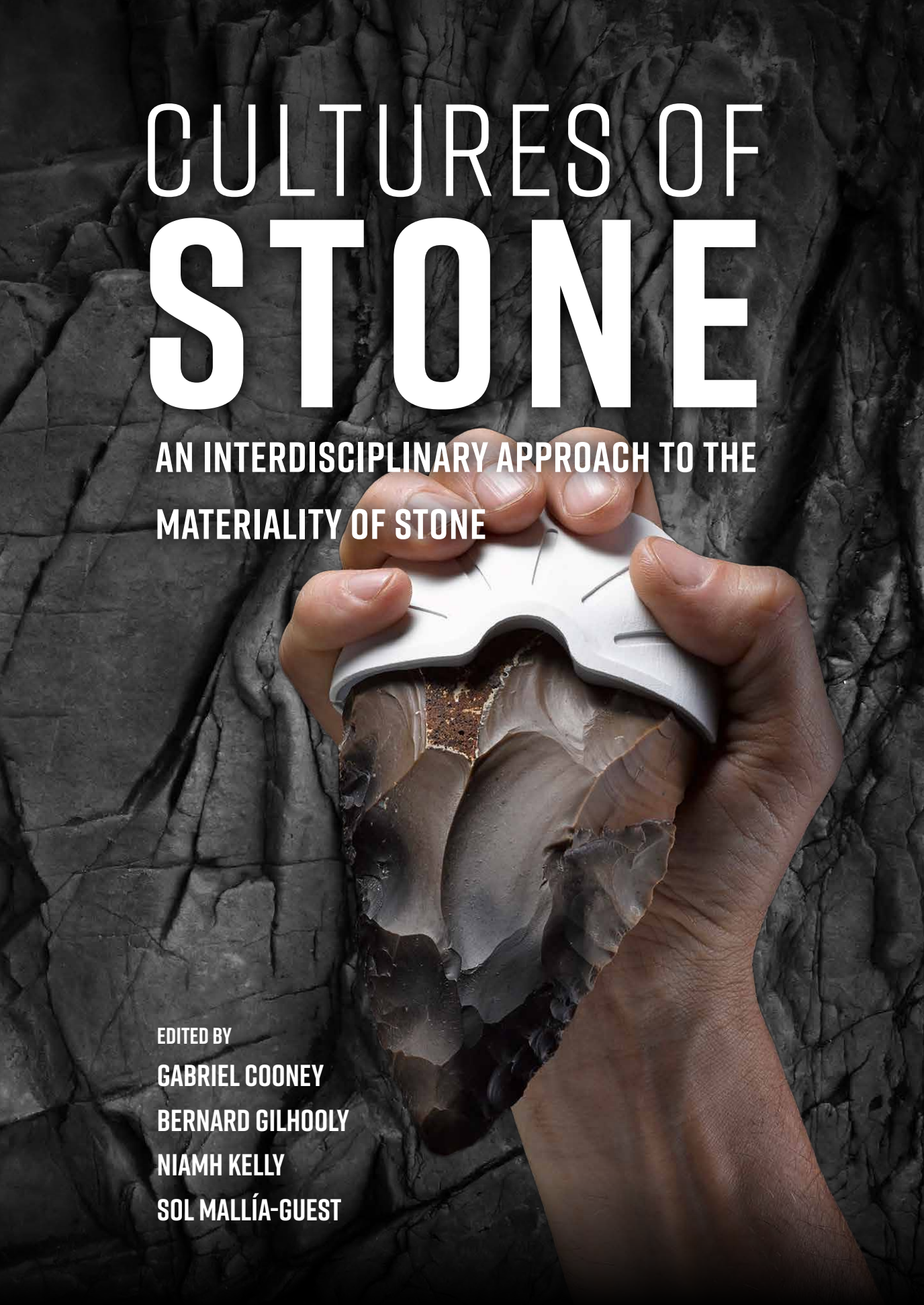
CULTURES OF
STONE
AN INTERDISCIPLINARY APPROACH TO THE MATERIALITY OF STONE
EDITED BY
GABRIEL COONEY
BERNARD GILHOOLY
NIAMH KELLY
SOL MALLÍA-GUEST

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Bosiljka Glumac, Scott M. Fitzpatrick: Yapese stone money: Local marble as a potential inspiration for producing limestone exchange valuables in Palau, Micronesia

Fig. 1. Location of Yap (Federated States of Micronesia) and the Republic of Palau in Oceania (A) and Micronesia (box in A, enlarged in B). Note the distance between Yap and Palau of more than 400 km (250 miles).

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Thomas Hess: Looking through the crystal ball: Ethnographic analogies for the ritual use of rock crystal

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Niamh Kelly, Sol Mallía-Guest, Bernard Gilhooly and Gabriel Cooney

Introduction

Constructing identities through stone

Stone is an interminable part of people's everyday lives both in the distant past and today. It forms the literal foundations for societies and provides one of the most persistent sources of raw materials, being used for everything from monuments, structures and sculptures to tools, ornaments and toys. Stone can act as a medium through which culture, ideology, and identity can be expressed. It is tied to ideas such as monumentality and remembrance; its enduring character creating a link through generations to both people and place (O'Connor and Cooney 2009, xxi–xxv).

The material properties of stone have ensured its importance to countless societies over the millennia. However, it is its materiality which has mediated the relations between the individual, society and stone as a medium. Bound up with the physical properties are ideas on identity, value, and understanding. Meanings become, through people's active engagement with the material and materiality (Tilley 2007, 18–19; Hurcombe 2007, 536–538). With such complex interactions and comprehensions bound up within stone, it is clear that a single approach to its study would not do it justice. It is therefore unsurprising that the integral role stone plays in societies places it at the forefront of research for a diverse range of disciplines.

This publication was originally borne out of the 2014 conference Cultures of Stone: Interdisciplinary Research on the Materiality of Stone which was hosted in University College Dublin in the fall of that year. The contributions from 43 individuals and groups representing 27 different nationalities worldwide—from North and South America, to Europe, Africa, the Near East, Asia and Australia—established a rich cross-disciplinary dialogue about the significance of stone in society across time and space.

To reflect such multifaceted nature of our engagement with stone, this volume brings together a collection of seventeen original conference papers which draw on a range of diverse disciplines and approaches; including archaeology, anthropology, classics, design and engineering, fine arts, geography, history, linguistics, philosophy, psychology and sciences.

Moreover, while it builds on the previous success of *Materialitas: Working Stone, Carving Identity* (2009) from which it has drawn significant inspiration, it pushes beyond Materialitas' Neolithic/Bronze Age European Atlantic scope to include research papers spanning from Palaeolithic times to the 21st Century, highlighting as well, geographical areas such as Western Australia and Micronesia.

in: G. Cooney, B. Gilhooly, N. Kelly and S. Mallía-Guest (eds) 2020: Cultures of Stone: An Interdisciplinary Approach to the Materiality of Stone. Leiden: Sidestone Press, pp. 29–30.

As a whole, this volume represents the first major cross-disciplinary publication to comprehensively address the materiality of stone with such temporal depth and geographical scope. With such diversity in mind and in order to provide a cohesive discourse, the volume is divided into three sections which consider the stages from sourcing to finished product;

Part one: quarrying and moving stone

Part two: making, building and re-imagining with stone

Part three: stone in ritual space and practice

While this is for the most part functionalist in its layout, the papers in each demonstrate the rich social and ritual importance of stone, and highlight it as a communicator of stories, ideas, and beliefs. They also demonstrate how the 'broader' properties of stone contribute to 'building' the world it occupies. From the significance of the source location, the movement of the stone, the working and shaping by those with an intimate understanding of its physical properties, to the finished object or structure, and how they are experienced, the importance of this ubiquitous, yet also unique material is key. Crucially, this also gives a more balanced insight into both production and consumption. In many cases consumption dominates discussions; this will go some way to redressing that imbalance.

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Part One

Quarrying and Moving Stone

Labour and limestone

The relationship between stone and life in the 19th- and 20th-century quarry town of Texas, Maryland

Adam Fracchia

Abstract

The small industrial town of Texas, Maryland, employed hundreds of Irish immigrants, and later, African-Americans and other groups, in the quarrying and burning of limestone during the 19th and 20th centuries. The stone was used as a raw material for industry and for building many of the national monuments and structures in the United States, including the Washington Monument and US Capitol. Serving as symbols of democracy and freedom, these gleaming white monuments contrast with the gruelling work necessary to extract the stone used in their construction, work that exploited and negatively affected the workers and residents of Texas. This paper explores the connections between quarry work and everyday life, drawing on the relationship between the town and the area's limestone industry. Instead of viewing the history of the town as part of a boom and bust progression, the trajectory of the town can be studied as a local example of the influence of the quarry industry and capitalism. Examining the priority afforded to the industry and capitalism in general, serves to illustrate how the town was created, shaped, and ultimately destroyed.

Keywords: limestone, Maryland, labor, capitalism, quarrying.

The small town of Texas, Maryland, has been tied to the limestone industry throughout its history. Large, shallow limestone deposits lead to the establishment of the town and the arrival of large numbers of Irish immigrants, and later, African Americans and other groups, to serve as labourers and semi-skilled and skilled workers. Crucial to the expansion of the industrialising United States in the second half of the 19th century, the quarry industry and the overall capitalist process shaped life in town and the town itself.

in: G. Cooney, B. Gilhooly, N. Kelly and S. Mallía-Guest (eds) 2020: Cultures of Stone: An Interdisciplinary Approach to the Materiality of Stone. Leiden: Sidestone Press, pp. 33–44.

This paper examines the history of the limestone industry and the town built around it to serve it. Examining Texas from the impact of industry documents the trajectory of the town beyond a simple boom-and-bust cycle, and contextualizes the town as a small but an essential part of the capitalist process. The pressure to maximize the accumulation of capital drove the industry and structured life outside of the workplace, building, forming, and then destroying the town. Understanding the priority afforded to industry and capitalism explains the justification of the hazards encountered not just by workers but the entire town, and illuminates the reasons for the town's disappearance, even though the area has prospered and the quarry industry remains.

The capitalist process

Today, the remains of the town of Texas sit amidst an expanding quarry and a growing number of large retail stores. These developments are just the latest examples of the continual effort and need of the capitalist process to expand and accumulate capital, often at the expense of everything else (Harvey 1989). The drive to produce spatial configurations that maximize capital leads to the creation of new spatial configurations and the destruction of less productive forms. This logic of accumulation and the overall circulation of capital, therefore produce or play a role in shaping the physical and social landscape (Harvey 1989). Understood from this vantage point, the influence and prioritisation of industry can be studied by its impact on people and the built environment. As a town, originally centred around one industry, Texas can serve as a dynamic example of the capitalist process at the local level, highlighting the concern for maximizing capital and its negative effects.

Building an industry and a town

Lying to the north of Baltimore City, the centre of Baltimore County was rural and agricultural for much of its early history. While tracts of land in the area were patented as early as 1698, settlement began slowly (Anderson 1981, 2). By the early 19th century, small quarries and kilns were in operation feeding local needs. The railway reached the area by the mid-1830s, connecting this area of shallow limestone deposits with the city of Baltimore and soon, other urban areas and markets (Edgington and Robinson 1998, 8.1).

Texas, Maryland, was established as the United States was beginning to undergo an acceleration in infrastructure, population, and industry (Figure 1). In Baltimore County, this expansion saw the creation and growth of small industrial hamlets scattered around the agricultural county to supply the raw materials and products needed for an industrialising nation (Chidester 2004). Two of these raw materials were limestone and lime, which spurred the growth of the quarry industry and creation of the surrounding town.

With the availability of rail transport, the quarrying and burning of lime quickly grew into an industry. The resources of Texas were likened to a boom and deemed critical to the prosperity of the state. By 1839, the lime trade was deemed so extensive that there was concern that the quarries might be exhausted, prompting the State geologist to evaluate the deposits and dispel fears (Matthews 1898, 174). Reflecting local boosterism, the *American Farmer* (1851, 422), an agricultural magazine, even stated after visiting Texas

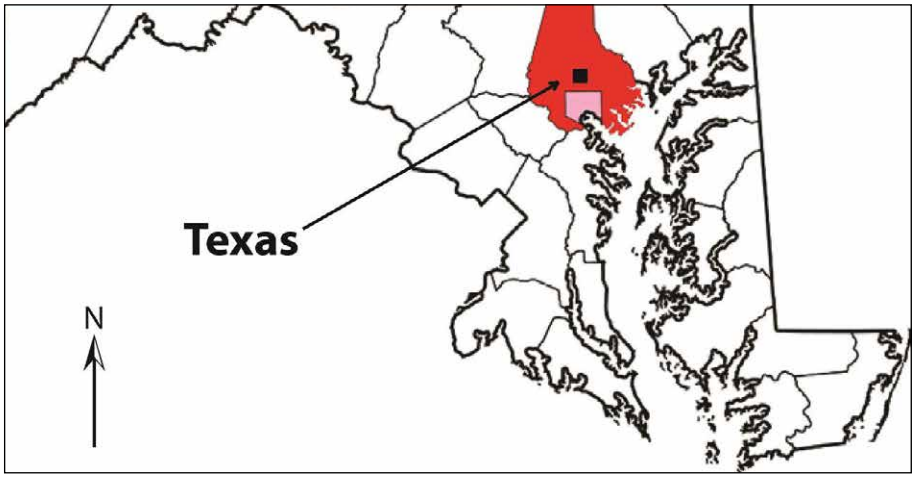

Figure 1. Location of the town of Texas in Baltimore County (dark shaded), Maryland (Image: the author). Baltimore City (light shaded) is situated seven miles south of Texas.

that the nine-acre area surrounding the railroad tracks was of more value '*by its power of creating wealth, than any similar extent of territory of the gold regions of California*'.

Limestone and industry

The relatively shallow deposits of limestone in the area, which gave the region its nickname the 'Limestone Valley' (Figure 2), vary slightly in composition. Differences in the physical properties of the limestone beds dictated the nature of their use. The limestone deposits around Texas comprise a coarse-grained crystalline marble of almost pure lime carbonate suitable for flux or fertilizer. A mile and a half away to the north, near the town of Cockeysville, the stone is a finer-grained dolomitic marble rich with magnesium. This Cockeysville marble, as it is often referred to, is suited for building and decorative purposes (Matthews 1898, 172–178).

Because of its properties, the Cockeysville marble or limestone became prized as a building stone. As early as 1847, the limestone building stone trade was firmly established in the area and highly valued. In the same year, the firms of Griscom and Burroughs, Fell and Robinson, and Thomas Symington submitted bids to supply lime and limestone for construction of the Smithsonian Institution building (Owen 1880, 604). Limestone was eventually quarried for many buildings in cities along the East Coast. These buildings and structures included the Washington Monument, for which 163,724 cubic feet of marble was used, and the US Capitol in Washington, DC. Other notable buildings, such as the Metropolitan Club and St Patrick's Cathedral in New York, the Peabody Institute and Baltimore City Hall in Baltimore, the US Post Office in Washington, DC, and the Drexel and Penn Mutual Insurance buildings in Philadelphia, were built with limestone from the Limestone Valley (Williams 1893, 136). Large amounts of the limestone were also commonly used as doorstops, lintels, facings, and steps in the construction of homes in the rapidly expanding urban areas (Williams 1893, 137).

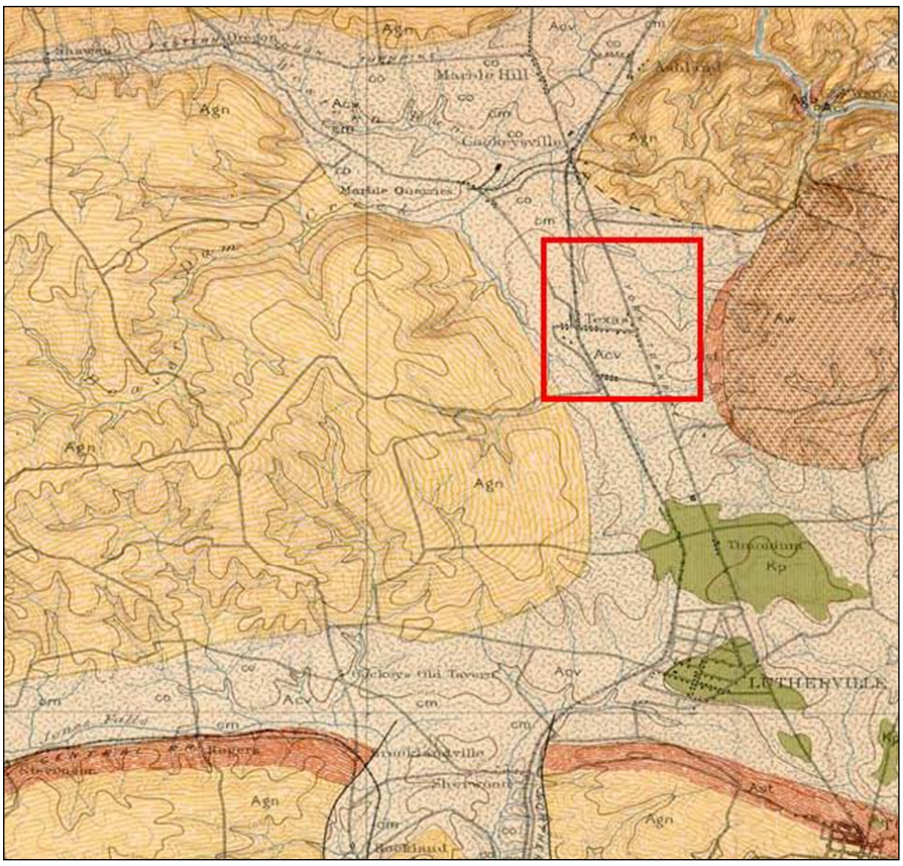

Figure 2. 1892 Geological survey map showing the different geological zones in Baltimore County including the Limestone Valley and Texas denoted with the box (Maryland Geologic Survey 1892). The lightly grey shaded area on the map shows the primary vein of limestone. Texas straddles the rail line and lies immediately to the west of the main turnpike.

While some of this building stone came from Texas, the bulk of the limestone was burned to make lime, as the crushing strength of much of the Texas limestone was deemed to be very low and thus, less suitable for building purposes. Lime was in demand as an agricultural fertilizer, a building material, and a raw material for industry. Due to this demand, by 1852, there were 51 lime kilns in operation in or near Texas (Brooks and Rockel 1978, 133).

Initially, the industry was burning limestone in intermittent or set kilns. The set or intermittent kiln used large amounts of fuel and wasted heat, as each charge had to burn out and cool before it could be unloaded and loaded again in a labour-intensive process that took between nine and thirteen days (Abe 2004, 6; Smith 1976, 6–7). Due to the intensity of the lime burning operations, the industry seemed to have exhausted the local supply of wood by this time. For example, lime burners and quarry owners, Thomas Galloway and Michael McCabe, when advertising their lime also offered to buy wood that could be brought to any spot along the rail line (*Baltimore County Advocate* February 21, 1852, March 10, 1855). The earliest aerial image of

the town taken in 1938 shows a completely denuded landscape, further attesting to this massive consumption of wood by the kilns.

Likely due to the limitations of fuel supplies and labour, capital was reinvested in the lime-kiln infrastructure. As early as 1852, a perpetual draw kiln was built in Texas by the Fell and Robinson operation (*Baltimore County Advocate* December 25, 1852). This draw kiln was more efficient and marked an improvement, since the kiln could be run continuously with loads of limestone and fuel from above, and the lime could be raked out at its base. The new kiln allowed operations to run day and night generating a larger and more efficient output of lime and necessitating a large, steady workforce.

The town and workers of Texas

Whether quarrying building stone or blasting out stone to be burned into lime, both operations required a large labour force and tremendous amounts of physical work to extract and process the stone into a useable commodity. Before pneumatic-powered tools, hammers and chisels, and rods and feathers were used to bore and split blocks of limestone for building stone. Hand drills consisted of 'V'-shaped pointed drills that were rotated slightly after every blow from a hammer to gradually drill a hole through the stone (Garvin 2001, 45). By repeating this method over and over again, a two-foot deep, one-inch wide hole could be bored by three men in two to three hours (*The Baltimore Sun* August 14, 1872). Steel plugs and feathers were used along a line of these holes to split off blocks of stone. The feathers consisted of half-round steel shims inserted into the holes with a plug inserted between them to act as a wedge and exert an outward pressure to split the stone (Garvin 2001, 45). This process was repeated countless times to extract usable blocks, some of which weighed several tons.

Gunpowder and hammers were used to blast and break up stone for burning. Blasted stone and quarried stone were collected and moved by cart or derrick, using human or animal power, to be processed further or shipped out on the railroad or roads.

The nature of this work was both gruelling and hazardous for workers, leading to accidents and even deaths (Figure 3). For instance, the *Baltimore County Advocate* newspaper (March 27, 1852) reported that a worker, John Ryan, had his leg badly broken by a rock from a blast in Joshua M. Bosley's limestone quarry in Texas.

Because of the labour-intensive nature of the quarry work, a steady and expendable workforce was key to the success of early operations. The vast majority of these workers were initially immigrants from the west and south of Ireland, and were largely Catholic and unskilled labour (Dolan 2008, 75; McGrain 1971; O'Donnell 1997, 16). To attract these workers and their families, housing and eventually a town were constructed.

Straddling the railroad and amongst the kilns and quarries, the layout of the town shows the priority afforded to industrial operations (Figure 4). The needs of industry were inscribed on plats and written into deeds. When quarry owners purchased and divided land, they laid out lots for quarries as well as houses, ensuring the rights-of-way for railway sidings and roads, quarry drainages, and dumping areas. This industrial layout placed most of the homes that were purchased or rented out to workers and their families next to the kilns and quarries in Texas. This priority afforded to industry was further reaffirmed in the courts. For example, in 1837, Amos Bosley successfully sued Thomas Deye Cockey and Ann Cockey to gain an access road and

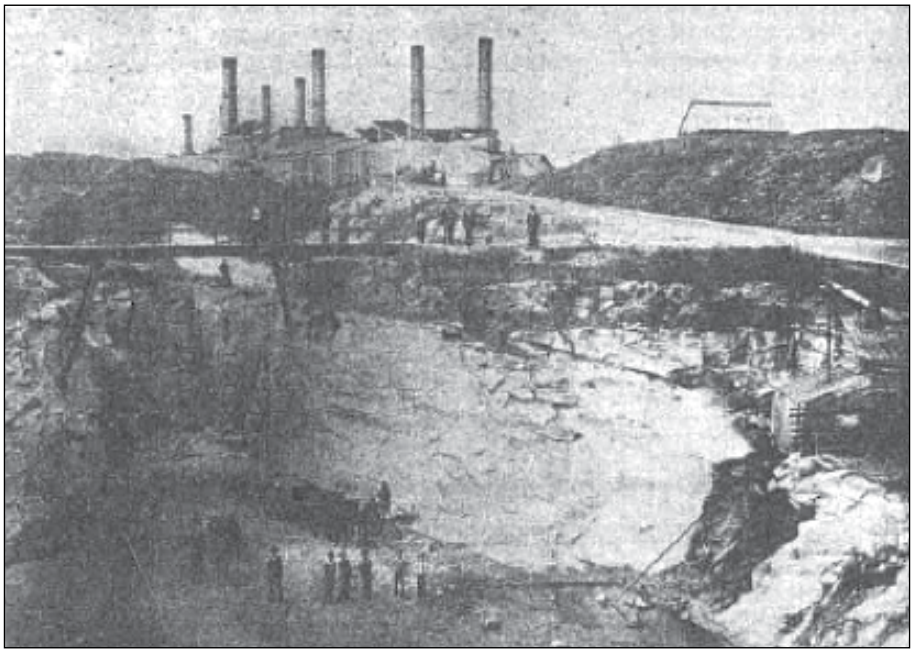

Figure 3. The only photograph of the lime kilns in Texas when they were still being used in 1892 (Harry T. Campbell Sons' Corporation 1967, 1). The image shows a series of towering brick stacks with make-shift covers for the workers labouring on top of the kilns. The photo portrays one of the shallow quarries and the precarious nature of the industry's extractive infrastructure.

rail siding from his quarry and kiln south of town through Cockey's property to the railroad (Baltimore County Circuit Court Records Liber TK 266, Folio 532).

The close proximity of workers to the quarries and kilns was beneficial to the labour requirements of the industry but negatively affected the town and its residents. With the kilns running all day and night, the town was often blanketed in dust and smoke. A *Baltimore Sun* (March 16, 1913) newspaper reporter noted the kiln stacks sending out clouds of smoke and sprinkling a grey, gauze-like film on workmen and '*…covering over everything*'. Historical Records show that a large percentage of causes of death amongst the residents, around the turn of the 20th century, were due to respiratory ailments, likely caused or acerbated by these airborne contaminants (Fracchia and Brighton 2015). The sound and vibrations of freight trains lumbering through the centre of town and the blasts of gunpowder and later dynamite in the nearby quarries disrupted daily life, shaking and damaging homes next to the railroad and quarries. The *Baltimore Sun* newspaper (May 16, 1893) provides some insight into this constant danger, reporting that a dynamite blast occurred early one morning that was so severe that people felt its percussion ten miles away and the explosion damaged several houses in town.

Even with these environmental pressures caused by the industry, the town grew. By 1850, the town had become '*…a thriving little village, of now some four hundred families…*' (*The Baltimore Sun* February 16, 1850). In that same year, the *Baltimore County Advocate* newspaper (November 11, 1850) noted the construction of another twenty dwellings, two stores, two blacksmith shops, one Odd Fellow Hall, and one schoolhouse, while according to the *Republican and Argus* newspaper (February 4, 1854),

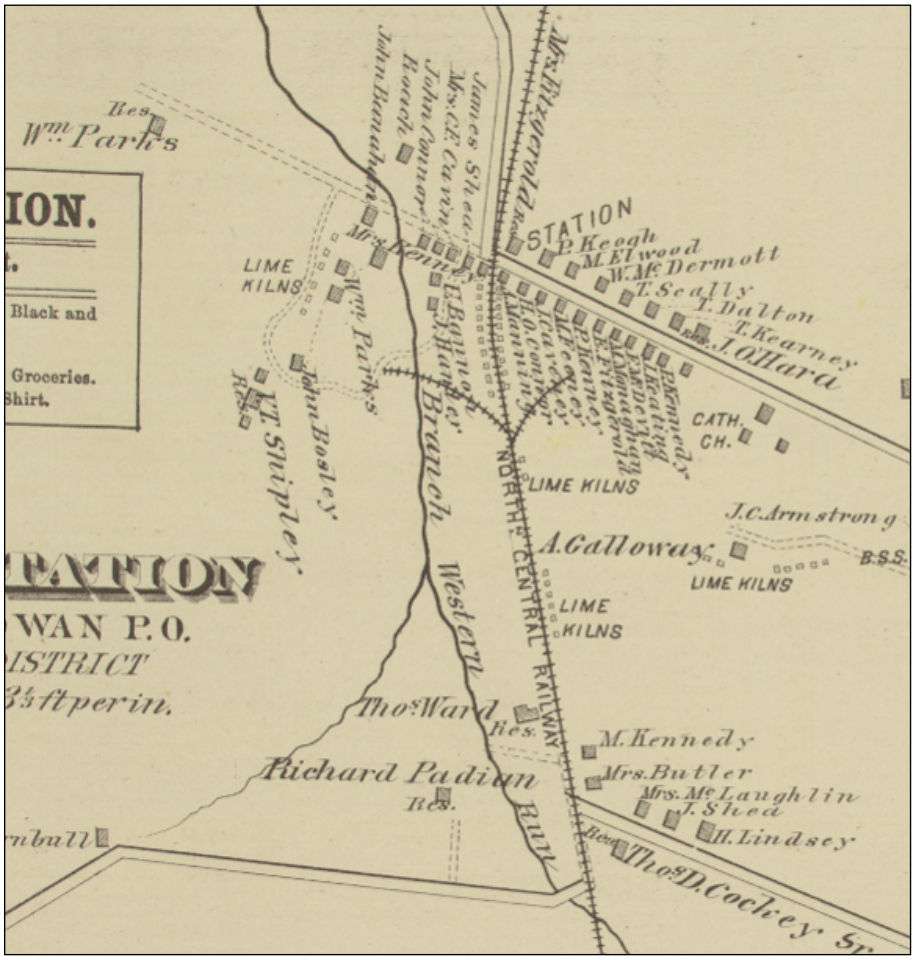

Figure 4. 1878 G. M. Hopkins Map, Atlas of Fifteen Miles Around Baltimore Including Anne Arundel County, showing the village of Texas. The map depicts houses, some labelled with names and some unlabelled, clustered around the kilns, quarries, and rail line. Homes along the railroad tracks are drawn with the same symbol as the lime kilns. Although not depicted, much of the empty space on the map was occupied by the quarries.

a Catholic Church, hotel and store, and eight dwellings were built in 1853. As the industry grew, the town expanded to serve the working population and their families. The town continued to develop along with the growth of industry until the 1870s.

Even though the quarry industry played a large role in shaping the built environment, workers helped to build a community. The workers constructed a church in town, St Joseph's Catholic Church, which served as the centre of social and spiritual life for the community. Workers also joined together and formed social and support groups. For instance, the Quarryman's Union and Beneficial Society was founded in 1868 and not only paid disability benefits, it was the first trade union organized in the County (St Joseph Church 1977, 8). Likewise, the St Joseph's Beneficial and Temperance Society was the first organization established in the

parish in 1870 to promote sobriety and, through collections, help society members in time of sickness and death (St Joseph Church 1977, 7).

Workers also responded collectively to the constant threat of being replaced and the continual pressure of competition. These pressures may have forced workers to try to protect what employment they had. According to the *Baltimore Sun* (May 17, 1854), a handbill was posted warning strangers from coming to Texas to work, on peril of their lives; '*the hands there, endeavouring in this way, to bring the employers to terms*'. The same article continues to note that a 'strange' man went to work for the Fell and Robinson quarry operation, and that same night he was caught and beaten by several unidentified people.

Workers not only sought to protect their jobs, they sought to improve their quality of life and advocated for better pay. Instances of workers' strikes in Texas and neighbouring Beaver Dam are documented from the 1850s to the 1890s. For example, in 1887, a strike by the lime-burners of Texas was said to be imminent (*The Baltimore Sun* May 4, 1887). In that year, 'lime-kiln hands' struck for seven days demanding an increase in wages from their winter wages of $1.25 and summer wages of $1.50 to $1.75 a day and won their increase (Weeks 1888, 79). Although the record of strikes is generally fragmentary, this strike is the only instance found where workers' demands were met. This lack of success highlights the role and influence of industry in the town, but also documents the continued efforts of workers to respond to and deal with the pressures of the industry.

Competition and consolidation

As the bulk of the expense of limestone quarrying was generated by the cost of extracting and processing the stone, mechanisation and capital improvements were key to the quarry industry. These investments allowed for the cheaper and faster extraction of stone. The associated reduction in time and labour is evident in the use of diamond drills in the building stone quarries. The drills could bore a 1-inch hole in diameter and 2 feet deep in the span of five minutes, doing the same work that would have taken three men with a hammer and drill two to three hours (*The Baltimore Sun* August 14, 1872). Steam-powered saws and other dressing machinery were also employed at the nearby Beaver Dam and Cockeysville Marble Works. This equipment was used to quarry and dress stone blocks that were 28 feet by 10 feet by 3 feet, and eventually shipped as 108 columns for the US Capitol building (William 1893, 136). In a statement possibly reflecting the cost savings brought about by the use of this new machinery, the stone was said to have been some of the least expensive marble used at the Capitol (*The Baltimore Sun* August 14, 1872).

Competition also had an impact on the lime industry south in Texas, and although the industry was consolidated, far less was spent on capital improvements. Demonstrating how competition had risen across the country, in the newspapers, Texas lime was being compared to the lime from Ohio and Indiana (*Baltimore County Union* April 30, 1887). Around the turn of the century, only six quarry operations and at least seventeen kilns were operating in Texas (Matthews 1898, 176–177). By 1900, the lime industry in Maryland as in other states such as Michigan, experienced further competition as improvements in transportation made the importing of stone and lime from out of state much cheaper (Morrison 1942, 262). Yet, due to consolidation, the most extensive lime burning in Maryland remained in Texas, where the

average annual production of the twenty or so kilns totalled around 200,000 bushels of quicklime for commercial and agricultural purposes (Williams 1893, 138).

The quarry industry also responded to the pressure of competition by minimising their highest cost, labour. Labour costs were reduced by cutting workers' pay and shrinking the size of the workforce. Gradually, the pressures felt by workers and their families meant less investment in their homes, and the built landscape saw a slow degradation over time. Eventually, the hazards and exploitation of the industry began to outweigh the attraction of home ownership and jobs, leading to a drop-in population and an even more rapid physical deterioration of the town. By the 1890s, buildings started to burn down and were not rebuilt.

Reflecting consolidation and the loss of jobs, the pattern of wage labour changed from the quarries to employment outside of Texas. Texans were increasingly moving out of town or working outside of town. Men were employed in nearby farms and factories while both men and women worked in skilled and unskilled jobs in the nearby county seat of Towson and even Baltimore City. The shift in employment further dissolved the community and family relations, a process that persisted throughout the 20th century.

Even with consolidation, the lime industry continued to suffer from a lack of capital reinvestment. A student paper, probably written in the 1980s, contains an interview with Lloyd Parks, who worked for William Lindsay in 1915 and describes the quarry operations (Student Paper 1980s, 9–10). Parks states that limestone, quarried by seven to eight men, was taken from the quarry by two men and a cart drawn by three mules. Once at the top of the kiln, a breaker used a ten-pound hammer to break the limestone into 8-inch pieces, while two men acted as lime burners tending to each kiln. Parks states that the men worked in two shifts, 6 am to 2 pm and 3 pm to 6 am. The day burners were paid $12.50 per day while the night burners received $15.00 and labourers earned $7.50. The description of Lindsay's kiln in Texas may be an example of the lime-burning process as it had been done in Texas since the town's founding, suggesting that capital was not sufficiently reinvested in updating the lime-burning operation.

New forms of accumulation

By the 1920s, Texas was under siege and undergoing dramatic changes to its physical landscape. The industry had not stopped, but changed. More capital was invested in mechanisation, limiting the number of workers needed. Thus, the town continued to decline, and after 1926, only one new building was built in Texas (EA Associates 1986, 2–2). The quarry operations also expanded by buying and consolidating land in town, exacerbating the town's deterioration.

In 1919, the Harry T. Campbell Company started leasing one quarry. By 1926, the company began to acquire more and more land in Texas (Harry T. Campbell Sons' Corporation 1967, 2). Over time, the Campbell Company continued to expand in Texas, investing in the mechanisation of the industry. The stone from Texas was used to meet increased demand, especially for crushed stone used in ballast, roads, and cement. By 1950, the company controlled all of the land to the west of the railroad and some of the land to the east (Anderson 1985, 5).

The quarry, its infrastructure, and related enterprises began to define the bulk of the landscape of Texas above and below the ground. The heavily mechanised quarry operations continued to enlarge and new uses were found for the limestone deposits. White stone or calcium carbonate, which is used in products ranging from antacid tablets to plastics, was mined in long tunnels that encompassed an area of 26 acres and which ran under the town (Henderson 1979). By 1979, the quarry had grown to the extent that it had obliterated much of the west half of town and portions of the eastern half.

Paradox of permanence

The stone and lime from in and around Texas were used throughout the country to build homes, to refine steel, and to construct towering white monuments and civic and religious buildings that still stand. Paradoxically, the town has been largely destroyed, not because the stone is no longer quarried. The area continues to supply thousands of tons of stone daily, from a quarry that grows larger and larger each day, but which employs a fraction of the numbers of workers it did in the 1850s. The means to extract stone has changed, and with it, the need for a large local workforce, and thus, a town.

Conversely, the more recent suburbanization of the Baltimore area has led to the increasing value of the land around Texas. In a 1952 aerial image by the US Agricultural Stabilization and Conservation Service, vegetation can be seen filling in the landscape and the smaller and older quarries in Texas, while the large active quarry dominates the former west side of town. Likewise on this photograph, the massive infrastructure of the quarry and the infrastructure of suburbanization are visible. Tracts of land have become businesses, homes, and industries, converting existing structures or destroying them. New roads, a highway, an electrical substation, and high-tension electrical lines all crisscross in and around Texas. To allow for these new spatial configurations of capital accumulation, homes were destroyed, including buildings protected by the preservation ordinances of Baltimore County. As throughout the quarry's history, the value of new forms of development, feeding capital accumulation, outweighed the value of community and heritage.

Conclusion

The history of the town of Texas is now a footnote to the present quarry operations and the history of Baltimore County. The stone that required tremendous amounts of human energy and sacrifice is visible in many of the towering civic and monumental structures of the United States, and the same stone is now extracted by the ton using heavy machinery and only a handful of people. Yet much of the town of Texas and its history are gone.

To understand this contradiction, the relationship between industry and the town of Texas must be contextualised from the perspective of the accumulation of capital. When the industry needed a large labour force, a town was constructed around the industry. The industry subsequently created a landscape geared to the cheapest extraction and processing of stone with the workers and town bearing the brunt of the industries' efforts to maximise profit. As workers were needed less and less, due to consolidation and mechanisation, little was expended on the town. The town was then deemed to be in the way of the quarry and other developments, and for this reason was neglected and destroyed. From this perspective, the history of the

town is not viewed as part of an inevitable and natural progression or evolution, but viewed as part of an active and detrimental process. Thus, Texas serves as one small example of the prioritisation and effects of industry and the wider capitalist process on a town and its people, a process that continues unabated in the present.

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Roman colours of power

Egyptian stones for the imperial metropolis, and beyond

Hazel Dodge

Abstract

Egypt, both the land and the culture, fascinated the Romans and once conquered furnished them with a whole array of resources, including stones for building and sculpture. The quarrying and use of stone had a very long tradition in Egypt, involving the transport of blocks 50–60 tons in weight over hundreds of miles. Red granite for the obelisks, such a characteristic type of Egyptian monument, was quarried by the pharaohs at Aswan in Southern Egypt. Obelisks were set up at sites all along the Nile valley, at Luxor, Karnak and Heliopolis. After the Roman conquest of Egypt, obelisks were the first large-scale physical pieces of Egypt to be transported to the imperial capital, where they were erected both as victory monuments and symbols of imperial ideology. Other stones shared in this ideology, in particular two stones which the Romans quarried in the Eastern Desert of Egypt the grey granite from Mons Claudianus and the purple porphyry Mons Porphyrites. This paper examines both the evidence from the quarries in Egypt and the effects of this phenomenon on the city of Rome, as well as further afield.

Keywords: marble, purple porphyry, Rome, Egypt, obelisks.

Introduction: parallels and meanings

> '*The buildings of our Nation's Capital serve as an unusual geological display, for the city has been constructed with rocks from quarries throughout the United States and many distant lands. Each building is a unique museum that not only displays the important features of various stones and the geological environment in which*

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> *they were formed, but also serves as an historic witness to the city's growth and to the development of its architecture*' (*Building Stones of our Nation's Capital*, US Geological Survey Pamphlet 1975, 2).

This act of bringing stones from far and wide to Washington DC demonstrates pride not only in the capital, but also in the natural resources of the nation, and by extension, pride in the ability to harness these natural resources. This phenomenon of transporting stone for use in one particular location is of course not restricted to 19th and 20th century Washington DC, but this particular instance affords not only the evidence of the buildings and monuments themselves, but also the written word to underline what the buildings, and the materials come to symbolise. On a much less grand scale, the characteristic red granite of Texas was used to form state monuments at American Civil War battle sites, for example Shiloh (Reaves 2012, 112). Similarly, but with appropriate stone brought from further afield, the Irish Brigade Monument at Antietam employed Irish granite from Co. Wicklow (Stone Sentinels 2016). The physical evidence of this same type of phenomenon can be seen as early as in the Neolithic passage tomb at Newgrange, Co. Meath in Ireland, where white quartz stones from Co. Wicklow and round granite boulders from the Mourne and Carlingford areas were used, as well as water-rolled stones brought from the nearby terraces of the River Boyne (Sweetman *et al.* 1987).

These practices would certainly have struck a familiar chord with the Romans. One of the most characteristic features of the art and architecture of the city of Rome from the 2nd century BC onwards is the increasingly lavish, and visible, use of decorative stones brought from various parts of the Mediterranean and its hinterlands (Borghini 1992; Dodge and Ward-Perkins 1992; Fant 2001; Hirt 2010; 2013; Russell 2013). At first glance, this might not seem particularly unusual; after all Pentelic marble, was used for the monuments of the Acropolis in Athens (Korres 1995a; 1995b). However, the quarries of this white marble were only 15 km to the north of the city, still a major feat given the available technology. Indeed, the Greeks would rarely contemplate the *long-distance* transport of such a bulky and heavy commodity (Fant 1988; Dodge 1991, 39). However, in Rome, with no marble in the immediate vicinity, both the appearance of these stones and their provenance bore important cultural and political meanings. By the early 1st century AD stones from North Africa, Greece, and Asia Minor, were being imported into the city in significant quantities (Pensabene 2013). Initially they had been introduced into the city by triumphant generals as tangibly impressive spoils of war and proofs of victory (Velleius Paterculus, 1.9.3–4; Pliny, *Natural History*, 36.7–8; 45; 50). By the time Augustus built his Forum (dedicated AD 2), a broad range of coloured stones was familiar in Rome (Fant 1999), but their exploitation at this time was driven predominantly by major Augustan projects. Thus, the message implicit in this complex was one of empire and dominion over the resources of that empire. Still in the early 1st century AD, the stones of Egypt played only a small role, except for one particular kind of Egyptian stone object, the obelisk (Iversen 1968; Curran *et al.* 2009; Swetnam-Burland 2015, 65–71).

This paper will address questions related to the exploitation, transport and politico-cultural significance of Egyptian stones present in the ancient city of Rome.

Egyptian obelisks and Rome

By the time of Augustus, the quarrying and use of stone had already had a very long tradition in Egypt; granite blocks, of some 50–60 tons, had been quarried from the middle of the 3rd millennium BC at Aswan in the south and then transported down the Nile for use at various sites in Lower Egypt (Arnold 1991, 58–66). The very ability to extract stones from obscure places was very much part of the ruler's command of resources (including manpower) and dominance over the natural world. The sheer scale of the different projects, the size of individual pieces (taking a variety of different forms and many over 400 tons) and their quantity, is staggering. For example, the colossal monolithic statue of Rameses II, still to be seen in the Ramesseum at Thebes where it fell, was carved from Aswan limestone and weighs an estimated 1000 tons (Arnold 1991, 38–39). It should be no surprise, therefore, that the obelisks, one of the larger individual forms and particularly iconic symbols of Egypt, have acquired new meaning and symbolism in later periods (Hassan 2003; Curl 2005, 22–30; Parker 2007; 2013), for example in the 19th century USA where obelisks appeared on military monuments, such as those at Bunker Hill in Charlestown, Ms., and in funerary contexts, such as Lincoln's tomb in Springfield, Ill. (Giguere 2014, 91–126 and 163–194).

At Karnak the remaining obelisk of two set up by Queen Hatshepsut is the largest now surviving in Egypt at about 29.5 m (96.78 ft). The transport achievement was recorded in the famous reliefs from her mortuary temple at Deir el-Bahri (Clarke and Engelbach 1990, fig. 39, and general discussion 34–45). It is important to emphasise that in the pharaonic period, obelisks were *always* both set up in pairs and carved with hieroglyphs (which supply their date), usually flanking and therefore further monumentalising an entrance into a temple complex. Thus, these were not originally solitary monuments in the later Roman manner, except the obelisk now standing near St John Lateran (Tuthmosis III) whose hieroglyphs explicitly state that it was a single obelisk and the first to be raised in Thebes (Iversen 1968, 15).

Ancient Rome had a long fascination, not always positive, with Egypt and Egyptian culture (Roullet 1972; Walker 2003; Swetnam-Burland 2015). This became increasingly evident in the later Republic when elite Romans started to travel to Egypt as diplomats and then conquerors. However, it was not until the time of Augustus, when Egypt was incorporated into the Roman Empire, that the first large-scale physical pieces of Egypt in stone arrived in the city (Swetnam-Burland 2015, 65–104).

Rome has been called 'the City of Obelisks', not surprisingly given that it has the largest number of standing Egyptian obelisks anywhere in the world (Iversen 1968; Habachi 1984, 109).[1] A total of fourteen (not thirteen as often claimed *e.g.* Habachi 1984, 109: see Coulston *et al.* in press, Appendix 5) can still be seen in the modern city including the largest obelisk ever known to have been successfully erected (placed in the Circus Maximus by Constantius II in the mid-4th century and now standing near St John Lateran), at a massive estimated 450–500 tons and 32 m (105 ft) in height (Liverani 2012); and still more once stood in ancient Rome (Iversen 1968, 56–64; Habachi 1984, 109–145). Some were original pharaonic monuments moved

1 The most reliable works on the obelisks of Rome are D'Onofrio 1967 and Iversen 1968; Brier 2016, though less detailed, is also relevant. Sorek 2010, despite its focus on the city, has a number of chronological and historical inaccuracies, which diminish its usefulness.

from various locations in Egypt, while others were products of Roman *de* novo quarrying of the quarries mimicking Egyptian practice (Parker 2007).

The ancient Egyptians considered obelisks (*tekhenu*) to be sacred to the Sun God, Ra, whose centre of worship was at Heliopolis (now a suburb of Cairo). This is where the first obelisks were erected and the practice continued throughout the pharaonic period, as well as elsewhere in the Nile valley (Habachi 1984, 3–14). The word 'obelisk' comes from the Greek, *obeliskos*, 'small spit', in reference to the monument's tall and narrow shape and the pointed tip. These were impressive monuments, not only for their lofty size but also for their high surface polish and decoration. The tip (*pyramidion*) was sometimes gilded to reflect the sun's rays (Habachi 1984, 11); in addition, the red stone itself was particularly appropriate to solar cult. The red granite at this time was *only* quarried at Aswan on the Nile; the distance from Aswan to the Thebes/Luxor area is 400 km (250 miles) and to Heliopolis 880 km (550 miles). The difficulty of moving and transporting such massive monoliths was an important pharaonic engineering triumph that the Romans fully appreciated and emulated. In addition, for the Romans obelisks provided very visible evidence of cultural appropriation and military domination.

The unfinished obelisk still lying in the quarries at Aswan is the largest known, with a height of 41.75 m (136.96 ft) and an estimated weight of 1168 tons. It should probably be dated to the 15th century BC, in the reign of the 18th dynasty pharaoh, Tuthmosis III (Engelbach 1922; Arnold 1991, 37). It cracked before it could be separated from the bedrock so it affords a unique opportunity to observe the quarrying process (Klemm and Klemm 2008, 238–240). Bronze tools would have been too soft so the quarrymen employed dolerite balls attached to rammers for extra force to isolate the obelisk from the bedrock, leaving scoop-like depressions on unfinished surfaces (Preti 1988). According to the hieroglyphs on the remaining obelisk of Queen Hatshepsut at Karnak, standing 29.5 m in height, the two obelisks for Karnak took 7 months to quarry (Engelbach 1923, 48–49).

The earliest obelisk brought to Rome was that which now stands in the Piazza di Montecitorio not far from its original location on the Campus Martius; it was removed from Heliopolis where it had been set up in the 6th century BC by Psammetikos II (26th Dynasty: 595–589 BC), and reached Rome by 10 BC (*LTUR* 3, 35–37; D'Onofrio 1967, 280–291; Iversen 1968, 142–160; Roullet 1972, 79; Habachi 1984, 125–129; Parker 2003; Swetnam-Burland 2015, 68–71) (Figure 1). In Rome, it found a rather different use, although still appropriate, as the *gnomon* or pointer of the great Augustan sundial, casting its shadow on a set of markings on the ground which served probably both as clock and calendar (Pliny, *Natural History* 36.72.15; Haselberger 2014). It stood until possibly the 11th century and was first rediscovered in the 16th century, though nothing more was done until 1748 when it was found again and re-erected under Pope Boniface XIV, after much heavy patching with red granite from other monuments (Iversen 1968, 147–157).

The Latin inscription on the base of the obelisk makes the date of erection quite clear marking the victory over Cleopatra and Egypt; in fact, it was the 20th anniversary of the event (*CIL* 6.702). It was arranged in such a way that it had a close visual and physical relationship with the Ara Pacis, a monument that embodied the peace, prosperity and purity of the Augustan regime. This kind of ambiguity, of combined messages of both peace and conquest was a particular characteristic of

Figure 1. Obelisk of Psammetikos II (26th Dynasty: 595–589 BC), brought to Rome by Augustus and set up in 10 BC as the gnomon of his horologium (Photograph: the author).

Augustan iconography (Zanker 1990, 143–145). The same text was inscribed on the pedestal of a second obelisk brought to Rome by Augustus and set up on the central barrier of the Circus Maximus (*CIL* 6.701). This example was also brought from Heliopolis, but dated to 1318–1237 BC under Seti I /Rameses II (*LTUR* 3, 355–356; D'Onofrio 1967, 173–177; Iversen 1968, 65–75; Roullet 1972, 69–70; Habachi 1984, 117–120). Positioning in the circus linked the solar symbolism of obelisks with the Greco-Roman concept of Sol driving the Sun across the heavens in his chariot (Humphrey 1986, 62–3, 91–4).

Thus, the choice of obelisks by Augustus stood for dominance and victory over Egypt and the power of the Roman people to bring this about, but a gradual change in the symbolism of such monuments over subsequent years can be observed. Some time later in the 1st century AD two obelisks were set up outside Augustus' mausoleum; they were still standing to be described by the 4th century historian Ammianus Marcellinus (17.4.16), but fell thereafter to be rediscovered in the 16th century (*LTUR* 3, 359). They now took on yet another new role in the re-planning of the papal city, and were repositioned in the Piazza dell'Esquilino under Sixtus V in 1587 and in the Piazza Quirinale under Pius VI in 1786 (Cipriani 1993; Parker 2013, 55–61). The original location of the mausoleum pair had symbolised imperial rulership and power, but these obelisks are different from those already discussed. Their shafts do not bear hieroglyphic inscriptions and they were not original pharaonic period creations, but were newly quarried for the project by the Romans. The emperors could now not only appropriate the symbols of pharaonic Egypt, they could make their own (Roullet 1972, 43–45; Swetnam-Burland 2015, 41–53). An added element to the symbolism of imperial power was indubitably the size, and therefore the transport difficulties involved, of these stone monoliths (Lewis 1985; Parker 2007, 211; Bronkhorst 2013). The emperor alone could source the raw materials and harness the technical resources to transport them.

The engineering achievement can be brought into sharp focus through a comparison of the accounts and records of the removal and transport of pharaonic obelisks from Egypt in the 19th century to Paris in 1833 (Rameses II, removed from Luxor where the remaining obelisk of the pair can still be seen), and the so-called Cleopatra's Needles of the Thames Embankment in London (early 1878) and Central Park, New York (early 1881) (Gorringe 1885, 1–58; Engelbach 1923,114–121; Habachi 1984, 152–182; D'Alton 1993). These last two were originally erected as a pair at Heliopolis by Tuthmosis III, but had been moved to Alexandria by Augustus about 10 BC to be placed in front of the Caesareum (the Temple of the Deified Julius Caesar). The obelisk destined to be set up in London fell in an earthquake in 1301, the other remained standing until it was removed to New York (Iversen 1972, 90–147; Habachi 1984, 165–168; Hassan 2003).

When Cleopatra's Needles were first observed in Alexandria by Baron Vivant Denon, a major figure in the scientific commission set up by Napoleon to study the antiquities of Egypt in the early 1800s, he noted that in his opinion they both *'might be conveyed to France, without difficulty, and would there become a trophy of conquest'* (Denon 1802). This imperialist sentiment is a good example of 19th century cultural appropriation, which was still important 50 or 60 years later when the first of Cleopatra's Needles reached London (Hassan 2003, 64). However, the thinking, and motivation, in the USA was rather different. For some, the arrival of the obelisk was not a moment too soon, if the city of New York's reputation on the world stage was to be properly expressed. A reporter wrote in the *NY Herald Tribune* in 1881 that

> '*it would be absurd for the people of any great city to hope to be happy without an Egyptian obelisk. Rome has had them this great while and so has Constantinople. Paris has one. London has one. If New York was without one, all those great sites might point the finger of scorn at us and intimate that we could never rise to any real moral grandeur until we had our obelisk*' (D'Alton 1993, 11; Hassan 2003, 64–65).

