke's opening paper sets the scene by highlighting many of the themes explored throughout the volume. Most importantly, it sketches out the great value and merit of Janet's work, discussing it within a wider context by considering its importance for our understanding not only of ancient Greek and Roman architecture but also of economic history more widely. The remaining papers collected in the present volume touch on many themes which have been at the core of Janet's work. While most papers concern Roman architecture, several (those by Jari Pakkanen and Ann Brysbaert) pose questions similar to those asked by Janet but for the Greek world during the Aegean Late Bronze Age, Classical, and Hellenistic periods.

Several contributions tackle questions related to building materials and the problems associated with their supply and organisation, a theme very much explored in Janet's own work on Rome and Ostia. Fred Hirt's paper reviews ostraca discovered at Mons Claudianus to outline some of the administrative concerns that the quarrying organisation faced as a whole, while Anna Gutiérrez García-M.'s contribution mirrors Janet's interest in the procurement and supply of ordinary, less expensive and everyday building material (the bulk of material from

Roman building projects). Gutiérrez García-M.'s paper explores the different types of stone in the territory around Tarraco and its employment in the town's monumental building programmes, considering the possible factors behind their selection, exploitation, and procurement.

Other key themes of Janet's work—building technology and the organisation of the building industry, including the social and economic status of builders and their place in society—are touched upon in numerous papers. For example, building technology is explored in-depth by Jeanine Abdul Massih in her paper on quarrying megaliths in Heliopolis (Baalbek). Massih's paper establishes the sequence of quarrying operations in relation to the monument, and her close examination of the organisation of the quarrying area, the extraction and transportation techniques, and daily life in the quarry made it possible to propose a reconstruction of the *chaîne opératoire* from the quarry to the temple. The paper by Anaïs Lamesa and Michael Gervers explores the status of medieval stonemasons employed on rock-hewn projects, asking questions about the organisation and skill-levels of the labour force for such projects. In Maria Serena Vinci's paper, the so-called Provincial Forum of Tarraco is used to identify the main stages in the construction of the Tarraco monumental complex and to reflect on some aspects of the building site that influenced its management, organisation, and construction times. Similarly, Santiago Sánchez de la Parra Pérez's paper addresses another avenue of research relating to building processes in Roman *Hispania*. Using epigraphic evidence, his paper examines the individuals or bodies responsible for initiating building projects, those responsible for its financing, and those responsible for aspects of the actual construction process.

The quantification of manpower and the 'cost' of construction in Roman building projects has been at the heart of Janet's work from the very beginning with her ground-breaking study of the Baths of Caracalla through to more recent forays into the economic factors involved in the choice of material and building techniques in Roman construction at Ostia. Janet's many papers on the subject have highlighted the fundamental importance of studying the labour involved in the construction processes of Roman buildings in order to understand these structures in their proper social and economic contexts. She expertly demonstrates the powerful tool architectural energetics can be when examining the role of architecture in the wider Roman economy. This methodology forms the basis of many of the papers in this volume. Contributions by Christopher Courault, Caterina Previato, Cathalin Recko, Francesca Bologna, Paolo Barresi, Javier Domingo, Daniela Matetić Poljak, and Natalia Toma apply the principles of reverse quantity surveying, which Janet pioneered, to quantify

the manpower required for a range of buildings (amphitheatres, temples, mausolea, and houses).

Applying this methodology to ancient buildings is not without difficulty; first and foremost is the problem of assigning values to tasks in terms of the time and level of skill required. The use of pre-industrial labour handbooks to reconstruct estimates for tasks in ancient construction, estimating labour rates, of course requires a meticulous methodology, and Janet's work provided significant methodological contributions to the field, setting benchmarks in terms of method and interpretation. The rigorous way in which Janet approaches the study of Roman architecture has been a common thread across all her work. In an effort to mirror her important methodological contributions, a number of papers in this volume offer reflections and new approaches to architectural energetics in order to better define the parameters for energetic studies concerning ancient construction. Simon Barker and Ben Russell's work on stone carving highlights alternative comparative data, such as price-books, building and other accounts, and modern restoration projects, to explore a range of 'hidden' costs beyond labour and materials. Riley Synder *et al.* take architectural energetics beyond its traditional application to construction projects in stone, brick, and concrete to examine neglected earth and turf construction. Their paper demonstrates the range of other sources, including the data generated by experimental archaeology, that can be used to explore the labour requirements of ancient construction. At the same time, it also offers new methodological horizons with a compilation of collected rates for each task rather than choosing one rate or group of rates from a single source.

No volume in honour of Janet DeLaine would be complete without papers focusing on the eternal city, as her work has done so much to illuminate its architecture and building industry. The paper by Francesca Caprioli *et al.* takes up the theme of imperial building projects through the case-study of the so-called Lower Peristyle of the Domus Augustana on the Palatine Hill. Roman literary sources and Roman legal texts provide the data for Marguerite Ronin's paper, which examines issues related to the development of the housing market in late Republican and imperial Rome.

As Vitruvius remarked in his opening of Book 1 of *De Architectura*, 'Architecture is a science arising out of many other sciences, and adorned with much and varied learning'. This is something paralleled in Janet's own approach to the discipline. Her work has encompassed many facets from expertise in civil engineering to the fundamentals of Roman architecture, in order to illuminate aspects such as processes of design and

construction technologies, which lie at the heart of Roman architectural innovation.

While this volume celebrates Janet's career and her contribution to the field of Roman architecture, Janet will undoubtedly continue to have a significant impact on scholarship, not least with her own volume on Roman architecture for the Oxford History of Art series. All the editors of the current volume offer thanks to Janet for her work and hope this volume stands in some small way as a fitting tribute to her accomplishments and inspiration.

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