The obelisk as monument had acquired yet another new meaning as a public expression of civic and national pride, with a healthy dose of morality (Parker 2007, 215)! The challenge facing Commander Gorringe, the US naval engineer in charge of all the technical and engineering aspects was that the obelisk was still standing (about 21 m high and weighing 244 tons) and it needed to be lowered onto its side for transport. Scaffolding was placed round it and from this point on it was American property, complete with the Stars and Stripes flag placed on the top. The voyage to New York was uneventful compared to the journeys of the Paris and London obelisks, and it eventually arrived (after a stop at Staten Island) at 96th Street on the Hudson River side of Manhattan (D'Alton 1993, 48–57). The huge endeavour involved is illustrated by the length of time it took, 112 days, from the river to reach its final site in Central Park. The closest precursors to this project were the lowering, long-distance transport and erection of already standing obelisks in both the Roman period and later (Iversen 1968; 1972; Parker 2007; 2013). For the ceremony surrounding the removal and re-erection of the Vatican obelisk by the engineer-architect Domenico Fontana under Pope Sixtus V (the only obelisk to survive still standing in Rome to the 16th century), see Iversen 1968, 29–37; Brier 2016, 64–92.

Stones of Egypt

The movement of the obelisks from Egypt to Rome, as well as the quarrying and manufacture of new ones represented a very visible act of appropriation. The stone used for the obelisks, Aswan red granite, was well-known to the Romans as *pyrrhopoecilos* (with 'fire-coloured spots') (Pliny, *Natural History* 36. 63–64), and had been quarried from *c*. 3000 BC (Klemm and Klemm 2008, 233–67). It was particularly used in Roman buildings for monolithic columns. Egypt was a region particularly rich in building stones: granites, porphyries and limestones (Klemm and Klemm 2001; 2008; Harrell and Storemyr 2009). Two in particular caught the attention of the Romans: grey granite from Mons Claudianus, termed '*granito del foro*' (granite of the forum) during the Renaissance; and purple porphyry, the 'imperial' stone which has had so much influence on more modern regal and imperial imagery of power (Arnold 1991, 57–66; Claussen 1992; Pensabene 2013, 246–251).

The quarries of both these stones were first worked in the Roman period, not before, and are located in the mountains of the Eastern Desert of Egypt, about 700 m (2200 ft) above sea level, 120 km (80–100 miles) from the Nile, and 70 km (40–50 miles) from the Red Sea (Peacock and Maxfield 1997, 9–10; Maxfield and Peacock 2001, 2–4). This required a complex apparatus of transport and supply, both to support the workforces in the inhospitable country, and to facilitate movement of the stone. This could only be created and administered at the level of imperial government for employment in the emperor's building projects; the isolated location as well as the appearance and quality of the stones added to their intrinsic and ideological value (Adams 2001; Maxfield 2001; Hirt 2010).

Mons Claudianus (Gebel Fatireh)

The stone from Mons Claudianus was a fine grey grano-diorite and the deposits were spread over a large area, in an arc of 1.5 km (over a mile) from the fort; 130 separate quarry locations over a wide area have been identified, all exploited by the Romans over a period of some 300 years, commencing by the second quarter of the 1st century AD

(Peacock and Maxfield 1997, 178–189, 287–288; Klemm and Klemm 2008, 280–290). A fort provided accommodation for both military and administrative personnel; documentary evidence from the site indicates that both soldiers and civilians, including women and children, lived there; the security was for the product in this very remote location (Peacock and Maxfield 1997, 34–138; Hirt 2010, 168–173). Quarrying was a highly-specialised operation and required a skilled workforce. However, there were not large armies of slaves involved; indeed the workforce was surprisingly small, partly through organised economy of action, partly because of exigencies of supply (Maxfield 2001, 154–155). *Ostraca* from Mons Claudianus provide key insight into the composition and numbers in the workforce, particularly in the earlier part of the 2nd century AD (Bingen 1992; Bülow-Jacobsen 2009; Hirt 2010, 206–214; Russell 2013, 39–42; 228–232). The excellent preservation of the fort is matched by the 'just-abandoned' state of the quarries, with some extracted items left on ramps awaiting transport, as if the quarrymen just downed tools and walked away (Klemm and Klemm 2008, 284–285).

Mons Claudianus provided stone for major imperial building projects in Rome, such as the Basilica Ulpia in the Forum of Trajan (Gnoli 1988, 148–150; Borghini 1992; Maxfield 2001, 156; Packer 2001). Twelve columns, 40 RF (12.19 m) long, supported the porch of the Pantheon in Rome, each weighing 84–100 tons (Wilson-Jones 2000, 211–212). (See Russell 2013, 215–219 on monolithic columns). The longest known monolithic columns attempted were 60 RF (18 m) long, as evidenced by a broken example abandoned in quarry 11 (part of the so-called 'Pillar Complex') at Mons Claudianus (Figure 2).

This is particularly instructive in terms of the quarrying of such large pieces. With an estimated weight of 207 tons, rather less than some of the obelisks, it was still an exceptionally large and heavy object to move over the great distance to the Nile (Peacock and Maxfield 1997, 179; 201; Klemm and Klemm 2008, 282–90). The column had been quarried as a round shaft (see Vanhove 1996 for similar shafts still attached to the bedrock in the Carystos quarries on Euboea). It had been separated from the bedrock, ready for transport down the rampways, when it cracked. In an attempt to salvage the column and the thousands of man-hours that had already been expended to achieve this stage, the break was clamped with metal ties. Not surprisingly, these gave way when they attempted to move it again and the column broke in another place (Klemm and Klemm 2008, 286). At this point the endeavour was abandoned. Part of another column is visible close by, of comparable diameter, which broke closer to the top so that the quarrymen were able to recycle it as a smaller column and successfully remove the majority of the shaft in one piece.

Tracing the journey these pieces would have taken from Quarry 11 to the main route across the desert to the Nile further emphasises the scale of enterprise and the technological endeavour. The column would have been dragged down the ramp using a system of rollers and ropes. Cairns of small stones on either side of the ramp have previously been interpreted as bollards used to steady and anchor loads, but they have rubble core and a dry stone outer layer, so they would not have been strong enough for this purpose (Peacock and Maxfield 1997, 260). Such arrangements are known in other quarries, for example in the Pentelic quarries north of Athens, and at Mons Porphyrites (Korres 1995a, 34–35; Maxfield and Peacock 2001, 135–137). Peacock suggested they actually functioned as stores of road metalling for instant ramp repairs. Considering the weight

Figure 2. Mons Claudianus 60 RF column in Quarry 11 (Photograph: the author).

of some of the loads and that some of the quarry slipways have a gradient of as much as 25–30%, such a provision would have been very necessary to ameliorate damage.

Loading platforms along the edge of the main wadi below the quarries aided the transfer of the stone to carts or sleds. The actual method of transport thereafter has been hotly debated in modern scholarship (Peacock and Maxfield 1997, 263–264; Adams 2001; Adams 2007, 67–68); the papyrological evidence and *ostraca* point towards the use of carts or wagons (Maxfield 2001, 157–161; Adams 2007, 67; Hirt 2010, 218–219). Thus, the 60 RF col would have required a cart with a 60 RF (18 m) long bed, 8.5 ft (2.6 m) wide supported on wheels 6.5 ft (2 m) in diameter with a gauge of at least 9 ft (2.8 m) (Peacock and Maxfield 1997, 261–263). Then the stone was dragged along the wadis, through the mountains surrounding the quarry area, to take the desert road for 120 km to the Nile. This road is still visible and two gauges are discernible: one of 9 ft and one of 7.5 ft (Peacock and Maxfield 1997, 264–266; Adams 2001, 173–174).

There is also much debate about whether animal or human draught power was employed (Adams 2001, 171–176; Maxfield 2001, 157–159). The 60 RF column would have required 400–450 donkeys to move it (Peacock and Maxfield 1997, 264; Klemm and Klemm 2008, 273). Camels are mentioned in papyri, specifically as being draught animals for stone transport in Egypt (*P.Giss*.69; *P.Oxy*. 3.498; *P.Lond.* II.328; Peña 1989; Adams 2001, 175) and do seem to have been integral to the quarry operations, but it is unclear what their relative importance was with regard to other forms of draught power (Maxfield 2001, 159; 2007, 73). One particularly noteworthy feature that emerged from studies of the quarries and transport routes, is the massive provision of water, suggesting the presence of large numbers of animals (Peacock and Maxfield 1997, 141–148; Hirt 2010, 214–248). Papyri evidence indicates that this journey could take as little as five days by fast riding-camel, but transport times using camel teams dragging a 200-ton column are less easy to

Figure 3. Pantheon, Rome. Detail of one of the porch columns of Mons Claudius granite with rippled joint (Photograph: the author).

determine and may have required up to a month, including loading and unloading (Maxfield 1996, 11–12; Adams 2001, 175; Bülow-Jacobsen 2009, 267–272).

Close examination of the Pantheon porch columns provides some indication of what could happen if supply faltered. The porch now has 40 RF columns but it was originally designed with 50 RF shafts (Wilson-Jones 2000, 199–212, particularly 208–210). This would help to explain the presence of a brick pediment on the face of the intermediate block, 10 RF higher, at a level just right for a 50 RF column design. Moreover, close examination of the topmost sections of some of the columns, reveals that the length of the columns had to be adjusted with the addition of a short piece of stone (Figure 3). The rippled joint was designed to visually obscure this provision and can also be seen in the Forum of Trajan. Thus, even with a shorter length of column, there could still be problems both in terms of supply and damage during transport. Russell has suggested a timeframe of 345 days (based on a workforce of 349 stonemasons enumerated in the *ostraca*) for creation of the 108 30 RF columns of Mons Claudianus granite used in the Basilica Ulpia of the Forum of Trajan (Figure 4) (Packer 2001; Russell 2013, 229–232).

Granito del foro was almost exclusively used in imperial building projects, and particularly for columns. Even though other grey granites were exploited elsewhere in the Roman Mediterranean with greater ease of transport, for example in the Troad area of north-west Turkey, the operations at Mons Claudianus continued for three centuries (Peacock and Maxfield 1997, 318–319; see also Röder 1999 for Felsberg granite as a substitute for Mons Claudianus). The point was precisely that people would know that the emperor's granite columns were obtained through endeavours that *only* imperial administration could sustain.

Figure 4. Basilica Ulpia, Forum of Trajan, Rome. Columns of Mons Claudianus grey granite (Photograph: the author).

Mons Porphyrites

The quarries of Mons Porphyrites were even more remote, approximately 50 km (30 miles) north of Mons Claudianus in mountains up to 1661 m (5400 ft) above sea level (Maxfield and Peacock 2001, 2–3; Klemm and Klemm 2008, 269–280). Again Pliny the Elder provided some context and insight when he stated that *'in Egypt too there is red porphyry, of which a variety mottled with white dots is know an "leptopsephos"* ["fine or delicate"]. *The quarries are able to furnish blocks of any size. Statues of this stone were brought from Egypt to the emperor Claudius in Rome by his official agent Vitrasius Pollio ……'* (Pliny, *Natural History* 36.57). An inscribed stele, set up in one of the quarry villages, records the discovery of the quarries on 21st July AD 18 by Gaius Cominius Leugas. It depicts Min, the god of the Eastern Desert, who the Greeks identified with Pan, (Maxfield 2001, 149). It reads:

> '*Caius Cominius Leugas who discovered the quarries of porphyry stone and black porphyry and also found multi-coloured stones, dedicated this sanctuary to Pan and Serapis, very great gods, for the well-being of his children. The fourth year of Tiberius Caesar Augustus, Epeiph 29th*'.

Leugas seems to have been a prospector in imperial employ, scouting out the Eastern Desert for new sources; it has been suggested that perhaps the Mons Claudianus granite is one of the 'multi-coloured stones' referred to in the inscription. Samples were taken back to the emperor where it found great favour (Pliny, *Natural History* 36.56–58) From the Bronze Age onward, purple was the 'colour of power' *par*

excellence, associated as it was with the rich, expensive shellfish dye of the eastern Mediterranean (Rheinhold 1970; Bradley 2009, 189–211). The porphyry from Mons Porphyrites was unique in Roman experience (Klemm and Klemm 2008, 208, 269). Indeed, the continuing regal and sacred power of porphyry was such that when the looting of Rome began in the 5th century AD pieces became scattered all across Medieval Europe. It was favoured by the Cosmati brothers and their followers from the later 12th century; the most northerly example of the latter can be found in Westminster Abbey. Fragments even reached Ireland (Gnoli 1988, 129–130; Greenhalgh 2008, 56–57; Claussen 1992; Hansen 2003; Delbrueck 2007).

Although also an igneous rock, the quarrying of purple porphyry was different from the grey granite of Mons Claudianus. In fact, it was more straightforward because the porphyry was well-jointed, a feature which could be capitalised on in the extraction process, and allowed blocks to be levered off from the bedrock (Maxfield and Peacock 2001, 131–191). However, the stone was very hard and compact. Furthermore, while the jointed structure allowed pieces to be broken off with relative ease, it limited their length to 9–10 m (30 RF) (Figure 5). The varied techniques employed in the quarries were all dictated by the specific geology of the stone; thus, there is evidence for the use of wedges to capitalise on the natural joints (Klemm and Klemm 2008, 272). Rock was split off from the quarry face by forcing boulders into joints. As at Mons Claudianus, there were no conventional stepped or sheer quarry faces. The main products of the quarry were columns and blocks, some of these hollowed out. Everything was worked to a certain stage to remove waste and reduce weight for transport (Maxfield 2001, 155; Maxfield and Peacock 2001, 168–170). There were also some multi-faceted blocks of more irregular shape indicating that the operators of the quarry were keeping their options open in terms of how the block could be cut and used on destination. This is a phenomenon known from other Roman period quarries, for example the *africano* quarries of Teos on the western coast of Turkey (Pensabene 2007; Pensabene 2013, 113–145).

From the mid-1st century AD, purple porphyry was initially used in small quantities, but increasingly acquired imperial meaning, being especially reserved for the portraiture of the emperors (Nista 1989, 35–46; Delbrueck 2007, 15–29). Under the Tetrarchy, the full potential of such symbolism was realised (Delbrueck 2007, 84–103). Apart from a few small-scale instances, this stone was always used in imperial contexts, whether for sculpture or architecture. Constantine and subsequent emperors shipped enormous amounts of the stone to Constantinople repurposed from Rome, hence its name 'Roman' or 'Egyptian' marble used by late Roman and Byzantine writers (Gnoli 1988, 129; Delbrueck 2007, 29–32). Under Constantine purple porphyry acquired the ultimate imperial symbolism; he used the stone to veneer the walls of the room in his palace where subsequent Byzantine emperors were born (hence *'born into the purple'*: Anna Comnena, *Alexiad*, 6. 7–8). It became the preferred stone for imperial sarcophagi and the emperors of the 4th and 5th centuries were regularly buried in purple porphyry sarcophagi, the last being the emperor Marcian in 457 (Vasiliev 1948). After this other costly stones, including alabaster and *verde antico* from northern Greece were employed. This was not an indication of a change in the stone's status, but more likely to do with economics and the availability of supply.

Figure 5. S. Crisogono, Rome. One of two purple porphyry columns which support the triumphal arch; at c. 30 RF in height they are amongst the largest standing in Rome (Photograph: the author).

Purple porphyry in the post-Roman Period

This symbolism of rulership attached to the stone in antiquity lived on, even if the supply of newly quarried pieces had ceased. For example, Theodoric, King of the Ostrogoths, was buried at Ravenna in a sarcophagus of purple porphyry (possibly originally a bath tub), and the tombs of the Norman and Hohenstaufen kings of Sicily at Palermo reusing purple porphyry columns, presumably transported from Rome for the purpose (Deér 1959).

Figure 6. The tomb of Abraham Lincoln, Oak Ridge Cemetery, Springfield Il.: right: exterior; left: the block of red quartzite from Minnesota placed on the site of the grave in the 1931 renovation (Photograph: the author).

Another emperor, Napoleon I of France was also buried in purple at Les Invalides, Paris. In fact, the sarcophagus was made from an aventurine quartzite from Finland (now Karelia, Northern Russia), but the colour symbolism was overt, made clear in a contemporary pamphlet:

> '*It was only with sorrows, sacrifices and difficulties beyond measure, that the transport from the depths of Finland to the banks of the Seine could happen, and it was only with the aid of the strongest steam engine that it was possible to cut, polish and sculpt the sepulchral form*' (Tombeau de L'Empereur 1853, 47).[2]

The same may be asserted of 19th century USA. The tomb of Ulysses S. Grant stands on the banks of the Hudson River in New York. The stone used for the sarcophagi of Grant and his wife is purple in appearance but is again red quartzite, this time from Montello, Wisconsin (Giguere 2014, 195–244). According to the contemporary newspaper reports, it was chosen to imitate Napoleon, as an indicator of leadership and great generalship. At Oak Ridge Cemetery, Springfield Il., Abraham Lincoln's tomb is surmounted by an obelisk, and within the burial chamber a seven-ton block of dark red quartzite from Minnesota marks his burial place (placed there as part of the reconstruction of 1931) (Giguere 2014, 238 n.3) (Figure 6).

Conclusions

The removal of very large Egyptian stone monuments under emperors, and the exploitation and close imperial control of a number of these stone resources, many of which required huge investment in terms of manpower, expertise and technology, was a singular

2 'Ce n'est qu'avec des peines, des sacrifices et des difficultés sans nombre qu'on est parvenu à le transporter du fond de la Finlande aux bords de la Seine, et ce n'est qu'à l'aide d'une machine à vapeur du plus puissant mécanisme qu'on a pu le tailler, le polir et lui donner la forme sépulcrale'.

Roman phenomenon. They took a Bronze Age tradition in the obelisks, and in their removal and erection in Rome, made it entirely their own, to the point of producing new examples (Parker 2007). Egypt had a unique status within Roman provincial organisation, the emperor taking a tight control of its administration; thus to some extent he had relatively free access to the resources (Bowman 1986, 37–38). The distribution of Egyptian stones, in particular the grey granite from Mons Claudianus and purple porphyry from Mons Porphyrites, emphasises even more that the workings of these particular quarries formed a special part of the imperial economy, not subject to normal market dictates (Dodge 1991, 39–40; Dodge and Ward-Perkins 1992; Pensabene 1994; Hirt 2010). Purple porphyry was geologically unique in Roman experience, but there *were* other sources of grey granite, almost identical in appearance, which were worked extensively, much closer to the sea and thus easer to transport. There can be only one conclusion as to why these resource-intensive enterprises were undertaken at the quarries in Egypt. While it is true that these stones were highly prized for their appearance, and for their special properties, the over-riding reason for their use was their provenance. They were special because to all intents and purposes they came from the ends of the earth, and they were produced only with huge investment and by the application of technology on an unprecedented scale. This technology was particularly emphasised by Pliny the Elder with grudging admiration: '*mountains were made by Nature for herself to serve as a kind of framework for holding firmly together the inner parts of the earth… We quarry these mountains and haul them away on a mere whim …*' (Pliny, *Natural History* 36.1–3).

In the context of Rome, only the emperor could make all this happen, only the emperor had the ability to apply that technology and therefore harness nature's resources for these ends. In the post-Roman period, as not only the materials but also the monuments themselves and the symbolism attached to them were re-cycled and reformed, they continued as symbols of victory and colours of power.

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Abbreviations

RF Roman Feet

LTUR Stenby, M. (ed.). *Lexicon Topographicum Urbis Romae*. Rome: Edizioni Quasar.

CIL Corpus Inscriptionum Latinarum.

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Yapese stone money

Local marble as a potential inspiration for producing limestone exchange valuables in Palau, Micronesia

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Abstract

Between *c.* AD 1400–1900, Yapese islanders in western Micronesia travelled to the Palauan archipelago to carve large circular or ovoid-shaped disks. Often referred to as 'stone money', they were made from a speleothem flowstone variety of limestone that formed by calcite precipitation along cave walls. These disks were an engineering marvel, and their transport to Yap by watercraft, more than 400 km away, makes them the heaviest objects ever moved over open-ocean by traditional Pacific Islanders. Thousands of pieces were brought to Yap pre- and post-European contact, and were (and still are) highly prized as important exchange valuables and symbols of cultural tradition.

One of the most fundamental questions regarding stone money is how and where it originated, given that Yap has no native sources of limestone. Palau and Yap are part of an intra-oceanic island-arc-trench system that separates the Pacific and Philippine plates. Yap is unusual in that it is mainly composed of metamorphic, not volcanic rocks. Yap also lacks uplifted limestone terrains common in the neighbouring archipelagos (*e.g.* Palau and the Marianas).

To address these questions, we examined the occurrence of rare, small, and lichen-covered outcrops of calcitic marble (metamorphosed limestone) on Yap. While there are no definitive records of Yapese stone money being produced from marble, this study documents an attempt to carve a disk from this material. We suggest that the white colour, crystalline texture, and shiny lustre of marble may have initially inspired the Yapese to seek similar material elsewhere. The discovery of abundant flowstone with similar composition and appearance on Palau, may have been the impetus for why this exchange system began. Even though the surface of most stone money on Yap is now darkened due to weathering, this would not have diminished its overall value, which is based on numerous other variables such as its pedigree, and not on visual appearance.

Keywords: currency, trade, Caroline Islands, Pacific.

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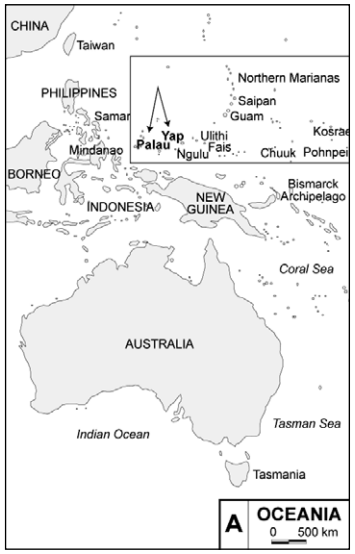
Introduction

At European contact, peoples on Yap, a small island group in western Micronesia (Figure 1), were observed displaying large stone disks, which they referred to as *rai*, but that are commonly known today as 'stone money' (Gillilland 1975; Fitzpatrick 2003a; 2008; 2016). These circular or ovoid shaped pieces of stone, typically perforated with a hole through the centre, were described to Europeans by the Yapese as having been quarried in the Palauan archipelago about 450 km (280 miles) away (Figure 1) and then brought back to Yap by raft or canoe (Hazell and Fitzpatrick 2006). During the Japanese administration in the 1930s, more than 13,000 pieces of stone money were recorded. While many were destroyed during various colonial administrations for use as anchors and construction material, or became broken or lost over time, there are still thousands of pieces found on Yap today.

On Yap, affectionately known as the 'Island of Stone Money', these disks are commonly displayed along roads, village pathways, and in front of family homes and traditional meeting houses (Figure 2). The surfaces of most *rai* are darkened due to weathering and heavy lichen and moss covering, so it is often difficult to see the true colour and composition of the stone that lies underneath. Macroscopic examination of clean examples indicates that they are made from a speleothem flowstone variety of



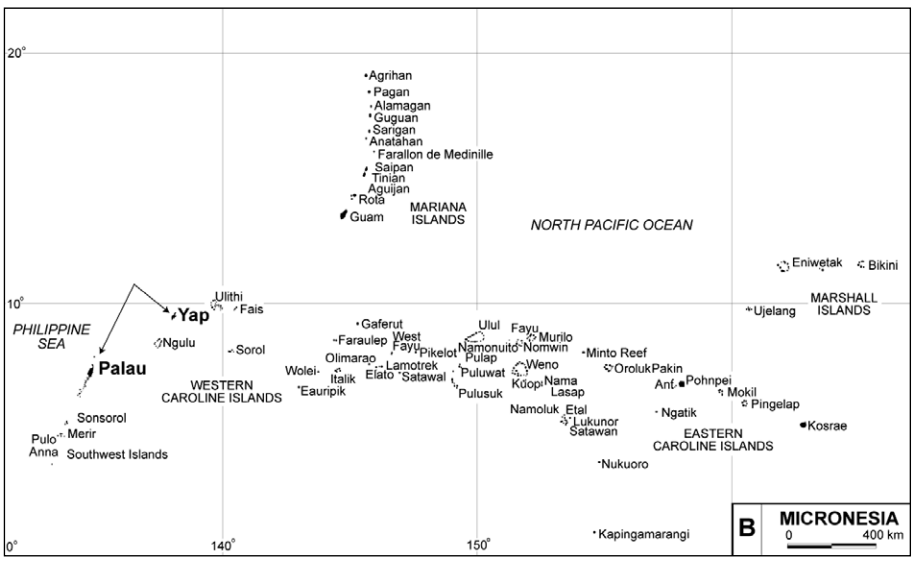


Figure 1. Location of Yap (Federated States of Micronesia) and the Republic of Palau in Oceania (A) and Micronesia (box in A, enlarged in B). Note the distance between Yap and Palau of more than 400 km (250 miles).

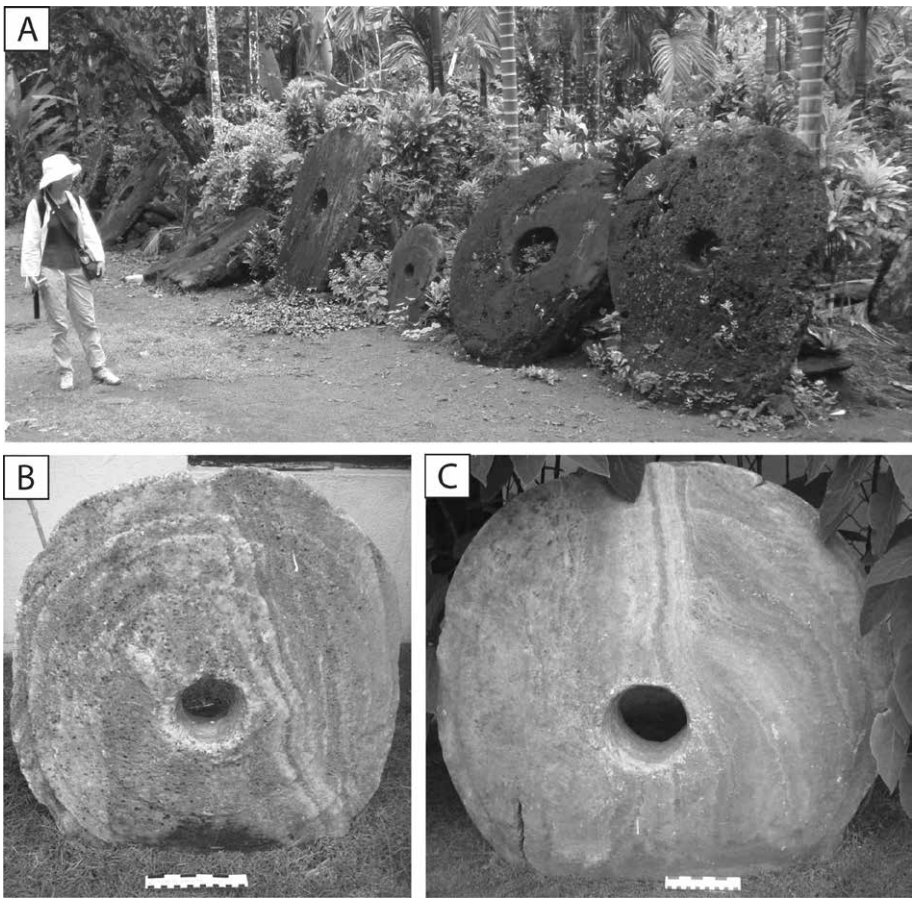


Figure 2. Appearance of stone money on Yap. A) Stone money lining a village pathway. Note its characteristic size and shape, and the darkened (lichen and moss covered) exterior. B) and C) Two examples of 'clean' stone money (displayed at a local hotel) showing the characteristic colour and texture of the limestone, of the cave flowstone variety, from which the stone money was made. Scale in centimetres and inches.

limestone, that forms by calcite precipitation along cave walls (Figure 2B and C). Calcitic composition has been confirmed by X-ray diffraction (XRD) analysis of both stone money found in Palau and associated manufacturing debris (Fitzpatrick 2003b). This limestone is commonly light in colour, laminated or banded, with a shiny lustre due to its typically coarse crystalline texture of large calcite crystals.

Due to the absence of limestone caves on Yap, the Yapese had to travel elsewhere (primarily, or even exclusively) to the Palauan archipelago, between perhaps *c.* AD 1400–1900, to carve stone money in limestone caves (Figure 3; Fitzpatrick 2003a). The carving of these disks using pre-contact stone and shell tools and movement from both inland and coastal quarries in Palau across rugged karst terrain and shallow reef systems was an engineering marvel, while their transport to Yap, hundreds of kilometres away, makes them the heaviest objects ever moved over open ocean by traditional Pacific islanders (Fitzpatrick 2003a; Hazell and Fitzpatrick 2006). The production and transportation continued post-European contact, using metal tools and ships

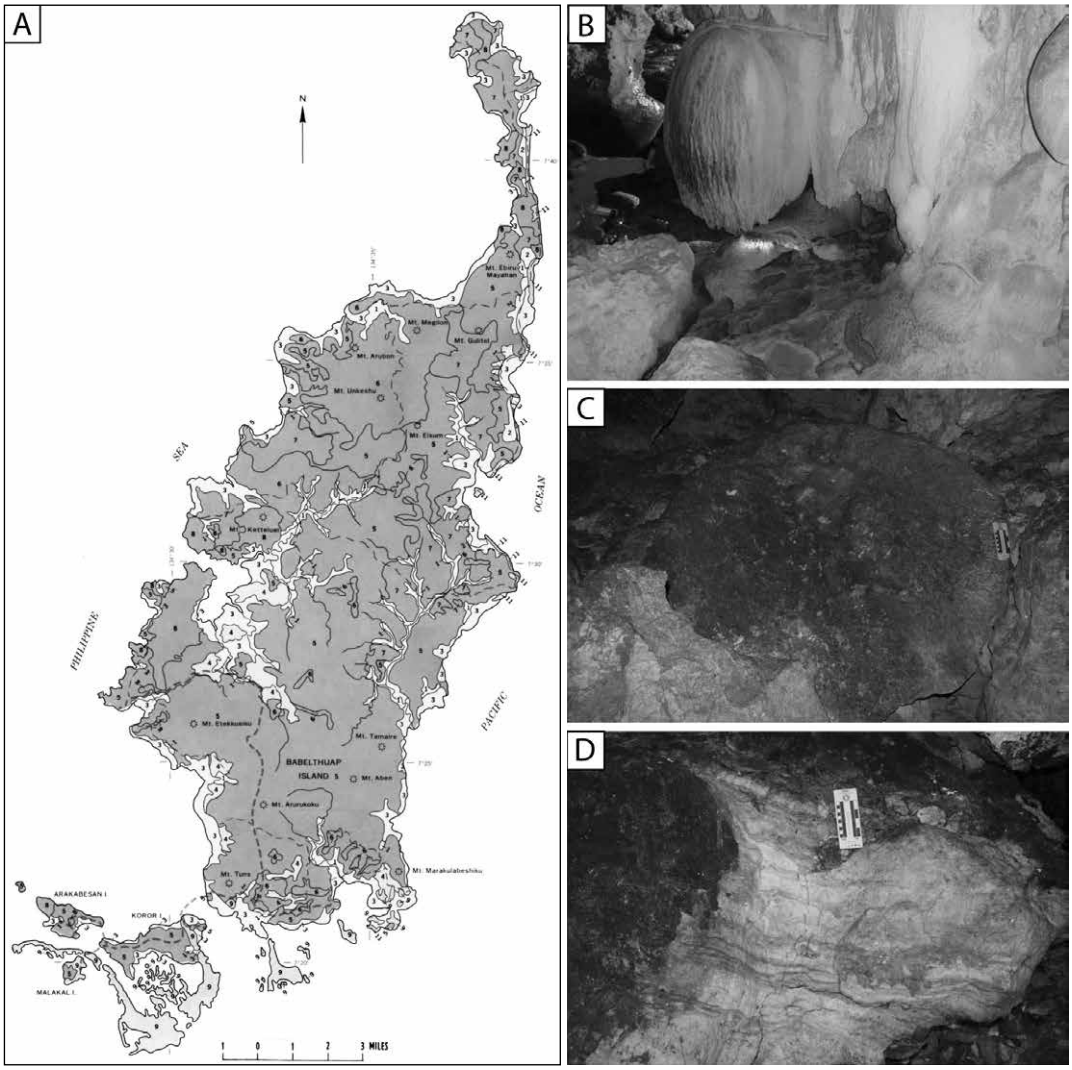


Figure 3. Geology and caves on Palau.

A) Soil map of Palau showing the dominance of soils developed on volcanic rocks (numbers 5–8) and the presence of soils developed on limestone (number 9) in the southernmost Rock Island area. Numbers 1–4 represent soils developed on valley floors and marine terraces, and number 11 indicates soils formed on coral sand. Note an older spelling for Babeldaob Island (i.e. Babelthuap),(General Soil Map, Islands of Palau 1983).

B) Interior of a cave on Palau developed in the limestone terrain on the Rock Islands. Note the thick speleothem precipitates of the flowstone variety along the cave walls. Person for scale in the central left.

C) An example of abandoned Yapese stone money inside a cave on Palau. Note its characteristic round shape and dark patina. Scale in centimetres and inches.

D) Fresh in situ exposure of cave flowstone showing its characteristic light colour and banded texture, which is identical to that of stone money (see Figures 2B and C). Scale in centimetres and inches.

(LeHunte 1883; Furness 1910; Matsumura 1918; Berg 1992; Gillilland 1975; *e.g.* starting in 1874 by an Irish sea captain named David O'Keefe).

On Yap, stone money are highly prized as important exchange valuables and symbols of cultural tradition (Einzig 1966; Gillilland 1975; Fitzpatrick 2003a). Stone money are used in many different social transactions, including births, name giving ceremonies, adoption, marriage, securing allies, ransom of a corpse, loan or promise, and purchase of goods or services. The value of a piece of stone money is based not only on its size, shape, and quality, but also the process by which it was acquired, including by whom, when and how it was made on Palau and brought to Yap, and what the risks and casualties were, as recorded in the oral history of individual objects (Einzig 1966; de Beauclair 1971). The pedigree of each *rai*, per se, was paramount in the determination of its value.

With this in mind, our primary research questions are:

- How did Yapese stone money originate?
- What may have inspired or served as the impetus for the Yapese to begin producing these limestone exchange valuables in Palau?
- Why would the Yapese travel to Palau to carve stone money and transport them to Yap?

To address some of these questions, we discuss the unique geological environments of Palau and Yap and relate geological origins of these Pacific islands to the distribution of stone resources and their availability and utilisation. We document an attempt to carve stone money on Yap from local marble and hypothesize that the textural and compositional similarity between marble and speleothem flowstone may have inspired the Yapese to carve stone money in the limestone caves found primarily in the Rock Islands of Palau (Figure 3A).

Geological setting and stone resources

The Republic of Palau

Palau is one of the typical intra-oceanic island-arc-trench system islands in the western Pacific composed mainly of volcanic rocks (Figure 3A; Rytuba and Miller 1990). The main archipelago stretches for about 150 km from Kayangel, an atoll in the north, to the southernmost island of Angaur in the south. The southern portion of the archipelago consists of an uplifted limestone terrain of Tertiary age, comprising several hundred, mostly uninhabited limestone islands, known locally as the 'Rock Islands'. They feature prominent bioerosional notches, shear limestone cliffs, small beaches, and densely vegetated interiors (Figure 3A). Geologically, the Tertiary limestone that makes up the islands is of shallow water origin and mainly composed of small to very large shell pieces in a muddy and sandy matrix. This sediment is analogous to that forming within the shallow lagoon and coral reefs that surround the archipelago today. The larger islands toward the north (Koror and Babeldaob), are primarily of volcanic composition, with the latter having extensive fringing reefs (Figure 3A).

The wet and humid climate of Palau, in conjunction with dense vegetation, results in extensive dissolution of exposed limestone and the formation of numerous

caves, rock shelters, overhangs, steep, jagged valleys, and other features typical of a karst terrain (Mylroie and Carew 1995; 1997). Inside the caves are very extensive and thick precipitates, or speleothems (Figure 3B). Of particular interest are speleothems that form thick coatings on cave walls called flowstone, because these were primarily used as the *in-situ* source material for the carving of Yapese stone money (Fitzpatrick 2003b). It is not uncommon to find unfinished or abandoned examples in or around quarry sites on Palau (Figure 3C).

Examination of cave flowstone confirms that this was the preferred source material for stone money: the light colour of fresh stone, its laminated structure, and the shiny texture deriving from coarse crystalline texture of large calcite crystals (Figure 3D) are identical to the material from which stone money was manufactured (Figure 2). Limestone bedrock, on the other hand, was never used to carve stone money on Palau, due to its highly heterogeneous and commonly very porous and friable texture, with loosely embedded shell material of a variety of sizes and shapes. Dissolution of marine limestone bedrock and its re-precipitation as thick cave flowstone, however, created a much more suitable stone carving medium, with more homogeneous and compact texture of interlocking calcite crystals. The relative softness of calcite allowed this special type of terrestrial limestone (cave flowstone variety) to be carved using traditional stone and shell tools (Fitzpatrick 2003b; 2016).

Yap, Federated States of Micronesia

Like Palau, the Yap islands are also part of an intra-oceanic island-arc-trench system formed by westward subduction of the Pacific plate underneath the Philippine plates (Figure 4). Yap is unusual, however, in that on the Pacific plate to the east of the islands, there is a large area of very thick oceanic crust with many seamounts and atolls, known as the Caroline Ridge (Figure 4). The existence of this ridge makes subduction underneath Yap very difficult (Rytuba and Miller 1990) and explains the origin of Yap and its unusual geology (Hawkins and Batiza 1977). Yap formed as a typical volcanic arc-trench system in the early Tertiary by westward subduction of the Pacific sea floor (Figure 4B-I). Blocking of the subduction zone by the Caroline Ridge, however, ended volcanism and caused the deformation, uplift, and over-thrusting of the sea floor from the west of Yap, over the former volcanic arc (Figure 4B-II). This process caused extensive metamorphism and instead of typical volcanic rocks, Yap is today composed mainly of metamorphic rocks (Figure 4B-III). Flat slabs of schist, for example, are commonly used to pave village paths on Yap (Hunter-Anderson 1983).

Unlike Palau and many other Pacific islands (*e.g.* Guam; Figure 4A), Yap does not have an uplifted limestone terrain (Nedachi *et al.* 2001). Such a terrain was never present or has been completely eroded away (Hawkins and Batiza 1977). Limestone of either shallow marine (atoll reefs and lagoons) or deep marine (planktonic ooze) origin was likely present around the incipient volcanic islands of Yap (Figure 4A-I). The process of metamorphism resulted in recrystallization of limestone into marble. Rare and small exposures of marble on Yap are part of the Map Formation of Miocene age (Figure 5; Johnson *et al.* 1960; Hawkins and Batiza 1977).

This formation is a polymict tectonic breccia (*i.e.* rock with large angular clasts of multiple composition) that formed along thrust faults during tectonic deformation and metamorphism of Yap (Figure 4B-II; Hawkins and Batiza 1977). It had been pre-

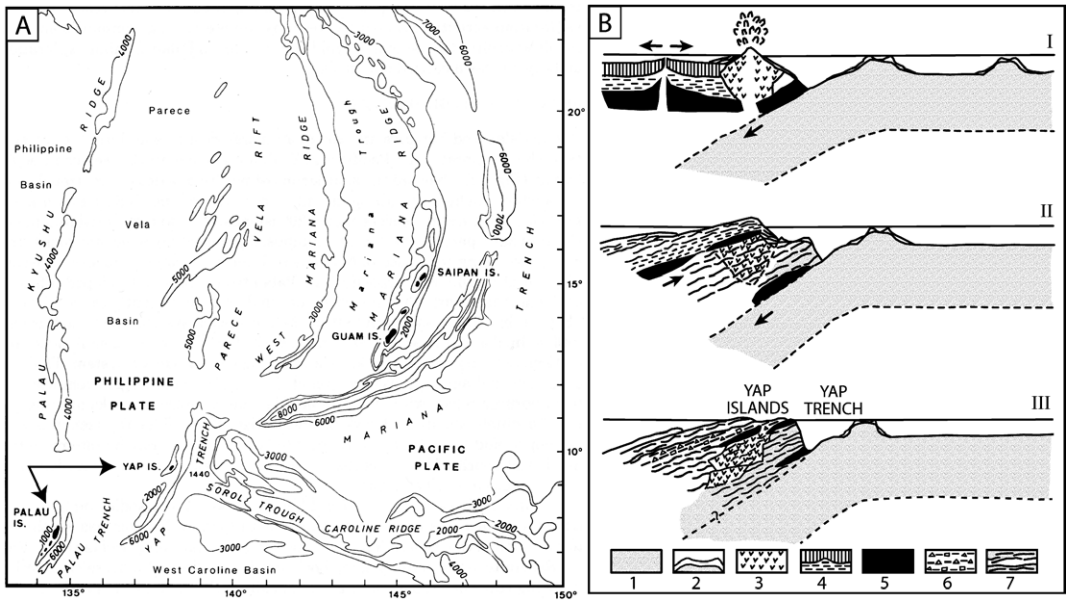


Figure 4. Geology of Yap.

A) Both Yap and Palau (arrows) are part of an intra-oceanic island-arc-trench system that separates the Pacific and Philippine plates in the western Pacific. Note the presence of an area with thick oceanic crust with numerous seamounts and atolls known as the Caroline Ridge to the east of Yap (Rytuba and Miller 1990).

B) Three stages in the formation of Yap (Hawkins and Batiza 1977). I) Formation of Yap as a typical volcanic arc-trench system in the early Tertiary by westward subduction of the Pacific sea floor. II) Cessation of volcanism due to blocking of the subduction zone by the Caroline Ridge, causing the deformation, uplift and over-thrusting of the sea floor from the west of Yap, over the former volcanic arc. This process caused extensive metamorphism and instead of typical volcanic rocks Yap is now composed mainly of metamorphic rocks. The Map Formation is a tectonic breccia that formed along the thrust faults. Blocks of marble within the Map Formation are metamorphosed limestone of either shallow (atoll reefs and lagoons) or deep marine (planktonic ooze) origin. III) Present-day schematic geologic cross section of Yap showing the dominance of metamorphosed igneous rocks and the distribution of the Map Formation breccia and intercalated marble. The island does not have an uplifted Tertiary limestone terrain that is common in nearby islands (e.g. Palau and Guam). Such a terrain was never present or has been completely eroded away. Key: 1=oceanic crust, 2=carbonate rocks of reefs, 3=volcanic-plutonic material of arc, 4=oceanic crust and upper mantle of marginal sea, 5=ultramafic rocks, 6=Map Formation breccia, 7=marble incorporated in metamorphosed equivalents of Unit 1.

viously described as breccia and conglomerate (*i.e.* rock with large round clasts) with fragments of metamorphic (hornblendite, hornblende schist, some greenschist, and minor amounts of serpentinite) and igneous (ultrabasic and volcanic) rocks, ranging in size from fine gravel to blocks about 2.5 m (8 ft) in diameter, embedded in a fine sandy or silty matrix (Johnson *et al.* 1960). Hawkins and Batiza (1977) noted the dominance of metamorphosed igneous rocks and the distribution of the Map Formation breccia with marble blocks on Yap (Figure 4B-III). These blocks of marble are now extremely rare on Yap, and we explore their possible role as an inspiration for stone money.

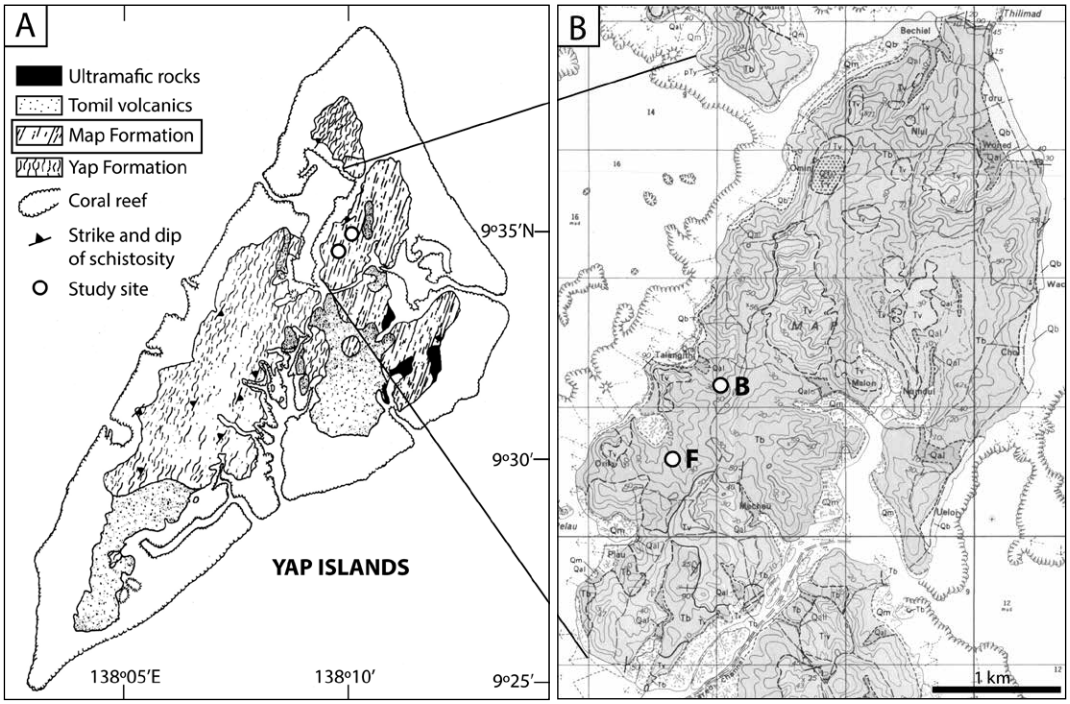


Figure 5. Locality map of marble exposure study sites on Yap.

A) Simplified geologic map of Yap (Hawkins and Batiza 1977, based on Johnson et al. 1960). White circles denote the two marble localities examined in this study. Note that marble belongs to the Map Formation.

B) Detailed geologic map of the study area showing the Blapachee (B) and Fadrik (F) marble exposures within the Map Formation of Miocene age (Johnson et al. 1960). The map shows that Yap is mainly composed of the Map Formation (Tb) and the Tomil volcanics (Tv), both of Miocene (Tertiary) age. Marble is rare and was not even mentioned in the accompanying description of the various rock types found as fragments in the Map Formation breccia and conglomerate.

Local marble as an inspiration for Yapese stone money?

On Yap, we examined two lichen-covered, boulder-size outcrops of marble, named the Blapachee and Fadrik sites (Figure 5 and 6). Cut and polished samples from these outcrops reveal the white colour, shiny lustre, and coarse crystalline texture typical of marble (Figure 6C and D). Examination of petrographic thin sections of these samples, under a polarized microscope, showed the characteristic texture of large, interlocking calcite crystals (Figure 6E and F).

Observations at the Blapachee outcrop are especially significant as the site contains a partially carved stone money disk (Figure 6B). Unfortunately, we do not know who attempted and abandoned carving at this site, or its temporality. The carvings have the same patination as the surface of the surrounding rock outcrop, suggesting that the carving is not modern (Figure 6B).

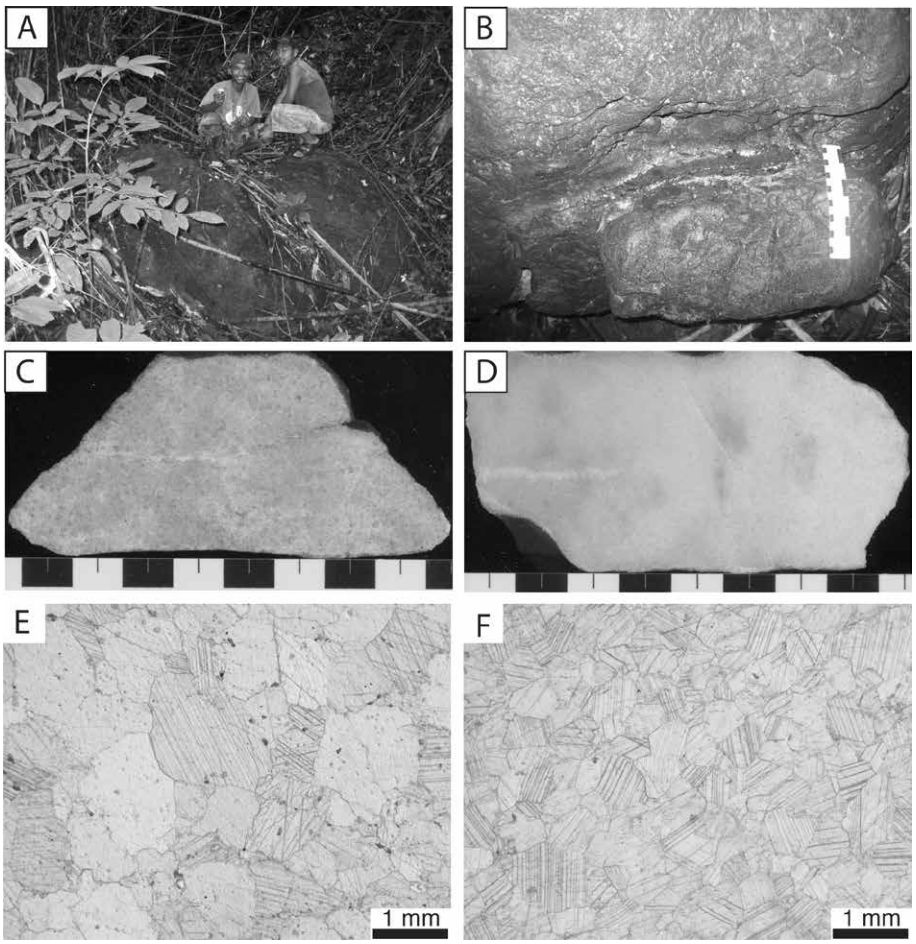


Figure 6. Observations at the Fadrik and Blapachee sites on Yap.

A) Field photograph of the Fadrik site showing the characteristic small size and boulder shape of rare, poorly exposed, and completely moss and lichen covered marble outcrops.

B) Field photograph of similar marble outcrop at the Blapachee site where we discovered a partially carved stone money shown in the lower portion of the photograph taken in planar view. Note the characteristic round shape of stone money and the very similar patination pattern of the carving and the surrounding rock surfaces. Scale in centimetres and inches.

C) and D) Cut and polished samples from the Fadrik and Blapachee sites, respectively, showing the characteristic light colour and coarse-crystalline texture of marble. Scale in centimetres.

E) and F) Photomicrographs of petrographic thin sections made from Fadrik and Blapachee samples, respectively, taken in plane polarized light, and showing the characteristic texture of marble with coarse, interlocking calcite crystals.

There are no definitive records of Yapese stone money being produced from marble (*e.g.* Einzig 1966; Gillilland 1975; Fitzpatrick 2003a). However, the Yap Historical Preservation Office staff recalls an oral tradition of a stone money disk that was referred to as the 'no tears' *rai,* because nobody was injured or died in the process of its acquisition; it was made locally on Yap by a person whose attempt at travelling to Palau was interrupted by a storm (personal communication, 2009). Perry (1979) also reports a piece of stone money on Yap that was named 'Without Tears', because no one died in its manufacture or transport. '*When compared to "tearful" rai–stones of broken bones, spilled blood and violent death–its value was diminished*' (Perry 1979). The details of this story or the whereabouts of this *rai* are unknown.

All of the exposed rocks on Yap are metamorphic and igneous, of relatively dark and dull appearance. Marble, in striking contrast, appears white and shiny. It is possible, therefore, that the occurrence of marble on Yap represented a very rare and precious stone resource, for people to utilize and turn into objects of special value. We suggest that the white colour, crystalline texture, and shiny lustre of relatively rare calcitic marble, may have inspired Yapese islanders to seek similar material elsewhere, after having perhaps already seen or heard of similar material in the limestone caves of Palau.

Limestone and marble are both composed of the carbonate mineral calcite ($CaCO_3$) and are relatively soft carving media. Geologically, limestone is a sedimentary rock that forms by precipitation of calcite from water and by accumulation and lithification (*i.e.* cementation) of shells and skeletons of carbonate secreting organisms. Recrystallization of limestone, under elevated temperature and pressure during burial, leads to its metamorphism into marble. This process destroys the primary texture of the limestone and produces the homogenous network of interlocking calcite crystals characteristic of marble (Figure 6).

Although limestone comes in many different varieties, the cave flowstones that form by precipitation of calcite, from water flowing along cave walls, are similar to marble, in terms of their texture and appearance: they are both light in colour and have a shiny lustre due to the presence of coarse calcite crystals. When stone money was originally carved and brought to Yap it was also white and shiny, but soon afterwards became darkened, due to weathering and colonization by lichen and moss in the warm and humid tropical climate, as noted previously at Blapachee outcrop (Figure 2). It seems, however, that this change did not alter the perception of its value, which is based in part on its pedigree, which in turn, is based on oral traditions of how each piece was acquired and owned, not simply on its visual appearance (Gillilland 1975; Fitzpatrick 2003a; 2008).

The distribution of marble *vs.* limestone on the islands in the western Pacific is controlled by unique geological and plate tectonic history of individual islands. Yap is geologically different from other islands in that it is mainly composed of metamorphic rocks, including rare marble, and not the typical volcanic rocks found elsewhere in the region (Figure 5). Yap also lacks uplifted Tertiary limestone terrains, which are common on many other nearby islands, such as the Rock Islands in the southern Palauan archipelago and some of the Marianas (*e.g.* Guam, Saipan) (Figure 3). Nedachi *et al.* (2001) related the lack of limestone on Yap to the culture of stone money.

We suggest that the dissolution and reprecipitation of limestone, in the form of flowstone in caves on Palau, produced a stone resource of special importance to the Yapese, possibly because of its resemblance to marble. While we hypothesise that the marble on Yap may have been the impetus to begin carving stone money, we must emphasise that cur-

rently there is no available information to anchor these events chronologically. The timing of the documented attempt at carving stone money from the marble on Yap (Figure 6B) is not known. It is possible that such attempts were also made during the active stone money exchange, as suggested by the account of the 'no tears' *rai*, and/or after the exchange began to decline. In any case, this study demonstrates an example of the relationship between geology and the distribution of stone resources, which in turn may have had a profound influence on the extensive, but highly unusual utilisation of limestone from Palau, for carving large megalithic objects for use in exchange by Yapese islanders.

Conclusions

Thousands of disk-shaped stone artefacts, commonly referred to as stone money, were brought to the western Pacific island of Yap in Micronesia pre- and post-European contact (between *c.* AD 1400–1900). They were (and still are) highly prized as important exchange valuables and symbols of cultural tradition. This study seeks to understand the reasons why and how this stone exchange system began. Here we documented an undated attempt to carve a disk from a small, lichen-covered outcrop of marble (metamorphosed limestone) on Yap. While there are no definitive records of Yapese stone money being produced from marble, we suggest that the white colour, crystalline texture, and shiny lustre of relatively rare calcitic local marble, may have inspired Yapese islanders to seek similar material elsewhere. The discovery of abundant limestone of the flowstone variety, with similar composition and appearance to marble, in caves of the Palauan archipelago, about 450 km (280 miles) from Yap, may have been the impetus for this limestone exchange. Future research will examine various pieces of stone money geochemically and mineralogically to discern whether the provenance of these objects can be sufficiently determined, to help answer further questions regarding this unique stone exchange system.

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Travelling stone or travelling men?

Models of sculpture production in the Early Middle Ages (8th–9th centuries AD)

Michelle Beghelli

Abstract

Despite nearly identical early medieval sculpted fragments have been found as *spolia* in several European regions (France, Germany, Switzerland, Austria, Italy, Croatia, Slovenia, Hungary, *etc.*), scientific literature has paid little attention to the modalities of their production. Most scholars have focused, instead, exclusively on the stylistic analysis of their decorations and the detection of parallels on a regional scale. An enlarged, overall look and a multidisciplinary approach (petrographic analysis to determine the provenance of raw materials; collections of reliable written sources describing craftsmen; archaeological examination of stone-quarries; study of working traces), enables us to obtain valuable information. This method, adopted in many researches on Roman, early Byzantine and late medieval sculpture, may lead to important results on early medieval production processes too. One of the most important is the widespread presence of itinerant groups of carvers and craftsmen, who travelled over short and long dinstances (sometimes even thousands of kilometers), being especially connected with high-level construction places. If one frames this tendency in a larger chronological horizon, it proves itself to be a consequent development of phenomena already occurring in late Roman times: back then, the massive exploitation of quarries and the long-distance transport of stone-blocks and ready-made objects were progressively abandoned due to the lack of demand, whereas the use of local raw materials became more and more common. Itinerant workforce, thus, increased (and further developed in the Late Middle Ages), also explaining the strong resemblances among early medieval sculptures from very distant findspots, yet made out of local stone. Besides this, however, a few cases bear witness of different models of production, as in certain regions political or economic factors kept to encourage the movement of raw stone on relatively long distances.

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Keywords: early medieval sculpture and architecture, Flechtwerk- und Rankensteine, itinerant craftsmen, liturgical spolia.

In two prominent works, Karl Ginhart (1942) and Thomas von Bogyay (1957) defined the most widespread continental type of early medieval architectural stone sculpture as *Flechtwerk- und Rankensteine*, *i.e.* 'stones decorated with interlaces and plant-scroll ornaments'. This kind of sculpture belonged to the liturgical stone furnishings of churches and monasteries—altars, chancel screens, ciboria, ambos, baptismal fonts, *etc.*, related to the Mass service and the Christian liturgy—and is to be found mainly in Italy, France, Croatia, Slovenia, Southern Germany, Switzerland and Austria (on the function of liturgical furnishings see Destefanis 2012).

These sculpted stones are almost always found in small or medium-sized fragments, reused as building material in the High and Late Middle Ages: this can create major difficulties in the interpretation and dating of the archaeological finds, and in the reconstruction of the liturgical furnishings the stone fragments belonged to (Jurković 2000, 225; Napione 2001, 54–55; Dierkens 2004, 73; Beghelli 2013, 9–26, with further literature). Molzbichl, in Austria, is one of the very rare cases in which it has been possible to achieve an actual reconstruction of the chancel screen. This was possible owing to both the number and the size of the fragments, and the careful archaeological excavations in the church, which exposed evidence of the chancel screen's stone-support on the ancient floor, allowing its original shape to be inferred (Karpf 2001; 2003) (Figure 1).

One of the most interesting facts about these materials is that one can find very similar, sometimes nearly identical, objects in very distant locations, hundreds or even thousands of kilometres away from each other (on this matter see, for instance, Lomartire 2009, 205–206; Crosetto 2013a, 365; 2013b, 191; Beghelli 2014). The example presented in Figure 2 is just one among many more; also renowned is the case of a decorative pattern called *Korbboden* detected in several European churches, especially in Italy and in the Alps area: a slab from Como, for instance, is surprisingly similar to another one from Schänis (Figure 3; Casati 2014, 64, with further literature; on the *Korbboden:* Schiavone, forthcoming). Such close similarities, of course, raise the issue of the sculptures' production process. Unfortunately, the scientific literature has paid very little attention to it. If we compare the history of Roman, Byzantine and early medieval studies concerning the manufacture of stone products, the first thing that becomes apparent is a remarkable difference in terms of quantity of publications. Countless articles and books have been devoted to this subject as regards Roman and Byzantine periods; in its whole, this scholarship offers a thorough analysis of several aspects: from the quarrying and the transport of stone to the working techniques, technical knowledge, organisation of workshops and craftsmen, and so forth (further research background can be found in Hirt 2010; Pensabene 2013; Russell 2013a; Marsili 2014). As for the Middle Ages, despite a few valuable publications devoted to single areas or sets of archaeological finds, the production processes of architectural sculpture had never been studied with a comparable depth, nor from an overall perspective. This, however, has been the goal of a PhD thesis which was delivered in 2018 (Beghelli 2018). In this paper, some preliminary results will be presented.

To achieve a general understanding of the whole phenomenon—the production system of sculptural stone artefacts in the Early Middle Ages—it is essential to take into consideration several lines of evidence, *i.e.* the information conveyed by the archaeological excava-

Figure 1. Molzbichl, Austria. Reconstructed chancel-screen (with integrations) (Image: Karpf 2003, 887).

tions, the written records, the petrographic analysis, *etc*. The scarce propensity to a transdisciplinary approach is perhaps one of the reasons why the study of the manufacture of the *Flechtwerk- und Rankensteine* has not significantly developed; and it is certainly among the reasons why uncertain or even misleading conclusions have been, sometimes, proposed.

As we shall see, the most popular theories on early medieval sculpture's production processes have been formulated by Karl Ginhart (1954, 217) and Jean Hubert (1968, 29), probably influenced by the scientific literature on Roman stone products available at the time. They both tried to explain the phenomenon described above, *i.e.* the presence of nearly identical sculptures found in very distant find-spots. Despite their success, though, these theories are sparingly formulated, have never been revised or their implications examined and represented, until a short time ago, all that was available on the issue of production processes.

In the later scientific literature on early medieval sculpture, the subject of craftsmen and manufacture has been often treated—again—in just a few lines. This way, Ginhart's and Hubert's models gained significant recognition and acceptance in the subsequent literature, without being critically reviewed.

Exactly as in the Early Middle Ages, in the Roman Imperial period, very similar architectural elements scattered over remarkable large distances also exist. In the last years, Ben Russell's (2013a; 2013b) and Alfred Hirt's (2010) thorough works, have analysed the economics of Roman stone trade and the functioning of imperial quarries, collecting a large quantity of information and proposing new viewpoints and interpretations.

Produced in the Roman quarries were not only blocks of raw stone, but also, quite often, partially worked or near-finished elements, such as sarcophagi, capitals or columns. These products were then transported to their final destination (from a few kilometres away up to thousands of kilometres away): if relatively close, a transport overland was possible, for instance with wagons pulled by oxen. This method was the most expensive and the slowest, especially for heavy loads, and was used on large distances only when there was really no other option. Otherwise, a transport on waterways was normally arranged. Archaeologists have detected dozens of shipwrecks still containing their stone cargo, all over the Mediterranean Sea and the main European rivers. Local materials, however, were the most commonly used as construction materials in buildings, for the short distance transport allowed to save time and money. But

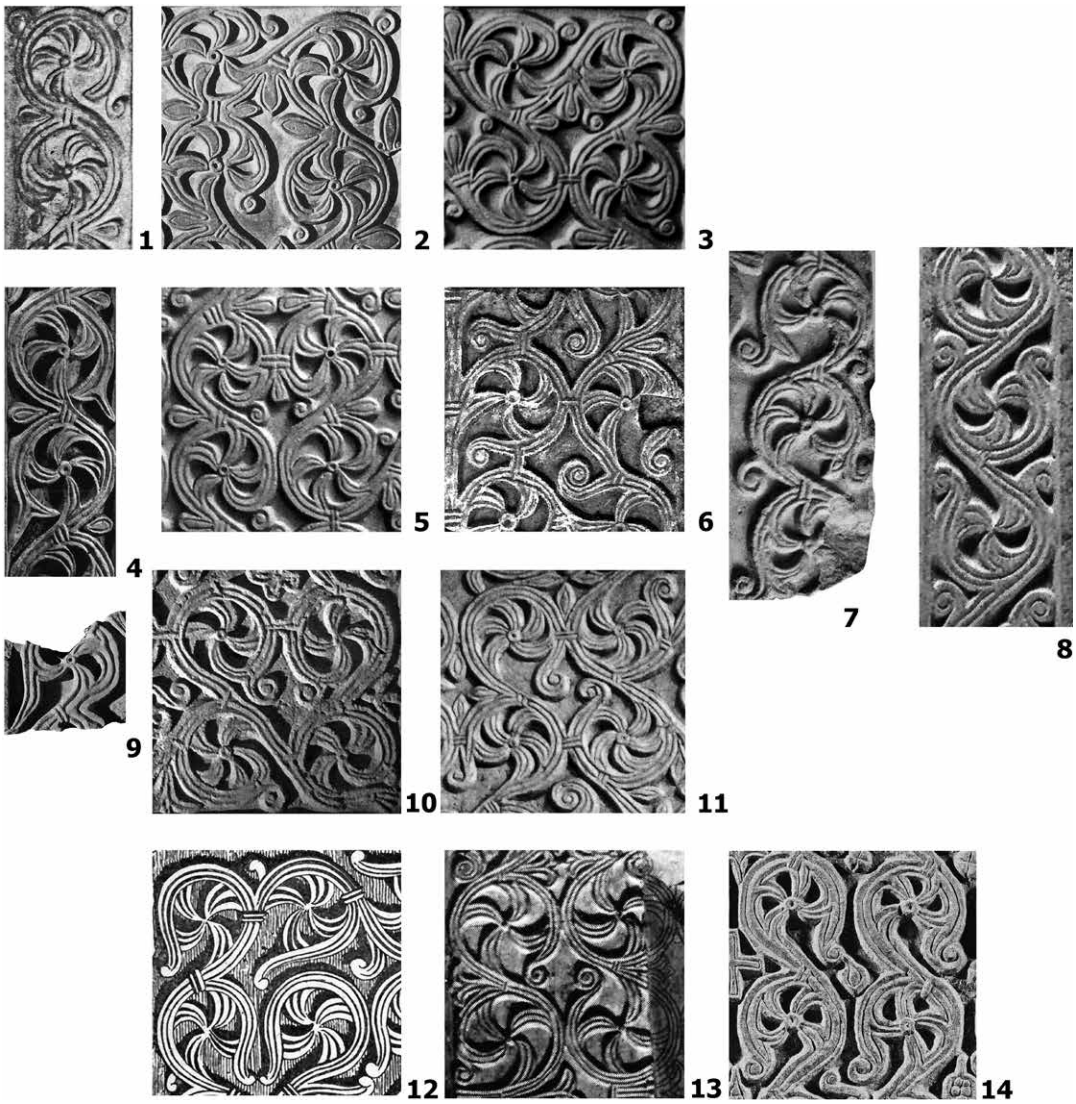

Figure 2. Similar plan-scroll ornaments (details) from:
1. Civita Castellana, Central Italy (Raspi Serra 1974, Pl. XLI);
2. Schänis, Switzerland (Kutzli 1974, 182);
3. Como, Northern Italy (Zastrow 1981, 174);
4. Rome (Museo dell'Alto Medioevo; Melucco Vaccaro, Paroli 1995, Pl. XXXII);
5. Como, Northern Italy (Roth-Rubi 2011, 257);
6. Venice (Coll. Dal Zotto; Dorigo 1983, 654);
7. Rome (Museo dell'Alto Medioevo; Melucco Vaccaro, Paroli 1995, Pl. XII);
8. Zadar, Dalmatia, Croatia (Milošević 2000, 166);
9. Sandau, Northern Germany (Dannheimer 1980, 69);
10. Ascona, Switzerland (Roth-Rubi 2011, 269);
11. Castel Sant'Elia, Central Italy (Roth-Rubi 2011, 257);
12. Bordeaux (Coutil 1930, 118);
13. Rome (Trinci Cecchelli 1976, Pl. LXXX);
14. Benried, Southern Germany (Dannheimer 1980, 43).

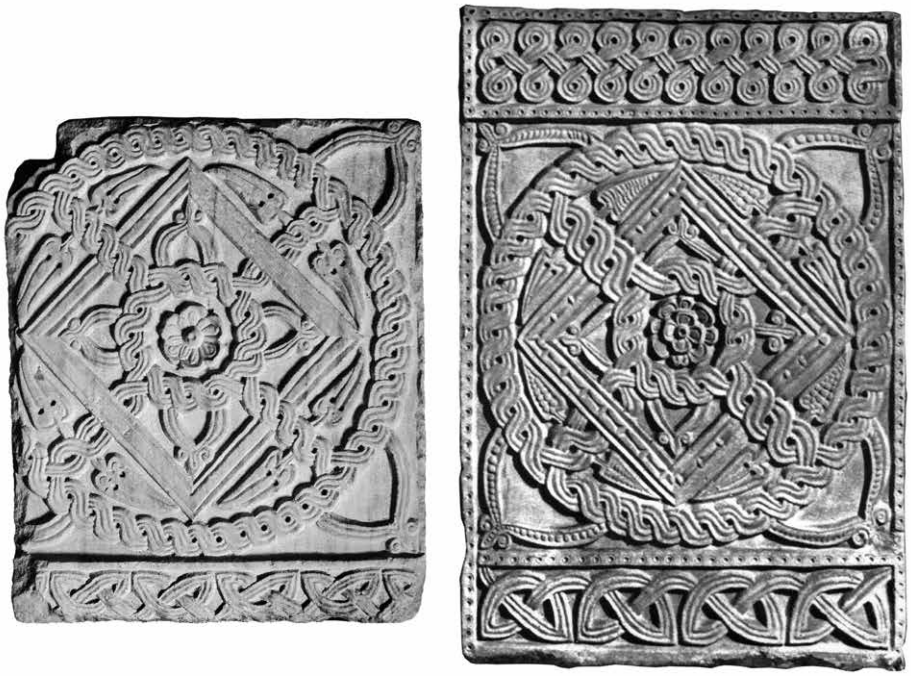

Figure 3. Chancel screen slabs from Como, Northern Italy (left: Casati 2014, 296) and Schänis, Switzerland (Hubert 1968, 32).

especially for high-level contexts, such as the imperial building projects, an import of precious, exotic decorative stone could be organised. In this case too, not only could raw materials be imported from afar, but also partially worked artefacts—which were then completed on site—and near-finished elements, almost ready to be set up (for instance, needing just a final polish). It is especially this third modality which explains, for the Roman period, the presence of very similar objects in locations which are a long way off from each other (Figure 4; for all these issues, see Dodge 1992; Hirt 2010; Dodge 2012; Russell 2013a; Dodge, this volume).

As for the Early Middle Ages, Karl Ginhart (1942) had thought of something else which could explain the distribution of nearly identical stone elements all over different regions of Europe. He reckoned that the *Musterbücher*—books with depictions of decorative patterns—travelled from a church to another, being used as a model for the local sculptors. The main problem of this theory, however, is precisely the assumption that in almost every location there were local craftsmen; which, in turn, implies that the market for sculpted architectural elements was remarkably broad—at least as broad as it was in the Roman imperial period. During the 7th–9th centuries, on the contrary, the gradual drop of demand—which had started in the 4th century in the West—had led to a remarkable contraction of the market of stone products. A whole, flourishing sector of the ancient construction industry—theatres, *thermae*, *fora*, *etc.*, mainly patronised by the emperors—had gradually disappeared. Also, the intense demand of private individuals that, in the Roman period, used to feed a vast non-imperial market—for products like sarcophagi, revetment panels, statues, load-bearing columns, capitals and other archi-

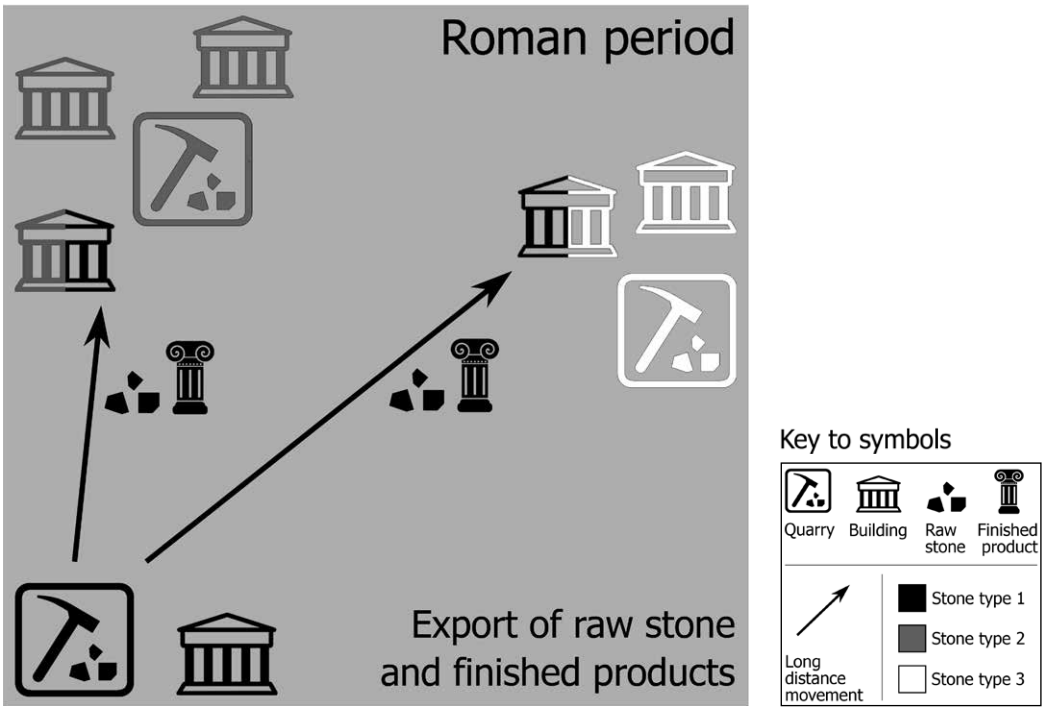

Figure 4. In the Roman period the local stone was the most commonly used in buildings; but especially for high-level contexts, such as the imperial building projects, an import of stone from afar could be organised.

tectural sculpted items, statues—had slowly faded away (Bessac 2004; Cagnana 2012; Greenhalgh 2008, 50–52; Russell 2013a, 164–166 and 196–200). By the Early Middle Ages, the Church had become 'unquestionably the only major builder' (Wood 2007, 237). While the incidence of new building had turned lower, churches had practically become the only expression of public monumental architecture—if generally smaller in size than in Late Antiquity—and decorative stone and sculpted items were therefore almost exclusively used in the context of ecclesiastical architecture (Ward-Perkins 1984, 58–61; Sodini, Barsanti, Guiglia Guidobaldi 1998, 301–302; Greenhalgh 2008, 15–16 and 50; Cagnana 2012; Beghelli 2018). Moreover, in many places, in the 7th–9th centuries there was simply no need to build a major church: almost all the most important urban centres of the former Roman Empire were already well equipped with their relatively recent ecclesiastical buildings. Mainly erected in the 5th–6th centuries, these were just two or three centuries old, still standing and constantly maintained and restored; and not all of them needed 'new' furnishings and architectural decorations (Capit. Reg. Franc. I, nr. 89, 189 and 91; Hubert 1968, 33; Ward-Perkins 1984, 49–154; Marcenaro 1994, 195; Tosco 1996; Sodini, Barsanti, Guiglia Guidobaldi 1998; Dodds 1999; Paroli 2001; Lomartire 2007; Chavarría Arnau 2009, 99–106; Farioli Campanati *et al.* 2009; Beghelli 2014; Marsili 2014; Beghelli 2018).

As Chris Wickham (2005, 650) pointed out, a reduced market of stone products could hardly have supported the existence of building contractors and stone-carver workshops in every single location—in contrast to the implications of Ginhart's theo-

ry—as demand for their services would have been insufficient. As for the *Musterbücher* themselves, this hypothesis has not been backed up by concrete evidence yet: they are not mentioned in the written sources, nor has a real book ever been found. Of course it is not impossible that evidence will be discovered in the future, but for now, the use of *Musterbücher* remains 'more suppositional than proven' (Zanette 1999, 32).

According to Jean Hubert (1968), the Roman production system described above—manufacturing in the quarry and transport far-off—was a model which could work for Early Middle Ages too. In his opinion, the production of architectural sculpted elements took place in the quarries of the Alps, from where the products were exported to other European regions: this would explain the remarkable likeness of sculptures distributed over great distances. His hypothesis was then supported in a number of later studies (*e.g.* Rasmo 1976, 148–149; Dorigo 1983, 648; Brugnoli 1999, 110). Had very similar sculpted elements been exported from a given quarry, one would obviously expect them to be made in the same type of stone, even far away from their place of origin.

However, this does not occur: during the last decades it became more common in publications on early medieval sculptures to include the expert advice of a geologist, who identifies the type of stone they are made of. The provisioning of raw materials is truly a key-point in approaching sculpture manufacturing in the Early Middle Ages, being of paramount importance in understanding the whole production process. Nearly always, the sculpted elements are made out of locally supplied stone, either freshly quarried in the region or taken from ancient buildings in the surroundings—a Roman temple, or theatre, *etc*.—and re-worked (Figure 5). The movement of stone over long distances is attested only in extremely rare occasions: they are almost all related, however, to a desire to re-use ancient architectural elements from prominent locations such as Rome and Ravenna. These objects, thus, are often moved in virtue of their religious and symbolic value and the status they conveyed, not in consequence of the existence of an actual trade of freshly produced stone products imported from afar (Stalley 1999, 114). Moreover, these few cases (collected in Beghelli 2018) all involve very high-ranked individuals, like rulers and popes: a renowned example are the columns, capitals and mosaics transported from Ravenna to Aachen, during the construction of Charlemagne's Palatine Chapel (Stalley 1999, 114; Zanotto 2001; Sculze-Dörrlamm 2009, 202, no. A4).

In the scientific publications one can frequently read that the early medieval buildings and sculptures are *generally* made out of local stone (*e.g.* Napione 2002, 332; Prigent and Sapin 2004, 118). But to what extent is the stone 'nearly always' local? One needs to quantify the phenomenon, before drawing conclusions from it. In order to do so, a sample-area including Northern Italy, Southeastern France, Istria, Austria, Switzerland and Southern Germany has been taken into consideration, collecting about 400 find-spots with the aim to list, for each of them, the provenance of the stone used to manufacture the church stone furnishings (Beghelli 2018). It is of course unfeasible to present the whole statistical analysis within a short paper, as the dataset includes many variables. It is however possible to describe at least the main results; we shall particularly focus on Northern Italy (Piedmont, Aosta Valley, Liguria, Lombardy, Veneto, Trentino-Alto Adige/Südtirol and Friuli-Venezia Giulia), as this is the geographical area where the majority of the find-spots concentrates. Preliminarily, it must be said that only about half of the scholars who published the Italian sculptures specified the stone they were made of and its provenance, or request the opinion

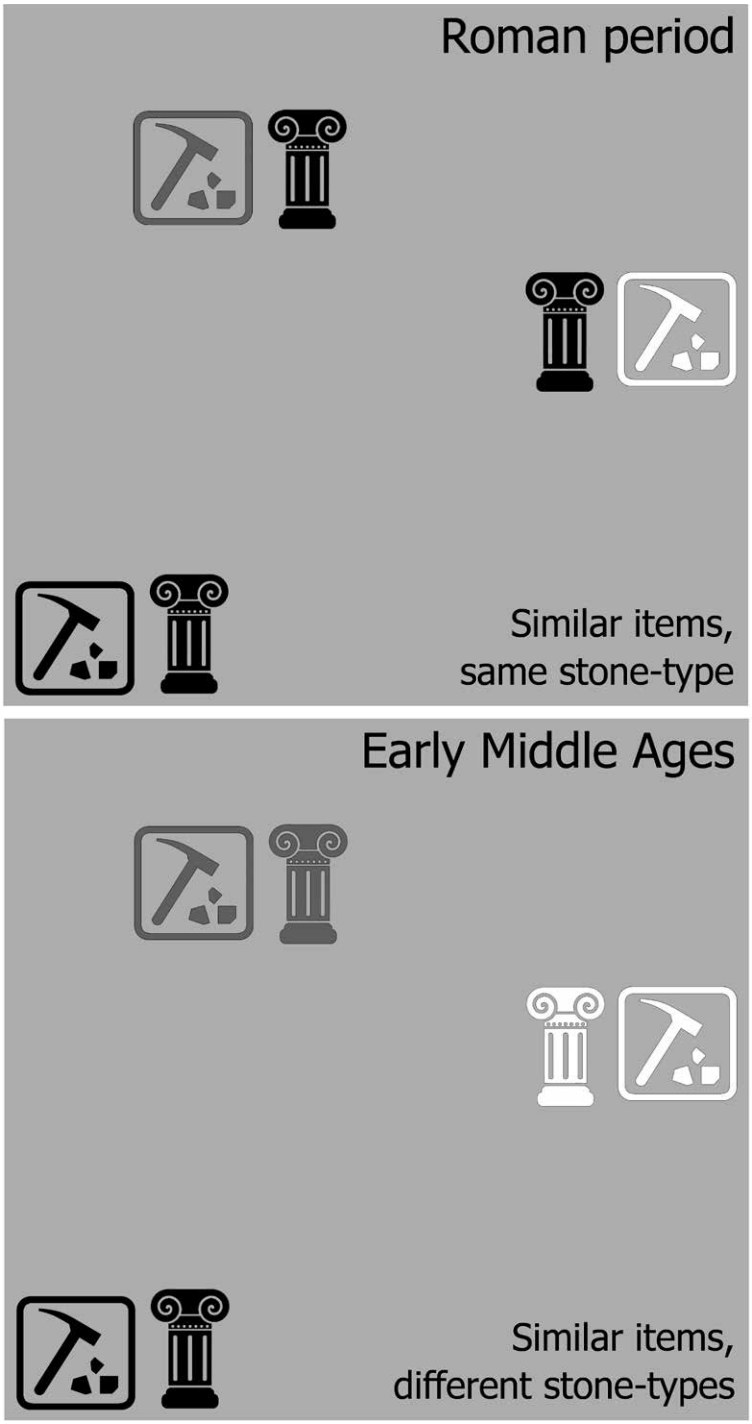

Figure 5. The export of finished sculpted items in the Roman period can explain the presence of very similar objects scattered over broad areas: they are indeed made in the same type of stone. Very similar early medieval sculptures in distant locations have also been found; but they are virtually always made in locally supplied stones (either freshly quarried in the region, or re-used).

of a geologist. These cases correspond to 141 find-spots, which account for 203 locations for the provenance of the stone used, for in the same building different stones could be used. In only one, dubious, case (0.5%)—that of Novalesa (Piedmont)—the author suggests that some of the sculpted fragments could be made out of stone coming from 200 to 300 km away, but also underlines the lack of petrographic analyses and refers to future studies for a final answer (Uggé 2004, 70). Moreover, the re-use of ancient Roman (inscribed) stone-blocks coming from the surroundings is certainly attested for a few sculptures from Novalesa, therefore the remaining ones could have been made out of re-employed stone too (Uggé 2010). In *all the other 202 cases*, the stone *never* comes from afar. In 91.6% of occurrences (186 cases), it was taken in the proximity of the find-spot—up to 30–35 km away—either from pre-existing ancient buildings or freshly quarried. The quarry was located within 70 km in 11 cases (5.4%), and within 90 km in only 5 cases (2.5%): but it must be noticed that in many of these 16 occurrences, it was possible to use waterways, due to the proximity to navigable rivers or major lakes (see Figure 6).

The datasets from Southern Germany, France, Austria, Istria and Switzerland follow approximately the same pattern. A relevant exception, though, concerns the last country. The marble used both at Schänis and at Chur in the early 9th century came from Lasa/Laas, *c.*150–180 km away. The efforts to transport the stone overland on this distance, however, has been related to the will of the bishop to procure materials in his own diocese, albeit from a distant location, rather than from more proximate stone source, but outside this territory[1].

None of these figures, however, are comparable to the thousands of kilometres stone could be transported in the Roman period. The results of the survey show that a system as the one first hypothesised by Jean Hubert could not exist: and, probably, one of the reasons why it was followed by some later scholarship was precisely the lack of an overall statistics on the stone-types employed and their provenance. Short-range supply of lithic material and the absence of elements made in the same type of stone distributed in different, far-off, find-spots are significant indicators of the change of the economic situation, namely of the stone market contraction in the Early Middle Ages; but there is further evidence against Hubert's theory, which implied—just as Ginhart's did—a broad and well organised market for stone products, comparable to the Roman one. Archaeological excavations at ancient quarries in the Western part of the Empire have indeed confirmed the end of their intense exploitation from the 4th century AD onwards: during the Early Middle Ages the extraction activities are sporadic, and the blocks extracted are no longer large, but small, frequently cut in the approximate final dimensions of the architectural element (Bessac 2004; Cagnana 2012, 84). Moreover, Ben Russell's systematic studies (2012; 2013a, 112–118; 2013b) on the shipwrecks with stone cargoes have provided another proof of the gradual disappearance of the long-distance transport of stone blocks and finished stone products. His collection of shipwrecks from the 3rd century BC to the Early Middle Ages shows that they reach their peak roughly between the second half of the 2nd and the first half of 3rd centuries AD but, afterwards, their number gradually drops down to zero occurrences in the 8th century AD. Furthermore, according to the Oxford Database online, only 10 shipwrecks on a total of 1784 can be attributed to the late 7th–end of the 9th centuries,

1 My gratitude goes to the colleagues Guido Faccani and Jürg Goll for the fruitful conversation upon the issue. For an overview on early medieval sculpture in Switzerland see Faccani 2013.

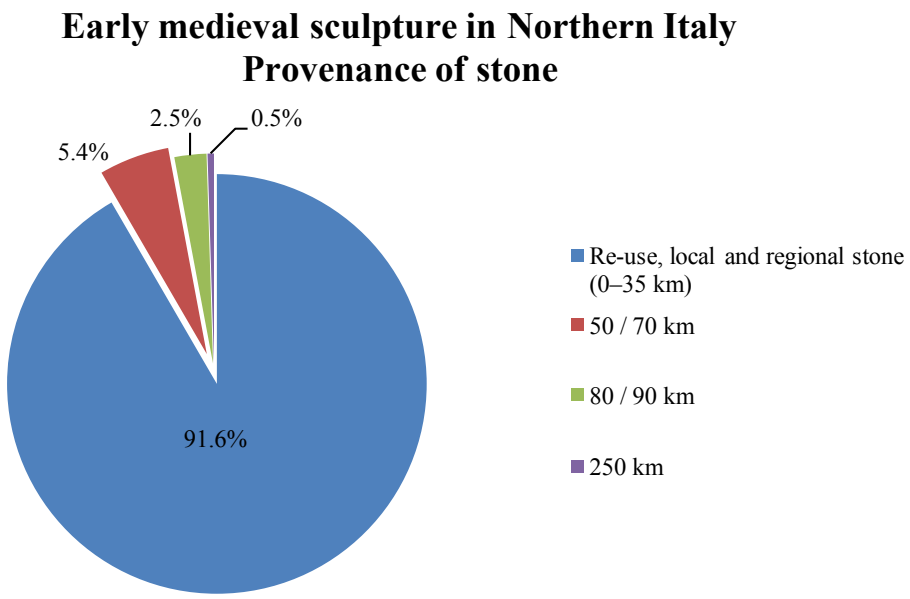

Figure 6. Provenance of stone for early medieval sculptures in Northern Italy.

none of which shows remains of stone cargoes (Strauss 2013, wreck ID: 7539; 8054; 8099; 8432; 8502; 8618; 8665; 8715; 8848; 8850).

Also the quarry workshops disappear in the Early Middle Ages. Hundreds of archaeological finds, from the Roman Imperial up to the Early Byzantine periods, attest the carving and working of architectural elements at or nearby the quarries of the Western and Eastern parts of the Empire (Russell 2013a, 214–220; Marsili 2014, both with further literature[2]). There is absolutely no evidence of this practice during the early medieval times in the west. To our knowledge and to this day, none of the thousands of sculpted fragments dating to the 8th–9th century found in Continental Europe were discovered in a quarry. The stone-carving at the quarry re-appears in the High and Late Middle Ages (Stalley 1999, 115, with further literature), whereas the early medieval liturgical furnishings were in all likelihood manufactured at the construction site, in the surroundings of the church (for all these aspects see Beghelli 2018).

How to explain, then, the surprisingly similar stone carved elements in distant European regions, yet made in different stone-types? If it was neither the stone which moved, nor the books, was it the men who travelled? Some scholars have called attention to the phenomenon of itinerancy of craftsmen (*e.g.* Jurković 1995; Jakšić 1997; Napione 2002; Binding 2005; Matejčić 2006, 16-17; Chavarría Arnau 2009, 110; Lomartire 2009; Basić, Jurković 2011; Crosetto 2013a, 365; 2013b, 191; Jurčević 2014; Ashby 2015). Several written sources refer indeed to itinerant labour force involved

2 I am grateful to the colleague Beate Böhlendorf-Arslan, who shared with me her discoveries on a number of previously unknown byzantine quarries with evidence of stone-carving, currently being studied by the same scholar.

in stone carving and building; they concern areas in Western, Central and Southern Europe during a period ranging from the mid-7th to the 9th centuries (records in Beghelli 2018; partial list in Beghelli 2013, 221–228; Beghelli 2014). These written documents clearly attest the existence of itinerant craftsmen in many European areas, over a large time-span and in different political contexts; their study led to a number of results about several aspects, useful to characterise these artisans. In the following pages the main ones will be summed up (Figure 7).

Firstly, the commissioners tended to summon from afar not single craftsmen, but whole groups including persons with different professional skills, such as sculptors, masons, carpenters, metal and glass workers, painters, *etc*. In the year 790, for instance, Charlemagne sent to the abbot Agilbert, at Saint-Riquier, *artifices doctissimos* to build the new church. They were 'the most talented craftsmen in working wood and stone, glass and marble'. The difference between masons and sculptors is shown by the use of the word 'stone', building material, as opposed to 'marble', to be carved (Hariulfus, Chronicon Centulense II, 6; Beghelli 2014; Beghelli 2018). Around the year 850 the archbishop of Salzburg, Liupram, sent to the prince Priwina, at Mosaburg/Zalavár, 'stonemasons and painters, smiths and carpenters', so that they could build a church (Conversio Bagoariorum et Carantanorum 11; Beghelli 2014; Beghelli 2018[3]). Logically, the number of artisans, and the professional categories selected, depended on the type and the size of the task to be carried out: a minor restoration, or the 'simple'addition of new stone furnishings in a pre-existing building, required of course a smaller group of workers. Often, the craftsmen came from the same city and, in all likelihood, travelled together. Once arrived at the construction site, they worked conjointly: the stone carvers making a chancel screen or a ciborium, for instance, had to operate side by side with the masons and the carpenters; it would be incorrect, then, to consider them singularly, isolated from their context (Eddius Stephanus, Vita Wilfridi XIV; Hariulfus, Chron. Centulense II, 6; Mem. Mercedibus Commacinorum; Notker Balbulus, Gesta Karoli Magni I, 28; Beghelli 2014; Beghelli 2018). A Lombard document dating to Liutprand's reign (712–744) is enlightening on the division of labour within a construction firm: besides masons and carpenters, it mentions *abietarii* and *marmorarii*, carvers who worked respectively wood and stone and produced small columns with their capitals, sculpted items and *cancella* (*i.e.* altar screens and/or balustrades: Mem. Mercedibus Commacinorum; Jarnut 2009; Lomartire 2009; Beghelli 2013; Beghelli 2014; Beghelli 2018).

The second fact we can deduce from the sources is that these groups of itinerant craftsmen are almost always connected to high-level construction projects and to high-ranked patrons: the more important they were, the further they could fetch the artisans from. The labour force moved because of an elite network, being almost always dispatched owing to a previous direct contact between two individuals; kings, emperors, archbishops, bishops and abbots sent craftsmen to one another in order to renew, restore or build churches, monasteries and palaces. The mobility of craftsmen, thus, was not only caused by the change of the economic system described above (*i.e.* by the lack of certain professional skills in a given area), but was also determined by the possibility, on the part of the elites, to get the very best artisans over a broad area (Beda,

3 On the archaeological excavations in Mosaburg/Zalavár, and on the early medieval stone sculpture fragments found there, see: Szőke 2007; Szőke 2014.

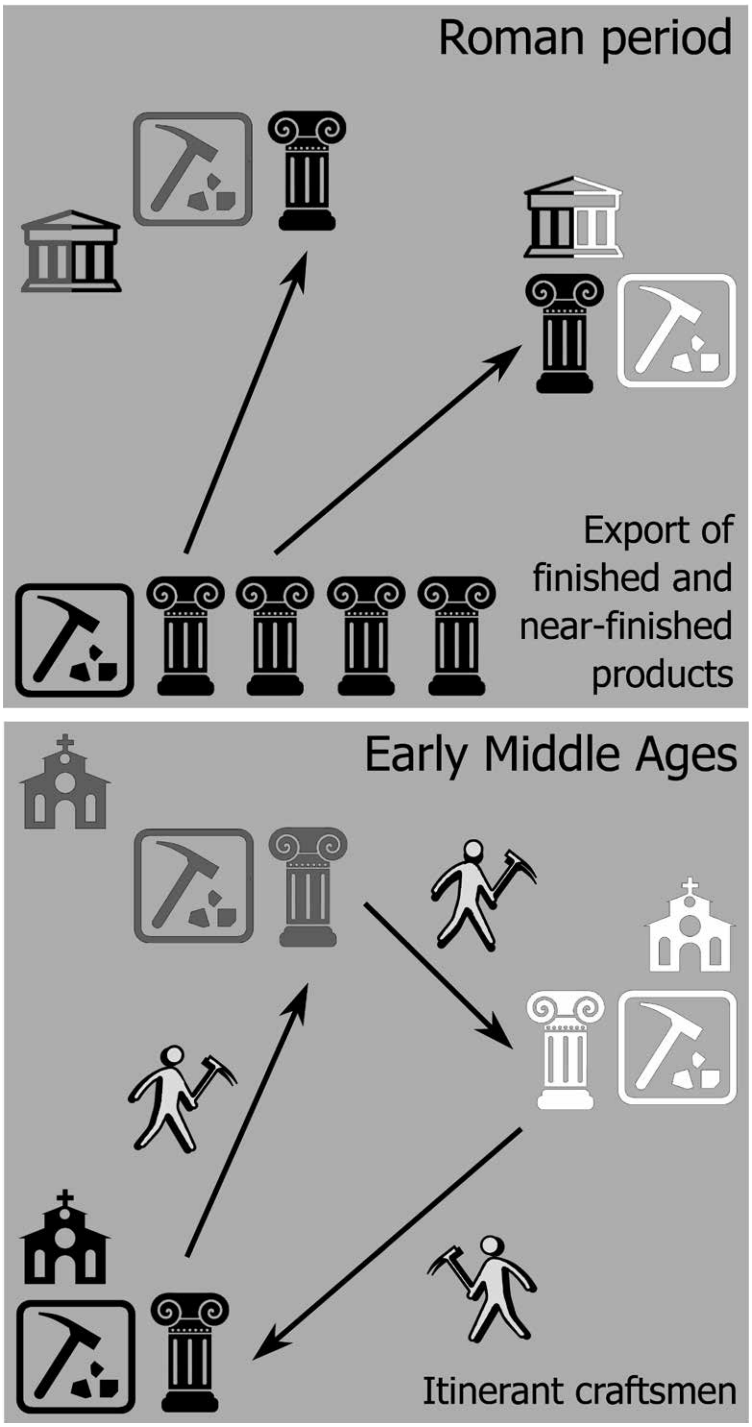

Figure 7. The occurrence of very similar early medieval sculpted items scattered over broad areas, but made out of locally supplied stone, can be explained with the itinerancy of craftsmen, who moved from a location to another and used the local lithic materials.

Hist. Eccl. Gentis Anglorum V, 21; Codex Carolinus 65, 592–593; Beghelli 2018; on the Early Middle Ages elite networks see: Quast 2009; Quast 2012). Indeed the length of their journeys easily-reached 300 to 500 kilometres, but travels of more than 1,000 and 2,000 kilometres are attested too (Beghelli 2014; Beghelli 2018). The most skilful artisans were the ones who had more chances to be summoned from afar; their skills were highly regarded, and their wages were of course proportionate to their outstanding abilities. If necessary, further unskilled workforce was hired on site, in the vicinity of the construction site. In Notker's account of the construction of the Palatine Chapel at Aachen, for instance, the craftsmen 'who came from a long way away' were entrusted to prefect Liutfrid's care, who 'was to feed and clothe them at public expense and always to supply them diligently with everything that pertained to that construction project'. These foreigner artisans are distinguished within the whole group of the workers, which clearly includes locals and is generally described as being supported by the local magnates (Notker Balbulus, Gesta Karoli Magni I, 28–30; Beghelli 2014; Beghelli 2018. Translation: Noble 2009). The complex reality described by the written records looks very different from some oversimplified pictures of an early medieval world populated by non-specialised artisans. Pictures as such, of mere 'makers', mirror the Romantic idea of a humble, anonymous craftsman operating in a context where specialised artisanal knowledge, mastery and creativity play no role at all: the scholarship has begun to abandon this viewpoint quite some time ago (see *e.g.* Mac Lean 1995; Stalley 1999, 107–108; Leclerq-Marx 2001; Murray 2013).

A third relevant fact suggested by the written sources is how widespread the phenomenon of itinerant labour force was in the Early Middle Ages. For instance, in the year 720 the Lombard king Liutprand promulgated a law to regulate what must be done, in terms of inheritance, *etc.*, in case that a merchant, or a master craftsman, had left home for work and did not come back within three years. Had cases like these —itinerant craftspeople being away from their place of origin for entire years—been rare, such specific regulation on the matter would have been unnecessary. Moreover, whereas the law is addressed to merchants in general (*negotiatores*), in the case of artisans it is addressed in particular to the *master* craftsmen (*magistri*), confirming that those who had more chance to travel for work were the most skilful ones. Besides other documents, this law is a further evidence that, as much as they could travel, the itinerant craftsmen were supposed to come back home, *i.e.* they were *not* permanently moving, and their change of residence was only temporary (Leges Liut. 18; Beghelli 2014; Beghelli 2018; for some remarks concerning the issue 'true itinerancy' *vs.* 'mobility' see: Quast 2009; Ashby 2015).

Regarding these artisans' origins, one might wonder about the characteristics of their places of residence. Jean Hubert (1968) reckoned that, just as in the Roman period, the sculptors lived and worked in close proximity of the major quarries, and he pictured them, so to say, as an 'independent unit' separated from other construction crafts. We have seen above how this model was unconvincing, not least because the written sources attest how often the work of the stone carvers was deeply connected with other professionals. Also, the written records refer to different types of seats entirely: early medieval building craftspeople tended to cluster *not* around the quarries, but around the locations in which the market was broader; namely, the most important towns and cities (see, above, the remarks of Wickham 2005, 650). Since the building materials were normally procured by the patrons, mostly from the surrounding areas of the construction site (see below), it was

no longer necessary, not even for the sculptors, to stay next to the quarries. As shown by the written sources and the concentration of archaeological materials and monuments, cities like Rome, Aachen or Constantinople were surely locations where a craftsman had more chances to work: they provided a suitable market even for the most skilful—and expensive—ones, who could possibly be summoned elsewhere. Next to the Capitals and the Papal See, however, further prominent cities are mentioned as the artisans' places of origin, especially archbishops' and bishops' sees: besides the example of Salzburg, seen above, one can quote, for instance, the craftspeople sent from Reims to Aachen around the year 827 (Einhard, Translatio IV, 2; Beghelli 2014; Beghelli 2018).

As well as briefly discussing some of the written sources about itinerant craftsmen, it is also worth exploring how the artisans' work was organised. Usually, the initiative to restore or build a church was taken by a bishop or an abbot, but also early medieval kings, emperors and popes undertook this kind of projects (Ward-Perkins 1984, 49–154; Février 1987; Binding 2005, 20; Chavarría Arnau 2009, 99–106; Farioli Campanati *et al.* 2009). It was frequently the commissioner himself who supervised and coordinated the workers at the construction site—typically, an abbot or a bishop, but we have records of noblewomen undertaking this task, too. The patron took care of almost all the aspects related to the building site, from the collection of the funds to pay the works to the recruitment of craftsmen and the supply of building materials—a good reason, then, to procure the stone from the surroundings (Binding 1996; Binding 1999; Binding, Linscheid-Burdich 2002; Binding 2010; on early medieval patronage see also Faccani 2013.). Concerning the use of *spolia* as raw materials, it seems that, just as it is attested for the Late Antiquity (Alchermes 1994), also in the Early Middle Ages an official permission was needed in order to take the stone from the ancient buildings; among many, one might quote the instance of Reims, when Louis the Pious allowed archbishop Ebbo to use some blocks from the city walls to restore the cathedral around the year 820 (Flodoardus Remensis, Hist. Remensis eccl. II, 19; Beghelli 2018). The stone transport on these (relatively) short distances could be done overland, through wagons pulled by oxen or horses, such as the ones described by Gregory of Tours (Greg. Turonensis, Lib. Confess. 18; Lib. Martyrum 66; Weidemann 1982, 356; 384–385); or on waterways, like it probably happened on the Lake of Garda. In some rivers of Northern Italy small wooden boats have been found, dated by dendrochronology to the 8th century which might have been perfect to transport small loads of stone (Napione 2001, 115–116, footnote 291; Ravasi, Barbaglio 2008; Beghelli 2018).

Besides the wage, the contract could provide that the craftsmen were also fed (Mem. Mercedibus Commacinorum, 5; Lomartire 2009; Beghelli 2018), but at least in Aachen the foreigner artisans were given clothes too (see above). The division of labour in a 'contractors firm', as we have seen, could be very specific (Mem. Mercedibus Commacinorum, 5; see above). Both the written sources, and the inscriptions on the stone liturgical furnishings themselves, attest that the sculptors' workshops were composed by a master and his apprentices, who were often his own sons (Dell'Acqua 2000; Beghelli 2018). Craftsmen were normally male; according to the early Irish law, however, if an artisan had no son, '*his daughter could be trained in his profession and there are records of female wrights* (*bansáer*)' (Murray 2013).

Itinerant carvers are occasionally attested in Late Antiquity and Roman imperial periods as well. We can follow them thanks to the workshops' marks—a sort of signature on the

stone elements, which disappears in the Early Middle Ages and is reintroduced in the Late Middle Ages—and thanks to the nearly identical objects they have left in different regions of Europe and Asia Minor (see *e.g.* Sodini, Barsanti, Guiglia Guidobaldi 1998, 164–166; Marano 2008, 161; Russell 2013a, 329–343; Marsili 2014, 35–40, 109–126). These itinerant carvers worked the local stone or, sometimes, travelled together with the raw stone.

In conclusion, itinerant carvers did not suddenly appear in the Early Middle Ages. Presumably, their number simply increased due to the changes in the stone market and, in general, to the social and political transformations which occurred in those centuries. The mobility of craftsmen would further develop in the 11th–13th centuries (Stalley 1999, 109; Beghelli 2013, 226, with further literature), confirming the key role that the Early Middle Ages had in the transition from the ancient production system to the Medieval one.

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Part Two

Making, Building and Re-imagining in Stone

MAN MADE

Contemporary prehistoric stone-tool design

Dov Ganchrow

Abstract

A series of works by designers Ami Drach and Dov Ganchrow contemplate the iconic prehistoric *hand-axe*: its usage and functions, as well as technological, material, aesthetic, and cultural standing.

Design today is used as a critical language by independent, academic and conceptual product designers similar to the manner artists use the medium of photography. These designers often create objects as a means of raising questions, making statements or holding a conversation as well as mediating new ideas and technologies.

The past couple of decades have seen a breaking down of the segregation between disciplines such as Craft and Design while *cross-disciplinary*, *multi-disciplinary* and *interdisciplinary* have become an academic norm.

Hence a project using the tools of *Design* to examine and build on an artefact traditionally in the realm of *Archaeology* or *Anthropology* gets a new hue and is easily communicated to many different audiences and the public in general.

The *hand-axe* is a teardrop-shaped prehistoric stone tool that has been worked from both sides into a typically and progressively symmetrical form and was most likely used as a multi-tool. It has arguably been the most popular hominin tool, spanning over 1.4 million years of use across several continents including Europe, Asia, Africa and North America.

By proposing various gripping and hafting possibilities spotlighting singular uses for the *hand-axe*, the designers focus on use scenarios, narrative, ergonomics, deployment, structure, and theories of evolution and aesthetics. The means of the project's realization include knapping, CAD, 3D scanning and 3D polymer printing. The present study thereby takes the form of a series of objects created to yield a group discussion on this archetypical tool.

Keywords: hand-axe, design, 3D printing.

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The Design discipline

Product design, as a modern profession and academic discipline, stands in parallel with the architectural discipline, as a crossroads where culture and engineering meet, only with an output on a typically much smaller physical scale. Historically, the making of products was particular to the craftsperson (carpenter, blacksmith, potter, *etc.*), but with the advent of industrial production, the giving of form was often put in the hands of engineers, architects and later, product designers. These product designers generally have a very broad understanding of the world around us; they should be versed to a point in many different manufacturing technologies, materials, human factors, technological possibilities, marketing, graphics and branding, engineering, historical processes, sustainability, regulation, trends, and so forth. Most of all, designers need to be in tune with the now, aware of what people need or want, with an eye on the future and an awareness of the past, and knowledgeable of the consequences of their decisions today.

Over the past couple of decades there have been shifts in the world of consumer products: digital technologies have created a slew of new products or swallowed preceding analog ones; globalization has made the same products available around the world with the Internet as the biggest shopping bazaar ever. Manufacturing has moved its weight geographically to Asia, and issues of both greenness and ethics, with regards to manufacture and consumption of products, are now part of almost everyone's agenda.

Design as a critical language in contemporary time was initially put to use by independent, revisionist and conceptual product designers 'piggybacking' on the Art world's existing discourse and platforms of museums, galleries and later, collectors. These designers often created objects as a means of raising questions, making statements or holding a conversation. This practice has become more commonplace, as the means of reaching larger and more specific audiences has become easier via digital media, and in light of designers' ideologically-rooted diminishing role as service-providers for industry, as well as their newfound standing as mediators of surfacing ideas and technologies. As British designers Anthony Dunne and Fiona Raby state in the feature documentary *Objectified* (Hustwit 2009), undertakings in this design field are '*Design for debate*'.

Objects speak and tell stories. Objects that have been designed to speak and tell stories often do so to different people in different tongues: a technologically inclined individual will likely hear a different story than the one heard by a history enthusiast with regards to the same object. Luckily most individuals have a more complex and layered understanding of their surroundings and can pick up on several conversations going on simultaneously.

A classic Bachelor's Degree Product Design assignment is to reverse-engineer an existing product. Not in the sense, of 'let's take its measurements and be able to replicate it' but rather in a more anthropological-detective sense. Why does this product exist? What context does it function in? Who is meant to use it? What materials and manufacturing process were used in its fabrication? And what traces thereof can be found in its physical imperfections? What were the milestones of the decision-making process its designer went through and why was the product driven to its current realised form? It is in this state of mind that designers take in the world, constantly questioning the reasons things are the way they are. This is inevitably followed by the questions, 'How else can this be done?' and 'How could *I* do this? Either making it better or making it *mine*', *i.e.* leaving a mark. Observation and assessment are a springboard for creation of something new more so than a means-to-an-end in themselves.

It is with this attitude that the world of prehistoric artefacts—and more specifically stone hand-axes—was explored in the design project here discussed. The realm of prehistoric artefacts makes for convenient territory to hold such discussions for two reasons. Firstly, the 'room' that exists for speculation due to the dynamic character of the field that is related to new finds and accompanying theories. Secondly, the distilled nature of the artefacts, whether for lack of surviving organic matter and the solutions of basic needs or the abilities they represent.

The hand-axe

The *hand-axe* is a teardrop- or almond-shaped prehistoric stone tool that has been worked into a typically symmetrical form. Archaeological records show that its symmetry grew progressively over time; from a mass of rock ending in a point or edge to a recognizable mirrored form. The symmetry is double, in that the tool is what is known as a *biface*, a stone artefact that has a sharp rim on its perimeter as a result of being worked from both sides, as well as face-on symmetry. The form is today easily identified in popular culture as a teardrop icon of 'primitive', though archaeologists categorise several variations of this form (Figure 1) with no clear functional differentiation (for example, Kelly 1988, 717–718).

The *hand-axe* is probably the most popular tool ever produced, spanning over 1.4 million years of use and found across several continents including Europe, Asia, Africa and North America. It is generally accepted that it functioned as a multi-tool for chopping, cutting and pounding, and was grasped during use in our ancestral hands, hence the term *hand-axe*. Its use, function (Kleindienst and Keller 1976) and purpose will be discussed in length here below, though on the purely mechanical level, the tool makes use of its weight coupled with velocity during use and transfers this force to a very small surface area (point or rim) so as to separate foodstuff or otherwise shape the physical surroundings. In this manner it is an extension or modification of our fists, fingernails and teeth.

There is an ongoing evaluation and probing of hand-axes (as well as other artefacts) long after their retrieval from the field. In fact, many artefacts are 'dug up' from museum store-rooms or university drawers and re-examined or documented anew decades after they were first acquired, this in light of the need to support a new theory, participate in a new study or simply because a new technology became ripe to retrieve further information from it.

Tools for the study of tools

Today's archaeologist employs a very wide range of tools when studying prehistoric artefacts. The age-old brush, sifter and shovel are still common, though at times their upscale big brothers are used: an excavator-tractor or water cannon, for more aggressive sectioning or clearing of earth.

A true technological leap in the field, and applicable here too, is the use of today's cutting-edge innovations from various fields, such as ground penetrating radar (GPR) and drones for surveying and mapping. Technologies developed for the medical field have also worked their way into the archaeologist's toolbox: X-Ray, Magnetic Resonance Imaging (MRI) or Functional (F)MRI can probe mummies or objects without invasive damage and endoscopic cameras manipulated from afar can peek into burial caves via a minute hole.

Figure 1. Knapped flint hand-axes, MAN MADE work in progress.

These new technologies allow not only access to information from afar or in a non-disruptive manner, but also acquire information that was not obtainable or processable a few decades ago, as for example DNA or the recent discovery of traces of fat on 500,000-year-old stone tools obtained by Fourier Transform InfraRed (FTIR) residue analysis which harnessed infrared to identify signatures of prehistoric organic compounds (Solodenko *et al.* 2015). Digital technologies applied spatially can aid in the virtual assembly of parts of a vessel into a whole, or produce topographies and shorelines at various moments in time over past millennia, helping archaeologists determine, for instance, probable settlement sites.

The digitising or scanning (Grosman *et al.* 2011) of artefacts and structures has created a revolution, allowing for quantitative studies across many collections, museums and universities on different continents. If at first information was obtained in new ways, now, that information is creating newer information by spreading, multiplying, morphing and, generally, being accessible to many more individuals.

The Dead Sea scrolls, one of the monotheistic religions' most important ancient manuscripts were scanned, uploaded and made accessible for study and viewing by anyone, anywhere, anytime through the partnering of The Israel Museum, Jerusalem and The Google Cultural Institute. Virtual libraries of artefacts are being created and other than the previously mentioned benefits for study and democratization of information, they also act as a kind of backup. We will inevitably have our whole world backed up at some point in the near future, which is a somewhat comforting thought considering the pace we can now see our world changing and the times we wished we had an 'undo' button in life.

Presently these archived digital files allow for 3D printing, bringing them back into the physical realm and allowing interaction with artefact replicas, whether in

a distant university or as a hands-on museum display. Consider for a moment the advances made in 3D printing over the past decade alone, in the range of materials printed, scale and application: from the printing of integral-hinges in polymer to printing titanium, from printing on a nanoscale to the printing of homes, from medical implants to food, everyone seems to be printing something at the moment.

There are now three basic technological fabricating approaches to 3D printing:

- FDM (Fused Deposition Modeling) involves basically the heating, as in a glue gun, of a filament which is then deposited layer-after-layer until the designed volume is constructed.
- SLS (Selected Laser Sintering)—powdered materials are used wherein they are deposited one-layer-at-a-time homogeneously on a plane, with a laser fusing the desired section after each layering of powder, slowly 'growing' the model.
- Stereolithography, for which light is used to solidify a liquid photopolymer one layer at a time with the 'work bed' dropping in increments into the polymer bath.

The scope of 3D printing possibilities for the rebirthing of virtual and backed-up objects into the physical world opens up many interesting applications.

Material culture is lost every day to war and the ravages of nature; even monuments succumb. In May 2015 the 60-metre-tall Dharahara minaret in Katmandu was lost to an earthquake. What if we had a scanned backup of the great Buddha of Bamiyan in central Afghanistan, that stood in solitude, nestled in a cliff for 1500 years, until it was blown-up by the Taliban in 2001? Would a replica be printed and replaced in its hollow? It would certainly be studied by future generations through its virtual existence even if it no longer stares down at admiring travellers.

How much further can these scanning and printing technologies be used? And how can they drive deeper interaction between different disciplines and people in general?

Do we dare intervene or alter a digital 3D scanned artefact? Surely context and the distancing from the original irreplaceable physical artefact afford us much more freedom. Were a Greek vase to be 3D printed for a museum display (the original artefact is often kept in a vault under precise temperature and humidity conditions), does it not make sense to take the vase's display into account and add, for instance, tappings in the vase's base prior to printing so that it may be fastened to its pedestal?

Present ethics of restoration dictate that the lay viewer be informed of what portion of an artefact is the original and what part has been added/recreated to complete the original. This is done not so much in words as in a visual manner, such as a fresco that has had its missing parts rendered in monochromatic outline alone, or the missing sherds of a pot reconstructed but in a different shade of clay, or at a recessed height giving us a glimpse of the vessel as a whole, but in an honest manner.

Today many of our everyday products begin as digital files (as opposed to the 3D scanning of existing products) that are then manufactured in various ways; others live out their lives in their digital form—think of objects in an online game. It is interesting to think how future archaeologists may excavate our current culture, unearthing digital products for study. Not unlike our current fantasy of producing extinct species from ancient DNA, will surviving digital products be fabricated? How will a digital online game's car be replicated for preservation and study if it was never in the physical

world to begin with? Will there be any point in printing all the virtual objects we have amassed? Perhaps we should be working on a 3D Eraser that while scanning an object, destroys it, transferring it from the physical realm to the digital, leaving our homes less cluttered without us having to actually give up our stuff.

MAN MADE

The MAN MADE project by product designers Ami Drach and Dov Ganchrow is one of a series of conceptual or '*design for debate*' works looking at prehistoric stone tools from a contemporary designer's vantage point. The studio study that began in 2011 with the BC–AD series of works makes use of product design tools and methodology by raising issues such as usability, ergonomics, branding, behaviour, technology and materiality.

The projects' roots can be traced back to an event held annually by the Bezalel Academy of Arts and Design, Jerusalem's Industrial Design Department, on the shore of the Dead Sea. The event, initiated a decade earlier by Prof. Ami Drach (1963–2012) when he was head of the department, is a workshop symposium focusing on low-tech and craft technologies ranging from reed weaving to blacksmithing to sandcasting and woodcarving. A young archaeologist conducted a knapping seminar and inadvertently ignited what would become a fascination, not to say obsession with stone tools. Over the next few years, skills improved and many individuals, as well as companies and research institutions, intersected with the project from different angles and at different times.

A curious evolutionary leap occurred at some point in prehistory, when the practice of breaking a stone with only a couple of blows to produce a sharp edge creating a tool that was crude but functioned sufficiently, was worked further into a refined recognizable form. Why invest more time and energy in something that already works? Why not leave well enough alone? In parallel, stone tool artefacts, already whole objects, resting on the studio desk for months were eventually not left alone but modified, worked further and altered into works of design (Machin *et al.* 2007).

The first series of works incorporated technological interventions in the stone tools such as rubber dipping (Figure 2) and silver electroplating (Figure 3) and later, 3D scanning and printing (Figure 4). Various stone tool typologies were used, but the one form that kept recurring was the 'teardrop' shape, a typology advanced enough to be descriptive and recognizable, but basic enough to feel charged and stand out as 'father of all tools'—the proto-tool. Over the course of the project, many intriguing stories, theories and speculations on this tool typology that is better known as a *hand-axe*, surfaced.

The stone axe's abundance and span within the archaeological record has led to several radical theories explaining its longevity. One controversial theory proposes that we have a predisposition for creating this form, not unlike certain avian species' genetically pre-programmed ability to create a certain kind (material/form/size) of nest. Another interesting theory links this form with our evolutionary aesthetic preferences, devoid of *cultural* or *learned* tainting (Dutton 2010), *i.e.* the pleasure we derive from symmetrical forms has been associated with our understanding that a person with a symmetrical body is probably healthy, and therefore a desirable mate. Symmetrical objects often project a calmness and thoughtfulness whereas asymmetrical objects often give the feeling of being dynamic and 'noisy'. Since we know from the archaeological record that *hand-axes* became ever more symmetrical over hundreds-of-thousands of years

Figure 2. An early typology hand-axe with yellow elastomer grip.

(Saragusti *et al.*1998; 2005), an ill-formed asymmetric teardrop-shaped tool might imply and be associated with an underdeveloped and less desirable maker. The object's appearance and geometry evoke an emotion or gut-reaction, one that may be grounded in a much deeper understanding than our immediate personal experience. Objects'

Figure 3. A silver electroplated hand-axe with geometric protrusions proposes itself for hafting.

Figure 4. Scanned flint dagger blade fitted with a 3D-printed handle.

and surroundings' clumsy or tarnished surfaces may repel us because they do not have a 'clean' look, and with this Darwinian mindset we can ascertain that this appearance indicates 'dirty' and potentially sickness-bearing surfaces. 'Staying alive and healthy' may have worked its way into our visual preferences. Certainly the attention our brain gives to motion picked up visually attests to an evolutionary purpose: we quickly and intently lock onto something moving in the landscape (not to mention the hypnotic TV screen…); this, coupled with pattern-recognition or deviation thereof probably kept us alive as both predators and prey. The existence of oversized or unused *hand-axes* has fostered the idea that perhaps its purpose was as a courtship object (Dutton 2010), boasting an individual's dexterity, ability to plan ahead, to make tools, and generally to be a good provider, traits increasing the chance of survival. Fast-forward a few hundred thousand years to underlying cues in today's material culture: extravagant cars, jewellery and accessories or brand names (presumably) signalling an individual's social and financial standing and hence, ability to provide. Speculation remains as to the *hand-axe's* exact use, but it is generally accepted that the *hand-axe* was a multi-tool (McCarthy 2016), that is, a tool that could be wielded in several manners, and functioned in various ways within changing scenarios of utilisation. As we evolved, our tools became more specific: look around. Something as simple and basic as a hammer today has many variations: a sledge hammer, a textured hammer for softening meat in the kitchen, a roofer's nail-extracting hammer, a doctor's rubber reflex hammer, a geologist's elongated hammer, a shoe cobbler's small but weighty hammer, and so forth. Though several variations of the teardrop form exist, they mainly still fall within the same geometric guidelines: a directional shape with circumscribed sharper edge, two-plane mirror symmetry, and roughly a size that can be grasped in one hand. The edge running the perimeter of the *hand-axe* allows a choice of edge geometry: deeply arced belly (as in a skinning knife), shallow arc (as in a kitchen knife), and point (as in a dagger). These variables along with the stone's weight suggest myriad uses.

The *hand-axe* was, at times, possibly hafted with a handle of sorts, be it a piece of leather wrapping so as to protect the user's hand from the stone's edge or a shaft to gain leverage and momentum. The MAN MADE series of works propose various gripping and hafting possibilities originating more from the stone *hand-axe's* form than from specific utilitarian actions. Each of the white-handled additions shown below spotlights a *singular* use of the tool, absenting all other use possibilities, effectively transforming the ultimate multi-tool into a specialised tool. Any multi-tool becomes specialised when frozen at a single moment in time during its use.

Before the project could begin, time was invested in improving and understanding the skill of knapping through both practice and the viewing of knapping 'How To' videos on YouTube. The 'How To' video genre along with 3D printing is championed by Markers and Open Source devotees, as a means for professionals and amateurs alike to share knowledge of craft and tips on the-making-of things. This information is shared on a completely level plane, devoid of financial and marketing mechanics, simply because someone out there might benefit from learning what someone else has to teach.

In setting up 'ground rules' for the project several questions regarding the knapping process arose: how 'local' geographically did the flint material used have to be? What tools other than a single 'hammer stone' could be employed? How refined, form and facet-wise, should the fashioned tools be?

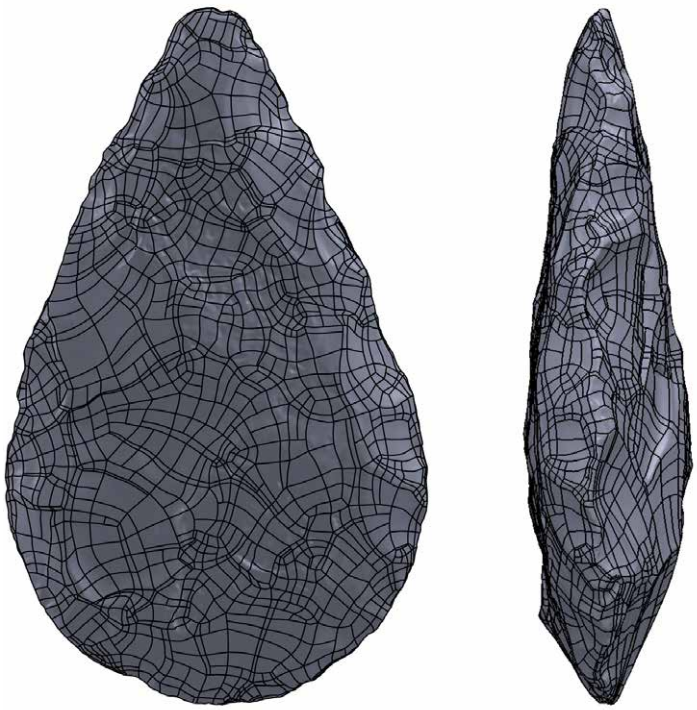

Figure 5. Stone 2 wireframe.

Test-knapping was done on flint (as well as other stone types) from different locations and of varying quality and visual appeal. Finally, flint rocks of desirable size, shape and material quality were sourced from the Negev desert in southern Israel and chosen for knapping. Despite the common use by modern knappers of striking tools such as antler or copper rods ('boppers'), a decision was made to use only other stones ('hammer stones') as percussion tools. These consisted of a series of mostly softer volcanic stones of several different sizes for more massive blows and later more gentle strikes.

The newly knapped flint hand-axes were then three-dimensionally scanned (Figure 5) with the gracious help of Prof. Leore Grosman's digital lab at the Hebrew University, Jerusalem's Institute of Archaeology, where artefacts are regularly scanned for research projects. The digital hand-axe files then had handles custom-designed exemplifying various tool uses.

Then, with support from Stratasys, a 3D printer manufacturer, the handle files were printed in Verogray, a performance photopolymer, for its combined durability and geometrical precision. The parts were then prepared and assembled on the original flint *hand-axes*, effectively joining the two most temporally distant *making* technologies: flint knapping and 3D printing. The knapped stones' external geometry, usually made up of a multi-facetted surface due to the individual fluting produced by each blow, are incorporated by means of the 3D scan in all the designs. The stone's geometry is 'imprinted' digitally on all interfacing polymer surfaces so that when

Figure 6. MAN MADE hand-axe number 5.

assembled, the fit is perfect. The 'organic' appearance of the stone's shape is sculpturally often contrasted with the clearly pure-geometric forms used in the computer-aided design (Figure 6). At times the stone's irregular surface is used to generate the 3D printed forms by means of offsetting the stone tool's surfaces, thus creating an exterior plastic shell indicative of its source geometry. Imagine snow falling and piling up on various objects: the thicker the snow the less 'readable' information we are able to perceive from the mound's original core object.

Specific tools in the *MAN MADE* series raise a few points for discussion, *e.g.* handling: a product designer working on a tool's design will need information on hand size and position during the tool's use, as well as defining single-handed or two-handed use, right-handed or ambidextrous use. Think of the variations in product examples around us: Where is the *safety* on a pistol located and how does a left-handed person engage it? The stick-control in a fighter jet allows no room for interpretation of hand-position and use, whereas a tennis racket can be held in multiple ways, two-handed included. The issue of handedness is brought to our attention by '*hand-axe* number 9' in which right-handed-only grasping is exemplified (Figure 7; Figure 8). Can right-hand dominance be traced back to an evolutionary point in time? '*Hand-axe* number 8' is designed for two-handed grasping proposing a digging or a pounding motion (Figure 9). Could this explain how, if at all, oversized *hand-axes* were used? Could there be some *hands-axes* among the many *hand-axes* found?

The principle of *indirect percussion*, a technique known and employed in the making of finer stone tools such as arrowheads or long blades, was incorporated and exemplified by the forming of a platform above the hand grip in '*hand-axe* number 7' (Figure 10), thereby providing a striking area for an additional stone or stick. If indirect percussion was known and used for making certain tools, perhaps this tool could

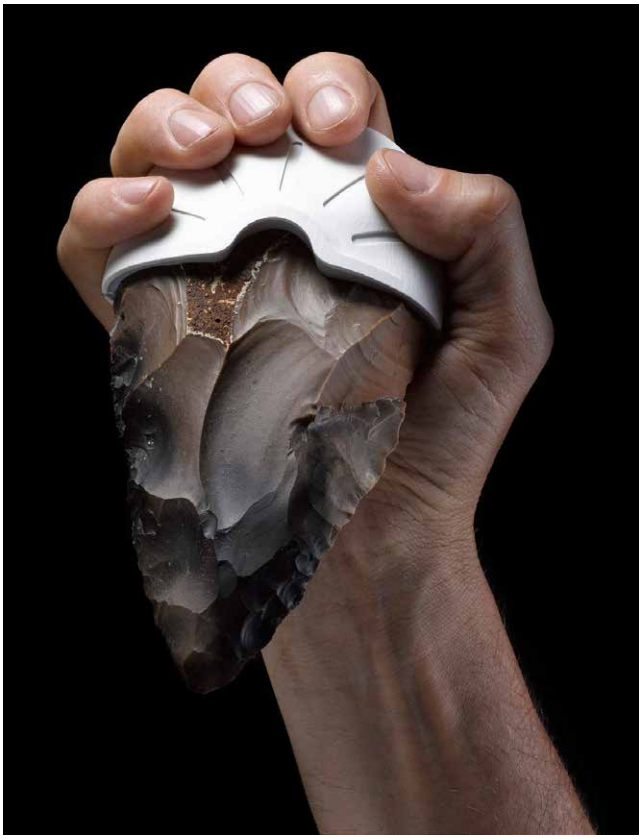

Figure 7. MAN MADE hand-axe number 9 grasp.

Figure 8. MAN MADE hand-axe number 9.

Figure 9. MAN MADE hand-axe number 8.

be used as an indirect percussion tool. A mason chiselling a groove in a stone surface comes to mind, as might the peeling of bark or sectioning of leather hide.

As the MAN MADE project is more about making new designs while raising issues for contemplation, the route taken was not one of producing proof of use. Hence, the objects proposed here were not 'put to the test', and even the white colour chosen for the series distances the objects from being mistaken for actual field tools; rather, they are *'about tools'*. White would probably never be an outdoor company's choice for their product line as it would always show wear and in a disturbing way. The white colour here has both a futuristic air to it as well as an almost clinical feel—they are objects in a lab, a lab of '*design for debate*'. The possible use of *latching* in prehistoric tool assembly is discussed in '*hand-axe* number 4' where the stone is fastened to the axe's body with the aid of a series of holes proposing the use of vine or cord bindings. The axe's shaft has a grip pattern that hints graphically to latching and may be the 'shadow' of earlier handle bindings. This axe also has interchangeable stone-holding head-plates exemplifying three different axe typologies and functions possible with the single stone head (Figure 11).

Figure 10. MAN MADE hand-axe number 7.

'*Hand-axe* number 2' takes the form of a spear (Figure 12) and also makes use of cord latching, by extending itself wedge-like into a split piece of wood and offering a designated portion for fastening. Here, the polymer part serves as a mediator between the organic and the mineral, a kind of connector that also appears in '*hand-axe* number 10'—the adze (Figure 13). The adze is a tool probably used in a chopping-pulling

Figure 11. MAN MADE hand-axe number 4 with interchangeable head brace.

Figure 12. MAN MADE hand-axe number 2.

Figure 13. MAN MADE hand-axe number 10.

motion for woodworking. Examples of hafted adzes have been documented in use in contemporary stone-technology cultures, such as amongst the tribes of New Guinea. Traditionally, the angle between the working stone and handle is both functional in use

Figure 14. MAN MADE hand-axe number 3.

Figure 15. MAN MADE hand-axe number 6.

and formed by a piece of wood with a natural angled branch growth (the tools 'foot') to which the stone is affixed. The polymer connector pays morphological homage to this branching and adds an engineer's structural rib for strength.

How is a *hand-axe* carried? Obviously, this is one of the first questions a product designer would ask his client if a hand-axe manufacturer approached him with a *hand-axe* design project. How were *hand-axes* carried?! Was one hand occupied all day, limiting climbing and balancing abilities? Were they nestled in carry pouches? Were they simply

Figure 16. MAN MADE hand-axe number 6.

left at 'home'? Or were they made on-site at the end of a hunt and then discarded? This question resides in the belt-holster for '*hand-axe* number 3' (Figure 14) coupled with a quick-release. There is a notion that if you are already carrying a stone when threatened by a predator, you will likely throw it at that predator regardless of the time invested in making it. Incidentally, there has been a study carried out trying to evaluate the aerodynamic effectiveness of the *hand-axe* as a hunting projectile (O'Brien 1981).

Lastly we have '*hand-axe* number 6', a tripod *hand-axe* display (Figure 15; Figure 16). This reclining cave-floor display presents the well-formed *hand-axe* as a courtship object, a means of boasting your stone toolmaking abilities, perhaps getting lucky and passing those traits on evolutionarily. This is the 'blooming flower tactic' of showing off, attracting and gaining pollination.

Each of the flint *hand-axes* used in this project differs from the other due to the material used and manner in which each was knapped. The specific character of each stone (size, colour, shape, *etc.*) was paired with what was deemed the most befitting handle and topic thereby yielding a 'group discussion' on the archetypical *hand-axe*.

Conclusion

In a sense, all the technologies and tools—digital and otherwise—employed in this project can be viewed as part of a direct and continuing line of evolution. We have continuously been refining our ability to make things that make/change other things; from the stone hand-axe–to the steel hammer–to motorized mechanical punches–to 3D printing. With this understanding we can transfer the discourse in various fields

surrounding the making of things both backwards and forwards in time. How does the tool-making practice drive metal capabilities? If we can identify the trajectory of advancement of our past tools through to today, can we predict what tomorrow's tools will be? Functionalism aside, in what way are our tools today projections of ourselves? Of our culture? —And to whom do they communicate?

Design for debate is not hard science; it is a cultural phenomenon and as such has great freedom. This freedom allows for an uninhibited foray into the fields of prehistoric archaeology, ergonomics and human factors, anthropology, evolutionary biology, engineering, geology and even business management. The MAN MADE design for debate project hopes to provoke professionals, academics and lay people alike. A provocation that will hopefully be disruptive for a short enough time so as to raise questions, allow for thinking or rethinking and tickle some enjoyment out of them—and at that very moment raise awareness to try and understand what might evolutionarily lie behind that enjoyment?

Epilogue

Where to now? The time spent pacing desert riverbeds and flint outcrops searching for the 'perfect stone' to transform into a tool, points to an additional direction that warrants investigation: what if we were able to control the raw material sourced for toolmaking? What would the 'perfect' stone's characteristics be: a hard homogenous material that takes well to knapping, of a texture and size comfortable to handle, with a predetermined geometry that would be receptive to blows and produce a good cutting edge quickly and easily, a cortex that left alone would be the perfect handle? This thought is one we hominins have moved on some time ago, initially using what nature gave us for what we wanted or needed, and later, engineering nature to give us what we want or need.

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Stormont's stones

The oratory of power through form and materiality

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Abstract

Since its construction in 1932, the parliament building of Stormont has stood at the apex of contested representational space in Northern Ireland. Stormont was determinedly conceived to physically create in stone a Protestant Unionist demarcation of difference against the Catholic Nationalist 'other'. This building, above all others, was constructed to symbolise the division of 'Planter' and 'Gael' and to represent visible, permanent and material proof of Unionist self-determination to remain politically linked to the British Empire, at a time when the rest of Ireland had gained independence from Britain. Stormont's exterior is designed in the austere Greek Classical tradition with an Ionic temple front entrance. Historians have analysed how the Classical forms of Stormont's design represented Unionist ideals, but have failed to adequately explore how the choice of stone used in the construction also reflected the Unionist agenda. Stormont has a façade of finely dressed English Portland stone which sits on a plinth of rusticated Mourne granite. This article will argue that this arrangement is a metaphor for the union of Ulster to Britain and symbolises the Unionist concept of the dominant and civilising forces of empire and 'Planter' over 'Gael' and native. It is known that Nationalists opposed the construction of Stormont because they regarded it as a permanent symbol of the partition of Ireland, but this paper will analyse the other Nationalist objections to the building's construction, such as financial cost and the decision not to use local Newry granite. In short, this paper will prove that the materiality and choice of stone used in the construction of Stormont was as potent a symbol of Unionism as was the Classical form of the building.

Keywords: Mourne granite, English Portland, Ulster Unionists, Irish Nationalists, material metaphors, Northern Ireland.

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Figure 1. Northern Ireland Parliament Buildings (Stormont) designed by Sir Arnold Thornley (Photograph: the author, 2018).

The impressive Neo-Classical Parliament House at Stormont in Northern Ireland represents the political oratory of mainstream Ulster Unionism realised in stone. This imposing monumental building, with its stone solidity and Classical forms, constitutes in physical terms, mainstream early 20th-century Unionist values and their determination to remain part of the British Empire at a time when the majority of Ireland was fighting for independence from the United Kingdom. Stormont (as the building came to be known) was constructed to house the new Northern Ireland parliamentary body which came into being in May 1921, following the 1920 Government of Ireland Act and the partition of Ireland. The Ulster Unionists, led by Sir James Craig, dominated the new government securing 40 parliamentary seats in the opening elections, as compared to Sinn Fein and Irish Nationalists who secured only 6 seats apiece (Officer 1996, 132). Craig became Northern Ireland's first prime minister, and he and his Unionist cabinet ensured that Stormont was built in a style and scale that was befitting of their image of a colonial parliament house. Several historians have highlighted the linkages between Stormont's architectural forms and Unionist expressions of power (Officer 1996, Greer 1999). What has been largely overlooked in such commentaries is how central the use of specific types of building materials were to the Unionist vision for the new Parliament Building. Stormont was constructed with a façade of finely dressed English Portland stone, which sits on a plinth of unpolished Northern Irish granite. This article will demonstrate that the materiality and choice of stone used in the construction of Stormont was as potent a symbol of Unionism, as was the Classical form of the building.

Stormont was officially opened by the Prince of Wales on 16th November 1932. Approval to construct the Parliament Building had been secured a decade earlier in 1922 and the British Imperial Exchequer was legally obliged to fund the

cost. Stormont was formally constructed under the supervision of the Office of Works in Whitehall (London) but there is clear evidence that Sir James Craig and his Unionist Party had direct contact with, and exercised considerable influence on, this government body (Greer 1999, 375–6). This same Office of Works was responsible to the Imperial Treasury for expenditure and they also appointed Arnold Thornely (FRIBA) of Liverpool as the architect (U.A.H.S. 1999, 16). Thornely's initial Neo-Classical design for Stormont included a huge dome, but this plan was abandoned in 1925 due to cost (UAHS 1999, 18). A scaled down (but equally impressive) Neo-Classical building was eventually completed at a cost of 1.2 million (U.A.H.S. 1999, 16).

The commanding and monumental character of Stormont and its location cannot be overstated. A publication by The Ulster Architectural Heritage Society, writing in a neutral style and using the detached language of aesthetics, describes the building and its setting as such:

> '*It is generally accepted that Thornely succeeded in both siting and design, taking full advantage of the elevated location and creating a well-proportioned, dignified and impressive building of Portland lime-stone resting on a plinth of unpolished Mourne granite. The hill-top background of dark trees both absorbs and sets off the substantial dimensions - 365 feet long, 164 feet deep and 70 feet high rising to 92 feet at the centre of the main façade*' (U.A.H.S. 1999, 19).

This art-historical description of Stormont is, for the most part, accurate. The colossal Parliament Building commands an elevated location which visibly dominates the surrounding countryside. However, the main driving force behind choosing the site for Stormont was not the architect Thornley, but Sir James Craig and his Unionist Government. Craig was so determined that the new Northern Ireland Parliament Building should be built on the site of the old Stormont estate that in 1921 he secured a personal bank loan of £3,000 to place a deposit on the purchase of the land (Greer 1999, 377). Remarkably, this was before the location was approved by either the Imperial Treasury in London, the architect Thornley, or most importantly the Northern Ireland Parliament. The latter's approval was legally required by section 8 (7) of the Government of Ireland Act for any location of the new Parliament Building outside of Belfast City boundary.

There were objections to the Stormont site from sections of the business, legal and farming communities in the Belfast area, along with Nationalist politicians. Many of those who opposed Craig's plans felt the new building should be in Belfast City. This was especially true of Northern Ireland Nationalist MP Tony Devlin, who complained that the Parliament Building was *'not in a convenient place'* and was *'too far away'* (Stormont Papers 13, 1931–32, 1501–1502). Despite such opposition, Craig knew he could get unanimous approval from the Northern Irish Government because of the numerical dominance of the Unionist Party, and his choice of site was endorsed by a resolution of the Northern Ireland Parliament on the 20th September 1921. Regarding the purchase of the site, Craig justified his unilateral actions to the Imperial Treasury by citing the need to act quickly to procure such a 'suitable location' at a bargain price. His gamble paid off and the

Imperial Office of Works and Thornley both acquiesced. It is evident Craig wanted Stormont to be a building which dominated the surrounding countryside from its elevated position. Most significantly, the terrain of the site (for the most part) demanded that the building faced south, towards the Irish Free State. In Craig's mind, Stormont was to be a symbolic vision, realised in stone, which represented Unionist determination never to be governed by Dublin.

Craig had succeeded in choosing the location for Stormont, and his personal vision for the building had captured the imagination and approval of the governing Unionist Party. So great was his personal interest in every aspect of the building's design that his longest letter as Prime Minister (to the cabinet secretariat) was about the design of the fence posts around Stormont's grounds (Buckland 1980, 98). This is not unusual, as public buildings often reflect the power of a dominant group. Architectural theorists have noted that the designs of parliament buildings are strongly influenced by personal predilections, both that of the architect and that of the sponsoring politicians and regimes (Vale 1992, 316). This is especially true for Stormont, where the new government was keen to advertise its national and international legitimacy. As such, the building powerfully reflects the ideology and values of Craig and the dominant Unionist Party.

The Ulster architectural historian Paul Larmour (writing in a similar apolitical neutral style as the U.A.H.S.) describes Stormont as follows:

> '[Stormont was] *designed in a Neo-Classical style … elaborate central façade with a wealth of Greek detail and a grand Ionic temple front … Pediment carved with a group showing Ulster bearing the Golden Flame of Loyalty to the Crown …*' (Larmour 1987, 110–111).

The sculptural decoration described by Larmour, which depicts a personification of Ulster bearing the golden flame of loyalty to the crown, is overtly political. Remarkably, Larmour does not mention in this specific description of the building, the huge statue of Britannia, flanked by two lions, which sits on the very top of Stormont above the pediment. In 1932, these explicitly Loyalist sculptural arrangements would have met with almost universal approval amongst Ulster Unionists; whilst also alienating the minority Irish Nationalist community.

A further factor which alienated the Nationalist community was the choice of a monumental Neo-Classical design for the building. In 1932, *The Builder* was warm in its praise of what it called the *'Greek Classical design'* claiming it was *'an excellent example of the modern use of ancient art'* and the style provided *'the dignity associated with Parliament'* (*The Builder* 11 November 1932, 806–12*)*. For many commentators in both the Nationalist and Unionist communities, the Neo-Classical style, with its perceived ideals of law, order and superiority, represented the architecture of empire at the beginning of the 20th century. As such, it was perceived by many in Northern Ireland that the British, in building Stormont in such a style, were effectively staking a permanent claim to Ulster.

Unionist Party M.P.s and other Loyalist commentators openly and publically advocated these views. With reference to the laying of Stormont's foundation-stone the *Belfast News Letter* claimed:

> '*It would be a great waste of money and of effort to erect a magnificent building as the home of a merely temporary institution. The laying of the foundation stone is a formal and public declaration that the state of Northern Ireland is firmly established and that it will never surrender its parliament …*' (Belfast News Letter, 21 May 1928).

In 1926, the independent Unionist M.P. Thomas Henderson gave a speech in the Northern Ireland Parliament (convening at this time in the Presbyterian Assembly's College) which declared:

> '*The citizens of Ulster have been the backbone of the* [British] *Empire, and in return for the great services they have rendered they shall be provided with proper* [parliament] *buildings at Stormont…*' (Stormont Papers 6, 1926, 1929).

Echoing similar sentiments, the *Northern Whig* published a speech made by the Rev. Brett Dean of Belfast, which proclaimed:

> '*The dominant characteristic of Ulstermen…was a passion for liberty…the building to be erected thereon, was regarded as a symbol of a dearly cherished possession, of an attitude of mind as well as a trait of blood. And Ulster identified with the ideal it represented. But the Imperial idea was, after all, but the idea of Ulster …*' (Northern Whig, 21 May 1928).

This Imperial and Unionist rhetoric further alienated the Irish Nationalist minority. It became increasingly clear to Nationalists that Stormont was a perfect embodiment of the Unionist regime, both politically and iconographically. Most importantly, this Unionist symbolism was also present in the choice of stone used to construct Stormont. Stone has an enduring quality which suggests permanency. The choice of stone and how it is used or displayed in a public building is of political importance and significance. This was the case with the most well-known buildings from Classical antiquity and this powerful symbolism is continued in many Neo-Classical buildings. The Parthenon in Athens was a Temple to Athena as well as being a potent symbol of the Athenian democracy and empire. It was built entirely of local Athenian Pentelic marble (Pedley 1998, 240) making it a building which both symbolised Athens and was made from Athenian stone. Crucially, this echoed the Athenian autochthon belief that they were born of the soil of Athens. Five hundred years later in Rome, the Emperor Augustus built the spectacular Forum of Augustus. The forum was paved with different coloured marbles from various provinces of the Roman Empire and was dominated by a majestic temple which had a facade of Italian Carrera marble. This temple was dedicated to the god Mars Ultor, who was said to be a divine ancestor of the Roman Emperor Augustus. It is evident that both the design and materiality of the Forum of Augustus served as a symbol of the diverse Roman Empire, with the different coloured marbles representing conquered provinces which were subject to the power of Rome and her emperor.

Stormont is a Neo-Classical building that was clearly invested with a similar style of symbolism for the Unionist movement. For them, it represented liberty, democracy and their connection to the British Empire; the building was envisaged as, and became a temple to Unionism. The stone used for Stormont was finely dressed English Portland stone

which was set on a plinth of unpolished native Northern Irish granite. This architectural arrangement was the choice of the architect Thornley, in conjunction with Craig and the Unionist Government. It symbolically represented the union of Ulster with England within the British Empire. Significantly, the English Portland stone (which was used to build so many British Imperial buildings) was placed on top. The arrangement was a clear metaphor for the dominant forces of empire and 'Planter' over 'Gael' and native. The Unionist concept that the British Empire had been a 'civilising' force in Gaelic Ireland is also suggested in the contrast between the carefully dressed Portland stone and the unpolished rustic native Irish stone. Equally significant, is the fact that Stormont's most symbolic piece of masonry, the foundation stone, was Portland stone and not Ulster granite. This is crucial, as it meant that the building, at its very symbolic core, had a British Imperial identity and not a modern native Irish identity.

Against this partisan background, Nationalist politicians in Northern Ireland objected to the building of Stormont for several major reasons. Firstly, they believed it was a structure that symbolised the permanent partition of Ireland. Secondly, they felt it was far too big for purpose and a grotesque waste of money at a time when Ulster was experiencing an economic depression. Joe Devlin commented:

> *'The number of members in the house is too small for a parliament building of that size. No doubt you will say that when the British government gave a million or million and a quarter, it was not your business to prevent the building being so colossal…'* (Stormont Papers 13, 1931–1932, 1501–1502).

Most importantly, Nationalists also objected to English Portland stone being used to build a Northern Irish Parliament Building. During the construction of Stormont, Portland stone was required at a rate never before demanded in Ireland. At the height of the contract 1600 cubic feet were laid in a week and a remarkable 135,000 cubic feet of Portland stone was used in total (U.A.H.S. 1999, 23).

The Nationalist objection to the use of Portland stone rested on a complex mix of patriotic, aesthetic and socio-economic considerations. Having accepted that they could not prevent Stormont from being constructed, the Nationalists felt it was their patriotic and moral duty to try and ensure that local Irish industries and Irish working class people benefitted from this enormous building project. They also attempted to give the building a stronger native Irish visual dimension and a greater Irish Nationalist symbolic content. This, they believed, would act as a counterbalance to the strong Unionist and Imperial elements of Stormont's design and imagery.

Over several years Nationalist politicians persistently argued for native Ulster stone to be used to build Stormont: an edifice which in theory was meant to be representative of all the people and communities of Ulster. The Nationalist M.P., C. Healy, questioned Craig openly in parliament stating:

> *'He is building a new Parliament house at Stormont and he could have had for it the most beautiful, the most artistic and most durable stone in the Kingdom from the granite quarries at Newry* [in Northern Ireland]. *Instead of that he*

goes to Portland [in England] *for stone… the money that ought to be giving employment to people in the vicinity of Newry is going to employ people in Portland*' (Stormont Papers 10, 1929, 109–110).

Craig and his ministers claimed that such decisions such as to which stone was used (and the cost) were ultimately the responsibility of the Office of Works in London. It is evident that they were being disingenuous here, as Craig in particular was examining and making recommendations for almost every aspect of the building's design. Also, when the Imperial Treasury refused to pay for Portland stone to be used for the new Royal Courts of Justice in Belfast, Craig and his government protested relentlessly. The British government was legally obliged to pay for the new Law Courts in Belfast (as well as Stormont) and the Imperial Treasury informed the Northern Ireland government that this building would have to be built of brick to keep costs down. Craig and his ministers responded by claiming this was totally inappropriate and that they would meet half the costs for English Portland stone to be used in place of brick. Hugh Pollock, Craig's Minister for Finance, stated:

'*I took it upon myself, subject to the confirmation of parliament, that as a compromise, we shall pay half the cost. That is the explanation why the law buildings are to be faced with stone and that stone Portland …*' (Stormont Papers 12, 1930, 195–196).

It is clear that Pollock and the Unionist Government acted unilaterally in this instance and were making decisions before they had been ratified in Parliament; knowing that the Unionist majority in the Northern Ireland Parliament was an assurance that anything they decided would later be sanctioned. In response, Nationalists protested that English Portland stone was being used for a second major government building in Northern Ireland and demanded that Newry granite be used for both buildings. A Nationalist M.P., Mr Collins, stated in reference to Craig '*for both of the buildings he is importing Portland stone. I think I have never heard anything more unpatriotic or disgraceful …*' (Stormont Papers 11, 1929–1930, 57–58*)*. Remarkably, the Nationalists were being supported in this argument by a few businessmen in the Unionist community, for example a Mr W. Campbell who had interests in the Newry granite quarries. In relation to Campbell, it is evident that we can see a case of economic self-interest trumping any Unionist ideology he may have had. It was also reported (to the abhorrence of many Nationalists) that: '*the only thing in the shape of Ulster granite that is going into the building is for the steps*' (Stormont Papers 10, 1929, 145–146).

The Nationalist M.P. Joe Devlin, further argued against the cost of Portland stone and emphasised that local Newry granite was as, or even more, aesthetically pleasing than Portland Stone. He stated:

'*For the law courts they consent to pay the margin between the cost of brick and the cost of stone and allow the money to be spent on Portland stone instead of granite. It could not be said that granite was inferior, because anybody who has seen buildings built of Newry granite will admit that from the point of view of beauty as well as enduring qualities, they are incomparable in any country of the world …*' (Stormont Papers 11, 1929–1930, 1013–10).

It is clear that Craig and his government wanted English Portland stone to be used for both Stormont and the Law Courts, as it fitted their imperial vision for the new regime's government buildings. English Portland stone had been used to build many government buildings in London and around the British Empire. Buckingham Palace (the official home of the British monarch) was built of Portland stone. Portland stone was also used for the British Military Cenotaph in London that honoured the British and Commonwealth soldiers killed in WWI. An emblematic connection to their deceased 'brothers in arms' in the other dominions of the British Empire was very important to the majority of Ulster Unionist WWI veterans and many of these veterans where present at the ceremony for the laying of Stormont's (Portland stone) foundation stone.

A concluding statement, which again justified the use of English Portland stone in Ulster and also underlined the new Northern Irish State's connections to the capital of the British Empire, was delivered by Pollock, who enthusiastically claimed in 1930 that '*the whole of London is being largely rebuilt at the present time of Portland stone* …' (Stormont Papers 11, 1929–1930, 1013–1030*)*. Within two years of this comment, Craig and his Unionist Party had finally succeeded in realising their architectural vision and Stormont was created in their imperial and ideological image.

Since its construction, Stormont has stood at the apex of contested representational space in the six counties which constitute Northern Ireland. The building occupies a highly visible and commanding location on a hill to the east of Belfast City, and faces south towards the Irish Republic. Both the choice of materials used in the construction, and the positioning of the building, were consciously conceived by the dominant Unionist Party to physically and psychologically create a Protestant Loyalist demarcation of difference against the Catholic Nationalist 'other'. This colossal Neo-Classical building of white, finely dressed Portland stone, sits on a plinth of unpolished Ulster granite and loudly proclaims the union of Ulster to the British Empire, and the dominant forces of 'Planter' over 'Gael'. Crucially, the most symbolic piece of masonry in the entire building, the foundation stone, is Portland stone. This is important, as it means the symbolic core of the building is not native Irish, but English, British and Imperial. Stone suggests permanency, and for Unionists, Stormont symbolically represents the permanent partition of Ireland and the legitimacy of the Northern Ireland State.

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Stone fisheries and their role in shaping the cultural landscape of the Minho River Valley, Portugal

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Abstract

This paper discusses both the origin of fisheries on the Minho river, in Northern Portugal and the role they play in the cultural landscape of the region.

These stone structures occur along the watercourse which defines the Portugal-Spain border, characterizing the riverine landscape in a unique manner. Their origin, however, remains uncertain. This valley retains the riparian forests, essential to regulating nutrient and water availability throughout the year but, has been subject to the pressure exerted by the development of the wine industry and human occupation of the river banks.

This paper presents new data on these structures, contributing to the few empirical studies on fisheries currently available. The innovative approach presented here relies on dimensional and building surveys of existing fisheries as well as recording the fishing gear used by local fishermen across the valley. On this basis, three distinct types of fisheries have been identified to suit the different characteristics of the riverbed along the route.

Moreover, the review of national and international specialised literature on this topic reveals that the fisheries discussed here differ from similar structures found in Europe, not only in terms of design and building systems employed but also in relation to their landscape as well as the social context in which they have emerged, since it is a border region.

Through this approach we evaluate the cultural significance that these fisheries have had in shaping the cultural landscape of this border region, stressing the urgent need for conservation of the ecosystems along the banks of the Minho River, to ensure the continuity of tradition associated with these structures.

Keywords: river fishing structures, cultural landscape, dry stone masonry, conservation, protection.

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Introduction

The Minho River is located in the north-west of the Iberian Peninsula, extending almost entirely within the Spanish region of Galicia; it is only in its final stretch into Portugal, that the fishing structures discussed here are to be found (Figure 1).

An oceanic temperate climate dominates this area, while a marked continental climate prevails inland; as shown also by the changes seen in the native vegetation and agricultural crops. The mountains form a condensation barrier against the winds laden with moisture from the sea, causing high precipitation levels. There is an annual rainfall of 1200 mm in the western part of the valley, reaching 3000 mm in the mountainous areas on the Spanish border. The topography of the region gives the river a steep slope which, combined with the narrowing of its basin provides favorable conditions for fish species that thrive in fresh water such as lamprey (*Petromizium marinus*), eel (*Anguilla anguilla*) and salmon (*Salmo salar*) (Carrilho 1999, 116).

Riparian forests play an important role in this area. By accommodating a considerable animal community that uses this ecosystem as an ecological corridor, these forests support a rather complex, yet poorly studied, variety of species. These riparian galleries contribute to slope stabilization, preventing soil erosion. They regulate the nutrients and pollution retention levels, acting as a flood control mechanism, while also regulating the input of organic matter into the water that supports the entire food chain of the river.

The human presence has produced profound changes, through the waterproofing of banks, mining activities and forestry. At the same time, the now-declining traditional agricultural practices, are the basis of a complex field structure and natural irrigation system which are home to a wide variety of animal and plant communities. Vinicultural activity has also increased in the landscape due to the cultivation of the so-called *Alvarinho* wine grape variety. This activity has taken over the river margins endangering the river ecosystem's balance that provides a variety and abundance of fish to feed those people who are willing to use their ingenuity and patience (Moralejo 1981, 22).

Nowadays, the fishing activity retains a cultural rather than economic importance, particularly, in the case of lamprey, eel and shad fishing. While different fishing techniques have been developed (*e.g.* fly and bait fishing or slingshots) the focus of this work is placed on the architecture of the fisheries, which are also known as *caneiros*, *caneiras*, *pesqueiras*, *pescos* and chests (Ladra 2008, 28).

The common feature to river fishing facilities is that they constitute a series of fixed barriers, made of quarried granite blocks arranged in the riverbed, on which the fishing gear is placed. The Minho River fisheries have been studied under different subjects: geography, history, anthropology and from the construction systems perspective, part of a broader architectural perspective.

Studies of pre-industrial rural communities are referenced by Eric Wolf (1966). Some researchers (see below) have contributed to deepening the knowledge about other activities taking place along with farming, but gaps are still present, especially in the case of river fishing. On several occasions, we cannot distinguish between fishermen, farmers or shepherds, because the same individuals dedicated themselves to the activities simultaneously or in specific seasons. Moreover, activities related to river fishing are carried out with the use of simple technologies of artisanal nature, generating a small-scale production, intended for consumption within their own communities.

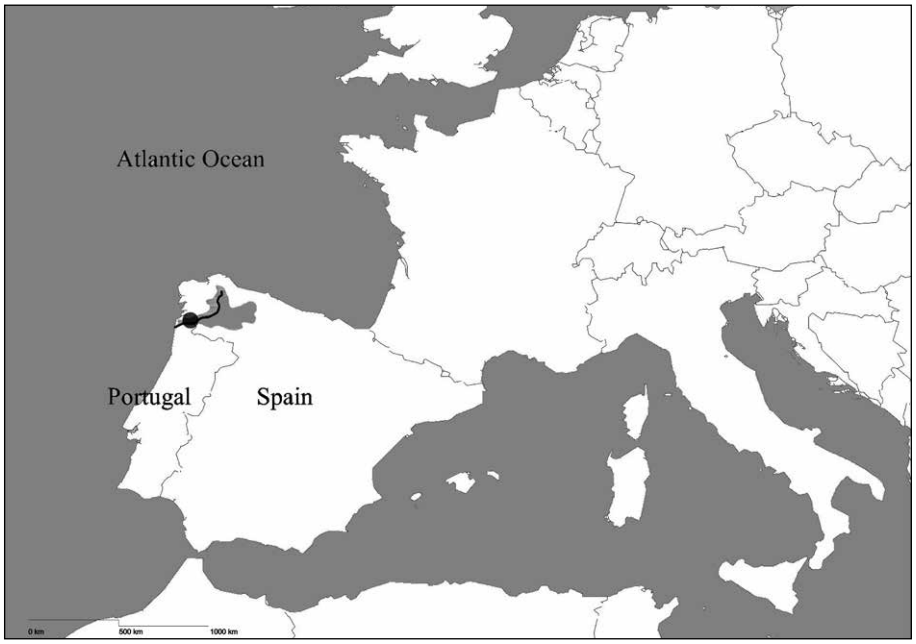

Figure 1. Location of the Minho River watershed and the studied fisheries (Rui Madail, 2013).

We can say, therefore, that the studies of river fishing are of an anthropological interest. The Anthropology of Fishing is a recent field of research, dating back to the mid-20th century. The main reference is the work of Raymond Fyrth (1975), *Malay Fishermen, Their Peasant economy*, first published in 1946. This was followed by other studies on fishing, such as the work of Acheson (1981), suggesting that the focus is the human adaptation to obtain food from this hostile realm. Studies on traditional fishing have a major historiographical tradition. The existing texts on this subject are based, as a rule, on testimonial approaches, seeking an ethnographic description. They obscure any details on the economic contribution, construction techniques and design of the architecture.

A number of studies produced in the last thirty years explore this more general subject with a wider scope, extending it to all river fishing. Xaquín Lorenzo's (1982) work, on the sea and rivers that relies on a vast volume of mass-ethnographic material on river fishing, is a perfect example of this. A brief summary by the architect Cesar Portela (1985), on the fisheries of the lower Minho, Elíseo Alonso's (1989) study of on the Galician-Portuguese fishermen, Antero Leite's (1999) contribution to the discovery of the heritage of the fisheries of the Minho River and Lois Ladra's (2008) work on traditional fishing in the rivers of Galicia are representative of the main theoretical frameworks published on this topic.

Antero Leite (1999, 17) argues that fisheries in the Minho River, more specifically, the existing fisheries situated along its international course, come from the *Cultura dos Castros*[1], and were developed, later, by the Roman civilization. On the other hand, a large

1 It could be translated as 'Hillforts Culture'. This was a civilization that emerged in the northwest of the Iberian Peninsula, between the Douro and Návia Rivers, west of the Galician Massif, from the late Bronze Age, 6th century BC. This civilization flourished, bridging the gap between the Mediterranean and the North Atlantic civilizations, until the Roman occupation in the 1st century BC.

group of authors support the idea that these structures were built in the Middle Ages, during the 7th century, and are closely related to the establishment of monasteries of different religious orders in the region. Much of the descriptive and illustrative work on this type of architecture is unpublished, such as that of architect Matilde Martinez (2000).

More abundant are the articles that refer to the Galician rivers, dominated by studies focusing on various stretches of the Minho River, such as the works of Perez Alberti (1975), Alonso (1989), Ladra (1998) and Peniza (2006). There are also essays relating to other Galician rivers, especially the Ulla River, as discussed by Ladra and Pereiras (2001). Research in Portugal, includes a number of studies on fishing in rivers in the north of the country, such as the contributions of Baldaque da Silva (1891), at a national level, and Arroteira (1979) on the Lima River specifically.

Studies on fisheries of medieval date include Mick Aston's (1988) survey of English fisheries and fishponds, the study by Berthier and Rouillard (1999) of Cistercian Order fisheries and the construction and dissemination of hydraulic devices in France. Similarly, Vendittelli's (1992) attempts to understand the origin of these structures on the Tiber River, Italy, between the 10th and 13th centuries, as well as the influence of the monastic orders on their development.

The fisheries

The Portuguese term for fishery, (*pesqueira*) is etymologically derived from the Latin *piscaria*, the latter term is composed of the root *piscem* (fish), and the locative suffix-collective aria through which *piscaria* or *pesqueira* (fishery), becomes a *locus in quo piscatur* or an abundant place for fishing (Carrilho 1999, 106).

In order to describe the fisheries on the Minho River, an overview of the equipment used is needed, since they will define the three major types of stone fisheries present in this area—*cabaceira*, *botirão* and composite (which combines the equipment used for the other two). The *cabaceira* net functions as an extension of the stone fishery. This is a 7-metre long (23 ft) and 4-metre wide (13.1 ft) mesh, placed perpendicularly to the river bank, in the same direction of the stone fishery. The other method used by fishermen in the region is the *botirão* also called *redeiro*. It consists of two conical-shaped nets; the outer net includes the iron arcs, while the inner net, consists of a narrow mesh, in which the fish get trapped. The *botirão* is placed at the mouth of the fishery, fastened by a chain, parallel to the river, and mounted with the current.

In general, a *cabaceira* fishery (Figure 2) is constructed at rock formations, functioning as an extension of them. They are designed to increase height and accessibility, to increase productivity. Their dimensions vary depending on the river's width; their lengths range between 9.30 m and 24 m (30.8 ft and 78.7 ft), generally 2 m (6.6 ft) wide, with a height between 5 m and 6.9 m (16.4 ft and 22.6 ft) (Leite 1999, 179).

There are three sub-types of *botirão* fishery. The first group consists of three to five fishing sections, with two to four fishing mouths. These sections form the *caneiros,* between which the water runs. Another group differs from this by the presence of a triangular body at the end or tail of the fishery. When the flow of the river is within its normal range, the water on the tail forms rapids, increasing the speed of the river. This diverts the fish to the banks, where they are drawn to the water passing through the mouths of the fishery and, where the *botirão* is assembled. Another feature of this group is that the sec-

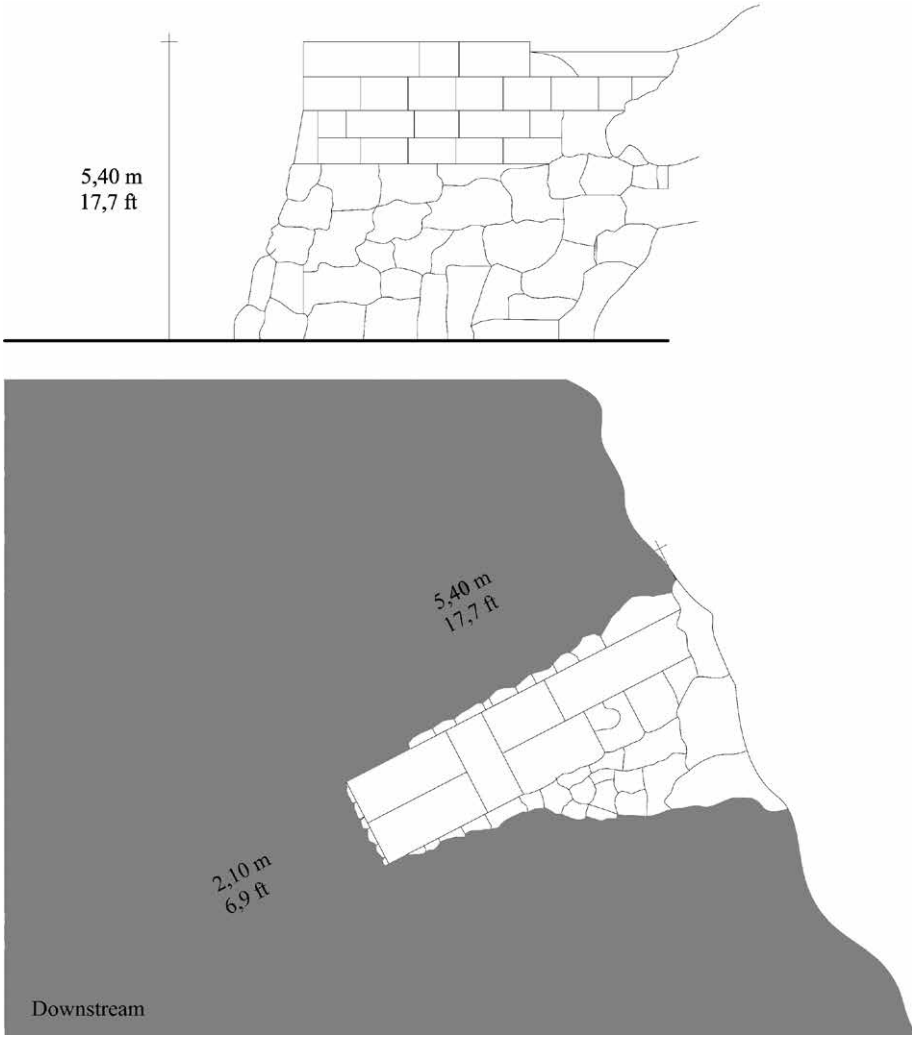

Figure 2. Survey of a cabaceira fishery (Rui Madail, 2013).

tions decrease in height as they move away from the river bank. The third type of *botirão* fishery is erected in a restricted area of the valley and characterized by stone fisheries on both banks forming a 'V'-shaped joint (Figure 3). Their length varies between 23 m and 48.5 m (75.4 ft and 159.1 ft), the width can vary between 1.8 m and 2.8 m (5.9 ft and 9.2 ft), and their height varies between 2.8 m and 4.30 m (9.2 ft and 14.1ft).The third major group is the composite fishery, which is characterised by the simultaneous use of two fishing gear-sets, making these the most productive fisheries. They differ from the other groups by not having the preceding sections interrupted by mouths. They also lack a tail, but their end is slightly curved downstream so that it forms a small eddy where the *cabaceira* net is placed. We can also differentiate this group from the *botirão* fishery, because they are generally higher and their final section ends with steps that help fishermen to assemble the nets. They are approximately 44 m long (144.4 ft), 2.2 m wide (7.2 ft) and 5 m high (16.4 ft) as shown in Figure 4.

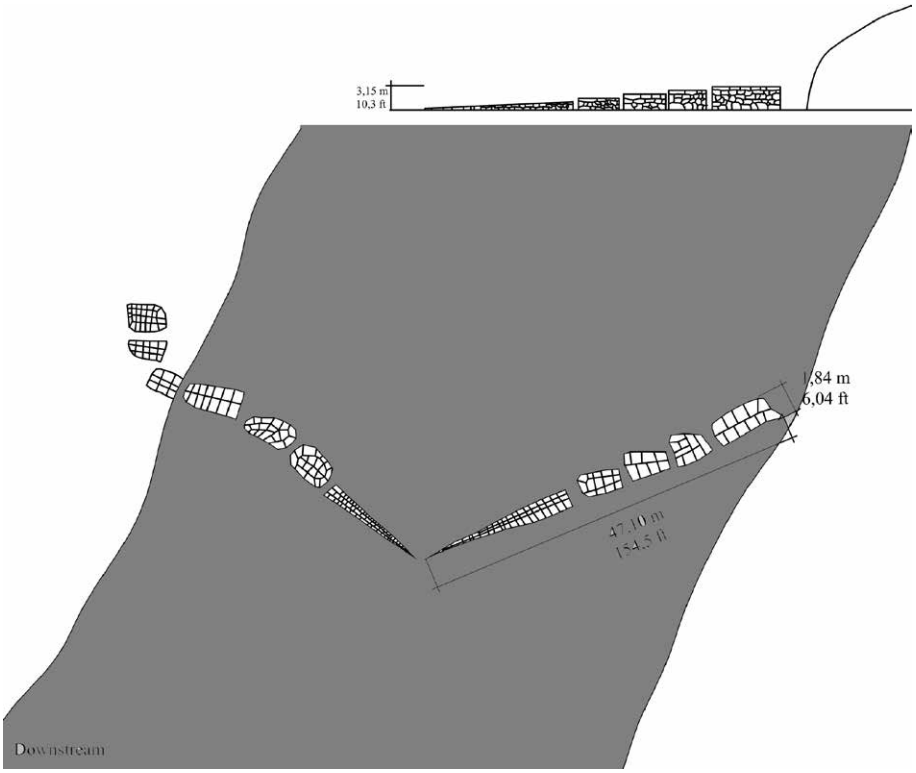

Figure 3. Survey of a botirão fishery (Rui Madail, 2013).

Each group of fisheries can be distributed to their corresponding areas along the river. *Cabaceira* fisheries are found in the intermediate section of the river, upstream from where the river ceases to be navigable, whereas *botirão* fisheries are located further upstream, where the riverbed is rocky and shallower. Composite fisheries are placed in the area where we find the other two types, as the topography of the river starts to change, becoming rockier.

Some aspects regarding the origin and life-cycle of the Minho River stone fisheries

Research was carried out to seek the origins of these fishing structures in the region. One can say that these types of constructions have accompanied mankind since the onset of sedentism. Take, for example, the case of the late Mesolithic fisheries made from wattle fences and wood stakes in Denmark (Fischer 2004).

The fisheries have evolved, becoming increasingly common in the European landscape. In the Roman period, it was common to find wooden structures in the Italian peninsula's rivers, as the consumption of fish was increasing, due the dietary restrictions imposed by Catholicism. In the Middle Ages, the existence of stone structures for fishing became common place.

River fishing was progressively abandoned as new technologies for oceanic fishing and the artificial reproduction of fish was developed, such as carp production in fish ponds.

Figure 4. A composite fishery in the Minho valley (Rui Madail, 2014).

Some scholars say that the fisheries found in the Minho River valley were pre-Roman in origin and were developed and perfected by the Romans (Leite 1999,17). This seems unlikely, since it would be predictable to find this type of template in other Roman provinces. What seems to be common in the Roman period, is the construction of wood and net traps along the coast to capture larger fish species, such as tuna, similar to the one found in Silvalde near Porto, Portugal (Oliveira 1968).

The production of *garum* and *allec*[2] was also studied to be sure that there were no stone fisheries involved in the production process, as the best *garum* of the Empire was considered to be the one produced in the Province of *Lusitanea*, which the Minho valley was part of (Edmonson 1990, 498).

The research, therefore, focused on the search for similar structures in Europe, considering primarily, the interest in fishing shown by the Cistercian Order and the date of its expansion in the continent, between the 12th and 13th century AD (Aston 2000). The location of various European monasteries in the vicinity of rivers was used as a starting point to identify the presence of fisheries. Hence, fishing structures were found in Hungary, Sweden, Ireland and Finland, along with Portugal, Spain, France and the United Kingdom. Some of these have been selected as comparative case studies (Figure 5).

2 *Garum* was a fermented fish sauce used as a spice in Ancient Greece and Ancient Rome cuisines. Although it was popularised during Roman times, the sauce was already used by the Greeks. It was prepared from small fish viscera in a bacterial fermentation process. Fishermen provided various types of fish, according to the specifics required by the producers. These pieces were macerated in salt and cured in the sun between one and three months. The liquid crystalline *garum* is formed on top of this mixture. The sediment, *allec*, was sold to the most disadvantaged classes.

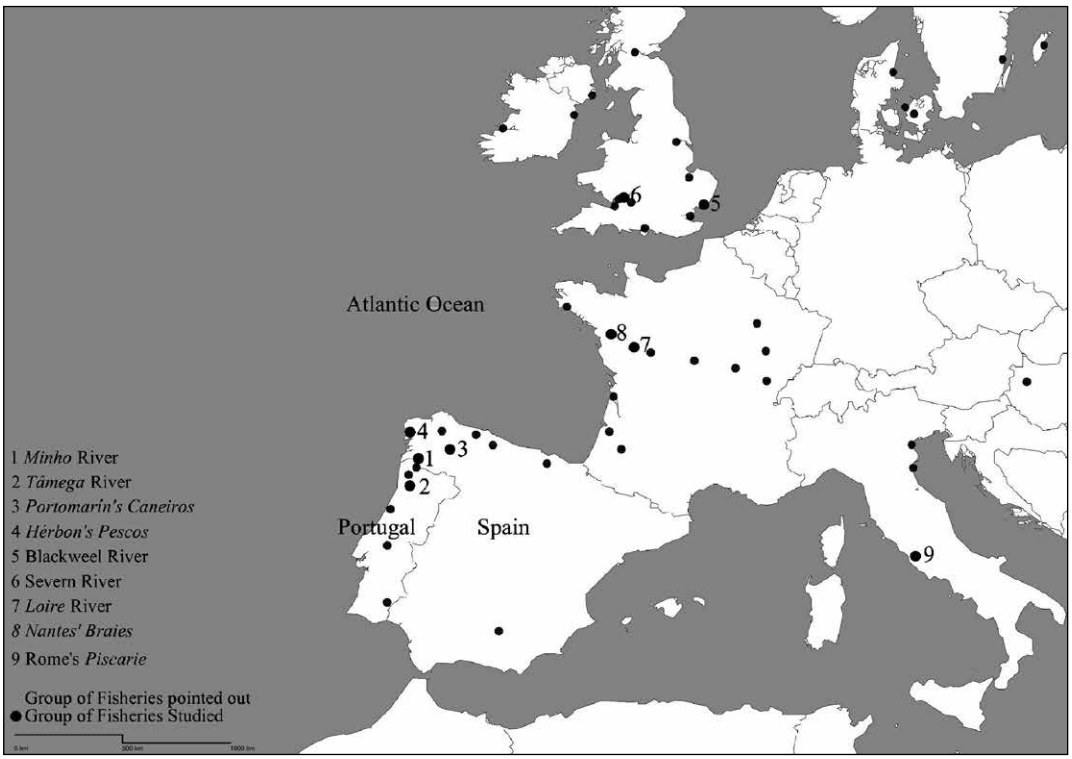

Figure 5. Location of the fisheries studied and referred to by the authors (Rui Madail, 2013).

Sourcing and selection of stone

Stone quarrying has always been a common activity in northern Portugal, due to the availability of the material. Information is available on the quarries that were used to build the walls of the

main cities of this region, such as Guimarães and Braga. The quarries that supplied the material were at the gates of the city within a 10 km radius (Melo 2012, 35).

Transportation costs, mainly by land, relate to the quarrying techniques employed and are reflected in the intaglioed stone as well as in its standardisation or modulation at the quarry to reduce overall costs. Easy access to the materials is also time-saving, since the only means of local transport would be animal-drawn carts. In the Middle Ages, this was also taken into account; shipping was expensive and the numerous tolls and taxes levied by feudal lords could double the cost of materials.

Therefore, and although there are no archaeological studies or relevant information about the origin of the stone for the construction of the Minho River fisheries, and given the stone available in the region, quarries must have been opened for their construction, as well as for some larger scale fisheries. It is clear, from an empirical point of view, that the stone was quarried *in situ*, using fire to extract the granite (Martinez 2000, 55).

If we take the example, for instance, of the Caneiros of Portomarín, in the same valley, although in an area rich in schist, the construction utilised this material (Férnandez-López 2006, 11). There is a constructive adequacy to the indigenous materials from each region, although there is a typological continuity derived from the adaptation to its function.

Construction techniques

The fisheries in the Minho valley are built in dry stone using no mortar, as the vernacular buildings of the region and the Romanic tradition of building monasteries. There are basic rules for the construction of walls that can be applied in any situation, including the construction of fishing structures (Deplazes 2005, 47).

Firstly, it is necessary to set the largest stones on the base, except for the locking stones and the cap stones. The second basic rule is to unpair the joints of the stones, two stones in different rows cannot be paired. The wall should be filled and compressed in order to maintain its structure. A question then arises regarding the construction of the fisheries' wall foundations; as the walls of the fisheries are made on rocky terrain, it is necessary to align a trench (Oliveira *et al.* 1994, 41), a task that seems impossible in the river. One may speculate that the builders based the first row of large stones, of the desired length and width, with the second row formed from smaller stones, all surrounded by rubble. This material would eventually be swept away by the river current. It also can be speculated that small wooden dams were built to deflect the most powerful currents or to dam the desired area of the river. The local hydrology could also help in the construction of the fisheries; they could have been built in the dry season when parts of the river were dry or shallow.

When the trench bottom is an uneven bed, a regular bed can be built using smaller stones, perhaps river pebbles, to level the base stones. It is likely that the walls of these structures required a greater number of lockups than common walls; these rocks have the function of connecting the outer edges together to form a single piece while balancing the two faces of the wall between themselves (Deplazes 2005, 49).

Capping is essential to prevent water from infiltrating the structure. This consists of a row of finishing stones along the top of the wall. The most common type is the horizontal capping, where the stones are placed side by side, forming large rectangular plates, resulting in a thinner and tighter finish (Portela 1985, 16).

Elsewhere in Europe, the fisheries of the Loire Valley, in France, are the best documented in terms of surveys and historical proceedings. One example, Grand Aireau, consists of three alignments of wooden stakes and a path of stones, that form two fishing systems between the island of Chalones and the right bank of the river, in a 'Z'-like shape (Berthier and Rouilard 1999). Archaeological excavations have dated this construction between AD 1187 and 1197. They are built with two rows of oak piles, with diameters ranging between 6 and 15 cm (2.4 and 5.9 in), filled with sedimentary rocks typical of the region, such as shale and sandstone, in 20 by 20 cm (7.9 x 7.9 in) sections. Currently, this fishery is abandoned, but its study also allows us to consider the logistics necessary for its construction, from logging and woodwork to stone transport, most likely by boat, since the river is navigable.

Ownership

The fisheries began as a royal and nobility privilege, and their slow secularization indicates the importance of these structures in the economy. The first testimonies related to fisheries in the Minho valley are those of noble families who donate their rights to the monasteries

of the region, or to the Diocese of Tui[3], between AD 1071 and 1223. What seems to have happened was that the king allowed the monasteries to fish, they paid a share to the monarch, or that some of the fisheries were his property, while others belonged to the monasteries which built them. Monastic accumulation, through the bequests and royalties, included the fisheries or fishing rights in some days, as ownership was shared (Leite 1999, 253).

In fact, the construction of all the European fisheries used as comparisons, were related to monasteries, such as those at the mouth of the Severn River in the United Kingdom. During the 1990's, a multidisciplinary archaeological research program uncovered more than thirty medieval fisheries. These fisheries seemed to belong to the church, more specifically to the Bishopric of Llandalf. Likely, these fisheries must have gone through a process of secularisation that led to their abandonment in the mid 20th century (Goldbold 1994, 9).

The same process of secularisation occurred in Portugal, as the ownership of fishing became so fragmented that it led to disinterest and consequent abandonment of these structures in the 19th and 20th centuries. In 1940, after a process of nationalisation, sixty-five fisheries were offered for sale in the Minho valley, without much interest from investors, although some were acquired and rehabilitated (Leite 1999, 87).

In Rome, during the Middle Ages, the same problem about property was acutely discussed. The *piscarie* of the Tiber River were installed mainly in urban sections. Generally, the granting of fishing rights was implicit in the land lease agreements with the monasteries. The *piscarie* were quite elaborate structures that consisted of a series of dams, partitions and wooden trusses, immersed in water, supported by wooden stakes driven into the riverbed. These structures defined mazes for fish, which unable to escape, were captured by fishermen. It is thought that they were very similar to the *lavoriere* from Venice's Lagoon, but smaller and adapted to the Tiber (Venditelli 1992, 391).

It should be noted that there are a vast number of documents on fishing-related ownership disputes between various monasteries, claiming to be owners of the *piscarie*. This led to the intervention of the Pope himself who, in many cases, resolved the dispute to his own favour by passing the property to the Papacy. As a consequence, the monasteries would interpose further actions, to claim ownership of fishing rights, when a new pope was elected (Venditelli 1992, 393).

From the 14th century onwards, the city's bourgeoisie begins to acquire the monasteries' property rights. This coincided with the development of open-sea fishing techniques, which could have led to a fall in prices of fish in Rome. Since this same bourgeoisie could also have been the owners of sea fishing companies, they could control prices, ruining the exploitation of fisheries and, controlling in this way, the river fishing activities. The secularisation process thus began its course. The reasons for the disappearance of these structures on the Tiber River are unknown. It is probable, however, that these causes are linked to urban pollution in Rome and further downstream. The maintenance costs involved in keeping these structures as well as changes in hydrology must have led to a decline in the use of river fisheries and their final disappearance.

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3 The city of Tui is situated on the banks of the River Minho, in Spain. It was the main exporting port of *garum* in Roman times, later becoming the capital of the Visigoth kingdom that dominated this area of the peninsula. As this diocese was contemporary with Christianisation, it became one of the most important ones in the local context, until the independence of Portugal.

Modes of maintenance practices

River fishing is a group activity. Since fishing is most productive at night, the owners of portions of the fisheries come together to set up the nets and spend the night fishing. In some cases, as in Pescos de Hébron, on the River Ulla in Galicia, houses were built along the banks for overnight stays and to store fishing gear. This river port was for centuries the freight gateway to the city of Santiago de Compostela. The first references to these fishing structures date back to the 13th century (Filgueira 1981, 327), and are associated with a convent nearby. These fisheries are large-scale granite constructions formed with large blocks interspersed with some smaller ones, perpendicular to the river bank. Between these constructions, we find mouths, where they assembled nets to catch lamprey and eel.

This is a seasonal economic activity, based on the life cycle of the fish species captured; the traditional community economies are cattle breeding and the production of maize. Fishing involved the riverine populations in the Minho River valley, with the men looking after the fishing gear and the fishing, while the women treated the catch and preserved it through salting or smoking.

This fostered the emergence of a solidarity which surpassed the actual activity. In fact, when Portugal and Spain were under dictatorships, the smuggling of goods and the crossing of the border was carried out through these structures, at night, disguised as fishing. This defiant attitude to the central power doest not seem to be recent. These structures were built, by local people and clergy, between these two nations who share the same river. Many of these were only fully functional when built on both sides of the river banks. Meanwhile in the ridges above, the nobles and monarchs built walled fortresses for defence and war.

The maintenance of the fisheries is also a community activity, as due to secularization they are owned by several families. The cost is shared and, in many cases, carried out by the owners, who know the correct construction techniques required for their repair.

Nevertheless, in many structures, knowledge was lost and repairs incorporating new materials like Portland cement and iron were undertaken, calling into question the originality and very same stability of the structures.

Abandonment

There are several reasons that led to the abandonment of river fishing, but all relate to human activity. The main reason is the construction of hydropower plants. In the case of the fisheries on the Tâmega River, in northern Portugal, all sixteen fisheries that had been owned by a Franciscan monastery built in the 14th century, were flooded due the construction of a dam in 1978. This group consisted of 'I'-shaped fisheries (Abrantes 1988). These structures were made of granite using the dry-stone masonry technique. The length varied between 6 and 7 m (19.7 and 23 ft) and 0.7 m in thickness (2.3 ft). Here mainly lamprey and eels were fished, using traps inserted into the mouths of the fisheries.

On the Minho River, the erection of dams decreased its flow. In fact, many fisheries are today above the current water level, leading to their abandonment.

Another problem that led to their abandonment relates to the fragmentation of ownership, which results in a decrease in income for their owners. If we partner this with the reduction of fish stocks from overexploitation at the beginning of the last century, it is easy to understand the state of disrepair of some of the structures.

The subsequent occupation of the river margins by pollution-causing human activities, such as aggregate extraction, mining and recreational activities, as well

as the displacement of the local population to more profitable activities, further endangers the heritage of river fishing.

Despite this, there has been in recent years, a recognition of the importance of fishing traditions, mainly due to the price of lamprey and the development of eco-tourism, which has increased the environmental awareness of the population.

Conclusion

A concise diagram is presented in Figure 6 to offer an overview of the fisheries here studied. The intention is to show the date they were built, not excluding the hypothesis, supported by some authors, of an earlier origin. It also shows the peak activity of these structures and their abandonment. The shape of the different fisheries was reduced to three basic forms: 'I', 'V' and 'Z', of which more or less complex variations are possible. They were also reduced to three basic building materials: stone, wood, and nets. Finally, the species that were captured are shown, focusing on the most abundant species that had greater economic return: lamprey, eel, salmon, shad and trout.

From a historical point of view, taking into account current knowledge, we cannot go back before the 11th century AD for references to fishing in the region of the Minho River, but we can find references, in Galicia, going back to the 8th century AD (Ladra 2008). There are no archaeological studies to prove the age of the fisheries, so it seems difficult to defend that these structures originate in pre-Roman times. The current study on the construction methods of these structures lead to believe that there was an associated knowledge, developed over the centuries, which calls into question the idea of cyclopean masonry, defended by those that advocated a pre-Roman origin. On the contrary, this study supports the most popular hypothesis that the different religious orders developed and perfected this knowledge, spreading it across Europe, as they built new monasteries.

The use of granite in the Minho River allows, in addition to an economy of resources, the integration of these bodies into the landscape, as it was available at the margins of the river. The fisheries seem more like natural rocky outcrops, characteristic of this valley. These architectural objects under the influence of that mighty sculptor—time—as Marguerite Yourcenar (1993) declares, eventually merged into the river's landscape.

The fisheries represent a memory, a cultural identity born on the banks of the river; they represent a time when the relationship with the river was strong and appeared as an endless supplier of resources. In fact, the great enemy of the conservation of these structures is not the river itself, or pollution, but the destruction of forests and its banks, which put in jeopardy the whole ecological balance of the river, leading to the disappearance of species with environmental and economic value. The fisheries combine the values inherent in a work of art: the aesthetic and the communication of ideals. These values have been unchanged over the centuries and they fulfil their social function and transmit principles that are appreciated by people, which are the secret to their greatness and longevity (CIES 1978).

The variety of fishing-related structures across Europe highlights not only the richness of the material culture specific to river fishing, but also the traditional ichthyological knowledge that underlies such enterprise.

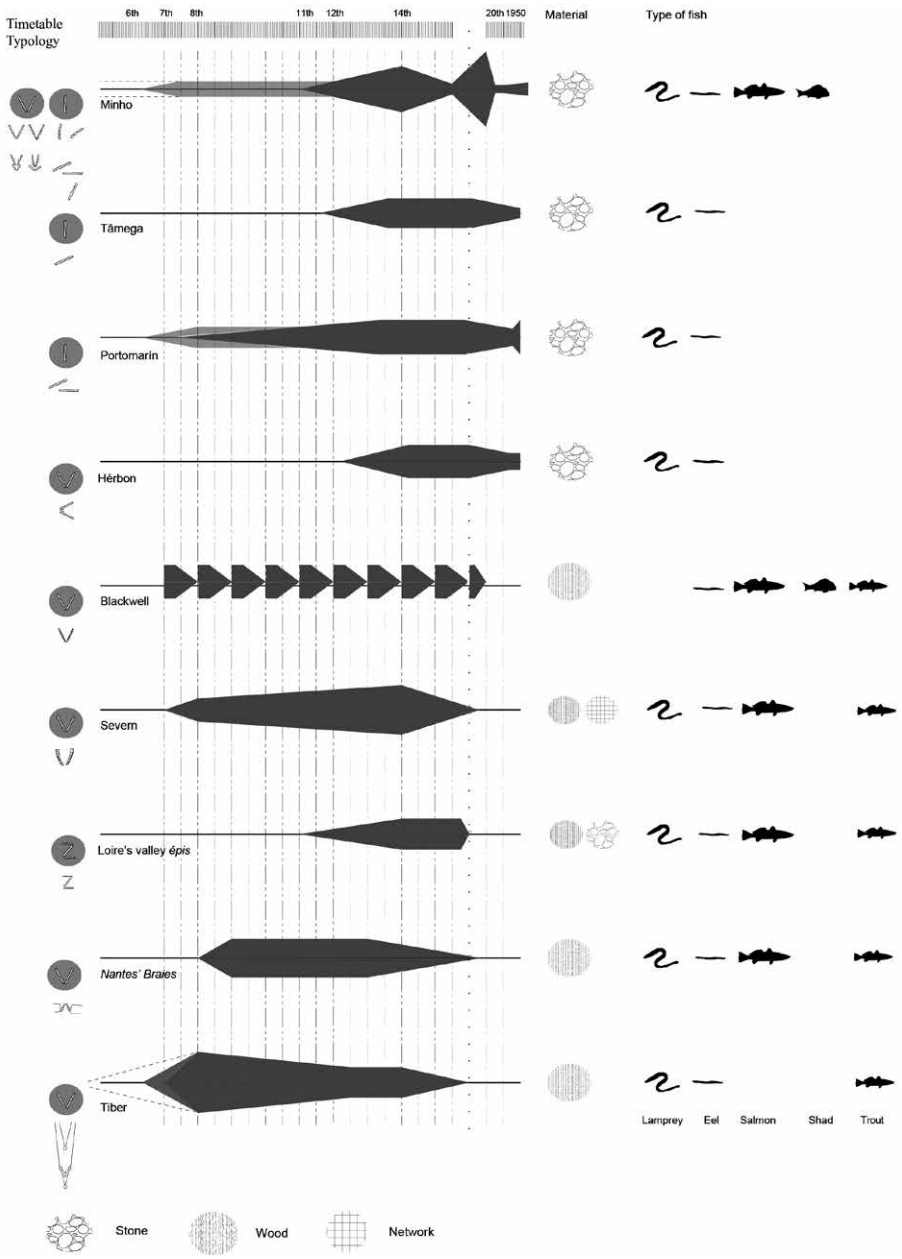

Figure 6. Timeline for the origin and use of the fisheries studied and referenced by the authors, showing type of structure, building material and fish species involved, including, as well, probable date of origin (solid light grey) suggested by the authors and by other scholars (dashed line) (Rui Madail, 2013).

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City of stone

Dialectics of impermanence in Josef Sudek's Prague

Adele Tutter

Abstract

The Czech photographer Josef Sudek's documentation of the stone iconography of Prague during the Nazi occupation and subsequent totalitarian Soviet control constitutes a quiet assertion of the endurance of his country in the face of a politics of terror. Yet Sudek's city of stone is also inexplicably delicate, as befits the capital of a nation born from the wreckage of World War I, and three centuries of Hapsburg oppression before that. Exploiting the dialectics of permanence and impermanence peculiar to stone, Sudek enlists the stone monuments of Prague as foundational aesthetic metaphors for the resilient and vulnerable city—and for the resilient and vulnerable self identified with it.

Keywords: Josef Sudek, Prague, nationalism, photography, Hradčany, monuments.

The Czech photographer Josef Sudek was only nineteen when in 1915 he was conscripted into the Austro-Hungarian army and sent to Italy to fight for the forces that had dominated his country for three hundred years.[1] In a matter of weeks, he was fired upon by his own regiment and wounded in the right arm, which went on to develop gangrene. Four years and many surgeries later, his arm was finally amputated at the shoulder. Without his right arm, Sudek could not resume the bookbinding apprenticeship he began before the war, but he discovered that he could manipulate a camera and tripod. After enrolling in a technical photography school, his pre-war hobby blossomed into a profession, and thence into a true vocation. By the 1930s, Sudek had already achieved considerable renown as a gifted artist in his own country, but his work remained for most of his life hidden behind the Iron Curtain, all but unknown to the West. Today, his photographic oeuvre is considered one of the most important in the

1 Biographical data is primarily drawn from Bullaty 1978, Fárová 1990a, 1990b, and Kirschner 1993.

in: G. Cooney, B. Gilhooly, N. Kelly and S. Mallía-Guest (eds) 2020: Cultures of Stone: An Interdisciplinary Approach to the Materiality of Stone. Leiden: Sidestone Press, pp. 149–166.

world. It is particularly distinguished by his iconic images of Prague, the city that for the entirety of his adult life he called home.

As a Czech in Prague, Sudek and his art must be considered in relation to his city and state, and within political and historical context (Tutter 2015a). Twenty-two years old when the Czechoslovak nation gained independence in 1918, he came of age during the cresting Czech National Revival, and, like most Czechs of his generation, engaged a particularly celebratory form of nationalism.[2] Sudek identified in a sensitive and corporeal way with his country, and with its principal signifier, the capital city of Prague (Tutter 2013). Historian Peter Homans (1989) observes that national, cultural and religious monuments '*are to the group what the body is to the ego; monuments are the* material soul *of the group*' (272). They are cherished in particular, historian T. Robert Rodman (2005) explains, for their resilience,

> *'because they have* survived . . . *ultimately unable to escape from death itself, we value that which can be relied upon to continue, that which can protect us by its intrinsic strength . . . we have a sense of presence and importance for anything that survives . . . when it could easily have been destroyed'* (62–63).

Monuments made especially durable in stone thus offer potent reassuring symbols of endurance and strength, mitigating feelings of rage, fear, debasement, and powerlessness evoked by the forcible occupation by hostile powers. Such is the history of Prague: in parallel to the violation of his body, the city that Sudek lived in and loved would also be brutally, multiply violated during his lifetime, during which its freedom as an autonomous nation would inexplicably come and go—not once, but twice.

Yet Sudek, and his city, endured. Speaking to his resolute loyalty, in 1955 Sudek refused to attend the ceremony at which he was to receive the Municipal Prize from the Mayor of Prague, a Soviet puppet. Instead, '*in lieu of myself*' (Fárová 1990b, 88), he sent a photograph of Prague—perhaps the dignified image he would choose to grace the cover of the monograph, *Praha Panoramatická* (Figure 1, upper). At the centre of the image he places his hat, making plain the degree to which his identity is *embedded* in his city. And this city is a city of stone.

The first known mention of Prague comes from Ibrahim Ibn Jakub, who in AD 965 travelled there on a trading mission. In a detailed report to his Caliph, he writes, '*Prague is built of stone and chalk*' (Lewis 2001, 145). Many have referred to Prague as an unknowable, even magical city, and no one has shared the private magic of its stone substrate—its delicate spires and secret spaces, its cathedrals and its cobblestones—as generously and as intimately as Sudek. Fittingly enough, he entitled one of the several monographs he devoted to Prague, *Magic in Stone* (Figure 1, lower left).

In his moving memoir of his time spent in Prague, *Prague Pictures,* the Irish writer John Banville (2003, 1) calls it '*Sudek's city*'. He means this more than metaphorically. Banville knew that Sudek lost an arm, and how he lost it; by putting Sudek's image of a manikin

2 I refer here to the generative nationalism that justifies the survival of a *conquered* nation, rather than the destructive nationalism that justifies the hegemony of a *conquering* nation, a useful distinction made by Michnik (1991).

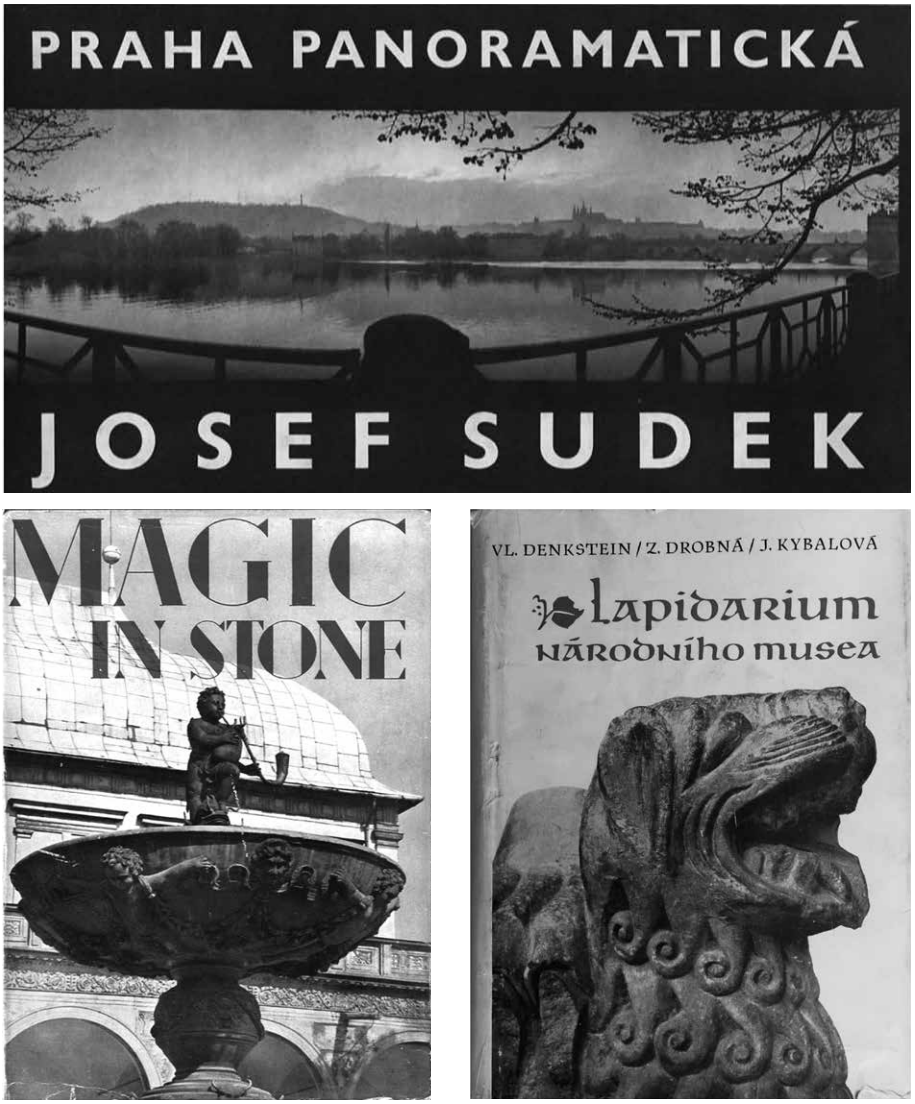

Figure 1. Photographic monographs by Sudek. Upper, Praha Panoramatická,1959; lower left, Magic in Stone, 1947; lower right, Lapidarium Národního Musea, 1958. Unless otherwise indicated, all photographs reproduced in this essay are by Josef Sudek.

with one arm on the cover of his memoir, he appreciates the artist's singular empathy with his mutilated subject. At the same time, he locates in Sudek's aesthetic representation of his amputation the multiple losses he endured and which his missing arm came to signify—not the least of which, the trauma of the nation with which he identified, marked by oppression, stifled by cultural erasure, and rendered all but invisible to the West.

> '*Prague has more famous sons, but none of them, not even Kafka, managed to capture so movingly the essence of the place, its mystery and weary charm, its tragic beauty, its light and shadow, and that something in between, the peculiar, veiled radiance of this city on the Vltava*' (Banville 2003, 69).

Indeed, it was only through Sudek's pictures, Banville admits, that he could really *see* Prague:

> '*All day I had been walking about the city without seeing it, and suddenly now Sudek's photographs, even the private, interior studies, showed it to me, in all its stony, luminous solidity and peculiar, wan, absent-minded beauty. Here, with this sheaf of pictures on my knees, I had finally arrived*' (*ibid.* 58–59).

Prague treasures and honours the legacy inscribed in its stone. The icons and artefacts of Czech culture are housed in the Lapidárium Národního Musea, a branch of the Czech National Museum. Standing in the exquisite galleries of one the most beautiful of European museums are the columns and gargoyles of long-vanished buildings and monuments, along with the stone likenesses of the Czech martyrs and kings whose legends endured, although their kingdoms did not. Most notably, the Lapidárium is home to the original statues that lined the famous Karlův Most (Charles Bridge)—originally named the 'Stone Bridge'. The photographic documentation of these statuary and architectonic elements housed in the Lapidárium was entrusted to Sudek (Figure 1, lower right) (Denkstein *et al.* 1958).

The principal building material of early medieval Prague is the buff to honey-coloured Cretaceous-Lower Turonian sandy marlstone known in Czech as *opuka.* Quarried from the Petřín Hill on which the Czech castle complex (*Hradčany)* stands, this stone was used in the construction of the oldest extant structure of the castle, the 10th-century Bazílika Svatý Jíří (St George Basilica). But *opuka* was found to be susceptible to deterioration when exposed to the elements. For example, the weathered worked masonry in Svatý Jíří reveals evidence of scaly disintegration and honeycomb weathering (Schutznerová-Havelková 1979) and, by the early 14th century, was largely replaced by the more durable Cretaceous sandstone. Thus encoded in the earliest structures of Prague is a tension particular to stone: its simultaneous strength and fragility that engage the dialectics of permanence and impermanence. Embodied and specified by stone, these temporal and material dialectics offer an apt metaphor for the material description of the vulnerability and resiliency of the Czech nation, emerging from the wreckage of World War I after three centuries of occupation by a now shattered Hapsburg empire.

Czechs knew well of the vulnerability of monumental stone structures, made manifest by the repeated destruction by flooding, most recently in the 19th century, of a critical symbol of Prague, the Karlův Most (Charles Bridge; Figure 2, upper). They themselves exploited this fragility in destroying a long-standing symbol of dominating power: the stone Marian Column erected in 1650 in Old Town Square by the Catholic Hapsburgs (Figure 2, upper right). In an echo of the 1871 Paris Commune's destruction of the Vendôme column that commemorated Napoleon's victory at Austerlitz, days after Czech independence was declared in 1918, a mob of ordinary Prague citizens toppled the Marian Column, posing for pictures by the pieces of what had seemed indestructible (Figure 2, lower right). This act of violence was committed even though the Czechs were predominantly Catholic themselves,

Figure 2. Upper left, destruction by flooding of the Karlův Most, 1890. Note the missing twin spires of Svatý Vít, unfinished at the time; upper right, the Prague Marian Column in Old Town Square, c. 1890; lower right, the Marian Column destroyed by Czech citizens, 1918; lower left, Nelson's Column after bombing, Dublin, 1966.

having been by then largely purged by the Hapsburgs of their Protestant Hussite traditions. Taking their cue from the Czech's rebellious gesture of autonomy, Irish nationalists in 1966 bombed Dublin's Nelson's Pillar, a replica of Nelson's Column in Trafalgar Square (Figure 2, lower left). While the Karlův Most has been rebuilt more than once, and *opuka* is currently prized for its historicity and unique aesthetic potential in period restoration and other usages such as contemporary sculpture, numerous efforts made to replace the Marian Column failed to generate sufficient interest. Stone is easily crushed, but only willingly resurrected.

If Prague is the prime signifier of the Czech lands, then Svatý Vít (St Vitus), the pinnacle of the Hradčany (Prague Castle) is the prime signifier of Prague. The building of the iconic Gothic cathedral, so familiar today, began in the 14th century but remained unfinished for six centuries, effectively becoming a ruin before it was ever completed (see Figure 2, upper). Ruins had attained a fashionable status during the 19th century, and it was common to romantically portray Svatý Vít as such, its grand arches and buttresses empty and open to the air (Figure 3, upper left). After the founding of Czechoslovakia,

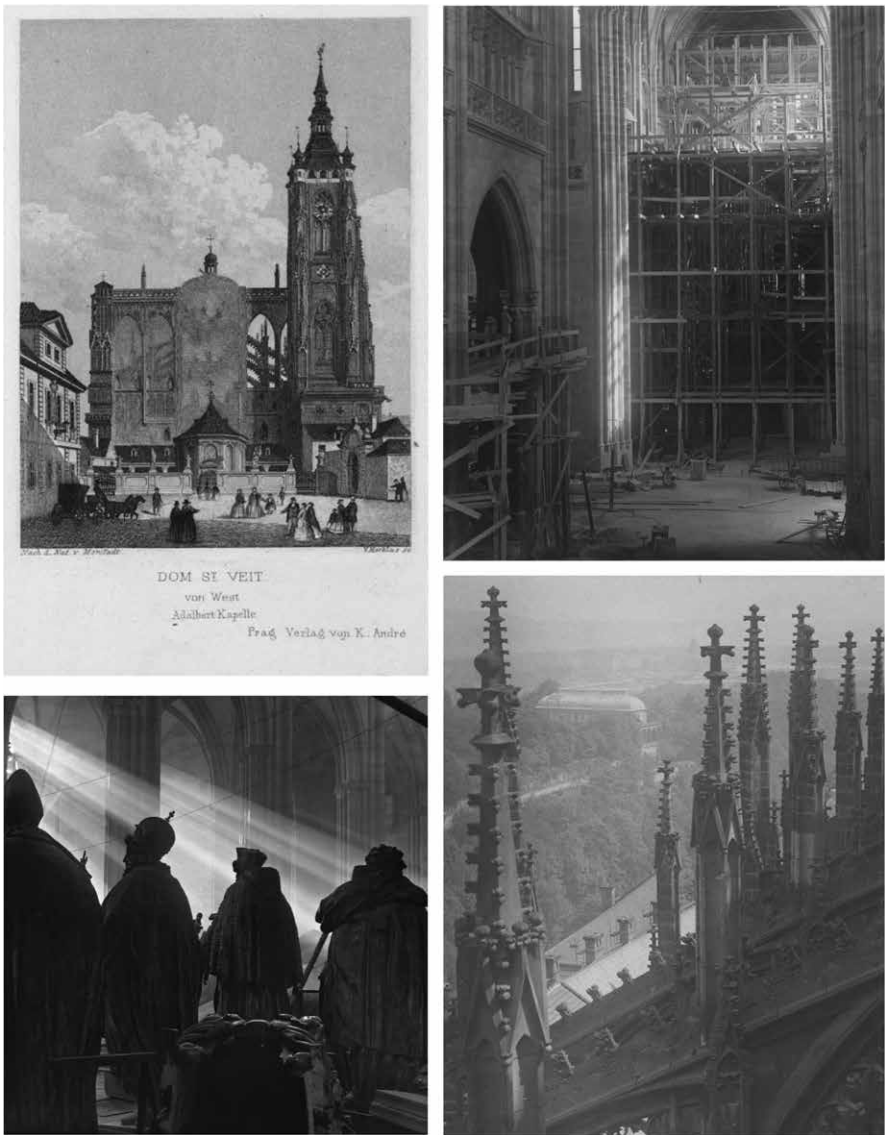

Figure 3. The cathedral of Svatý Vít. Upper left: a 19th-century etching of the incomplete cathedral. From Contrasts, 1928: upper right, the choir and scaffolding erected for the Triforium, seen from the new part of Svatý Vít; lower left, Svàty Vit; lower right, view from above the pinnacles and flying buttresses of Svàty Vit, north-side.

construction recommenced, and was hastily brought to a close in time for the tenth national jubilee in 1928. In honour of the occasion, Sudek published a folio of images of Svatý Vít, *Contrasts* (Figure 3, upper and lower right, lower left). As its title suggests, this radical series contrasts the cathedral's agelessness with its attenuation; widely praised, it brought Sudek to national attention for the first time. Shrouded in scaffolding and filled with piles of sand and tools, in Sudek's eye, the neglected cathedral and its displaced saints seem forlorn, calling out for care and attention. Indicative of a country whose autonomy was summarily arrogated and whose language and culture systematically suppressed for

Figure 4. Left, View of Prague from Seminářská zahrada (Seminářská garden), c. 1946–1955; right, Národní divadlo (National Theater) across the river, c. 1950–1960.

three centuries, it is impossible *not* to imagine that Sudek saw himself in this incomplete cathedral: as a Czech, whose identity as such had been denied; and as a man, whose body was sacrificed to the very country that subjugated his own. In one view, the spires of Svatý Vít stand like soldiers, guarding the Czech National Theatre in the distance. At the time the latter building had recently been completed; before then, the Hapsburgs had only allowed Prague a German-speaking theatre (Figure 3, lower right).

Bill Brown (2001) of the University of Chicago writes, '*inanimate objects organize the temporality of the animate world*' (16). Sudek's Prague is lost in time, as if it had always been. But this city of stone is also inexplicably delicate: witness his admiration of its fine Gothic filigree. Sudek repeatedly animates Prague's monuments by tracing their silhouettes with natural life, creating the sense that the shadow capital of a country, which for over three centuries remained nameless, could in fact vanish at any moment (Figure 4).

He also emphasizes temporality in portraits of stone statuary. Time may efface these figures and raise their stones' grain, but this only seems to enhance their solemn, tactile presence (Figure 5, left). Many of Sudek's subjects have also lost limbs; while the mutilated statues of antiquity may be classic trope, his examples are marked by a powerful intimacy, perhaps through his identification with these vulnerable subjects: the missing hands of an exultant Madonna and child fail to lessen their joy (Figure 5, right).

The borders of the First Republic remained intact for only twenty years. In 1938, the West allowed Hitler to annex the Czech Sudetenland, and one year later, to freely invade it, choosing not to interfere in what Neville Chamberlain called 'a quarrel in a faraway country between people about whom we know nothing.'[3] Nor could the great stone

3 Radio broadcast of 27 September 1938, quoted in 'Prime Minister on the Issues', *The Times* (28 September 1938, 10).

Figure 5. Left, Untitled, 1934; right: Statue, 1968.

Titans guarding the Mattias Gate leading to the Hradčany prevent Hitler from seizing it. *Reichsprotecktor* Reinhardt Heydrich—'the Butcher of Prague'—oversaw the Nazi occupation of Czechoslovakia, notorious for its brutal suppression of all acts of resistance, whether real, perceived, or potential—including the aesthetic expression of nationalist sentiment (Figure 6, left). Under Heydrich's direction, thousands of Czech artists, intellectuals and musicians, were murdered, and many others were sent to concentration camps, among them some of Sudek's closest friends. In 1942 the group of resistance fighters that assassinated Heydrich hid themselves in the Kostel sv. Cyrila *a* Metoděje (Sts Cyril and Methodius church), where they were soon found and executed; the patron saints of the Czechs failed to protect them. A monument commemorating their sacrifice is mounted above the Nazi bullet holes in the stone church (Figure 6, right).

Long before the forfeiture of his arm and other horrors of war, Sudek was immersed in catastrophic loss; indeed, he was born to it: when only two years old, his father died quite suddenly from pneumonia. A series of tender portraits of the tomb of a little girl evokes another loss: the older sister who died shortly after birth, one year before Sudek was born (Figure 7). Although the stone visage is pitted with age, the dressing of the grave with fresh ferns and flowers shows us that time has not forgotten the child buried there. In a process that Freud called *Nachträglichkeit,* early tragedies reverberate with later ones, echoing and amplifying them. Surely Sudek's burden was palliated by the symbolising and sustaining function of his work, and by the deep identification with city and state that it manifests.

And yet the notion of Sudek's *identification* with his city is, I think, too limiting to fully describe his special connection to his material surroundings. The French phenomenologist Maurice Merleau-Ponty (1993) argues that the embodied self is experienced as physically continuous with its environment:

Figure 6. Left, Reinhardt Heydrich, Reichsprotektor of Bohemia and Moravia (aka 'Hitler's Hangman') occupying the Hradčany. Note behind him the stone Titans at the Mattias Gate guarding the First Courtyard; right, bullet holes preserved in a monument to Heydrich's assassins, Kostel sv. Cyrila a Metoděje (Sts Cyril and Methodius) (Archival photographs)

Figure 7. From the series, A walk in the Malá Strana cemetery, 1946.

> '*the body is a thing among things; it is one of them. Things are an annex or prolongation of the body; they are incrusted in its flesh, they are part of its full definition; the world is made of the very stuff of the body*' (125).

If the fluid contours of the embodied self can include the immediate environment, then it follows that they can reach to the limits of the city, historically bounded as Prague was

Figure 8. Hladová zed ('Hunger Wall'), Petřín Hill, Prague, c. 1360–1362 (Photograph: Aktron/Wikimedia Commons).

Figure 9. Upper left, Clock tower in Staroměstská radnice (Old Town Hall) after bombing, 1945; lower left, Emmaus Monastery after bombing, 1945; right, 1611 engraving of the army of the Bishop of Passau defenestrating the Emmaus monks of Kostel Panny Marie Sněžné (St Mary of the Snow).

by the medieval Hladová zed ('Hunger Wall'; Figure 8). Nietzsche (1874) intuits, '*the history of his city becomes the history of his self; he understands the wall, the turreted gate . . .like an illustrated diary of his youth . . . and finds himself in all of them*' (19). One can reach this argument all the way to the later and more plastic yet still inherently physical construct of the nation-state, thereby rendering corporeal the traditional psychoanalytic formulation of nationalism as an expansion of the self. Apropos, *city* and *citadel* share the Latin root *civis*, 'citizen'. It is no wonder that after Sudek lost his arm in Italy, he vowed never again to leave the safety of his country's confines again (Tutter 2013).

Conversely, the benefits of nationalism come at an additional cost, especially when heightened in reaction to oppression; for to experience one's homeland as a physical continuation of the self is to experience any assault on that homeland as a profoundly personal and threatening one. Perhaps this is why Sudek included only a few ruined monuments in his portrait of an otherwise miraculously intact Prague, such as the Old Town Hall, which houses the famed astronomical clock (Figure 9, upper left); and the Emmaus Monastery of Kostel Panny Marie Sněžné (St Mary of the Snow; Figure 9, lower left). Repeating the defenestration of the Emmaus monks in 1611 (Figure 9, right), in the 1930s the Nazis sent the monks that lived there to Dachau.

During the Nazi occupation, Sudek risked death by continuing to catalogue the historic iconography of Prague. One of the monuments with which he was particularly preoccupied was the Třetí nádvorí (Third Courtyard) of the Hradčany, in which Svatý Vít stands. The foundations of the castle's oldest known structures, dating from the 9th century, were found underneath the courtyard when excavated for the reconstruction of the Hradčany in the 1920s (Figure 10, upper). The new Třetí nádvorí would be paved with squares of granite quarried from every region of the young nation, piecing together a virtual geological atlas of the historical kingdoms of Bohemia, Moravia, Silesia, and Slovakia—an impenetrable stone quilt to blanket and protect some of the nation's most hallowed spaces. In a tribute to the nation it represents, the strong horizontal that neatly bisects Sudek's panoramic image of the courtyard invokes the boundary between the architecture above it and and the privileged history concealed beneath it (Figure 10, lower). Here, the paving stone surrounds and defends the cathedral, whereas in other images (not shown), the cathedral walls protectively cradle the meaning-laden mosaic. In one view, the rain subtly highlights its patchwork pattern (Figure 11). Such images were Sudek's private gesture of defiant solidarity: a quiet reassertion of the *sovereignty of his country in the face of a politics of terror.*

Sudek was born in time to enjoy the twenty-year life of the first Republic, and lived to witness its repeated violation—by the Nazis in 1938, by the Communist coup d'état of 1948, and again, by the Soviet invasion of 1968. During the harrowing years of the Warsaw Pact, he created expansive panoramas of Prague with an obscure antique Kodak camera. Puncturing most of their sweeping horizons is the unequivocal silhouette of Hradčany—which, although tiny and hazy, remains an absolute and orienting reference (Figure 1, upper). Like a flag that still stands, the persistence of this tiny sign, and the other national signifiers Sudek documented, were proof and promise of the survival of his country and his countrymen. Other images are less optimistic. The sacrifices of the past, the uncertainty of the future, and the tension of the captive present are obliquely articulated by a series of mysterious stone staircases that ascend, turn, and vanish: documents of permanence, and of disappearance (Figure 12).

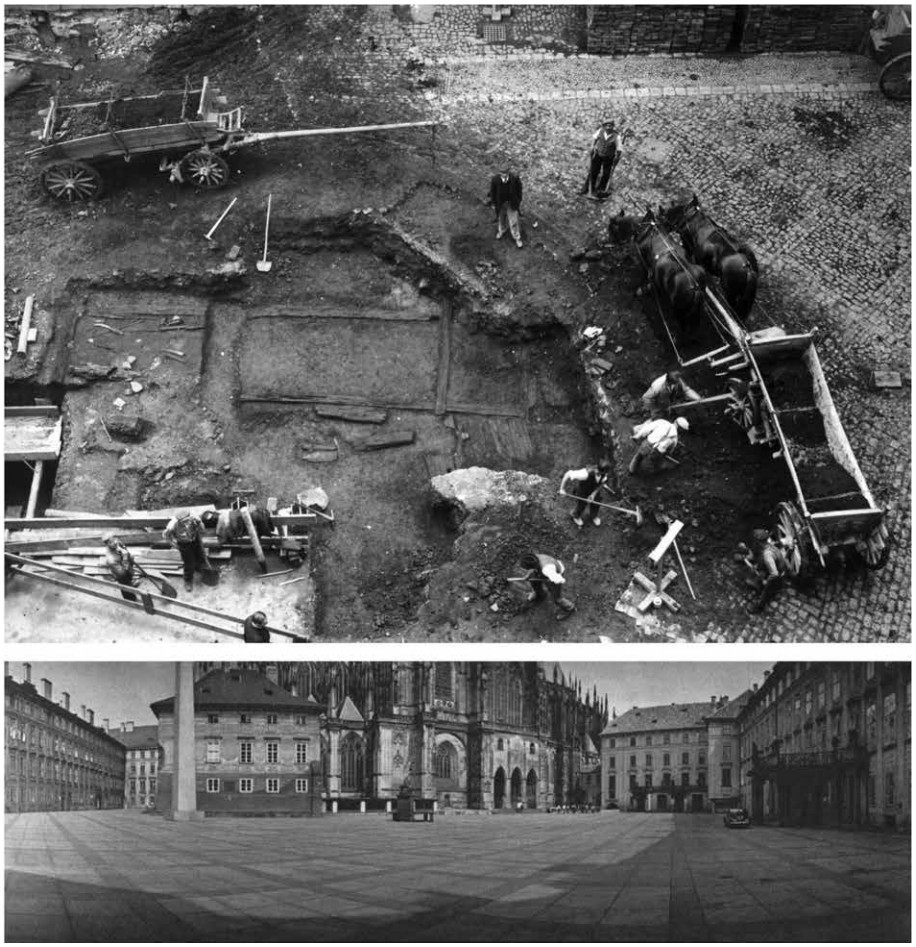

Figure 10. Upper, excavation of the Třetí nádvorí (Third Courtyard), revealing the oldest known structures of the Hradčany (archival photograph). Lower, Třetí nádvorí, c. 1954.

Sadly, Sudek did not live to see the Velvet Revolution liberate his country in 1989; others would document the fate of the statues of Stalin and Lenin that fell like the Marian Column did seven decades before. But the gentle, peaceful qualities of Sudek's art suggest that it gave him no little solace. In portraying his city and his homeland he seems to have located a sort of stoic acceptance in which life and death are understood as a natural cycle, transcending not only the grief of loss, but also the quest for its reversal and restitution (Tutter 2015b). Stone is not eternal; it lives and dies; and, in the end, is finally absorbed by Nature. Mottled with lichen, great stone urns echo the shapes of trees, both enlivened and mortalized by the equation (Figure 13, upper). A stone courtyard with an empty doorway is slowly given over to vines (Figure 13, lower right). And in the Jewish cemetery in Prague, its graves many layers deep, even the stones are eventually laid to rest; tilting toward the earth, they lean and tumble into the arms of trees (Figure 13, lower left). The dichotomy of durability and frailty thus achieves resolution, resigned to the consolatory circle of life and the natural order of things.

Figure 11. Třetí nádvorí, c. 1954.

Figure 12. From Remembrances, 1950.

Figure 13. Upper, Gardens of Troia Castle, 1953; lower left, Jewish cemetery, 1928; lower right, A Walk in the garden of the lady sculptor, 1957.

An image of cracked ground rock reiterates this theme; its pink tone and softly modelled, anthropomorphic appearance recall Michelangelo's slaves (Figure 14). But whereas the Master's *non-finito* figures are permanently trapped and immortalized in marble, Sudek's shattered rock is contained, and finally consumed by *terra madre*. Just as the surrounding matrix of earth holds together the fragmented rock, so does the artist contain his self, fragmented by trauma, within the holding matrix of the photograph. The stone dies; the art lives. Stone is the foundational metaphor with which

Figure 14. Left, Cracked ground rock, 1930; right, Michelangelo Buonarroti, Awakening slave, 1519–36, Galleria dell'Accademia, Florence; (Photograph: Umberto Baldini).

Sudek bridges representations of the resilient and vulnerable self, and the resilient and vulnerable city with which that self is identified. Through his empathic lens, Sudek brings to light an invisible city, and shows us the soul of a city of stone.

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Figure credits

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Figure 2: upper, https://perthgirlparis.files.wordpress.com/2012/06/img_4109.jpg; lower left, https://petrabostlova.files.wordpress.com/2014/11/ms-snimky-bradna-023.jpg; lower right, http://www.lidovky.cz/foto.aspx?r=ln_domov&c=A090927_154738_ln_domov_mpr&foto=MPR2e11af_sloup_padl.jpg.

Figure 3: upper left, http://www.katedralasvatehovita.cz/cs/fotogalerie/katedrala-ve-sbirkach-narodni-galerie-praha; upper right, http://www.mfa.org/collections/object/the-choir-and-scaffolding-erected for-the-triforium-seen-from-the-new-part-of-the-cathedral-saint-vitus-from-the-portfolio-sv%C3%A0ty-vit-saint-vitus-270295; lower left, https://oscarenfotos.files.wordpress.com/2013/04/josef_sudek_42.jpg; lower right, http://www.mfa.org/collections/object/view-from-above-the-pinnacles-and-flying-buttresses-of-the-cathedral-of-saint-vitus-north-side-from-the-portfolio-sv%C3%A0ty-vit-saint-vitus-270293

Figure 4: left, http://www.mfa.org/collections/object/view-of-prague-from-the-seminarska-garden-402233; right, http://canadianart.ca/features/2012/11/16/josef-sudek/

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Figure 7: left, http://www.mfa.org/collections/object/a-walk-in-the-cemetery-of-malastrana-402243; right, http://www.mfa.org/collections/object/a-walk-in-the-cemetery-of-mala-strana-402242.

Figure 8: Creative Commons 3.0 license, http://commons.wikimedia.org/wiki/File:Praha,_Sm%C3%ADchov,_Kinsk%C3%A9ho_zahrada,_Hladov%C3%A1_ze%C4%8F.jpg.

Figure 9: upper left, http://artgalleryofontario.tumblr.com/post/32517501364/prague-after-bombing-clock-tower-with-fountain-in;
lower left, http://www.liveauctioneers.com/item/14093194_emmaus-church;
right, Popular Imagery Collection, the Harry Ransom Humanities Research Center, University of Texas at Austin, Box 7, item 300, http://www.lib.utexas.edu/taro/uthrc/00484/00484p2-P.html

Figure 10: http://www.cradlesec.eu/cec2014/Galerija/Prague_v.jpg;
lower, http://valentinska.rajce.idnes.cz/josef_sudek_praha_panoramatick-a_1959/#img631.jpg.

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Figure 13: upper, http://artgalleryofontario.tumblr.com/post/33078395163/gardens-of-troia-castle-1953-josef-sudek-czech; lower left, http://www.mfa.org/collections/object/a-walk-in-the-garden-of-the-lady-sculptor-402282; lower right, http://coopimage.com/histoire/sudek.html.

Figure 14: left, http://baruchfoundation.org/albums/sudek/sudek_cracked-ground-rock.jpg; right,http://upload.wikimedia.org/wikipedia/commons/thumb/6/66/%27Awakening_Slave%27_by_Michelangelo_-_JBU_02.jpg/682px-%27Awakening_Slave%27_by_Michelangelo_-_JBU_02.jpg

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‘The living stones’

Encountering the prehistoric past in West Cornwall

Elizabeth Pratt

Abstract

This paper will outline selected findings of my doctoral research into contemporary local engagements with the prehistoric archaeological heritage of West Penwith, Cornwall. Termed ‘the granite kingdom’ (Thomas 1970) on account of its highly visible and distinctive geology, I demonstrate that an awareness of its *culture of stone* is integral to understanding relationships between people, place and the past. The Land’s End peninsula is said to host the densest concentration of megalithic monuments in Western Europe (Michell 1974). Whilst inexplicably neglected within academic syntheses of British prehistory, this is not to presume a similar disregard at the community level. Heritage Studies can shed light on contemporary ways of knowing and experiencing the ancient past. The aim of my work is to examine interactions with sites, to identify processes of meaning-making, and to investigate the construction and negotiation of ‘unauthorised’ interpretative narratives by 21st century-inhabitants. Qualitative interviewing and participant observation have proffered fascinating insights into the nature and role of sensory engagements with this lithic landscape. I begin by introducing the key later prehistoric sites, acknowledging the suggestion of the purposeful echoing of tor outcrops in megalithic architecture (Tilley 1995, Tilley and Bennett 2001). Continuing with this idea of ‘rocks as resources’, I explore how present-day narratives of place and the past are underpinned by geological encounters. First, I demonstrate how the locally-perceived place identity of West Penwith is sculpted by everyday embodied and imagined engagements with the ubiquitous granite. Focussing on the notion of ‘ancientness’ reveals an entanglement of archaeological/geological and site/landscape. I highlight the inherent challenges to recognising certain features as prehistoric monumental remains, on account of the material coherence of granite

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in this environment. My work illustrates the importance of *cultures of stone* to knowing and being in the Land's End, for communities both past and present.

Keywords: granite, local narratives, geological/archaeological entanglements, 21st-century community identity, West Penwith, Wales.

Since the millennium, increasing scientific attention has turned towards defining the advent of the 'Anthropocene': a new, human-dominated geological epoch (cf. Hamilton *et al.* 2015). The impetus for such discussions is surely the current, unprecedented pace of technological change, urbanisation and globalisation. Environmentalists have claimed that much of the world's population is 'losing touch' with the natural world (Attenborough 2011; Moss 2013); and the same might be true of our physical and felt connections to the more chronologically-distant periods of the human past. In England, certainly, our Holocene prehistories are typically poorly understood by general (*i.e.* non-specialist) audiences. Until very recently, school curricula had neglected study of the peoples and cultures that existed prior to the Roman Conquest in AD 43; similarly, museum exhibits have tended to focus upon historical discoveries and narratives. This issue was acknowledged by limited academic research undertaken during the 1990s (cf. Merriman 1999; Stone 1994) and recently re-surfaced in a national Research Strategy for Prehistory, which proposed that: '*Despite recent high-profile discoveries and projects, the prehistoric periods* […] *remain undervalued* [by the general public] *and we currently have little understanding of the reasons for their "invisibility" or how this might be addressed'* (Last 2010, 18).

My doctoral research (Pratt 2016) sought to interrogate this claim in relation to the Neolithic, the Bronze Age and the Iron Age (*c.*4000 BC–AD 43, although caution should be exercised in citing such 'fixed' chronological schema). These millennia see the beginnings of farming, sedentism and metalworking, with increasing complexity of social organisation and, in some regions, the construction of megalithic monuments (cf. Whittle 1996; Scarre 2002). On account of time depth and the nature of the archaeological record, tangible evidence of this past is typically masked within the environments in which people now live and work; in addition, its material culture is often mistakenly dismissed as 'uninspiring' (Swain 2007, 218–222), comprising little more than 'stones and bones' (Wood and Cotton 1999, 42). However, academic understanding of prehistoric Britain has greatly expanded over the past 25 years, in part due to the wealth of data recovered through archaeological investigations that are now routinely conducted in advance of development. A multitude of previously unknown sites have been identified: arguably the most high-profile among these is the incredibly well-preserved Bronze Age settlement at Must Farm in Cambridgeshire, which has been dubbed 'the Fenland Pompeii' (Kennedy 2016; Marchini 2016). Given the continued popularity of archaeology, the wealth of opportunities for active involvement, and the ready availability of information through television and the internet, might the public in fact be more aware of the prehistoric past than has hitherto been assumed? Are people finding ways to engage with the archaeological record? What do they understand of these periods? And how?

My research has tackled these questions at the scale of the local, specifically: in the Land's End District of Cornwall (also known as West Penwith). Allegedly hosting the densest concentration of prehistoric megalithic monuments in Western Europe (Barnatt 1982, 95) but often overlooked within academic syntheses of Neolithic and Bronze Age Britain, I decided to undertake an ethnographic study to discern if and how (a wide range of) local inhabitants recognise, interact with, make sense of, and derive meaning from, this archaeological heritage. In this paper, I discuss the 'culture of stone' that exists at the Land's End. I reveal how the lithic character of the peninsula is key to local imaginings of, and engagements with, place and the past; and I show how a blurring between what is purely geological and what is archaeological poses a challenge to identifying certain megalithic elements of the prehistoric landscape.

The granite kingdom

Cornwall is the most south-westerly region in England, and has a rich and distinctive cultural and natural heritage. Although the Cornish language fell out of common usage by the early to mid-19th century, there remains a strong sense of regional identity that is founded in part upon the traditional industries of farming, fishing and tin mining (Laviolette 2003; Laviolette 2011). Considered one of the 'Celtic' nations, several local political parties have fought for devolution; and in early 2014, Cornwall was formally recognised by the Council of Europe's Framework Convention for the Protection of National Minorities (BBC 2014). West Penwith occupies the furthest and most exposed seaboard enclave of the region; hence its alternative moniker, the Land's End District (Figure 1). Its geographical isolation, rugged 'wilderness' and temperamental climate have fuelled and intensified the notion (long shared by both insiders and outsiders) of this being somewhere 'other', somewhere that is certainly 'not England'. Writers D. H. Lawrence, Virginia Woolf and Daphne du Maurier, artist Alfred Munnings and sculptor Barbara Hepworth all lived here for a time to seek inspiration from the unique and volatile landscapes, seascapes and skyscapes.

West Penwith certainly exhibits a varied geography and a mosaic of environments that are the product of granitic and Devonian Age metamorphic geology (Tilley and Bennett 2001, 336; Knight and Harrison 2013, 188). Almost the entire length of the coastline is characterised by high, craggy cliffs that descend directly into the sea. Inland, the northern area of the district is dominated by open, upland moors punctuated by rocky outcrops. Carn Galver, crested with a 'saddleback' of tors, is a distinctive landmark. Its lower slopes, running towards the cliffs, comprise a patchwork of fields defined by walls built of large stones and boulders (known locally as 'hedges'). Trees are generally scarce; when present, they are typically stunted by the strong winds that sweep across from the Atlantic. The southern part of the district is more hospitable, providing fertile pasture for dairy cattle. There are some rounded hills here, such as Chapel Carn Brea, and sheltered wooded valleys at St Buryan and Lamorna. West Penwith is very much a rural agricultural landscape, peppered with farmsteads, hamlets and villages that are interconnected by narrow winding lanes, whilst the towns of St Just, St Ives and Penzance occupy more coastal locations.

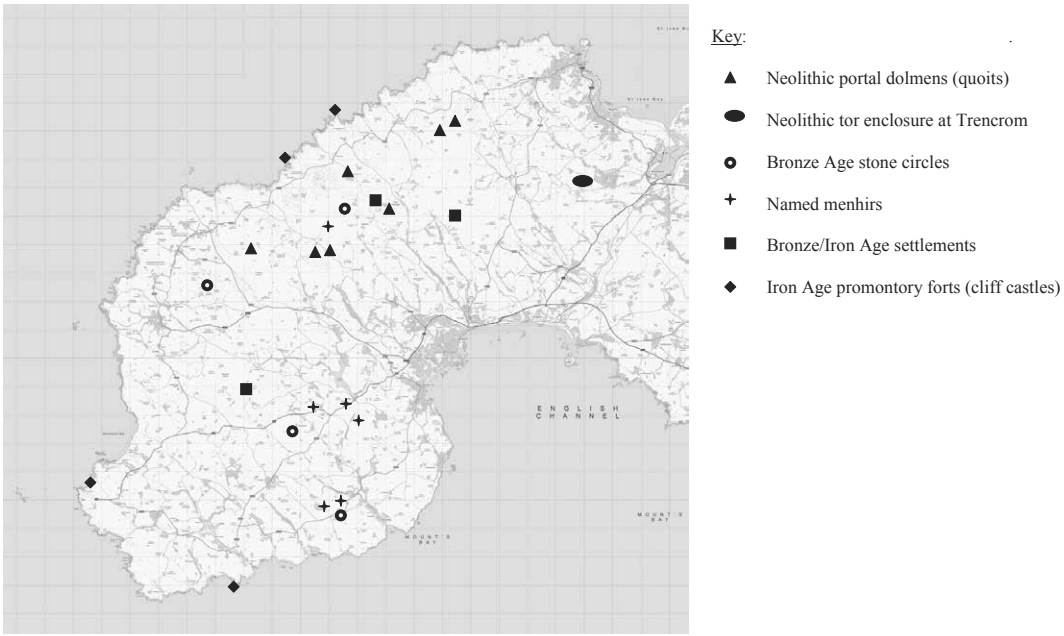

Figure 1. The Land's End district of Cornwall, showing selected prehistoric monuments (Source: Crown Copyright and Database right, 2015).

Prehistoric Penwith

But it is not just topography which differentiates the district from any other. Ordnance Survey Explorer mapping (scale 1:25,000) displays an abundance of dot, star and cross symbology and the accompanying italic text traditionally used to indicate the presence of archaeological monuments. 'Tumulus', 'Chambered cairn', 'Standing stone', 'Stone circle', 'Hut circle' and 'Settlement' appear more than sixty times; and specific names are marked in some cases (*e.g.* '*Mên-an-Tol*'). First recorded and studied by local rector and antiquarian William Borlase in the mid-18th century, and re-investigated by his great great grandson William Copeland Borlase a hundred years later, this impressive gazetteer of megalithic and earthwork remains is proof of a significant human presence in West Penwith throughout later prehistory. For scholars of archaeology, the region offers much scope to better understand the monument-building tradition and the circulation of ideas during the Neolithic and Bronze Age. For scholars of heritage studies, much can be learned from investigating people's connections to these sites in the 21st century.

The extant megalithic monuments comprise seven portal dolmens (known locally as 'quoits'), several chambered tombs of Scillonian type (so-called on account of being endemic to the Isles of Scilly and West Penwith), five stone circles (three of which retain 19th century folk-names: 'The Merry Maidens' or 'The Nine Maidens'), more than fifty solitary or paired menhirs, four well-preserved 'courtyard' settlements, two possible 'tor enclosures' and several promontory forts (or more colloquially, 'cliff castles'), and around ten 'fogous' (curious stone souterrains of unknown function). A particular concentration of monuments is found on the northern moors between Zennor, Morvah and New Mill; with many of the standing stones dispersed across the lowlands. It is hard to believe that this is only a surviving sample of a

once larger body of sites; antiquarian accounts and 20th-century surveys (cf. Russell 1971; Michell 1974) document the historical destruction and uprooting of quoits and menhirs by local people searching for buried treasure or by farmers hoping to facilitate ploughing and cultivation. Fortunately, most monuments are now safeguarded through Scheduling (formal designation by the state) and the conservation and outreach activities of the Cornish Ancient Sites Protection Network (a local volunteer-run organisation established in 1997).

Yet signposts and interpretative boards for these monuments are curiously absent, despite their having been subject to field investigation. From the 1930s onwards, some of the more complex sites were excavated by members of the West Cornwall Field Club and its later incarnation the Cornwall Archaeological Society. During the 1980s and early 1990s, the popularity of 'alternative archaeologies' led to a particular flourishing of the 'earth mysteries' movement in West Penwith—with growing attention, too, from contemporary pagans who seek a spiritual connection to/at ancient sites (cf. Blain and Wallis 2007). However, keynote academic texts of British prehistory have scarcely acknowledged the astonishing gazetteer of sites here. Richard Bradley only makes passing reference to Neolithic tor enclosures and the possible survival of Bronze Age field systems (2007, 70, 184); Chris Scarre (2007) does not mention Cornwall at all. An exception is Prehistoric Britain from the Air by Timothy Darvill, which offers a focused synthesis of extant features within the landscape (1996, 245–249). Noticing and responding to this paucity of (available and accessible) literature, some local enthusiasts and self-taught experts have produced their own guides (cf. Weatherhill 1981; 1985; Cooke 1993; Straffon 2004), which have become the go-to texts for interested residents and visitors alike.

Place and the past

A core component of my doctoral research (Pratt 2016) was to investigate if (and how) local people were aware of, engaged with, and understood the prehistoric archaeological resource. By writing to community groups, and then using the snowballing technique, I conducted semi-structured and conversational interviews with more than forty permanent (but not necessarily native) residents of the district. These insights were supported and contextualised by participant observation of guided walks and other archaeological activities such as site clear-up days. I interacted with people of all ages (spanning 18 to 80) and differing educational backgrounds and occupations, including farmers, manual workers, shopkeepers, artists, professional and amateur archaeologists, contemporary pagans and site conservation activists. Almost everyone had an existing interest in archaeology, due to the self-selecting nature of recruitment. When citing interview dialogue, I have given some indication of the individual's identity but pseudonyms have been used to preserve anonymity.

To initiate conversation as an outsider, I often began by asking my informants about their physical and felt connections to the district. Most people (but especially long-term incomers) readily identified a special quality to West Penwith, founded upon its geographical isolation and the unique character of the landscape. B&B owner James thought: '*it's a slightly wild place, a bit of an on-the-edge place*'; whilst professional archaeologist Laura admitted: '*I couldn't believe it was in England*'. The peninsula was described as a rugged and dramatic 'wilderness' of open spaces and

unusual places. There is a sense of freedom and solitude on the northern moors and of exhilarating exposure to the elements at the craggy cliffs; whilst hilltops provide panoramic views (in some cases, from coast to coast) and wooded valleys of the southern interior offer timeless tranquillity. When people articulated their attachments to place, topographical descriptions were laden with sensory attributes: awe-inspiring, unknown, beautiful, bleak, intimate, other-worldly. Emotional responses were particularly forthcoming from artists, writers and contemporary pagans. For instance, Aisling commented: '*I have a great feel for the land down here. I can feel its heartbeat. I know it's very romanticised but I don't care, it's how I feel*'. But those who had been raised in the district were often more blasé to its unique qualities. Retired teacher Ray, who lived in a hamlet almost entirely populated by members of his wife's extended family, suggested: '*sometimes I don't think we always appreciate it, if you live here. You need to go away and come back. You have to stop and look at something as if you'd seen it the first time*'.

Crucially, the idea of West Penwith being a 'wild' landscape was often coupled with remarks about its perceptible antiquity. Laura referred to '*this ancient end of the peninsula*', whilst Sheila felt that '*everything's steeped in history*'. A sense of the past is seemingly inherent to the whole landscape, but at the same time, '*show*[s] *through in certain places*' (Peter). Seven people referred to the northern coast road between St Ives and Pendeen, which offers vistas of moorland and rocky outcrops (to the south) and a patchwork of fields delineated by stone 'hedges' (to the north) beyond which is the open expanse of sea. Several other people saw the immutable craggy coastline as embodying ancientness, as retired incomer Pat explained: '*there's a hymn or something and it talks about the hills that are for ages stood. You know, it's like the cliffs and everything. For ages and ages they've been there*'. Meanwhile, Laura considered that the Bosworlas Valley near St Just conveyed an aura of timelessness, due to being '*completely cut off from the outside world*'. It would appear that antiquity is read into those spaces that allow for escapism from 'civilisation' and the 'everyday'. In other words, getting closer to the natural world becomes almost synonymous with travelling back in time.

Archaeology enthusiast Peter alluded to the past surfacing as '*unusual and ancient records*' of occupation and activity. People I met were certainly aware of the presence and prevalence of prehistoric (and historic) archaeological remains. Archaeology graduate and young mother Leah commented: '*there are so many* [monuments] *and you see them everywhere*'. Artist and writer Andrew stated: '*I don't think you can divorce ancient sites from the landscape*'. But I found it especially interesting to hear several interviewees suggest that the megaliths on the northern uplands to be more special—indeed, more 'authentic'—due to their setting. It seems that the isolation and 'wilderness' of the moors corroborates the ancientness of archaeological remains in these locales; in turn, such monuments provide a tangible anchor to, and are a visible reminder of, the time depth of the peninsula. Antiquity is seemingly associated with the most lithic parts of the West Penwith landscape. In the words of Daphne Du Maurier, '*Here in the lichened stone is the essence of memory itself*' (1967, 13). Meanwhile travel writer Denys Val Baker considered that: '*to feel this sense of the past one has only to place the palms of the hands against some smooth worn shape of granite*' (1970, 106).

Artist Ithell Colquhoun even dedicated an entire work to 'The Living Stones', believing that:

> '*The structure of its rocks gives rise to the psychic life of the land* […] *West Penwith is granite, one of the oldest rocks, a byword for hardness, endurance, inflexibility* […] *It may be that granite more than any other rock retains for aeons such psychic forces.* […] *Not only the tors but also the "rude stone monuments"* [prehistoric megaliths], *the more widely acknowledged relics of an unimagined age, are repositories still of ancient power*' (1957, 46–46).

Reading the granite

Without any encouragement, all of my interviewees acknowledged and discussed the lithic character of this landscape. Thinking as much about upstanding and built features as the bedrock, Ben stated that '*underneath it all, it's all made out of granite*'; Aisling used the phrase '*the bones of the land*' to articulate a similar sentiment. Phil commented more simply that '*the place is* […] *littered with stones*'. Esther, a farmer who was born and bred in the district, assumed that my interest in 'old stones' encompassed the natural topography and geological strata (craggy cliffs, tors and geological erratics) as well as its archaeological and historical remains (megalithic monuments, boulder-built 'hedges', farmhouses and barns). It is perhaps significant that local historical folklore and customs are associated with certain tors, logan (or 'rocking') stones, Neolithic quoits and Bronze Age stone circles alike; with giants, piskies and human petrification being common themes (cf. Trower 2013). In the present-day, too, both geological formations and archaeological structures attract curiosity and appeal to imaginings that are redolent with anthropomorphism and/or zoomorphism. During a guided walk to the Iron Age cliff castle of Treryn Dinas, participants enjoyed picking out a mermaid and the heads of three horses in the strangely-weathered outcrops; whilst artist and practicing pagan Jo told me about a whale and a dog that she had identified in the stones of Lanyon Quoit.

I decided to look more closely at if and how people are able to distinguish archaeological structures from purely geological features, and furthermore, whether certain monument types pose greater challenges of identification. All of my informants could readily name and talk about specific sites that they had visited and found interesting or impressive. Typically, these were quoits, stone circles and courtyard settlements (such as Chûn Quoit, Boscawen-un and Carn Euny)— which are reasonably accessible and readily visible in their surroundings. But during several guided archaeological walks, I observed individuals struggling to recognise other prehistoric features. In particular: the simplicity of form of standing stones provides no clues as to their origin or function, whilst collapsed quoits and eroded or overgrown tumuli do not necessarily conform to an imagined blueprint of a monument, and furthermore, are typically camouflaged within their ostensibly wild and rocky surroundings. As local author Cheryl Straffon notes: '[in] *the ancient landscape* [of West Penwith], *wild and elemental in places* […] *you are never sure what is natural and what has been built*' (1998, 51). Or, in the words of professional archaeologist Laura: '*there's a big crossover between the stones that were placed and shaped by humans, and the natural weathered landscape with the granite*'.

Figure 2. The paired standing stones known as The Pipers (Photograph: the author).

Figure 3. The collapsed stones of West Lanyon Quoit (Photograph: Tony Shipton).

The confusion surrounding menhirs was due in equal part to their invisibility and visibility. Some are concealed within, against or by hedges and vegetation, and despite their physical magnitude, are only revealed at close range. This is certainly the case for the paired stones known as The Pipers, which Hannah, a student of archaeology, felt were '*almost overlooked a little bit! You know, they're these massive menhirs, and I can imagine hardly anyone knows they're there!*' (Figure 2). Many more menhirs are dotted within pasture fields of the lowlands; but this presents another difficulty, perfectly encapsulated by this question from one member of the St Buryan Women's Institute following a talk I had given: '*How do you know it is so old, if it is just a stone?*'. The presence of a solitary upright slab within a grassy field might suggest purposeful positioning, but there is no indication as to when this occurred. Gateposts and the so-called rubbing posts for cattle, erected in the post-medieval and modern periods, look remarkably similar to smaller Bronze Age menhirs. This ambiguity was even noted by antiquarians (Borlase 1872, 95) and echoed by Hannah: '*If I was just walking by, I wouldn't even look at it and think 'Oh a menhir', I'd just think someone's erected a large stone*'.

Ruinous or ephemeral sites proved especially challenging for many people. Poorly preserved megalithic monuments can create the illusion of granite outcrops, or scattered eroded tor material. Referring to West Lanyon Quoit (Figure 3), retirees Ray and Graham noted: '*there's a chambered tomb* […] *but it just looks like a pile of rocks in the middle of a field, and there's lots of things like that'; 'if you didn't know it was a quoit, you'd just think…*'. Meanwhile, Agnes told me about a possible ruined stone circle that had been discovered by her daughter: '*And I said, "Could be just natural. Sometimes there's natural things*"'. It is not always easy to conclusively pick out the 'cultural' or humanly-modified elements in/of this rugged landscape. Archaeological sites can be masked within their setting; megalithic monuments and tors alike can resemble built structures. As travel writer Denys Val Baker noted: '*the area is scattered with high granite masses that, though obviously belonging to a dim past, nevertheless have a look about them of having been constructed*' (1970, 146). It takes experience to distinguish (whether visually or otherwise) archaeological features from those that are purely geological. Among practitioners of 'alternative archaeologies', such as Phil and his wife Linda, dowsing is a popular technique to determine the status of possible ancient sites.

The dense bracken scrub of the uplands can also easily mask low-lying stone and earthwork prehistoric remains. On a guided walk to the courtyard settlement of Bosullow Trehyllys, I observed participants taking time to 'get their eye in': by moving around the site as a whole and frequently changing the focus of vision so as to understand its plan and layout. Teenager Mia commented: '*you could only just sort of recognise* […] *a house*'. Sites may not marry up to expectations of form. Self-taught enthusiast Ray admitted: '*some are hard to see… you can find a line of stones and you think "That's it, is it*?"' On a guided walk across Chûn Downs, Graham and others found it difficult to pick out earthworks of enclosures amongst the furze: '*You keep saying, "Where's this bump? I can't even see it", you know*'. During interview, B&B owner Christine recalled that despite having frequently ridden her horse past the tumuli near Boskednan stone circle, '*until they were pointed out to me, I hadn't even realised they were there*'. It is not only the materiality of granite that hinders recognition of certain monuments, but also the topography and vegetation cover. The defended Neolithic tor enclosures and Iron Age hillforts and promontory forts (cliff castles) present a unique challenge for

Figure 4. The hilltop plateau of the Neolithic tor enclosure and Iron Age hillfort of Trencrom (Photograph: the author).

engagement, since they incorporate both 'natural' (*i.e.* fixed) and 'built' (*i.e.* placed) geological components.

At the tor enclosure of Trencrom, the hilltop plateau is encircled by ramparts and inner and outer walls and ditches that are comprised both of natural rock outcrops and moved boulders. A path takes a winding route around the base of the hill before taking a steep incline to the summit. The slopes are dotted with large rocks; the plateau is reached after passing through a pillared gateway and affords spectacular views to the north and the south. Having made the disorientating ascent through a scattered field of granite, for me, the material had become so familiar that archaeological features within the enclosure were inconspicuous (Figure 4). The remains of hut circles are easily mistaken for surfacing outcrops; it is difficult to tell which rocks have been moved. Even archaeology student Hannah struggled: '*I've been wandering around a hillfort all this time and had no idea whatsoever*'. Similarly, the rugged character of the coastline arguably masks earthen ramparts at cliff castles such as Gurnard's Head. To gain access to these sites, it is necessary to clamber over and through a veritable obstacle course of angular stone. In taking such an undulating route, various areas of the promontory are at once concealed and revealed. Moreover, the exposed and liminal situation—crags jutting out and descending into the sea—seems hostile to human occupation. Leah, an archaeology graduate, reflected: '*there isn't a lot to suggest it was prehistoric* […] *it was just because I was told that I knew*'.

A culture of stone

The blurring between the geological and archaeological in West Penwith has been noted by other scholars (cf. Knight and Harrison 2013; Tilley and Bennett 2001). Elaborating on an earlier synthesis (1995), Chris Tilley and co-author Wayne Bennett explore the significance of both 'natural' and constructed rock features to later prehistoric cosmologies. They argue that the district's hills, weathered tor stacks and outcrops, and solution-eroded rock basins would have held specific meanings and associations for ancient communities; and thus may be considered as 'super-natural'. Tilley and Bennett embellish upon the observed similarities between the architecture of tors and megalithic tombs (cf. Bradley 1998) to suggest that the modelling of quoits sought to echo (at a distance) the tors and their natural chambers, which may have been perceived as potent places where the ancestral beings who created the world entered and left it (Tilley and Bennett 2001, 344). Towards the end of the Neolithic, there was a shift from mimetic to additive and incorporative practice. Cairns, tor enclosures and cliff castles emphasise and enclose 'super-natural features', perhaps to appropriate and control ancestral powers. The authors attribute this to changing economic practices that necessitated different modes of engagement with the landscape (Tilley and Bennett 2001, 360).

In the historical periods, the people of West Penwith continued to use 'rocks as resources'—with the use of granite as a building material and the emergence of folktales to understand the origins of natural rock formations and megalithic monuments alike. My research indicates that geological encounters remain critical in the 21st century. Granite is omnipresent: forming the '*bones of the land*' (to cite one of my informants), outcropping as craggy cliffs and moorland tors and having been sculpted by human hands to create standing stones (whether these be menhirs, ancient crosses or rubbing posts) and the walls of field systems and buildings. Although historical folklore has been largely forgotten, it would seem that the lithic landscape still holds a certain allure and appeal for those who encounter it. Not only does the materiality of the ubiquitous granite underpin contemporary perceptions of place and the past at the Land's End, but it (and its manifestations) are imbued with other meanings and associations—which have only been touched upon here.

Conclusion

In this paper, I have presented some of the findings of my doctoral research into 21st-century perceptions of and engagements with the prehistoric archaeological heritage of West Penwith in Cornwall (Pratt 2016). A 'culture of stone' has existed here for more than 5000 years: today, local inhabitants' imaginings and interactions with place and the past are (still) mediated through geological encounters. Citing interview dialogue and field observations, I have focused here upon demonstrating that the lithic landscape can hinder the recognition and identification of megalithic monuments that occupy an '*ambiguous position in relation to the nature:culture divide*' (Basu 2010, 123). My doctoral research has gone on to interrogate individuals' engagements with specific ancient sites in West Penwith: exploring processes of knowledge- and meaning-making and 'local' identity formation and negotiation. I have challenged and complicated the claim made by

English Heritage of the 'invisibility' of prehistory within public consciousness and I have shown the potential of an ethnographic approach, utilising qualitative research methods, for eliciting the nuances of heritage at the scale of the local.

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Sacred granite

Preserving the Downpatrick High Cross

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Abstract

This paper describes the 2013–15 project to conserve and protect the Downpatrick High Cross, dating to about AD 900, by moving it to a new purpose-built extension at Down County Museum, just 150 metres from its former location outside the east end of Down Cathedral since 1897. It considers the geology of this Scripture Cross, a brief biography of the monument, its removal, conservation and replication through a major European Union grant, and its reconstruction and interpretation in a new 'Raising the Cross in Down' gallery at Down County Museum, opened in September 2015. The project to preserve the High Cross offered the opportunity to record it in detail through geological analysis, photography, illustration and photogrammetry, all of which have contributed to a re-assessment of the cultural significance of the monument. The use of Mourne granite suggests the wish to create an enduring, eternal monument with the appearance of a jewelled cross. The identification of the carved panels as being part of a scheme of symbolic communication of biblical history, from the creation of the world to the Last Judgement, and Christ's redemption of humanity, show that it was designed to have a deep impact on the individual as he or she knelt before it to pray at the outer entrance to the monastery of Dún Lethglaise. Evidence is provided that the Cross reflected the Christian identity of the medieval population, and was still central to Catholic funeral customs after the Reformation. The granite Cross became a focal point in the sacred topography of the monastic town, guarding the burial-place of St Patrick and marking the threshold of the monastery, which local people and pilgrims would have recognised as a sacred city, in effect the 'Jerusalem of Ireland'.

Keywords: Early Christian, high cross, Mourne granite, Downpatrick, conservation, replication.

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'The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased and not impaired in value. Conservation means development as much as it does protection.' Theodore Roosevelt

Introduction

In September 2015 Down County Museum completed a two-year project to move and conserve the 1100-year-old Downpatrick High Cross, and install it in a purpose-built extension constructed to the rear of the late 18th-century gaol building in which the Museum is located. The High Cross had stood outside the east end of Down Cathedral for 116 years but was badly worn due to weathering, organic growth and deliberate damage. This paper traces the development of the project to preserve and interpret the High Cross, from planning through to completion, and explores some of the cultural issues surrounding its creation, history and future.

The aims of the project were to stop the deterioration of the monument and conserve it for future generations to appreciate, to replace the High Cross with a high-quality replica in Mourne granite outside the east end of Down Cathedral, and to make the original Cross the centre-piece of an interpretative display of Early Christian heritage in a new extension at Down County Museum.

Geology of the Cross

The stone used for the Downpatrick High Cross has been identified by geologist Ian Meighan as G2 coarse-grained Outer Mourne granite (Meighan 2014). This rock was formed over 56 million years ago and is notable for its pink and white feldspar, dark shiny quartz and black biotite mica inclusions. The stone therefore sparkles in sunlight, and this may be one reason why such a hard stone was selected for carving by the patron and sculptor of the Downpatrick High Cross. They could also have selected Mourne granite in order to depict the biblical story of the world on a substance perceived as going back to the creation of the world itself and possessing an 'eternal' quality reflecting the Christian imagery carved on its surfaces. Furthermore, it may be significant that the Mournes are clearly visible from the Hill of Down, so that the selection of Mourne granite may have been a symbolic as well as a practical decision. The makers of the Cross may have recognised Slieve Donard as a holy mountain, associated with St Patrick and St Donard by this time (Moore 2012, 57–67).

The slabs of granite required for the High Cross were probably sourced somewhere near the Bloody Bridge River on the southern approach to Slieve Donard, and transported to the shore for carriage by boat around the County Down coast, through the Narrows into Strangford Lough, and finally up the River Quoile to the Hill of Down. A similar route into Strangford Lough has been proposed for the transportation of G2 Mourne granite millstones for use in the early medieval tidal mill at Nendrum monastery on Mahee Island in Strangford Lough (Meighan 2007).

Brief biography of the Cross

The Downpatrick High Cross is a Scripture Cross carved in relief mainly with biblical images and was probably set up in the decades before or after the year AD 900 (Harbison 1992), at the eastern entrance to the hill-top monastery of Dún Lethglaise, first mentioned in the annals in AD 753. Irish high crosses were often put up to mark the sacred ground, boundary or entrance of a monastery, while some were probably erected to mark an important event or a place connected to a local saint or founder. The placing of inscriptions on the bases of some high crosses suggests that people knelt in front of them to pray (Higgitt 1986, 127). The figures on the scripture crosses would have provided ample subjects for meditation, and acted as a reminder of the suffering and ultimate triumph of Christ. Such subjects would also have been suitable for those doing penance.

Our first evidence for the location of the Downpatrick High Cross suggests that it was originally the focus of the monastic town of Dún Lethglaise, situated at the outer entrance to the monastery, later to become known as the Market Cross at the junction of English Street, Scotch Street and Irish Street in the centre of the town of Downpatrick. Records show that the coffin of William Merriman was carried once around the Market Cross in the town as part of a Catholic funeral service on 9th December 1617 (MacCuarta 2007, 322). This custom reflects the importance of the Cross for the Catholic community, as a monument taking centre-stage in the life of the medieval town, representing in material and imagery their local cultural identity and their religious view of the universe. In making a clockwise circuit of the ancient Cross, made from an enduring local bedrock of God's created world, the soul of the departed was symbolically confirmed as a participant in the story of creation and redemption depicted on the Cross, and subject to the Last Judgement shown on its head.

A Cross of St Moninna mentioned in this vicinity, in a charter of John de Courcy prior to 1183, may indeed be identical to this Cross (Rankin 1997, 27). One source suggests that the High Cross was dismantled in 1729 (Cleland 1846), and certainly by 1744 three fragments were located outside the Courthouse on English Street (Harris 1744, 32):

> '*Near the Court-house in the Street lie several Pieces of an old Stone Cross…it is generally called the Market Cross; yet probably stood in one of the Church Yards… the Pedestal is in one solid Stone, on Form of a Cube, about three Feet high, the Shaft or Pillar twelve inches by sixteen, and five Feet high, and the Cross about four Feet high, all of a stone called the Lapis Molaris or Grit.*'

The fragments listed here would have made the High Cross 12 ft, or 3.66 m, high if it had been reconstructed, but the pieces appear to have been dispersed after 1744. The cross-shaft was re-used as a gate-post at some point after Harris saw them. Fortunately, both the cross-head and shaft were salvaged and made available to the Belfast Naturalists' Field Club when members proposed reconstructing the High Cross outside the east end of Down Cathedral, under the direction of Francis Joseph Bigger and William Fennell in the 1890s (Bigger 1891). The cross-head was given by Major R. H. Wallace, having been stored in his manure yard in English Street, and the cross-shaft was given by Rev. P. O'Kane, P.P., who had preserved it outside the Catholic Church (King 2014b). The reconstruction of the High Cross, at a cost of £10 and 10 shillings, by S. & T. Hastings Stonemasons of Church Street,

Figure 1. The architect William Fennell standing by the Downpatrick High Cross, soon after its reconstruction in June 1897 (Photograph: Gibson of Downpatrick).

Downpatrick, under the supervision of the Belfast architect William Fennell, on 26th June 1897, is well recorded (Bigger and Fennell 1897).

The *Down Recorder* newspaper of 26th June 1897 mentions a time capsule being placed under the Cross, which consisted of a bottle containing copies of the *Newsletter*, the *Recorder*, and the last issue of the *Ulster Journal of Archaeology*, together with a current programme of the Belfast Naturalists' Field Club and an account written on

parchment of the work of restoring the Cross. A trough or socket stone formerly in the possession of Mr R. Denvir was used as a base stone, set on a thick layer of concrete, and a newly carved pedestal made from Newry granite was placed between the base and the original cross-shaft, to provide a full height of 3.45m (Figure 1).

Deterioration of the carvings

Although the Cross was perceived by its makers as a permanent monument, made from a stone expected to stand the test of time, the monument has clearly suffered from the actions of both people and the environment. The gradual weathering and biodeterioration of the monument was noted by archaeologist Cormac Bourke (Bourke 1991) and conservator Malcolm Fry (Fry and Martin 2001, 81–82). Comparison of black-and-white photographs of the Cross, dating to about 1900, with modern images clearly showed considerable losses of carved detail due to weathering, exacerbated by environmental pollution. Both experts supported the idea of moving the High Cross a short distance to the neighbouring Down County Museum, where it could be preserved under cover and interpreted for visitors (Bourke 1991; Fry 1995, 15). A conservation report on the monument in 2011 by Graciela Ainsworth noted organic growth, natural fractures developing in the stone and insect infestation. Lichen and moss had established themselves in various locations and would need to be removed. The possibility of further deliberate or accidental damage to the High Cross was also a consideration. The rounded corner mouldings of the cross-shaft had already been removed through fragments being chipped off, probably when it was re-used as a gate-post. This period of re-use and neglect would also account for the creation of a pyramidal tenon, and the partial removal of the carved panels depicting Adam and Eve (east side) and the Presentation in the Temple (west side) at the base of the shaft.

Genesis of the project

Although the conservation needs of the High Cross were therefore clear, the method of protection required careful consideration. Alternatives to moving the Cross inside, as had been achieved successfully at Clonmacnoise (King 1992) and Cashel (Lynch 1983, 11), would be to cover it with a roofed structure, as had been done for the Kells Market Cross, or encase it in a large glass shelter, similar to those built for Sueno's Stone and the Shandwick Pictish cross-slab in Scotland (Foster 2001, 21–25). Neither of the last two options would eliminate the organic growth, fractures and infestations affecting the monument. Additionally, serious doubts about the desirability of boxing in a monument in glass have arisen due to the adverse visual impact and the potential greenhouse-effect that this approach can create. A closed glass box can trap humidity and condensation, creating an unnatural climate around stone surfaces, and can lead to further conservation problems (Fry 1995, 13–14).

The success of the short-distance High Cross moves and replica replacements at Clonmacnoise and Cashel signalled that the option of providing a high quality Cross replica was a real possibility in Downpatrick. The solution to the problem lay partly in the hands of the owners of the Cross, the Dean and Chapter of Down Cathedral, and partly in the decision of the Environment and Heritage Service of the Department of

the Environment as to the best course to follow. Both parties approved the move of the Cross, and its long-term loan, to Down County Museum, located only 150 metres from the site of the Cross outside the east end of Down Cathedral, as a suitable venue for its protection, interpretation and display. Crucially, the Cross was not in its original position, but had been moved several times previously. If moved, it was clear that the production of a high-quality replica would be required, to replace the original in its last location, where it had stood for 116 years. The Department of the Environment was prepared to fund the creation of such a replica.

In order to house the High Cross, the Museum would have to find major funding for such a conservation project. Fortunately, Downpatrick has close historical connections with St Patrick's mission and legacy, and had been recognised as a key hub on the Northern Ireland Tourist Board's (now TourismNI) signature project, the St Patrick Trail. As such, the preservation and interpretation of one of Ireland's iconic High Crosses, at the location in Ireland most closely linked to St Patrick's mission, was seen as a considerable tourism opportunity. Down District Council therefore put forward the project to move the Cross to the Museum as a flagship scheme in the East Border Region's Tourism Development Plan. This was to be funded by the INTERREG IVA Cross Border Programme, supported by the Special European Union's Programme Body to the sum of £500,000. In this way, key conservation and tourism outcomes could both be met through the Museum's Downpatrick High Cross Extension Project.

The Council agreed to fund the balance of the project, £103,000, and to provide designs and costs for a 12 m by 18 m two-storey extension to the Museum in its rear garden area. This would also include a new tearoom and galleries dedicated to the farming and maritime history of County Down, and the history of the gaol in which the Museum was located. Planning permission was secured on this basis, and, as required, an archaeological excavation was carried out on the site, with no significant archaeological features being identified. The way was now clear to progress the two key aspects of the project in parallel—the moving and conservation of the High Cross, between December 2013 and April 2015, and the construction of its new home at the Museum, between July 2014 and June 2015.

Removal and conservation

Down County Museum was fortunate to receive £45,000 from the Environment and Heritage Service of the Department of the Environment (DoE), now the Historic Environment Division of the Department for Communities, for four elements of the Downpatrick High Cross project, namely the moving, conservation and replication of the High Cross, and the production of a new socket stone for the original Cross in the new Museum extension. Prior to its removal, S. McConnell and Sons carried out a full scan using a hand-held portable Artec 3D scanner, so that a 3-dimensional model could be created for producing the replica. Once the DoE had granted Scheduled Monument Consent for the removal of the High Cross, it was therefore possible for the appointed conservators, Cliveden Conservation, to move it into the Museum.

On 6th December, the cross-head, measuring 1.2 m wide and 0.92 m high, and weighing 480 kg, was successfully removed from the shaft and carefully transported to temporary storage in Down County Museum. The cross-head had been secured

solely by a slate dowel, held in place by cement poured in through a circular aperture made in the side of the cross-head. Unfortunately, a change in the weather meant that the cross-shaft could not be successfully removed in December 2013; this was accomplished in February 2014. Both sections of the High Cross were then cleaned and recorded in the Museum, in order to inform plans for its reconstruction in 2015.

The removal of a granite-based cement mix on the top of the cross-head revealed the remains of a rectangular socket-hole with sloping sides, which must have held the tenon on the base of a house-shaped capstone, now lost. A centrally-drilled round hole in the base of this socket-hole appears to have been made by masons from S. & T. Hastings and Co. in 1897, to hold upright a mason's steel point, used as an armature to hold the cement fill in place. The mason's point was retained for display, and the drilled hole was later re-used to hold a 20 mm diameter steel rod to fix in place a new capstone.

At the foot of the cross-shaft, it was clear that perhaps 25 cm of the decorated surface of the shaft was missing, deliberately removed to create a tenon, which had been inserted into the new pedestal stone of Newry granite in 1897. Although it was not possible to re-instate the missing section of the cross-shaft, the tenon was later to serve a very useful function in the reconstruction of the High Cross in the Museum.

Replication

The production of the replica High Cross was placed in the safe hands of S. McConnell and Sons of Kilkeel, who had previously made the replica of the Drumadonnell High Cross, erected in Castlewellan in 2005. The G2 fine-grained Inner Mourne granite blocks for the cross-shaft and cross-head were sourced from the only quarry now supplying Mourne granite, on Thomas' Mountain above Newcastle, in December 2013. They were cut to shape by primary and secondary saws, prior to automated carving of each surface using a CNC (computerised numerical control) machine. Three different routers were used in succession to bring the carvings to within a millimetre accuracy, using the model created by the Artec Studio software. A time-lapse film of the drilling was made to assist understanding of this process in the final exhibition.

A new pedestal section made from Newry granite was also commissioned. This was to the exact proportions of the block added beneath the Cross in 1897, since portions of this block had to be cut away to release the tenon of the cross-shaft in February 2014. The objective was to recreate the profile of the High Cross familiar to local people and visitors for over a century, rather than to change its appearance.

When the sections of the Cross had been finished by careful hand-carving, to remove signs of machining, they were ready for reconstruction at the east end of Down Cathedral. The replica was erected on 16th April 2014, just before Easter, using steel rods to connect the sections together (Figure 2). The only visual difference was the brighter surface of the freshly-quarried and newly-carved fine-grained G2 granite in comparison with the duller more weathered appearance of the original, carved from coarse-grained G2 granite. However, we now have an idea of how the High Cross may have appeared when newly-carved in about AD900. Although it has been suggested that the high crosses were painted, no evidence for this has so far been found (Harbison 1992, 351). Indeed, it would have been counter-productive to paint the original Downpatrick High Cross. It is likely that the sparkling effect of the quartz in the granite, especially in direct sunlight,

Figure 2. The replica High Cross being put into position on 16th April 2014 (Photograph: the author).

was intentional. The glittering High Cross would have been a fitting reminder of the gem-covered cross installed at Golgotha, outside the ancient walls of Jerusalem, by the emperor Theodosius II, in AD 417—during the lifetime of St Patrick. In due course, we will be able to monitor the replica for any weathering and change in colour.

Orientation

By analogy with other high crosses, it is clear that the Victorian orientation of the Downpatrick High Cross was incorrect, and was probably guided by the desire to orientate the Crucifixion scene towards the viewer approaching Down Cathedral from the Mall. As the most recognisable scene surviving on the Cross, its orientation towards the east in this instance was understandable. However, *in situ* high crosses such as that at Arboe in County Tyrone display the Crucifixion facing west, and this led to the decision to imitate this western orientation in the reconstruction of the Cross in the new Museum gallery. In setting up the replica, the same (eastern) orientation of the Crucifixion was selected as in 1897, in order to replicate exactly what had preceded it, and to pay respect to the achievement of Francis Joseph Bigger and William Fennell in 1897.

Reconstruction

The aim of the rebuilding of the High Cross in the 'Raising the Cross in Down' exhibition in the new extension was to recreate, as far as possible, its shape in about AD 900, using the original cross-head and shaft and a replica socket stone and capstone. The replica parts were modelled using surviving evidence and comparators for guidance. This reconstruction offered a different approach to that taken by Bigger and Fennell.

The original socket stone was referred to as a cube roughly 3 feet in height (Harris 1744, 32). The large stone in the Cathedral used as a font since 1931, and formerly

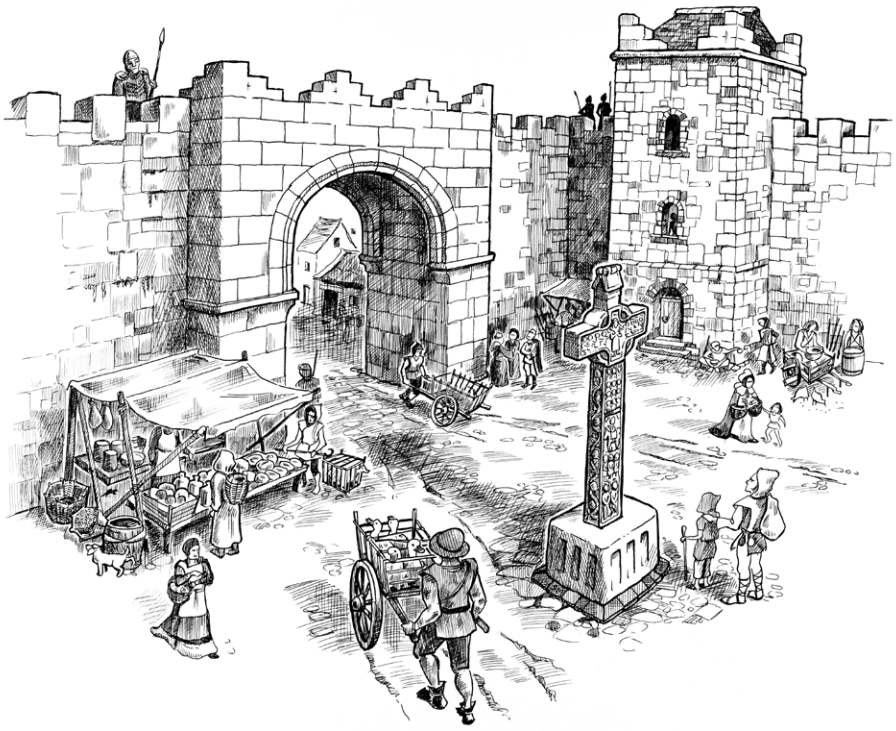


Figure 3. The Downpatrick High Cross, as it may have appeared in its original position between c. AD 900 and 1729 (drawing by Steve Murphy).

used as a water trough in a yard in English Street, conforms to these measurements in plan, but shows signs of having been split laterally at the base using wedges. It therefore seems likely that the font is the top half of the original socket stone for the Downpatrick High Cross. The vertical sunken panels on the sides are reminiscent of the decoration of the cuboid socket stone of the Drumadonnell Cross (Harbison 2014, 39–40), also from County Down. The symmetrical key pattern on the east side of the font is found at locations around the Irish Sea in the late ninth and early tenth centuries. This fits with the dating of the cross-shaft and cross-head of the Downpatrick High Cross (Allen and Anderson 1903, 335). Ian Meighan, collaborating with Peter Harbison, has identified the stone of the font as the same type of Mourne granite used for the other two sections of the Cross (Harbison 2014, 39).

It was therefore decided that a replica socket stone based on the Cathedral font would be made by McConnells of Kilkeel, to hold the original High Cross and reproduce something approaching its original appearance at the foot of English Street, between about AD 900 and 1729 (Figure 3). The font was scanned and a digital model created. The replica socket stone subsequently manufactured weighed almost 2 tonnes, and was made 80 cm high so that it could still be moved through the narrow doorways of the old gaol, in which the Museum was located. A central socket hole allowed for the insertion of the tenon at the base of the cut-down cross-shaft.

The damaged rectangular socket hole on the top of the cross-head provided evidence of a lost capstone, which had been made separately. Investigations led to the identification of a house-shaped capstone with a tenon from Tihilly, County Offaly, available for close

study in the collections of the Archaeology Department of University College Dublin. It was therefore decided that a two-part capstone for the Cross reconstruction would be modelled by S. McConnell and Sons on this example. They moulded the under-side of a platform section to the damaged socket-hole on top of the cross-head, and fixed a house-shaped section into place above this, using a 20 mm diameter steel rod through both.

Given the combined weight of the High Cross fragments of just over 3 tonnes, the architects ensured that a reinforced concrete floor was included beneath its intended location in the gallery. The height of the ceiling was also considered crucial, to allow for the extra height of the socket stone and capstone, and facilitate effective lighting of the monument from above.

Once the production of the new sections of the High Cross had been timetabled, a programme for its reconstruction by Cliveden Conservation was set for the week of 20th–24th April 2015. The process of rebuilding the Cross was carefully recorded, and its completion initiated the creation of a new exhibition. This included a film documenting the project, shown in the new 'Raising the Cross in Down' gallery, in order to interpret it and place it in its historical context (Figure 4).

Interpretation

One of the key benefits of moving the High Cross inside was the opportunity to light the carvings of the Cross to good effect and interpret them for the public. Although the interpretation of the worn carvings appeared a difficult task, some biblical scenes on the Cross had been tentatively identified (Harbison 1992). The move and study of the Cross presented a challenge to provide a fuller interpretation of this important Scripture Cross, which had been erected in a town with such close associations with St Patrick. Photographic recording of the High Cross by Tony Corey of the Historic Environment Division of the DoE assisted greatly in the interpretation of the carvings. Careful study of other Irish Scripture Crosses provided clues to the identification of scenes and allowed James Patience (DoE) to create drawings of how the carvings on the west, east and south sides of the Cross appeared (Figure 5a–b). John Meneely of the School of Natural and Built Environment, Queen's University Belfast, made a photogrammetric survey of the Cross, which has helped with the identification of a number of subjects among the worn carvings.

Although the lowest scene on the west side of the Cross has been cut down, and the figures have lost their lower bodies, close examination and photogrammetry have revealed the head and shoulders of a person on the left, holding out a child to another individual on the right (Figure 6). The child's legs may be seen dangling below the outstretched arms of the left-hand figure. By analogy with other early medieval scenes of this type, such as an illumination in the early 9th-century Corbie Psalter (f. 137), this image appears to show the presentation of Christ by the Virgin to Simeon in the Temple, who is the first to recognise him as the Saviour, and reaches out to receive Him with veiled hands (Luke 2: 22–39; Humphrey and King 2014).

Above this image from Christ's nativity, the two central carvings on the cross-shaft appear to show scenes from Christ's Passion. The second scene from the base shows three figures, all 30 cm tall, with the heads of a further three figures above them, giving the impression of a crowd scene. Although worn, the proximity of the two figures on the

Figure 4. The original High Cross installed in the 'Raising the Cross in Down' exhibition in the new extension at Down County Museum, in September 2015 (Photograph: Peadar Curran).

left and in the centre of this crowd, and the disembodied heads of the figures behind them, suggest a comparison with the ivory carving of the Kiss of Judas at the Arrest of Christ on the 9th-century Carolingian Cranenburg Situla, a vessel for holy water, now in the Metropolitan Museum in New York. The three worn figures above this scene, again 30 cm tall, are reminiscent of the carving below the cross-head Crucifixion on the contemporary Arboe High Cross, depicting two Roman soldiers taking away a purple cloak and mocking Christ with the words 'Ecce Rex Judaeorum' (Matt. 27: 27–31).

The uppermost scene is also worn, but appears to show two seated figures with large heads. The gaps between the legs of their chairs are visible beneath them. They appear to hold something round between them and a central protrusion appears above their heads. All these features suggest a very worn depiction of the two desert saints, St Antony and St Paul, meeting in St Paul's cave shortly before his death in about AD 346, breaking a loaf of bread between them, delivered to them by a raven from above. This image is frequently found near the Crucifixion on Irish High Crosses, as the two saints were highly regarded by Irish monks as the fathers of monasticism, while their breaking of bread was seen as a symbol of the Eucharist (O'Carragain 1988, King 2013).

Taking all these interpretations together, it is possible to see the west face of the Downpatrick High Cross as representing the theme of the Recognition of Christ. He is first recognised by Simeon in the Temple, and later by Judas and the Roman soldiers. Subsequently, he was acknowledged symbolically by the first hermits Antony and Paul, who came after Christ and recognised Him in the Eucharist, as did the Irish patrons of the Cross themselves (Figure 7a). This theme extends to the Crucifixion scene on the cross-head. Here, the blind spear-bearer, Longinus, to the lower right of Christ, was able to see and recognise Him when blood flowed from Christ's wounds into his eyes. Similarly, the Good Thief, depicted on the left arm of the cross-head, is said to have recognised Christ and gone to Heaven, in contrast to the Bad Thief on the right (Humphrey and King 2014).

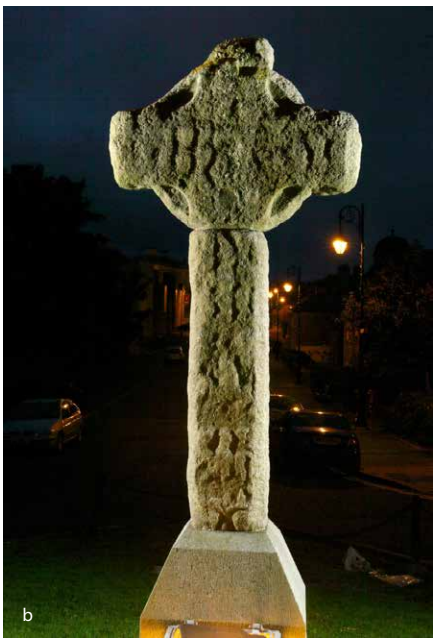
Figures 5a–b. Drawings of the west and east sides of the cross as they may have originally appeared (Drawings by James Patience, DfC).

A similar overriding theme appears to be detectable on the east face of the Cross (Figure 7b). Although their bodies are lost, the heads of Adam and Eve have been identified at the base. A good case has been made for identifying the three figures above as Cain, on the right, about to strike Abel in the centre, with God the Father witnessing the first murder in biblical history, on the left (Harbison 1992, 68). These two scenes suggest the theme of Original Sin frequently found at the base of Irish High Crosses. A rider on an ass facing left above these carvings could be seen as problematic, unless we see here the figure of Christ entering Jerusalem. The presence of a Last Judgement scene on the east side of the cross-head is suggested by figures processing either side of a very

Figure 6. Photogrammetric image of the lowest carved panel on the western side of the High Cross depicting the Virgin presenting the Christchild to Simeon in the Temple (John Meneely, QUB).

worn central figure of Christ the Judge. Although the scene of rows of heads or busts at the top of the cross-shaft is again very worn, it is possible that this represents the Second Coming of Christ, when compared with a similar scene at the top of the east side of the shaft of the Arboe High Cross. If this is the case, we could interpret this side of the High Cross as presenting the Redemption offered by Christ; the chance for every Christian to enter the Heavenly Jerusalem with Christ, and reject the Original Sin of Adam and Eve. The story is a momentous one that encompasses the biblical history of the World, from the Creation to the Last Judgement (King 2014a). Significantly, this side of the Cross faced the viewer as he or she approached the entrance that led to the monastic site on the Hill of Down, echoing the imagery of Christ entering Jerusalem on the Cross itself. This imagery may have been a deliberate attempt to portray the monastery of Down—where it was believed St Patrick was buried— as the Jerusalem of Ireland.

Although the south side of the Cross has little ornament surviving, the north side exhibits a complex interlace pattern formed from two strands. This design has been drawn by James Patience and used to decorate a series of display panels in the 'Raising the Cross in Down' exhibition. This aims to tell the story of the Downpatrick High Cross as part of the story of the development of Christianity in the local area, encompassing St Patrick's mission and legacy. The display includes a range of other early medieval stone crosses and artefacts, photographs of local Early Christian sites, finds from past excavations on the Hill of Down, and reconstruction paintings of the medieval landscape by Philip Armstrong. The missing lower section of the east side of the Cross, depicting Adam and Eve, has been recreated in granite by stonecarver Clare Sampson. A tactile relief carving in granite of the Crucifixion on the cross-head has been produced by McConnells, for the benefit of visually-impaired visitors in particu-



Figures 7a–b. The original west and east sides of the High Cross pictured prior to its removal to Down County Museum (Photographs: Tony Corey, DfC).

lar. An information plaque next to the replica High Cross outside the Cathedral has been provided to direct visitors to the Museum to see the original High Cross if they wish.

Last Judgement

The conservation of the monument, the attempt to recreate something approaching the original appearance of the Cross, and a suggested interpretation of its meaning are the main benefits of the project. In the process, we have also learnt how the material to make the Cross, and its placing in the centre of the developing monastic town, outside the gateway to the monastery, were deeply symbolic. The granite was sourced in the Mournes, which are visible from the Hill of Down, and represented a substance which, for the makers, could be associated with the beginning of time itself, but which possessed an enduring eternal quality and a jewelled appearance appropriate for the portrayal of the story of Christian salvation. Simply stated, the stone was seen as a material which could link this life with the next.

Transplanted to the centre of the nascent town, outside the eastern gateway to the monastery of Dún Lethglaise, the granite of the Cross became part of the sacred topography of the settlement, guarding the burial-place of St Patrick and marking the threshold of the sacred city, in effect the 'Jerusalem of Ireland'. The carvings on the Cross not only represented the biblical history of the world and the great story of redemption, of which Patrick was a part, but also invited the individual to recognise Christ on a personal level, and to kneel and pray at the entrance to the monastery. As such the Cross reflected the Christian identity of the pop-

ulation, and was still central to Catholic funeral customs after the Reformation. Though subsequently dismantled and neglected, the importance of this 'Town Cross' was never forgotten, with the reconstructions of 1897 and 2015 reflecting Gaelic Revival and modern-day conservation-driven attempts to preserve the monument and restore its central place in the life of the community.

Although it is no longer possible to place either the original or a replica in the monument's original location in the centre of the town, the placing of a high quality replica in the same material outside Down Cathedral will ensure that a familiar landmark is still accessible to everyone. Crucially, the reconstruction of the original in Down County Museum, with replicated socket stone and capstone, is fully reversible, and it will be possible for future generations to re-engage with this monument, as technology and society move ever onwards.

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Part Three

Stone in Ritual Space and Practice

‘Living stones built up’

Symbolism in Irish round towers

Sarah Kerr

Abstract

The study of Irish ecclesiastical round towers has all but stagnated with the conclusion that they were constructed as belfries. A number of secondary functions are listed in the annals such as repositories, sanctuaries, lookouts, and status indicators. In previous studies the actual fabric of round towers has been dismissed; therefore, this paper summarises the results of a sample survey of extant round towers, in which the fabric itself was examined. The results argue that the fabric reveals a symbolic function related to ecclesiastical ritual. This is based on the degree of aesthetic quality of the masonry and the evidence for its development towards ashlar masonry. It is argued that the masonry was left exposed, that is not rendered, allowing the stones to be seen. The symbolic purpose of stone will be discussed as well as the physical context of the round tower in the ecclesiastical centre.

Keywords: round towers, masonry, ecclessiastical ritual and symbolism, Ireland.

Introduction

Irish ecclesiastical round towers are free-standing cylindrical towers with homogenous features built between the early 10th and the mid-13th centuries (Barrow 1979, 13; Ní Ghrádaigh 2007, 110). Those which survive in Ireland provide vital evidence of the relationship between early-medieval people and ecclesiastical buildings, as well as the stone with which the buildings were constructed.

This paper discusses the fabric of round towers, from the stone type to the degree of coursing, use of spalls, length of stone used, and how together these factors contributed to the visual quality of the masonry. In turn, the extent of the relationship between aesthetic quality and symbolism will be evaluated. The function of round towers has been debated since Petrie (1845) and the conclusion has rested on the view

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of a multi-functional building. However, this is based on the evidence of their use rather than the function for which they were built specifically. This paper approaches the discussion by focusing on the masonry quality and its symbolic function.

The substantial contributions from the last century elucidated that the round tower was not an indigenous Irish invention (Lalor 1999, 49) and the inspiration is likely to have derived in the Rhineland or Italy. Lalor (1999) posited the likely origins were the engaged towers of France and Germany; such as St Michael's, Hildesheim, which was built in the early 11th century and had four engaged bell-towers with conical caps and windows below the cornice. Others argued a direct link with the free-standing towers of the Ravenna region of Italy; however, this is difficult chronologically as many Ravenna belfries were built at the beginning of the 11th century, for example the tower at Sant' Apollinare Nuovo in Ravenna (Lalor 1991, 49), while there are Irish examples from AD 950. Ó Carragáin (2010) suggests that the virtually simultaneous construction of round towers in these regions was the result of independent expressions of a similar preoccupation with the past.

Function of round towers

There is evidence of 90 round towers which once stood throughout Ireland; 65 are extant in the archaeological record to some degree, with a further two in Scotland and one on the Isle of Man. The homogeneity of round towers means they are easily recognisable, not least because of their height. Of the examples which remain close to their full height, Kilmacduagh, County Galway, stands to almost 35 metres; Fertagh, County Kilkenny is 31 metres to the cornice; and Glendalough, County Wicklow is just over 30 m (100 ft) in height. The disparity between height of the Irish round tower and its associated church is not seen elsewhere; for example, the European cases named above are similar in height to their related churches. The great height may be attributed to the supposed 'perfect' properties of the number one hundred, as cited in the Old and New testaments and insular exegesis (Ó Carragáin 2010, 63). One of the earliest round towers, potentially even the first, was constructed at Armagh in the early 10th century. Although the round tower is now lost, it may have been built to match the height of the associated church, and subsequent round towers may have emulated this early example (Ó Carragáin 2010, 63). Reproducing the round tower of Armagh elsewhere would have caused the disproportion in height between church and round tower, as the early-medieval churches were characteristically small in stature.

The homogeneity of round towers is further perceived in the external circumference, which ranged from fourteen to fifteen metres, and the wall thickness which was around one metre. The thickness of the wall decreased with the increase in height to aid stability of the structure. All towers had a conical roof or *bencobbar*, sitting atop the cornice. One such roof remains in-situ at Clondalkin, County Dublin. They had one window for each floor within the tower, however the number of floors varied across the examples. Just below the cornice at the top of the tower, they often had four windows, each pointing to a cardinal point or thereabouts. Other standardised features include a solid floor, constructed of circular foundation courses with a rubble-filled centre. It is somewhat surprising that the foundations extend only to a depth of one metre given the height of the towers. Not all features of round towers are uniform, rather some elements display only a similarity to other examples. For example, the doors are often

located at varying heights above the ground, such as over eight metres at Kilmacduagh, while other examples are situated at ground-level. In these instances, it is attributed to up-filling of the surrounding ecclesiastical site. The similarities, particularly with the height and circumference, suggest that the builder was working to a formula which intended the height of the round tower to be twice its circumference (Stalley 2001, 37, 39; O'Keeffe 2004, 60; Ó Carragáin 2010, 112). This suggests that round towers were built for the same purpose, even if they were not used solely for this function or functions in actuality.

The function of a building is twofold: the intended function for which they were built and how they were used in reality. The intended function of round towers has been debated throughout the literature, and since the 1990s, the consensus is that of belfry (Ó Carragáin 2010, 161; Lalor 1999, 67; Edwards 1990, 128; Stalley 2000, 11). Secondary functions, such as repositories, sanctuaries for the *civitas*, lookouts and status indicators, have also been evaluated; these appear to be how the buildings were used rather than their intended function (Ó Carragáin 2010, 13). Consequently, an exploration of the round towers' fabric suggests a primary function related to ecclesiastical symbolism and ritual. This function may have been more important than the round towers use as a belfry.

The word *cloicthech*, meaning literally 'bell house', was first mentioned in the Irish annals in relation to Slane, County Meath, in AD 950 (Mac Airt and Mac Niocaill 1983, 395). There is no *cloicthech* reference before this and the last reference, in 1238, relates to the construction of Annaghdown round tower, County Galway (Hennessy 1871, 349). Of the twenty-four round tower references in the annals, two relate to the year of construction or completion and nineteen to the complete destruction or significant damage, often by lightning or intentional fire (O'Keeffe 2004, 19–21). The final three references note a murder taking place at a tower, the death of a patron, and one being plundered but not burnt (*ibid.*).

The early medieval period saw the spread of ecclesiastical belfries across Europe, coinciding with the introduction of the cast bronze bell (McDonnell 2004, 71). There are two references in the annals to the presence of bells; Armagh, County Armagh, was burnt in 1020 '*with its bells*', while the '*foreigners*' burnt Slane and '*the best of all bells*' in AD 950 (Mac Airt and Mac Niocaill 1983, 457, 395). There is no architectural evidence remaining to suggest bells were attached within the towers, due largely to the collapse and reconstruction of the top of towers and the lack of surviving flooring; however, hand-held bells may have been used from within the tower. Some manner of suspended bell is more likely, although the sound of hand-held bells could have projected a great distance due to their height above the ground (Edwards 1990, 128; Stokes 1978, 82). It is unfortunate that bells have not survived, except one possible example from Glendalough, County Wicklow (pers. comm. Cormac Bourke). There is no other building from the early medieval period more suited to the purpose of belfry.

The surviving textual references indicate the secondary functions of the round tower. These appear to be the result of the adaptation of the building to satisfy requirements as they arose, rather than the purpose for which the round tower was built. Their purpose as ecclesiastical keeps was strongly argued by Petrie (1845) and Stokes (1878), based on the narrow door raised above the ground and few windows at the lower levels of the drum (circular wall forming the tower). The evidence from the annals of *cloicthech* burnings and attacks appears to support this, as they refer to the burning of

Monasterboice, County Louth, in 1097 which included its '*books and many treasures*' (Petrie 1845, 369; Mac Airt and Mac Niocaill 1983, 533). Similarly, when Slane round tower was burnt, it included '*The founder's episcopal staff … the lector Caenachair and a large number with him*' (Mac Airt and Mac Niocaill 1983, 395). This suggests that they may have also been keeps for the community; however, it is rather unlikely the towers were built for this purpose. A ladder could not be pulled inside the tower due to the position of the wooden floors and it seems unlikely that groups of people would climb a rope to seek protection in haste (Stalley 2001, 29). Furthermore, the towers are noticeable from many miles away. This would have attracted the community to the ecclesiastical centre, aided the travel of bell-ringing, and acted as a status indicator of the founder; however, it also signalled the location of wealth and important people to, for example, the Vikings. With this in mind, it is likely that the high doors' main function was to aid structurally stability and those killed in the towers may have entered thinking they would have some sanctuary from attackers (O'Keeffe 2003, 74).

The development of masonry quality

Dating the masonry of round towers is problematic; as Stokes observed in 1878, attempting to classify them is '*replete with difficulty*' (Stokes 1878, 56). Since then, the use of masonry as a method of dating has been dismissed. As Leask states, '*it is not possible to arrive at definitive dating from masonry types*' and the use of large stones is '*an un-datable building custom*' (Leask 1955, 67). More recently, Lalor has stated that '*Dating is not an explanation for such differences*' in masonry quality (Lalor 1999, 79) and that there are '*no radical variations over a 250 year span*' (*ibid.*, 62). Lalor uses the masonry design to construct a typology; however, as the early examples had no decorated masonry, he can only conclude that those with Romanesque doors date from the 12th century and those without are earlier (*ibid.*, 64). The general reluctance to use this method may be due to failed attempts to date churches this way, by Petrie (1845) and Phipps (1939), which gave unacceptably early dates which have since been dismissed. Despite this, round tower masonry quality, which is the aesthetic quality of the exterior of the structure, varies throughout the extant examples. This requires further exploration.

Accomplished masonry quality was determined by the following aspects: coursing, stone cutting, use of spalls (small fragments of stone), and length of stones. The continuous line, or course, of masonry could be constructed of water-rounded stone or fieldstones; however, for stones to fit together tightly, without the use of spalls, they had to be cut horizontally and vertically to create a brick-like shape. Length of stone is significant as it requires the face of the stone to be dressed in respect of the tower's curvature. It appears from a sample survey of twenty round towers (Kerr 2009) that these features developed over the duration of the early medieval period until the beginning of the Romanesque. The evidence indicates that early round towers, such as Antrim, were constructed of naturally rounded stones, roughly coursed, with heavy use of spalls. Later round towers, such as Kells, County Meath, displayed long stones cut to the curve of the tower, set in uniform courses with few spalls. This development towards ashlar (finely worked stone) or near-ashlar masonry indicates an awareness of the aesthetic quality of the fabric. Ashlar did not increase the structural integrity of the round tower; it was a form of display.

Figure 1. Clones, County Monaghan, is a Type 1 round tower with poor masonry quality (Source: Kerr 2011).

A sample selection of round towers were surveyed and categorised into types based on their masonry quality (Kerr 2009; 2011). The subsequent typology correlates to the dates of construction suggested by Lalor (1999) and Barrow (1979), indicating a strong relationship between date of construction and masonry quality. The earliest round towers in the sample, labelled Type 1, exhibit the lowest level of masonry quality; while Type 2 shows a progression resulting in improved aesthetics. For example, Type 1 round tower at Clones, County Monaghan (Figure 1), was constructed of stone and spalls in irregular courses, whereas a Type 2 example, such as Inishkeen, County Monaghan, had more regular courses and fewer spalls (Figure 2). Type 3, for example Armoy, County Antrim (Figure 3), and Type 4, such as Glendalough, County Wicklow (Figure 4), show even further developments in masonry quality. Type 5 examples, such as Donaghmore, County Meath, have the most accomplished masonry, comparable to ashlar in pre-Romanesque round towers (Figure 5). Type 5 round towers were followed by those built during the Romanesque period. The majority of examples from the 12th century display the apogee of masonry quality: true or almost ashlar masonry. For example, Devenish I, County Fermanagh, was constructed of well-dressed and cut sandstone, some of which were particularly large and cut to the curve of the tower. Devenish has an annalistic reference from 1176 detailing the burning of the king of Fir Manach by his kinsmen at the round tower (Lalor 1999, 145; O'Keeffe 2004, 24). The development towards ashlar from the early round towers built of rubble, clearly demonstrates that the monastic community aspired to achieve fine aesthetic quality (Barrow 1979, 143).

The Romanesque period signals a distinct change in round tower display and fabric. Romanesque arches were introduced to decorate apertures, some of which, such as Timahoe, County Laois, were very elaborate. The external door case was flanked by

Figure 2. Inishkeen, County Monaghan, is a Type 2 round tower demonstrating an improvement towards ashlar as the medieval period develops (Source: Kerr 2011).

Figure 3. Type 3 round tower Armoy, County Antrim, demonstrates the development towards ashlar masonry with an improved masonry quality from Type 2 (Source: Kerr 2011).

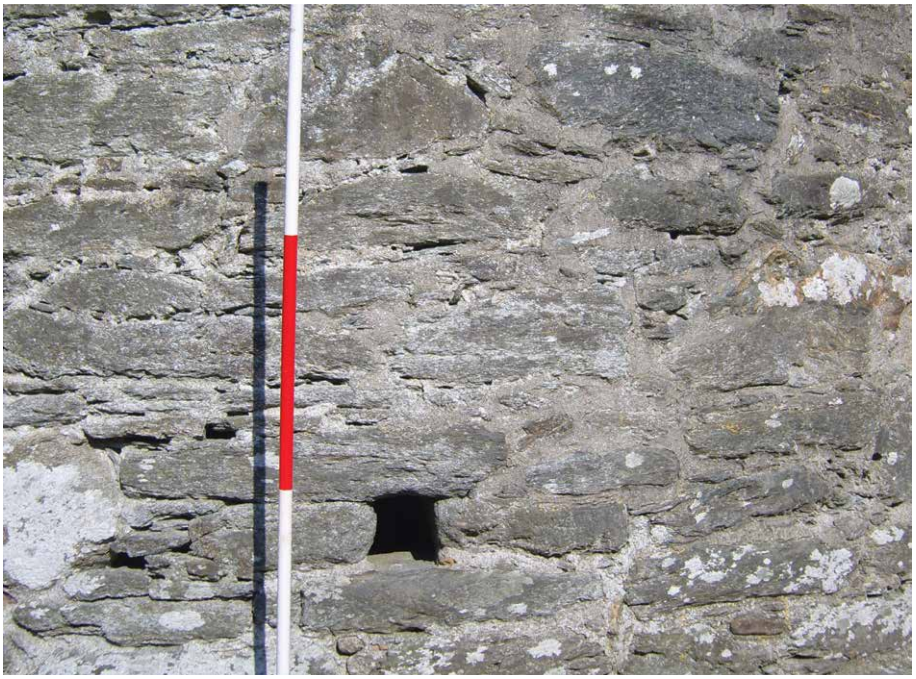

Figure 4. Glendalough, County Wicklow is an example of a Type 4 round tower with near-ashlar masonry (Source: Kerr 2011).

Figure 5. Type 5 round towers, such as Donaghmore, County Meath, demonstrate the masonry closest to ashlar in pre-Romanesque examples (Source: Kerr 2011).

double columns, with bases and capitals, and a true Romanesque arch. A second door case sits within the first, equally highly decorated, with chevron moulding and columns. This is the final stage of the development of round tower masonry; the emphasis of display turned to the Romanesque decoration while the fabric of the drum became less important. Drumiskin, County Louth, was built in the 12th century and the masonry contradicts the ashlar seen in contemporary round towers (Lalor 1999, 185). The fabric is comprised of small, random rubble, possibly fieldstones and many spalls, and the visual emphasis is concentrated on the Romanesque door. Romanesque buildings were built of local rubble often; for example, Clonfert Cathedral, County Galway, has very poor quality masonry, in contrast with its pedimented portal into the nave (O'Keeffe 2003, 368). The portal is 4.05 metres wide on a 10.50-metre-wide façade, and with the decorated pediment it is almost 8 metres in height (*ibid.*, 270). The focus of display is directed towards the Romanesque features, while the masonry with low aesthetic quality was concealed with render and hence not visible. Therefore, it is likely the contemporary Romanesque towers with similarly poor quality masonry were rendered. However, the round towers which display high aesthetic quality masonry, and the developments striving towards this, must have remained exposed or simply white-washed to highlight the fabric quality.

Clonmacnoise, County Offaly, has some of the most accomplished masonry on an Irish round tower. Built in the 12th century, there are two annalistic references from the beginning of the century (Lalor 1999; 2009). There is a second 12th-century tower at Clonmacnoise, an engaged round tower known as Temple Finghin, which also had fine ashlar (*ibid.*). The individual stones were long and cut on all sides to create ashlar masonry and there was little embellishment beyond the Romanesque arch over the door; therefore indicating that the quality of the masonry was enough decoration in this instance.

The geological properties of the stone must be considered as this could affect the degree to which it was worked. In the sample survey of twenty round towers, those categorised as Type 1 were each constructed of a different stone type; limestone, basalt, slate and sandstone, all resulting in the same level of masonry quality. Within Type 2 there were two limestone round towers, two slate and one granite. Limestone was used in the construction of over half the round towers in the sample. This may be due to the geological characteristics of limestone or to the degree of availability across Ireland. It was used for all five of the Type 5 round towers, each displaying near-ashlar quality masonry. This demonstrates that the differences in fabric quality between Type 2 and Type 5 was not the result of the stone used, rather in the later Type 5 examples, there was a desire for high aesthetic quality.

It is generally assumed that medieval buildings were constructed of locally available stone, therefore locality was considered (Leask 1955, 51; Champneys 1910, 34). It has been suggested that building stone was not transported in pre-12th century Ireland, as the Anglo-Normans introduced the methods required, and the Gaelic population were not able or willing to transport material more than three kilometres in most cases (Hourihane 2000, 41; Ó Carragáin 2005, 131). However, it did occur for round tower construction and sometimes over substantial distances using Ireland's waterways. For example, eight of the sample round towers had granite doors despite their location in areas low in granite availability, while Glendalough round tower was constructed of slate despite its location in the granite-dominated Wicklow Mountains. This demonstrates that pre-Norman Ireland had developed the ability to

transport stone as early as the 10th century, and they had the desire to use non-local stone (Kerr 2009). The transportation of stone farther than indicated in previous studies suggests value was placed on non-local or unfamiliar materials and when used for construction it added prestige to the building (Hourihane 2000, 14).

Deliberate consideration of stone type is evident in the doors of round towers. While highly decorated doors are restricted to the Romanesque period, there is some articulation on pre-Romanesque examples, which indicates the visual importance of masonry. In a sample of twenty pre-Romanesque round towers, eighteen retain their doors and of this selection, eleven had a stone type for the door different to that of the body of the tower. This deliberate change of stone may suggest a requirement for masonry easier to work; for example, sandstone is easier to carve when compared to igneous granite, which is extremely hard. However, from the sample, there are just six sandstone doors and eight granite doors, indicating that the properties were not the reason for choosing the stone. Of eleven articulated doors, ten are composed of imported rather than locally available stone (55% of remaining doors in the sample). This was similarly frequent in pre-Romanesque Irish churches; where twenty out of thirty-five (57%) had non-local stone for articulating quoins or apertures (Ó Carragáin 2005, 131). This demonstrates that the visual quality, and potentially the significance of the stone, was a consideration. This suggests further that round towers with high quality masonry were not rendered. Leaving the round tower's masonry exposed or lightly whitewashed allowed the contrasting textures and/or colours to be seen; even as the towers stand today the contrast between an articulated door and surrounding fabric is visually striking.

Discussion

The development towards ashlar, the use of transported stone, and the frequency of articulated doors suggests that the fabric of pre-Romanesque round towers was intended to be viewed by, and even impress, the early-medieval audience. This indicates that the fabric was not concealed, rather it may have been left bare or lightly whitewashed. This evokes comparison with some early-medieval Irish churches, in particular cyclopean examples. The masonry of Mac Dara's Church, County Galway, was left exposed, baring the symbolic importance of the stone. At Glendalough round tower, County Wicklow (Figure 6), there is further evidence that the stone was exposed. There are courses of decorative masonry within the fabric, the different colour and texture in contrast to the slate drum. The exposed and decorative masonry demonstrates that this was significant to the audience, and this should not be underestimated (Ó Carragáin 2005, 102; Hourihane 2000, 14). The early-medieval audience '*regarded almost everything in terms of symbol and allegory*' and '*architectural forms were readily associated with specific Christian beliefs*' (Stalley 1999, 59). This discussion of round towers demonstrates that the very fabric was significant and may have contributed to a symbolic function of the buildings.

It is likely the symbolic importance of the round tower was equivalent to that of the church in the ecclesiastical site. Pre-Romanesque Irish churches were visually and technically in contrast with pre-Romanesque round towers. They were small and simple, usually single-celled and rectangular, for example 10th-century Killoughternane, County Carlow, which measured 5.7 by 3.7 metres internally (O'Keeffe 2003, 63, 71; Ó Carragáin 2005, 99; Ó Carragáin 2010, 57, 311).

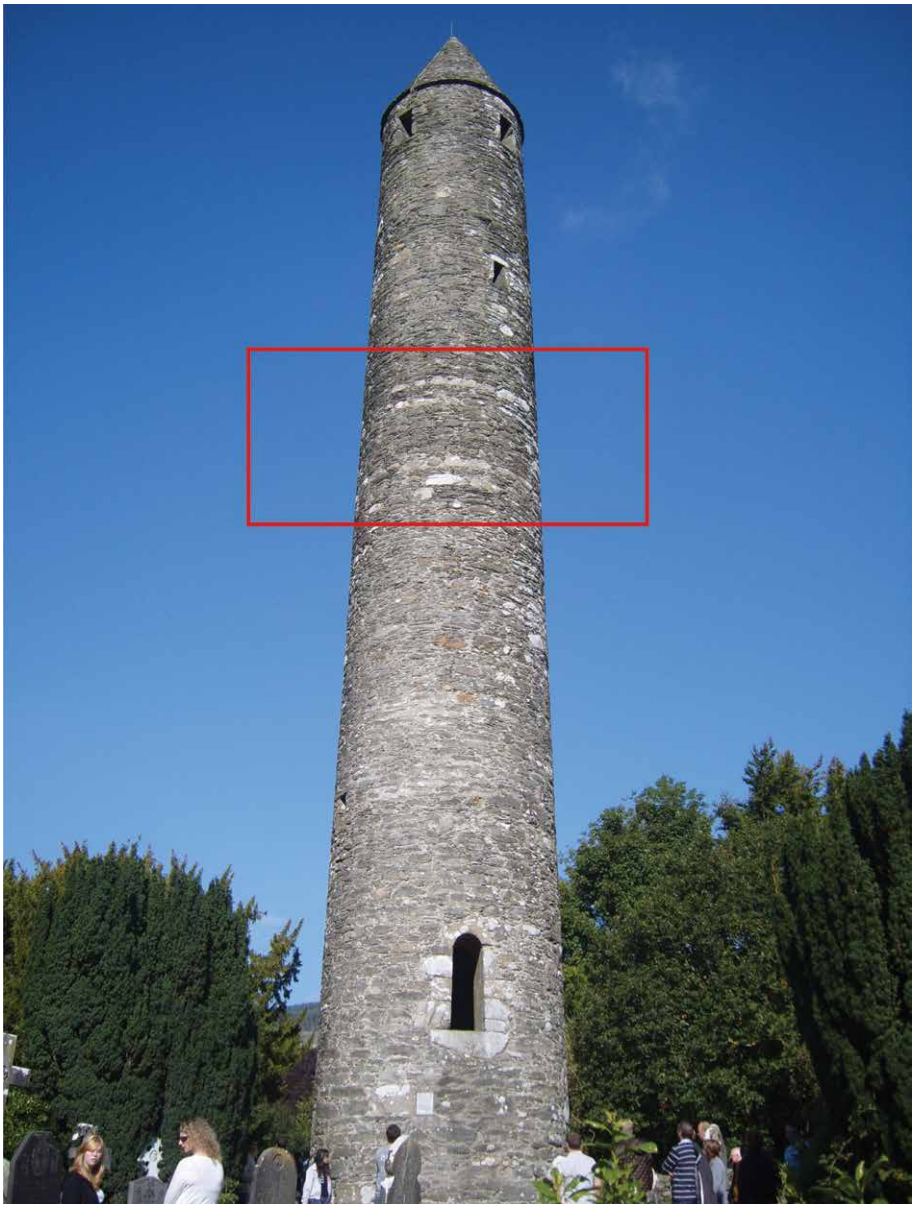

Figure 6. The decorative courses on Glendalough stand out as a different stone type to the remainder of the round tower's body (Source: Kerr 2011).

The modest size of a *damliac* (stone church) was a deliberate choice, rather than a lack of skill, as when they replaced an earlier *dairthech* (wooden church), they were built to the same dimensions and often upon the original footprint (Ó Carragáin 2010, 57). The construction of deliberately modest *damliac*, the development of antae, and the increased use of stone, are important indicators of how people regarded buildings in early-medieval Ireland (Ó Carragáin 2010, 26–27, 31). There was a distinction between building with stone or wood, as

indicated by the writings of the Venerable Bede. In the 8th century he wrote how Benedict Biscop went to Gaul for masons who could build '*a stone church in the Roman manner*' (Giles 1880, 310), whereas Finan alternatively built a church in '*the manner of the Irish, not of stone but split oak*' (*ibid.*, 67). The very fabric of the building was important to the audience, as seen in the early-Christian cyclopean churches. This was not unique to pre-Romanesque Ireland as the Romans used large blocks to lend an impressive quality to their structures; once again individual blocks were intended to be seen. Another description by Bede indicates how the use of large stones gave a monumental, even godly character to a building;

> '*Some of these stones were so great that it would seem to have been scarcely possible for four men to have lifted them, but nevertheless he was found to have brought them thither from elsewhere with angelic aid, and to have placed them on the wall*' (Colgrave 1940, 97).

The length and size of stone used was an important element of the building fabric; however, it can be argued that the overall appearance of the façade, including precise details, were significant to medieval audience. The 7th-century poem *Hisperica Famina* detailed the external structure of an oratory. After describing the shape of the wooden beams, the foundations and the doors, the poet continues with: '*the chapel contains innumerable objects, which I shall not struggle to unroll from my wheel of words*' (Herren 1974, 109). This suggests that the building was equally as important as its contents. While round towers were used as belfries, as their name *cloicthech* reveals, they were not revered solely for housing expensive bells; the fabric itself was equally significant to early-medieval people (Stalley 1999, 59).

To understand why building fabric was important, early-medieval religious symbolism is considered. The early church writings of Eusebius, Isidore and Ambrose suggest the fabric of buildings symbolised the faith of the community. The writings detail how the very body of the building was a symbol for the body of the faithful with its strong and weak members. The two scriptural texts from which they draw are Ephesians 2:20–21, which describes the formation of a new people of God '*built upon the foundation of the apostles and prophets, Jesus Christ himself being the chief cornerstone in whom all the building framed together grows into a temple*'; and I Peter 2:5, which calls on Christians to be '*as living stones built up, a spiritual house*' (Ó Carragáin 2005, 102).

The physical location of round towers assists understanding their symbolic function and they must be viewed within the context of the ecclesiastical site. Sacred acts were articulated and expressed through a variety of buildings; for example, baptism took place in a separate building from the main church, and funerary traditions resulted in separated mausolea (Ó Carragáin 2010, 170; Stalley 1999, 59). The position of the round tower within the sacred area, almost always beyond the liturgical west-end of the church, suggests a religious procession may have involved the round tower, such as the ceremonial transferring of the Eucharist (O'Keeffe 2004, 57; Ó Carragáin 2010, 170).

Conclusion

The exploration into the visual quality of round towers' masonry indicates that they were symbolically, even iconographically, significant as a representation of the congregation's faith. They were constructed within a sacred space, alongside the *damliac* on the footprint of the earlier wooden church, literally setting in stone the religious significance of the foundation, alongside other buildings, each with specific religious functions. Therefore, round towers were part of the ecclesiastical ritual and procession which took place within this space, as suggested by their position beyond the liturgical west-end of the church. This is supported by the annalistic references to the people who sought sanctuary within the round tower from invaders; they may have been seeking protection in the religious space.

The discussion of the function of round towers has highlighted two aspects on this issue: the purpose for which the round tower was built and how it was actually used. The annals have revealed the uses of round towers as repositories, sanctuaries and lookouts, which were not the intended primary functions. The development of masonry quality, from fieldstones in irregular courses to ashlar, demonstrates the integral importance of fabric to the construction of round towers. It is clear that this was related to their intended function, alongside that of belfry. Therefore it can be concluded that they were built as bell towers with a symbolic function of tantamount importance, which may have even surpassed its utilitarian purpose.

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Flaming torches

The materiality of fire and flames on Roman cinerary urns

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Abstract

The appearance of torches or flames on sculpted marble Roman ash urns has been interpreted iconographically as a symbol of a life ended prematurely. Fire has certain affordances and properties, which make it an exceptional metaphor for both life and death. By exploring the connections between representational strategies and the materiality of fire, this paper will illuminate the subtle ways in which the sculptural content on Roman cinerary urns demonstrate an awareness of their function as receptacles for bodies, as well as the role of fire as a signifier of transformation. This investigation focuses on the materiality of marble cremation urns from the 1st and 2nd centuries AD with depictions of torches, since these cinerary urns reflexively allude to their status as vessels and containers of the body, after its physical transformation by cremation.

Keywords: materiality, fire, marble, Roman, cinerary urn, iconography.

Introduction

When thinking about material culture in the Greco-Roman world, materials and materiality have been suppressed conventionally in favour of historical or stylistic discussions. Recent anthropological and archaeological debates have placed the materiality of objects at the forefront of studies, although the emphasis on the *materiality of objects* over *materials and their properties* has been questioned (Ingold 2007, 3 original emphasis). New directions in material culture need not sublimate systems of signification in favour of a materials-based approach, but instead, they can be incorporated fruitfully. Interesting questions are being asked about objects from the ancient world, in order to determine whether there is a way to engage materials with their own materiality, and if so, whether

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this can be done with a corpus of evidence for which the general function and context is known, although precise archaeological recording of provenience does not survive.

Studies of Roman funerary sculpture have been interested predominantly in epigraphy, iconography and social history (Davies 2003; Huskinson 1996; Koch and Wight 1988; Zanker and Ewald 2012). The status of art objects in their contemporary viewing contexts can sometimes be reconstructed when provenience is known, but it affords little room for considering the social actors who manufactured, produced, sold, and consumed these objects. As an alternative approach to studying funerary iconography, this paper examines the materiality of one particular motif—namely fire, flames and torches—on cinerary urns in an attempt to re-frame the traditional object-oriented discussion of death and commemoration. One aspect of the materiality of fire on funerary urns is an iconographic approach to symbols on stone, but the larger picture requires an examination into the subject-object relations and the meaning of an object in its social context (Tilley 2007).

The Roman proclivity for erecting funerary monuments in stone provides a canvas upon which attitudes towards grief and mourning, memory and commemoration can be explored, while also acting as referents to other religious rituals (Davies 2007). Funerary symbols and motifs have been explored energetically throughout the 20th century, and there has been much debate about symbolic language, and whether or not certain funerary motifs can be 'read' for insight into funerals and the afterlife (Cumont 1942; Davies 2003; Nock and Beazley 1946). Some scholars have advanced the proposition that funerary decoration provided a language for expressing beliefs about the afterlife, whereas others have argued for multivalent meanings of symbols, depending on the context of use (Davies 2003, 212). Certain images appear more commonly than others on Roman funerary monuments, such as garlands, drinking vessels, Dionysiac motifs, flowers, *cornucopiae*, birds and ships. Collectively, these motifs are borrowed from sacred and profane contexts, both public and private, in order to form a language associated with mourning, celebrations of life, and transformations to states of otherness (Zanker 1988a; Zanker and Ewald 2012).

The appearance of torches or flames on funerary monuments is extremely rare in comparison to garlands and flowers, despite the fact that the material properties and affordances indicate that fire is a particularly powerful symbol. Literary evidence suggests that lighting candles, whether in the form of lamps or torches, was necessary for the final rites and preparation of the body for disposal (Rushforth 1915, 163). When it occurs, fire has been interpreted as signifying the importance of torches in funeral ceremonies (Sinn 1987, 58) or as a symbol of a life ended prematurely (Huskinson 1996, 117), but these interpretations are predicated on a direct correlation between images *qua* images and images as symbolic metaphors. By exploring the connections between representational strategies and the materiality of fire, both for its inherent properties and affordances and in its depiction on sepulchral monuments, this paper will illuminate the ways in which a conventional concentration on images and narrative over objecthood has dematerialized the material vehicles of the image, and how the representational challenges of depicting fire on marble are at odds with its properties and affordances.

The materiality movement in archaeology raises questions about the complexity of social meaning in relation to everyday objects, their social biographies, and revised semiotic approaches (Leitch 2010). While the symbolism of fire, flames and

torches should not be overlooked, the emphasis here is on the apparent contradictions between medium and materiality: how the iconographic representation of fire is translated into stone form, as well as its polyvalent significance for living viewers. In this paper, it is argued that torches on funerary monuments are not simple transcriptions of funeral events, but that these motifs assume a plurality of meanings in the repertoire of scenes in which they occur. Torches in figural scenes have received a greater degree of scholarly attention than those on 'decorative' or 'ornamental' receptacles, yet the motif has not been thoroughly realized for its many insights into Roman funerary and artistic practices, since fire can act as a signifier of transformation through cremation. This motif appears on a small number of funerary altars, cinerary urns and sarcophagi from the Roman Empire, which have been interpreted largely as a framing device on marble cinerary urns (*cippi*) from the 1st and early 2nd centuries AD in Rome. A closer look at monuments with torches reveals a connection between their function as framing devices on cinerary urns, cremated bodies that have been transformed by fire, and the vessel as a container of the body.

Fiery and stoney properties

Before exploring representations of fire on a specific corpus of funerary vessels, it is worth expounding on the material properties of fire, its processual nature and the transferability of its metaphoric value, as well as its relationship to stone (Arnheim 1987; Gibson 1977; Knappett 2004). Fire has certain affordances and properties, which make it an exceptional metaphor for use in the context of both life and death. Fire can symbolize destruction and ruin, or it can provide the protection of illumination from darkness, of heat from cold. Once ignited, flames have anthropomorphized qualities: they breathe, move, grow and diminish; they give off heat, illuminate darkness, and have the ability both to destroy and purify. As one of the most basic elements of nature, fire exacts and causes reactions to other agents with its ability to melt, shape, dissolve and transform. As an element, fire cannot be shaped or moulded, and while it has certain physical properties, it has no singular, solid, material form. There are several levels of duality in the various meanings, analogies, and symbolism of fire: it both represents life and has the ability to end it; fire is the ultimate dichotomy between helpful and harmful. Through the use of lamps and torches, fire is contained, controlled, and limited in its ability to spread, yet not rendered wholly safe or constrained in its power of destruction. In this capacity, fire is subdued to flames, and the destructive power of fire is harnessed for its portability, ability to illuminate and to provide heat.

In Gaston Bachelard's *Psychoanalysis of Fire*, the unique 'lifeness' of fire is stressed, as is its relation to processual change, since *'fire suggests the desire to change, to speed up the passage of time, to bring all life to its conclusion, to its hereafter'* (Bachelard 1964, 89). In the ancient world, fire was used in a variety of contexts, both in daily life and as a marker of religious rites, festivals, and ceremonies. In Stoic philosophy, objects were combinations of inert matter and a life-giving, material breath (Brennan 2005, 235–6). Such a material approach to the world was based on the Stoic idea that a primal fire was the generative source for all things in the universe, in which system the soul took the form of a fiery breath or *pneuma* (Platt 2006, 247). It was identified as a hot breath, a *pneuma pyrōdes*, an *anima inflammata*, as the source that maintained and preserved men (Cumont 1959, 12–13). In the context

of metal production, Pliny tells us that '*this element is of immense, boundless power and, as to which, it is a matter of doubt whether it does not create even more than it destroys*.' (Pliny, *Natural History* 36.68, Loeb Trans.). Roman torches were bundles of reeds, which were soaked in animal fat (tallow), in order to burn slowly.

The material properties of fire are seemingly at odds with those of stone, since the latter can be hard, shiny, cold, reflective, grainy, coarse or smooth (Tilley 2004). Marble, more specifically, is a hard material that can be cut, shaped, carved and polished. It has knots, grains, faults and certain anthropomorphic qualities that give rise to an *anima* or soul (Leitch 1996). Leitch addresses the sensory qualities that are embedded in the material, which instil meaning in the use of marble across various contexts. Based on observations from the quarries of Carrara in Italy, Leitch (2010) argues that marble is a material which gives rise to an intersubjective, reciprocal and dynamic relationship between workers and material, one that invokes ideas of marble as an animated and living material. Its qualities include whiteness, translucency, hardness, permeability, mutability, weight and veining (Leitch 2010), and with the exception of mutability, these properties are arguably in contrast to those of fire. Among the properties of fire are heat, a spectrum of colours and the ability to illuminate, all of which are unable to be translated and inscribed in visual form on marble cinerary urns. The movement and heat of flames cannot be captured adequately in still form, and fire ultimately becomes unmoving and cold in its marble form, thus rendering the essential materiality of fire as frozen and lacking its 'fiery' qualities. To depict fire on stone is to freeze its life force and to petrify it; such a challenge is both representational and conceptual for an artist, which might be precisely why fire is infrequently depicted in stone.

The Roman corpus

In Roman Italy, cremation—as opposed to inhumation—was the predominant method of corpse disposal in the late 1st century BC and the 1st century AD (Carroll 2006; Graham 2006; 2015). For ceramic vessels as containers of the body in the Neolithic period, Knappett *et al.* (2010) have argued in favour of the interactive properties, possibilities or affordances that emerge from a vessel's ability to contain, as well as the attendant forms of mediated action, agency and material engagement. Their use of embodied mind and conceptual metaphor theory in material culture studies provides a useful lens for thinking about other types of containers for the body, namely, marble ash urns from the early Roman Imperial period. In Friederike Sinn's (1987) study of Roman cinerary urns, 714 vessels from Rome and now dispersed in museum collections around the world were identified, among which approximately 20 are adorned with flames, torches or candelabra. In contrast to garlands, birds and vines, torches on funerary monuments are uncommon, and it seems likely that their relative paucity owes to fire's resistance to iconographic representation. Because the marble medium is at odds with its fiery materiality, fire and flames on marble cinerary urns present an artistic conundrum, and they have seldom been discussed beyond their significance to Roman funerals or religious rites. On cinerary urns, torches are found as decorative elements in the corners, possibly as semi-architectonic or framing elements, and it is precisely for this reason that they have been overlooked and assumed to refer either to the funeral or the afterlife, with little room for alternate interpretations (Platt 2012).

Figure 1. Marble cinerary urn with flaming torches at corners, Berlin, Altes Museum, formerly the Berlin, Antikenmuseum, Staatliche Museen Preußischer Kulturbesitz 1975.4. No inscription (Photograph: the author, 2014).

As it will be demonstrated, torches appear in both figural and non-figural scenes on marble *cippi* urns, yet unless they form part of a scene that has been interpreted as the depiction of a funerary ritual, such as a funerary banquet, torches have been relegated to the status of a 'filler motif' in modern scholarship, and their importance to corporeal transformation by cremation has been overlooked.

As a framing device on funerary monuments, fire can act as a metaphor for life by opening and closing scenes of human interaction; it frames and encapsulates human life. Sinn (1987) has argued that torches do not act as a metaphor for life, but they can alternatively be a framing device on a cinerary urn. In the 1st and early 2nd centuries AD, torches appear most often in pairs at the front corners of ash chests or in sets of four on the sides. The backside of these chests is often undecorated, which indicates that they were likely intended to be viewed from a privileged position that favoured the front and lateral surfaces, perhaps in a collective funerary enclosure like a *columbarium* tomb (Platt 2012). Without exception, representations of torches on funerary art are lit with a burning flame, whether held right-side up or upside down.

One such urn at the Altes Museum in Berlin takes the shape of a cubic box with a separate lid in the shape a pediment (Sinn 1987) (Figure 1). The front of the urn is demarcated by a blank field for inscription, with two birds feeding from a two-handled krater; the rest of the front surface is furnished with vines and leaves. Torches adorn all four corners of the object, which function in a semi-architectonic manner, as if to support the lid of the urn. Floral 'acroteria' and flowers are framed in the pediment

Figure 2. Marble cinerary urn of Ancharina Phaedra, Museo Nazionale Romano, 34158. Inscription: CIL VI 6207 (su concessione del Ministero dei beni e delle attività culturali e del turismo – Soprintendenza Speciale per il Colosseo, il Museo Nazionale Romano e l'area archeologica di Roma).

on the lid, while leaves slope down the long sides, as if to create a thatch roof. The sides of the Berlin urn are each adorned with a radiating palmette. Based on stylistic details, the urn can be dated to the reign of Tiberius or Claudius in the first half of the 1st century AD, which is in keeping with the contemporary preference for cremation and subsequent deposition in large family tombs.

The Berlin cinerary urn finds close parallel with an urn in the Museo Nazionale in Rome, also from the 1st century AD (Figure 2). Both urns contain a two-handled vessel on the front surface with birds drinking from it, although the latter is noteworthy for its decreased emphasis on floral motifs and additional birds in the pedimental void of the lid and on the two sides of the urn. Instead of mirroring architectural elements, the lid of the latter example bears close resemblance to an altar, which would become a common form of urn by the early 2nd century AD. These first two examples feature torches at the corners of the vessels whose flames have been frozen in stone and denied the heat that they purport to bear. Like other marble sculptures and statues, there remains the possibility that these urns were vividly painted in antiquity, which might have added a layer of vitality to the otherwise unmoving scene.

Another example, now in the Museo Gregoriano Profano at the Vatican, employs torches at the corners of an elongated urn, with three flowers flanking each side of an epigraphic field that commemorates a deceased woman called Volussia Epe (Figure 3). The absence of figural decoration on the front surface of this ash urn hints at the representational challenges that depicting fire in various media ignites. Thus, the absence of figural bodies might prompt the viewer to contemplate what is, in fact, present within

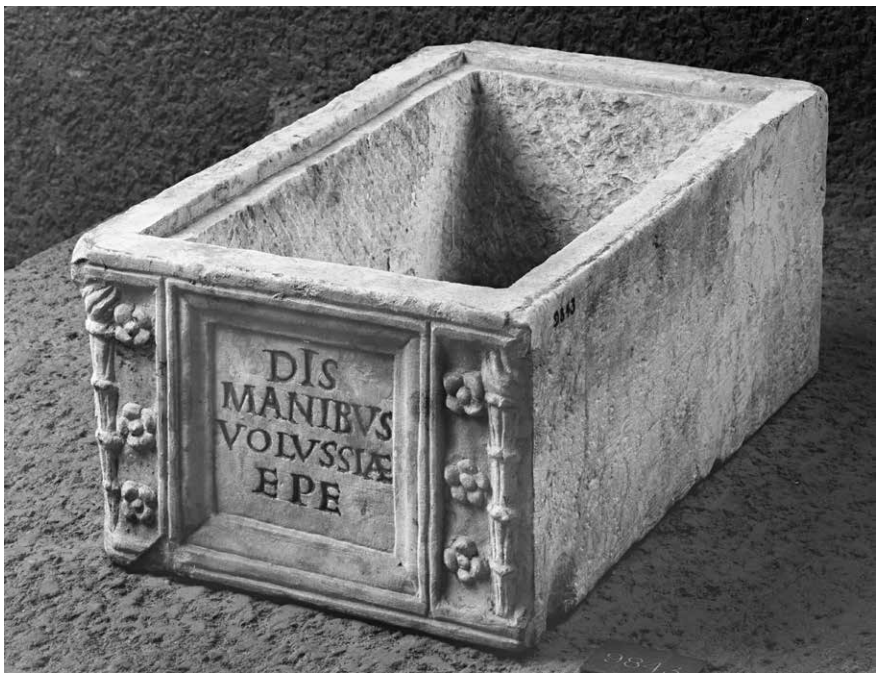

Figure 3. Marble cinerary urn of Volussia Epe, Rome, Museo Gregoriano Profano, Musei Vaticani, 9843. Inscription: CIL VI 7390 (©Cologne Digital Archaeology Laboratory FA1762-04_21660, www.arachne.uni-koeln.de).

the urn: a body transformed by fire, reduced to cold, grey ash, no longer a bound entity. In this case, torches do not act solely as a metaphor for the extinction of life, but they also allude to the transformation of the body and the denial of the essential materiality that burial by inhumation, rather than cremation, brings about (Graham 2015, 52, 57).

The combination of iconographic elements and the shape of these vessels employ an architectural vocabulary, which enables the urn to become a house for the deceased, both structurally and metaphorically (Wallace-Hadrill 2008). These cinerary urns function to contain the fragmented, cremated remains of the individual after they undergo transformation by fire (Graham 2015; Platt 2012). As is the case with all of the urns under consideration, torches do not operate in isolation; rather, they form part of the decorative scheme, but one that has been habitually ignored as a minor element. Zanker (1988b) has shown the extent to which ornamental and floral elements can function in a carefully cultivated, symbolic manner. In this instance, the torches create a contrast with the surrounding floral elements; man-made objects serve as framing devices for elements of nature, yet they are arranged and cultivated unnaturally. Compared to the size of the birds and the vessel upon which they are perched, torches in the first two examples appear diminished in scale and elongated in form, to the point where the flames are smaller than most of the surrounding leaves. The contrast between varying degrees of naturalism and impossibility seem particularly appropriate for a type of art object whose function is predicated on the act of transformation to enable possibility, since the urn size is too small to contain a human body without the power of fire itself.

Figure 4. Marble cinerary urn of Vernasia Cyclas, showing couple in the dextrarum iunctio pose with torches at the corners. British Museum, London 2379. Inscription: CIL VI 8769 (©Trustees of the British Museum, http://www.britishmuseum.org/).

Cinerary urns with torches and other non-figural motifs are dated primarily as Tiberian, Claudian or Neronian (*c*. AD 14–68) on the basis of stylistic, epigraphic and prosopographic conventions. This type of marble *cippus* tends to be cubic in form, decorated with torches at the corners, vines or ivy, garlands, flowers, birds, and vessels, among other non-figural motifs. The depiction of torches or elaborate candelabra as framing devices in scenes of human interaction is a Flavian-Trajanic innovation of the late 1st and early 2nd centuries AD. This type features scenes of a funerary banquet or the deceased reclining on a couch, and the form of the marble urn becomes elongated with increasing resemblance to funerary altars (Figure 4).

An urn in the Metropolitan Museum of Art enables us to trace the development between non-figural and figural motifs, in which torches are present, but not often discussed in relation to the scene (Figure 5). In this instance, the urn is elongated in form, with a framed epigraphic field at the bottom and a human figural scene above, occupying slightly more than half of the body of the urn. The inscription records that M. Domitius Primigenius made it for himself and for his freedmen and their descendants, although it is not clear whether the inscription refers to the larger context of a tomb monument or the urn itself, and could thus indicate that the cremated remains of multiple individuals were comingled and interred in one vessel (Alexander 1928). The scene appears to be a banquet, in which an adult, possibly the deceased, reclines on a *kline* couch with a three-legged table in front; a woman perches on the side of the couch, while two smaller figures look on from the sides of the scene (Alexander 1928). Behind the banqueters, flowers frame a brick background, which provides an internal framing device in addition to the one created by the torches at the far edges of the *cippus*. In contrast to other *cippi* or funerary altars where the torches fill the length of the front, the New York example has torches that occupy only the space between the epigraphic field and the lid of the urn (Waywell 1982). By dividing the front of the urn between the human and epigraphic spheres, the New York *cippus* firmly places the torches in the upper half—the world of the human—rather than using them purely as decorative motifs for the monument as a whole. This subtle placement invites the viewer to think of fire as an integral part of funerary rituals, without directly involving the flames in the action of the banqueters. These examples cannot be said to comprise a corpus of funerary receptacles that are characterized primarily by the torch motif, but rather, employing torches signifies participation in a wider realm of Roman religion without necessarily portraying or transcribing funerary rituals.

Urns in religious contexts

Torches on cinerary urns operate as agents of transformation which reduce bodies into ashes, in addition to reinforcing the connection between the living and the dead, because it is by means of torchlight that the living are enabled to visit the deceased at the tomb. Excavation of large family tombs, such as the Columbarium Statiliorum on the Esquiline Hill, suggests that urns in their niches were visible to tomb visitors (Caldelli and Ricci 1999; Hasegawa 2005). The significance of decorative motifs on these cinerary vessels can be explored from the perspective of the viewer, both at the time of death and upon subsequent visits to the family *monumentum*. For someone holding a torch and looking at one represented on an urn, the distance between the living and the dead is

Figure 5. Marble cinerary urn of M. Domitius Primigenius, showing a banquet scene and a kline couch. Metropolitan Museum of Art 27.122, New York (© The Metropolitan Museum of Art, www.metmuseum.org).

heightened by the disparity between the torch as a real, illuminating object and the one frozen in sculpture. Not only were torches part of the funeral itself, but also their role in subsequent visits to the tomb and in festivals to the dead recalls the performative aspect of funerary rituals. It is through these recurrent events and the representation of torches on cinerary urns that flames in a tomb setting mediate reflexively between the worlds of the living and the dead. In this way, the images on tomb furnishings are closely related to ritual and the cult of the dead, which makes it impossible to approach the repertoire of funerary iconography without discussing it in a sacred or religious context.

Cinerary urns relate to religious rituals in both form and decoration; the lids of some chests mimic temple superstructures with antefixes, acroteria and a triangular pediment, while others take the shape of an altar. This particular category of Roman funerary receptacle encourages the viewer to think about the religious contexts in which these decorative motifs occur: torches and garlands conjure up images of life and death in the context of weddings, sacrifices, and funerary processions. Zanker (1988a) has pointed out that many funerary motifs were inherited and adapted from the developing iconographic program of Augustan state art, such as garlands, which appear prominently on monuments of religious significance, including on the interior of the Ara Pacis screen. In addition to being a common motif in religious art, garlands are appropriate funerary motifs for similar reasons as torches: made from fresh, natural

elements, they are ultimately transitory and fleeting, subject to decay and disintegration, yet made permanent through memorialization in sculpture. Like the materiality of flames, the properties and affordances of garlands undergo transformation when rendered in stone, but as a number of ash urns demonstrate, such a combination was entirely appropriate for a funerary context. Previously, Toynbee (1971) interpreted garlands and flowers in a funerary context as tomb offerings, in a framework where individual symbols carry explicit meanings, but it is here argued that garlands and torches evoke different responses and invite multiple levels of readings.

Torches are absent from the archaeological record, although they appear on marble sculpted scenes of funerary activity from Rome. By the very nature of their perishable materials, torches are burned down or disintegrate over time; in contrast, sculpted funerary reliefs portray fire as contained and mediated by torches or candelabra. Charred remains might be all that survive of fire in archaeological contexts, whereas torches on Roman funerary monuments are always depicted with a live flame, which hints at the differences between the materiality of fire as it is, versus how it purports to be on stone objects. Such a discord is united by the underlying presence of fire as a connecting and transformative element in funerary ceremonies.

While this study has focused primarily on torches as a decorative motif on cinerary urns from the 1st century of the Roman Empire, it is worth noting that there is a certain degree of continuity on later Roman funerary art. Rather than acting as a framing device, torches on sarcophagi appear as an attribute of Eros or as agents of illumination: Cupids lean on upside down torches and they guide the way for mythological figures like Selene and Endymion, Pluto and Proserpina. Of more than 10,000 surviving sarcophagi, many are elaborately decorated with intricate scenes of both mortal and divine interactions (Elsner and Huskinson 2010). Torches as framing devices were employed almost exclusively on marble ash urns from the 1st century AD for cremations, rather than inhumation burial containers, which supports the suggestion of multiple layers of interpretation, signification, and referents within funerary iconography.

Conclusions

The polysemic nature of flames lends itself well to a plurality of iconographic and literary representations in ritual contexts. Within the Roman mortuary realm, it has been argued here that fire should not be interpreted simply as an allegory of life, particularly in the context of an eternal life for the deceased. The connection between torches on funerary monuments and the continuity of religious rituals suggests that fire as an allegory of life is, in fact, one of several appropriate metaphors, not for the deceased as it has been traditionally argued, but equally for the living. I have resisted viewing funerary motifs as expressions or anticipations of the afterlife, as well as the modern notion that a single motif has a fixed meaning. This discussion has reframed an iconographic approach by engaging with the 'material turn' in the social sciences that incorporates medium, material properties and materiality. Following Miller's concept of the 'humility of the object,' the corpus of Roman cinerary urns with depictions of flames allows us to address the subtle connotations and seemingly contradictory material properties that are objectified through their forms and properties (Miller 1998; 2005). Rather than side-lining torches as framing devices or ornamental motifs, the representation

of fire on Roman funerary receptacles demonstrates a self-conscious awareness of their function as containers for bodies, and they capitalize on the metaphors of material forms and part-whole relations between body and container.

By representing fire in stone, it becomes solidified in time and fixed to the monument upon which it occurs. Not only can fire function as a vivifying metaphor for life, but it can also be used to symbolize the ways in which human mortality is extinguished: it can dwindle without sufficient oil to sustain its flame, burn to the end of its wick, or be snuffed before burning out naturally. Like the process of mourning, fire can represent a state of transition, mutability and ultimate volatility; it can be ignited or quenched with decisive suddenness. Like the intangible properties of water, fire cannot be held or controlled, but it must be mediated through man-made, inhuman devices like torches and lamps. In these capacities, fire as a motif is utterly appropriate for cinerary urns, since these vessels operate as containers for bodies that have been transformed by the fire of the cremation pyre, yet the material properties of fire are at odds with its ability to be depicted in stone, and to a certain extent it resists depiction. From a temporal perspective, marble is often associated with an enduring geological timescale, whereas fire consumes and spreads with rapidity. Ultimately, however, fire can destroy marble when burnt in lime kilns, so even fire with all of its impermanence has power over stone.

The eclectic nature of decoration and the limited number of scenes with funerary torches suggests that this motif was one among many and its possibilities for expression are multi-fold. By thinking about the materiality of fire and of cinerary urns with depictions of fire, another interpretation is offered, in which torches are not cast not as iconographic attributes of certain gods, although the power of their image can operate on those levels. Instead they bear significance in a number of ways, including for the living viewer. Despite the intricate layers of meaning that spring from the material properties of fire and its appropriateness for funerary contexts, the general scarcity of flames on funerary monuments invites us to consider that it is precisely because of those properties that fire avoids representation on stone. Various iconographic studies have demonstrated that fire has a range of potential meanings in a funerary context; however, little attention has been paid to the materiality and mimetic functions of a symbol that purports to be the opposite of its real properties when rendered in stone. Thinking about fire, flames and funerary torches in this way heightens the discord between real physical properties and the ideological sphere of the funerary realm, as these cinerary urns are transformed from objects of insignificance into canvasses for communication.

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Stone-grave building at the cemetery of Les Tombes at Estagel (Pyrénées-Orientales, France)

Some economic, visual and symbolic aspects

Joan Pinar Gil

Abstract

It is commonly accepted that funerary archaeology is an important source to approach social, economic and everyday-life aspects of any community. Archaeological and anthropological evidence from cemeteries throughout Europe makes it possible to understand a wide range of aspects of the cultural identity of their users, such as their religious practices, economic status, professional activities and even their hygiene and eating habits. But even in the most thoroughly researched cases, the so-called funerary architecture has seldom been integrated into this kind of approach. The re-examination of the evidence from the cemetery at Estagel (Pyrénées-Orientales, France) dated to the Visigothic period, represents a good opportunity to explore a number of aspects regarding stone-grave building practices, which has a direct impact on the appearance and organisation of the funerary space as a whole.

Keywords: stone-graves, early medieval cemeteries, Visigothic period.

The cemetery of Les Tombes at Estagel

The site corresponds to an inhumation cemetery connected to a small settlement or a station on the Roman road along the Agly valley, about 15 km west of its intersection with the coastal via Domitia (Figure 1). The site is positioned in a small agricultural valley extending over a sedimentary basin of Quaternary origin, surrounded by pre-Pyrenaic foothills rich in limestone, schist and marble.

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Figure 1. Estagel-Les Tombes. Location and plan of the early medieval cemetery (J. Pinar after Lantier 1949; Alessandri 2001 and Kotarba et al. 2007).

The cemetery was excavated during 1888, 1935–36 and 1946–48; as a result, over 200 graves were identified and investigated. In 2001, an evaluation excavation enabled the identification of almost 60 new graves, most of which were already destroyed or emptied. Taking into account the attested examples of graves having hosted more than one burial, a minimum number of individuals of almost 300 people is represented at the cemetery. That renders Estagel the largest cemetery excavated in rural Languedoc-Roussillon and one of the largest found in southern France.

The preserved documentation is far from perfect: the only available information comes from a series of short publications by R. Lantier—author of the excavations in the 1930s and 1940s, some unpublished excavation notes and photographs by Lantier himself and the short official report from the 2001 excavation (Lantier 1943, 1949; Alessandri 2001; Alessandri and Hue 2005; Kotarba *et al.* 2007, 378–382). Additionally, a few photographs of the 1888 excavation have been recently identified at Estagel. Fragmentary as it may be, the body of documentation enables a better understanding of the cemetery, and it confirms the numerous points of interest regarding the site: a long chronology of use (at least from the early 5th to the mid-7th century AD), a well-defined spatial organisation, combining funerary and non-funerary spaces, and the attested presence of different levels of wealth.

The funerary structures

The overwhelming majority of recorded graves can be described as slab cists, formed by five schist slabs lining the internal sides of trapezoidal or rectangular grave pits. The structure was covered by a sixth capping slab, which in most cases appears to be another monolithic schist slab (Figure 2).

With a number of variants, the idea of burying the dead inside slab cists or related structures is recorded from prehistory to modern times, in many European and non-European territories. Nonetheless, the cemetery of Estagel can be better understood in its immediate chronological and geographical background: it belongs to a consistent group of cemeteries dating from the very beginning of the Middle Ages, scattered throughout coastal Languedoc.What renders grave building at Estagel so particular is its almost unparalleled homogeneity: over 97% of the graves correspond to cists made of six schist slabs, including the capping stone.

Other uniformly built rural cemeteries are to be found in the nearby Aude and Hérault departments: at Pouzols-Minervois where twenty out of twenty-one graves can be defined as slab cists (Barou and Rigal 1987); at Saint-Mathieu-de-Trevières, fifteen out of sixteen (Arnal and Riquet 1959). These cist graves, made of local limestone, are thus above 93% of the total number, but it must be considered that these cemeteries comprise a smaller number of graves and far shorter periods of use than Estagel. Furthermore, in these sites the number and form of the slabs varies greatly from grave to grave. Another rural cemetery with a clear predominance of uniformly built slab cists is that at Villarzel-Cabardès (Guiraud and Cattanéo 1968, 1969, 1974): limestone slab cists are by far the most usual structure, although the cemetery included a number of graves made of *tegulae* set *a cappuccina* (that is, stacked over the corpse in the form of an inverted 'V'), a sarcophagus and a possible wooden coffin. Other contemporary cemeteries in the region comprise also simple grave pits, wooden coffins, as well as brick ones, sarcophagi and grave-

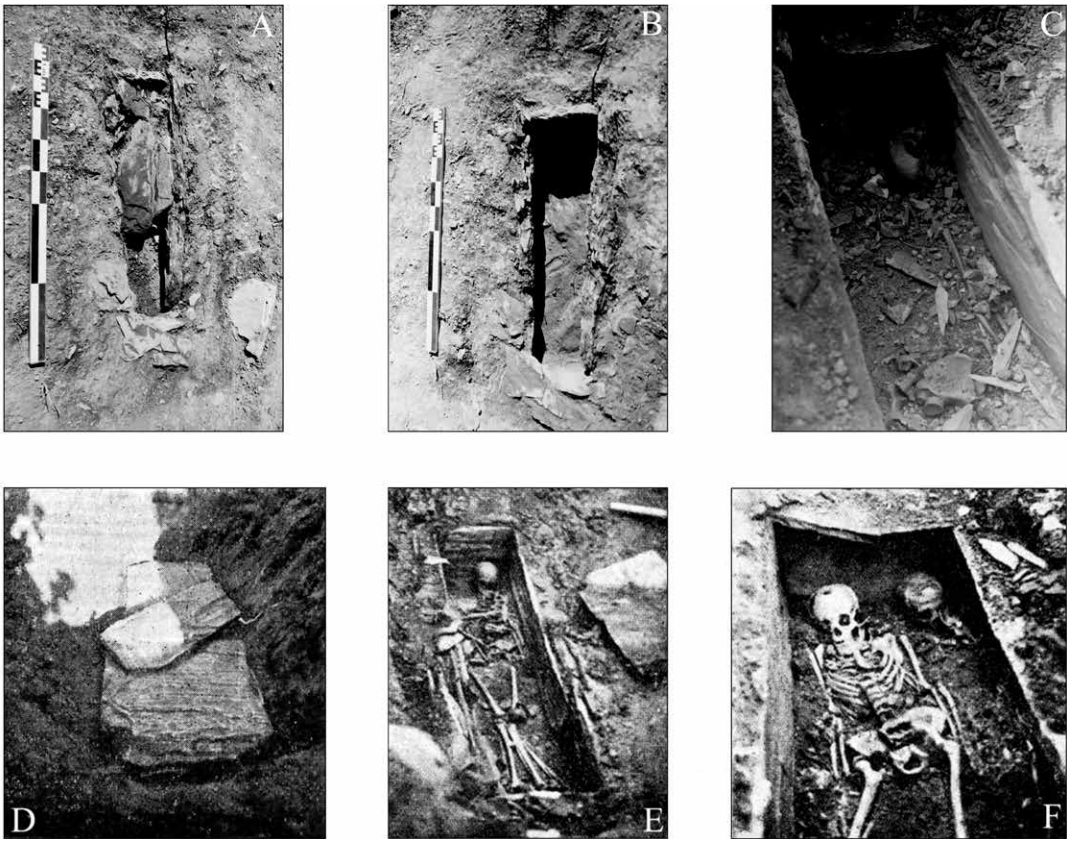

Figure 2. Estagel-Les Tombes. Examples of slab coffins unearthed in 1888, 1935–36 and 2001 (A–B after Alessandri 2001; C courtesy of Daniel Henry, Estagel; D–F after Lantier 1943).

pits with brick or stone-lined walls. At Les Horts (Raynaud 2010, 116–119), slab cists are the most frequently attested type of grave, but only account for 27% of the total number of graves. A similar picture can be seen in other nearby cemeteries (Blasco *et al*. 1987; Taffanel 1959). This mix of grave-building traditions and techniques characterises also the rural cemeteries of other Mediterranean regions, for example in Spain and Italy.

As said, the homogeneity at Estagel is even more remarkable if we take into consideration that the cemetery has an unusually long chronology for this type of rural cemetery. Thus, the earliest slab cist belongs to the late 4th or the early 5th century AD, while the latest one is probably of a mid-7th century AD date. While there is continuity in the sphere of stone building traditions, other aspects of the burial practices performed at Estagel mirror a remarkable transformation of funerary habits. Amongst these is, for example, the transition from N-S oriented inhumations (early 5th century AD) to E-W oriented ones (from the mid-5th century AD onwards); also, the transition from inhumations with 'Late Roman' pottery and glassware (late 4th–early 5th century AD) to inhumations clothed after 'barbarian fashions' (mid-5th century–late 6th century AD), and to the abandonment of clothed inhumation (late 6th–early 7th century AD).

The visual appearance of the cemetery

Archaeological literature has dealt with a number of aspects of the so-called 'row cemeteries' of the early middle ages; the contributions of French and German schools being particularly relevant. Some researchers insisted on the importance of the so-called 'vertical elements' (gravestones or related furniture) for the spatial organisation of the cemeteries (*e.g.* Salin 1952, 92–182), as it was commonly believed that the graves were deeply sunk into the ground and fully covered with dirt. Accordingly, they unavoidably required visible markers above the surface to ensure a regular development of the cemetery and to enable certain funerary practices, such as the reuse of graves or some archaeologically less visible actions: the deposition of offerings on or around a grave, or simply, the occasional visit to a deceased relative's, neighbour's or friend's grave.

Evidence for such vertical elements has been recorded at Estagel: the excavation reports describe some stone blocks placed next to non-funerary surfaces, which can be interpreted as 'border stones' delimiting such spaces (Lantier 1943, 176–177; 1949, 70–71).[1] A similar stone block was found lying on the capping slab of a grave, perhaps acting as a gravestone. Lastly, two graves preserved traces of more sophisticated, architectural elements that may have played a significant role in the visual appearance of the cemetery. They consist of wall-like structures made of local river pebbles and mortar, which rested directly on the grave's capping slabs. All these few surviving vertical elements are probably nothing but a small sample of the structures originally present above the surface; their shallow positions would make them particularly vulnerable to both natural and human alterations and, accordingly, less likely to be archaeologically recordable. I do not think though that the small number of attested vertical elements has to do exclusively with post-depositional processes and archaeological visibility.

A number of sites in the Languedoc region offer an alternative picture of the appearance of 5th–6th century AD cemeteries, in which vertical elements would not have been indispensable, as the grave covers were set on the original ground surface, not below it. This fact is particularly well-attested among the oldest graves associated with early churches, as at Saint-Pierre-des-Cuisines in Toulouse, Martres-Tolosane, possibly Clos de la Lombarde and Hôtel-Dieu in Narbonne and Montferrand (Cazes and Catalo 1988; Boube 1957; Solier 1989; Ginouvez 1996–97; Audy 1958). In all of them, the covers of the sarcophagi appear to be laid directly on the original floor surface inside the buildings. However, the practice was by no means limited to the inner spaces. A particularly well-recorded example is from excavations around the church of Saint-Vincent at Lunel-Viel (Raynaud 2010, 153–159, 173). There, not only the sarcophagi's covers were visible above the cemetery surface, but also the capping slabs of many cist graves (Figure 3B–C).[2] The rural cemetery at Yvoire-Les Combes in the Upper Savoy is another striking example: an accurate stratigraphic recording has led to the identification of the ancient ground surface (Serralongue 1996, 1998, 1999), consisting of a layer of gravel uniformly extending over all the cemetery area. Judging from the published

1 Non-funerary surfaces appear to have been an important element of the cemetery. Topo-chronological data suggest that they would have been probably planned from the very beginning of the cemetery, or at least from its period 2 (AD 440/50–470/80), corresponding to the earliest burials in the central area. They might be interpreted as stations for funerary processions and gathering places during commemorative ceremonies.

2 In the nearby cemetery of Les Horts, instead, only the sarcophagi's covers were visible above the surface, whereas 'underground' graves were indicated by gravel layers or actual gravestones (Raynaud 2010, 119–125).

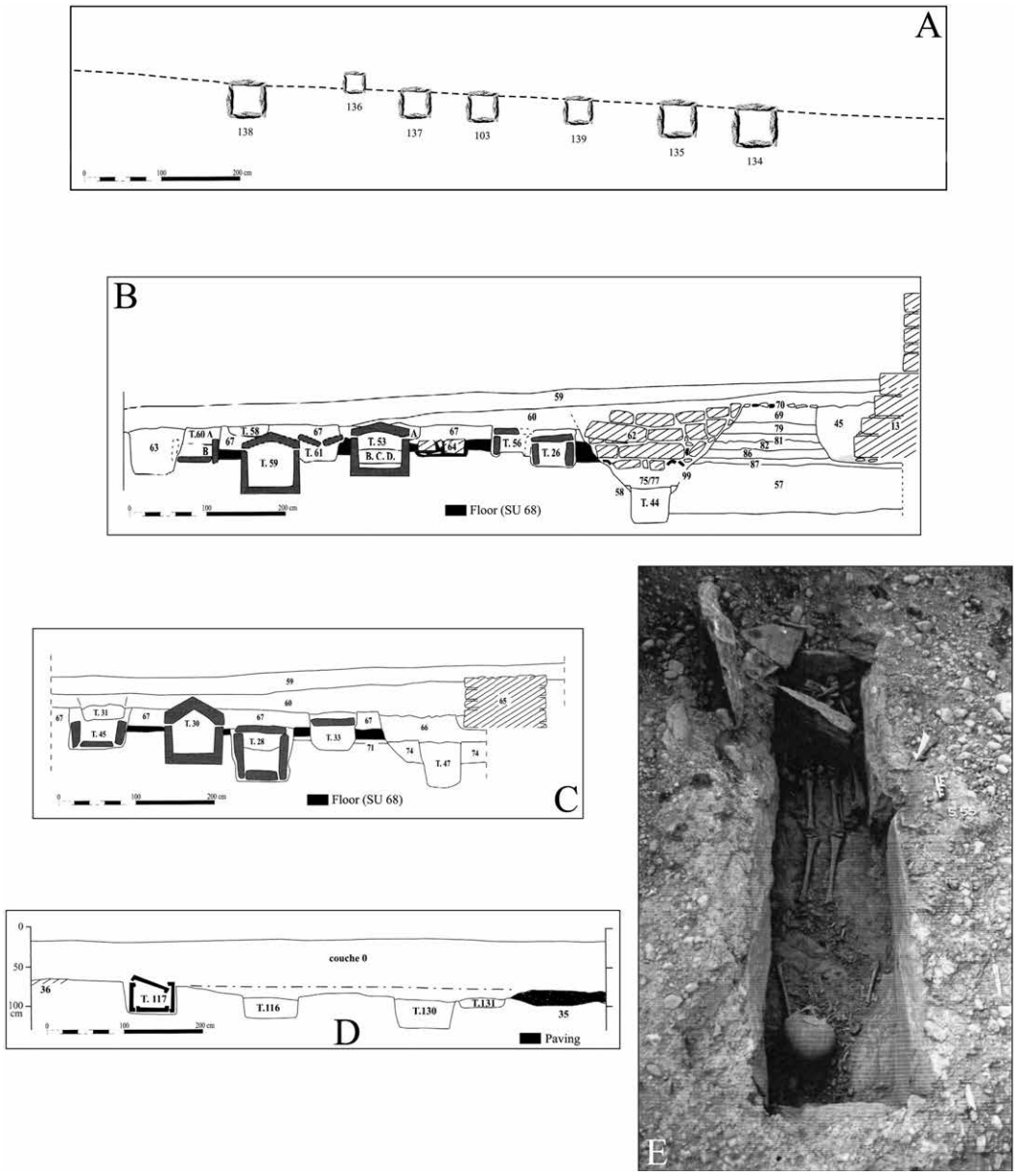

Figure 3. Examples of early medieval grave covers visible on the cemetery surface. A: Estagel-Les Tombes, reconstruction of some graves' relative heights and their relation to the trampling surface. B–C: Lunel-Viel–Saint-Vincent, grave covers lying on the floor num. 68. D: Lunel-Viel–Le Verdier, grave covers lying at the same level as floor num. 35 and street num. 36. E: Yvoire-Les Combes, slab coffin and rests of gravel paving (A by J. Pinar after R. Lantier's notes; B–D after Raynaud 2010; E after Serralongue and Treffort 1995).

photographs, the covers of the slab cists are laid on this layer (Serralongue and Treffort 1995, fig. 12–14) (Figure 3E). Traces of a similar paving have been preserved at the somewhat earlier cemetery of Le Verdier at Lunel-Viel, where the *tegula* or slab covers of some graves are also laid at the level of the original floor surface (Raynaud 2010, 51) (Figure 3D).

Figure 4. Estagel-Les Tombes. Reconstruction of the cemetery's surface (Francesca Frasca, Bologna).

The examples of early medieval rural cemeteries preserving consistent stratigraphic sequences are still few, but they are consistent with the data reported by older publications. During his excavations, at Estagel for example, Lantier was careful to record the depth of the graves and, occasionally, their relative heights. According to his notes, there were only two levels of graves: the overwhelming majority had its capping slab placed at the same height, while a small group of children's graves were set somewhat higher. It is furthermore reported that the covers of the lower graves lay at the same level as the bottom of the higher graves (Lantier 1949, 70), so there is little doubt that the very same level corresponds to the original surface of the cemetery (Figure 3A). A further confirmation of this comes from the aforementioned cemetery at Le Verdier, where the height of the ground surface, the sunken graves and the surface ones—children burials in amphorae—has been carefully recorded (Raynaud 2010, 51).

In such a cemetery, the grave covers were entirely visible. As such, they were not only a major feature of the underground cemetery intended to hold and to protect the corpse, but also the main architectural element on its surface, which determined the organization and definition of the cemetery spaces: with each grave visible, the circulation corridors and the free, non-funerary squares were perceived clearly by every passer-by (Figure 4). A number of eloquent examples of interaction between visitors to outdoor cemeteries, grave slabs and sarcophagi set *super terram* are provided by the 6th-century historian and hagiographer Gregory of Tours (GC 35, 52, 71; GM 66).

Besides its direct impact on our perception of the visual appearance of the cemetery, the visibility of the graves has a number of implications for the interaction between stone structures and the community of the living. That kind of cemetery, indeed, had to be regularly looked after. One must consider, for instance, the impact of snowfall on the graves: its accumulation on the grave covers could easily lead to the breaching of the fragile schist slabs, as some written sources suggest (Gregory of Tours, GC 71). Therefore, a certain task force—likely to be integrated by grave owners and other volunteers—had to be set up after every strong snowfall to shovel snow off the capping slabs. Another element requiring regular care was the ground surface itself: judging by the absence of any mention of stone pavements in the excavation reports, one must assume that the spaces between the graves were strips of soil. They were probably covered by grass, as strong practical reasons suggest: firstly, the grass would help to prevent the cemetery surface

from becoming marshy after rainfalls,[3] secondly, it is likely to have contributed to a more pleasant olfactory environment (Roch 2009, 353–357). In any case, the cemetery's grass had to be cut regularly, as excessive growth might have concealed the capping slabs in a relatively short time, causing difficulty with orientation and even access to some areas of the cemetery. The visual appearance of the cemetery surface at Estagel must have been completed by a wide range of elements archaeologically invisible. Among them, one may mention flowers and aromatic herbs which, according to written sources, were often spread over the grave covers to embellish and perfume them (Jerome ep. LXVI.5; Prudentius, hymn X.169; Roch 2009, 353–357). Some other elements were probably intended to customize and ease the identification of the grave, as could have been the case with small stones placed on top of some capping slabs.

The extraction and transformation of stone: social and economic implications

One of the less researched aspects of grave building in the Early Middle Ages corresponds to its economic implications. A systematic research on this topic requires an integrated archaeological, historical and petrographic approach enabling the identification of the sources of the raw stone, the available transportation infrastructure and the corresponding patterns between stone-built graves, gender and age, and types of grave goods (*e.g.* Louis and Delahaye 1983; Liégard *et al.* 2004; Paya 2015; Polinski 2015). Research on slab cists appears to have particular problems concerning, in the first place, the availability of stone samples, since grave slabs are seldom preserved after excavation. At Estagel, for instance, most of the schist slabs unearthed between the 19th and 20th centuries had been removed from their original locations, with some of them reused in field-boundary walls in the neighbouring plots (Figure 5A–B). Furthermore, at Estagel the scarcity of data on the stone slabs interweaves with a general lack of osteological material from the graves.

Meagre as it may be, the evidence from Estagel conveys some hints on the economic and social background that conditioned grave-building and maintenance. The first applies to evidence of repairs to a number of capping slabs (Lantier 1943, 178; 1949, 72). They appear as fillings of schist chips set into the slab's cracks, to seal them against water and sediments. As said, natural agents such as snowfall and winter frost, may result in the breaking of the exposed part of the grave. It is very likely that most of the fractured slabs needed to be replaced, but there is no evidence of such in the archaeological record. In any case, the evidence of repairs implied that cutting, transporting and setting a new slab had a cost that not everyone was willing to pay: instead they contented themselves with a cheaper and faster patched solution. Some 5th–6th century AD evidence for theft of structural grave elements should be interpreted also from this point of view (Lex Wisigothorum II.2; Gregory of Tours, GC 17).[4]

Another clue to the economic dimension of the building of graves at Estagel is provided by its striking homogeneity: as said, almost every single grave in the cemetery

3 An unhappy combination of snowfalls and incompetent grave diggers degraded the originally green grassy surface all over and around Apollinaris' grave near Clermont (Sidonius Apollinaris, ep. XII).

4 Both texts refer indistinctly to *sepulchra* and *sarcophagi*. The latter was probably used to also describe slab coffins (see also Lex Salica XVIII.2, where both types of grave are generically referred to as burials *in petra*). Evidences of repairs and replacement of covers can also be seen on some sarcophagi (Louis and Delahaye 1983, 281).

was identical as regards its morphology, manufacture and raw material. The general picture would be, thus, that of a relatively egalitarian community, where no marked differences in economic status were observed. And yet, the grave goods inside the slab cists contradict such a premise, since they do mirror certain economic stratification (Pinar 2017). The association of the same grave structures, with both 'expensive' and 'cheap' belts and brooches, implied that a slab cist was cheap enough for the poorest members of the community, yet still acceptable for the richest. At the same time, it suggests that to the people living at Estagel—even to the richest—accessing good-quality bronze ornaments was easier than importing more valuable stone or already-made sarcophagi. Even with Estagel lying relatively close to Narbonne, a major production centre of stone sarcophagi (*e.g.* Mérel-Brandenburg 2002), the costs of acquiring and transporting them must have been incomparably higher than bringing home some portable metal objects from their manufacturing workshop(s).

The homogeneous grave structures at Estagel are connected to nearby easily accessible extraction areas, since the cemetery is set at the base of a hilly area characterised by abundant schist outcrops (Figure 5). As far as the excavation reports and the preserved reused slabs show, every stone cist at Estagel was made of grey slaty schist. This specific type of schist is the main element in the upper layer of the Silurian formations in the Estagel municipal territory (Berger *et al.*1993, 21–23), and is easily distinguishable from other similar local outcrops, such as the Ordovician pelitic schist from the neighbouring municipality of Montner. Not surprisingly, one of the main outcrops of grey slaty schist in the whole region is located right in front of the cemetery, barely 50 m southeast of the southernmost graves (Figure 5D). That suggests everybody could afford such a grave, because both the extraction and transportation of schist was very easy, due to the relative softness of the stone and its availability next to the cemetery. This, together with the evidence of grave repairs, implies there was indeed a cost related to the production and transport of slabs for grave building. It cannot be excluded that the very location of the cemetery, probably some hundreds of meters from the settlement area, had actually to do with its proximity to the raw material.

The physical properties of this type of schist offer some hints to the labour and overall organisation involved in grave building. It would not be suitable for the usual stone work, as it is too fragile to be sculpted or chiselled. Thus, the large grave slabs had to be quarried directly into their approximate final shape in the nearby schist outcrop by chipping the block longitudinally, that is to say, in the direction of the outcrop. They were probably cut ad-hoc, adapting their measurements to the deceased's body size, which meant that the work had to be done during or just after death and before the funeral. Most probably, the schist quarry was bustling with activity, as rites such as the preparation of the body and the vigil were being performed. According to the available data, the cemetery area was only a part of a topographical unit that also included the quarry and, most likely, the path that may have divided/connected both areas with each other and the settlement.[5]

There is little to be said about the identity of the grave builders, as no written source speaks explicitly about the organisation of that craft in the early medieval countryside,

5 Lantier claimed that the path connecting the ancient cemetery to the present day centre of the village may have had ancient origins (Lantier 1943, 176). The dissemination of the recorded Roman and early medieval finds makes it very likely that the settlement related to the cemetery was located there.

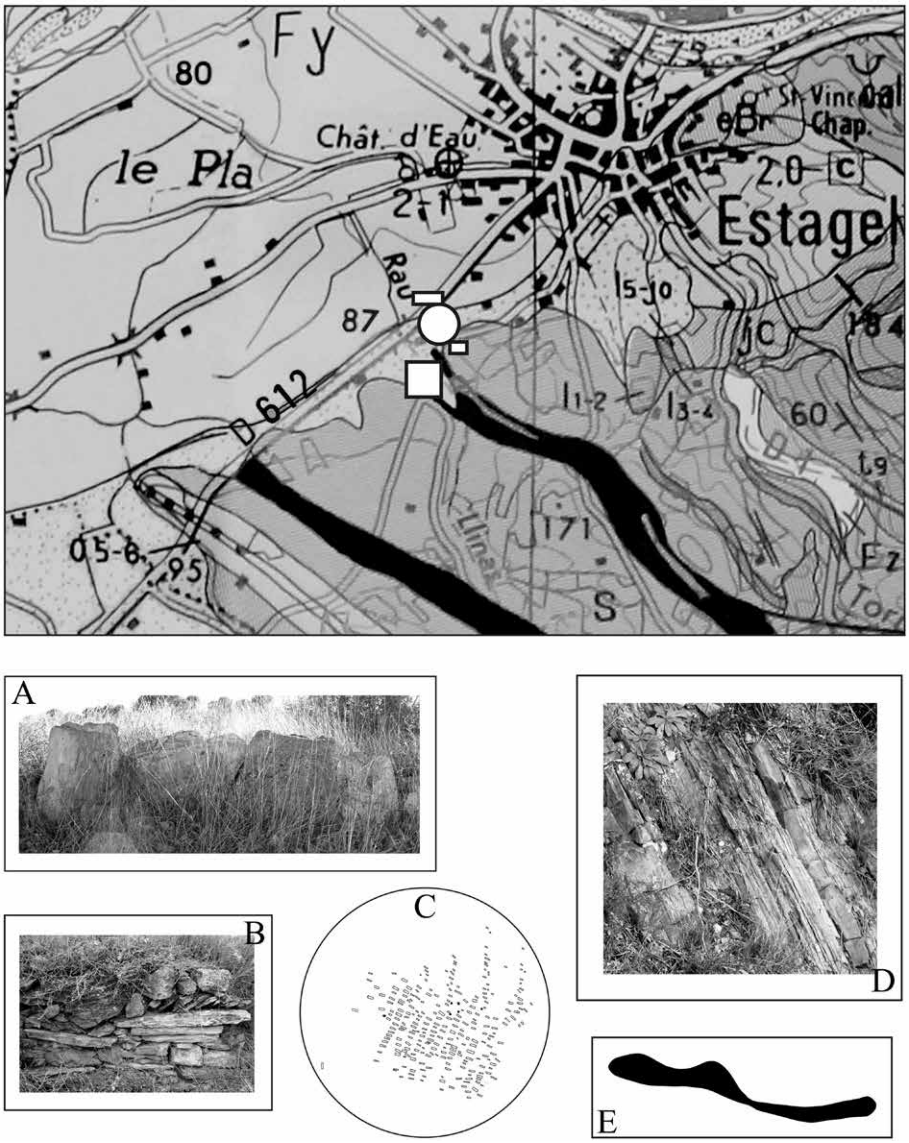

Figure 5. Estagel-Les Tombes. Location of reemployed grave slabs and schist outcrops in the vicinity of the cemetery. A–B: schist slabs reemployed in the cemetery borders. C: early medieval cemetery. D: grey slaty schist outcrop in front of the cemetery. E: grey slaty schist veins of the Estagel block (map after Berger et al. 1993 with additions by J. Pinar; Photographs: J. Pinar).

and the description of metropolitan and monastic milieus do not convey convincing elements for a comparison. At Estagel, the nature of the raw material implied a certain level of specific skills: due to its softness, schist is easy to carve out, but also very prone to breaking. Moreover, it had to be cut regularly along its natural cleavage direction, which was particularly important in order to ensure a relatively impermeable—and more resistant to frost—cover slab. Nonetheless, it seems likely that the grave builders were not specialized craftsmen devoted full-time to that activity. They would have quarried

stone slabs as a complement to other activities, probably related to stone working, such as masonry.[6] In any case, their work as grave builders must have been rewarded, whether in monetary terms, in kind, in time—by being freed from other activities—or in favours.

Slab cists, sarcophagi and churches: symbolic spaces and meanings

The previous lines attempted to address the question of why every family at Estagel could have had a slab cist, and which were the factors rendering slab coffins affordable. The next important question to be asked is why almost everyone should want to be buried in one of these graves. Provided that it was not a technological matter—as other raw materials and building techniques were known and occasionally used at the cemetery—the answer might lie in the symbolic sphere.

The symbolic meaning of the different types of early medieval graves has attracted the interest of some researchers. For some time, the discussion was focused on finding out whether certain types of grave structures were more 'Roman' or more 'Germanic' in character (*e.g.* Salin 1952, 101–103; Gagnière 1965, 80–83; Vieillard-Troïekouroff 1979, 325). In these works, slab cists were interpreted as a somewhat primitive way of burying the dead, bound to proto-historical traditions surviving among the Germanic people settled in Gaul, and mirroring technical limitations in extracting, transforming and using stone. They were regarded as opposed to the two-pieced sarcophagi, which were instead attributed to Roman populations, an interpretative model that has been rejected by more modern approaches (Louis and Delahaye 1983, 292–293; Delahaye 1991, 297–298; 1993, 143). Indeed, a mere morphological examination suggests that both types of graves were closely related. Slab cists and sarcophagi share not only their major features—a closed rectangular or trapezoidal stone cist providing a sort of 'final place of rest' to the deceased (Louis and Delahaye 1983, 290–292), but they also followed an identical path in terms of how their forms evolved through time: in Merovingian Gaul, the earliest rectangular containers gradually evolved into trapezoidal forms as decades went by. Moreover, the same type of stone slabs was used to cover both sarcophagi and more humble graves—stone cists and even simple pits—in some regions of Gaul (Flèche 1985, 57). From a morphological point of view, stone cists can thus be easily defined as low-cost sarcophagi (Colardelle *et al.* 1996, 281).

An examination of the ways of using both types of graves seems to confirm this proposal. Unlike in Classic Antiquity, Late Antique and early medieval sarcophagi were often set on the ground surface of churches and cemeteries or sunken—whether partially or totally—in it. Some authors connect this change to the spreading of Christianity, which encouraged a more direct contact with sarcophagi, as elements not just of funerary, but also of religious practice (Pietri 1986, 136; Duval 1993, 32–35; Sapin 1996, 66–68). Be this as it may, the most typical sarcophagus arrangements are mirrored by the evidence from Estagel, where most of the grave covers lay just above the original ground surface, while some children's (probably infant) graves rested on it. The latter are the result of a conscious

6 Even if evoking a completely different topographic and economic environment, the examples of *caementarii* reported to build and care for bishops' graves in Ravenna may be an illustrative example (Agnellus of Ravenna, LP 36, 52).

effort to grant them architectural prominence, for their raised height is combined with unusual topographical positions: they are located in the middle of the corridors, between the rows of regular graves, interrupting the circulation and therefore acting, not only as graves, but also as actual funerary monuments. The evidence for particular topographical arrangements related to infant graves might contribute to explaining their 'invisibility' in many early medieval cemeteries, as the 'standing' graves would have fewer chances to withstand the erosive processes following the abandonment of the site.

The ultimate symbolic implications of such praxis need to be explored yet; it is obvious though that there was a direct connection between the passing of a younger member of the community and the siting of an above-average position within the cemetery. Such a use seems to be intimately connected to the location of certain 'privileged graves' in specific architectural spots, and it appears to be inspired by 4th–5th century Christian monumental complexes: the latter may thus be regarded as the ideal topographical environment that far humbler rural cemeteries, such as Estagel, tried to evoke. Sarcophagi set at two main heights can be noticed, for example, in the aforementioned basilica of Clos de la Lombarde at Narbonne, a possible model for later cemeteries in the Languedoc countryside. The sarcophagi in the side naves would have been partially sunk into the ground, with their covers lying above the floor, while the sarcophagus set in the centre of the main nave—in front of the chorus—rested entirely on the floor (Figure 6). In this case, the location of the grave and its height clearly points to an unusual grave.

These pieces of evidence help to identify the slab cists as conscious imitations of the concurrent stone sarcophagi. The latter, frequently on display in early Christian monumental complexes, became an ideal grave in which many people, irrespective of their social position, wanted to be buried. Depending on the available resources, workforce and transport infrastructure—that is, depending on the final price—, one could acquire a grave which more or less resembled a sarcophagus. For example, getting a sarcophagus-like grave must have been relatively cheap and easy for the people living at Estagel, whilst at other locations, it must have been more expensive and, accordingly, not everyone could have afforded one.

The spread of an ideal grave model—the sarcophagus—might help to explain the increasing use of slab cists throughout Gaul between the 5th and 7th centuries AD (Gagnière 1965, 80–83, 104–110; Boissavit-Camus *et al.* 1996, 262–263, 267; Colardelle 1983, 348–350; Colardelle *et al.* 1996, 284). It is indeed a pattern that resembles very much that of the spread of limestone, sandstone and plaster sarcophagi throughout Merovingian Gaul, which became more widespread from the late 6th century until, at least, the beginning of the 8th century AD (Delahaye 1985, 1989, 1991, 1993; Périn and Renou 1985; Périn1991, 1993; Henrion 2000, 358–362; Liégard *et al.* 2004; Büttner and Henrion 2009). In some regions, the spread of slab cists preceded and announced the popularization of sarcophagi, while in some others, the appearance of both types of graves must have been broadly synchronic. In both cases, the two phenomena appear to have been closely related.

There is little doubt that the popularisation of sarcophagi in Merovingian Gaul is a consequence of a deeper transformation in the way in which people conceived the relationship between architecture, funerary spaces, the living, the dead and the material embodiment of their remembrance (Sapin 1996, 66–68). In other words, it was not only the sarcophagi and the slab cists becoming popular, but the cemeteries with surface stone slabs and all their implications for funerary and commemorative praxis. The phenomenon is insinuated

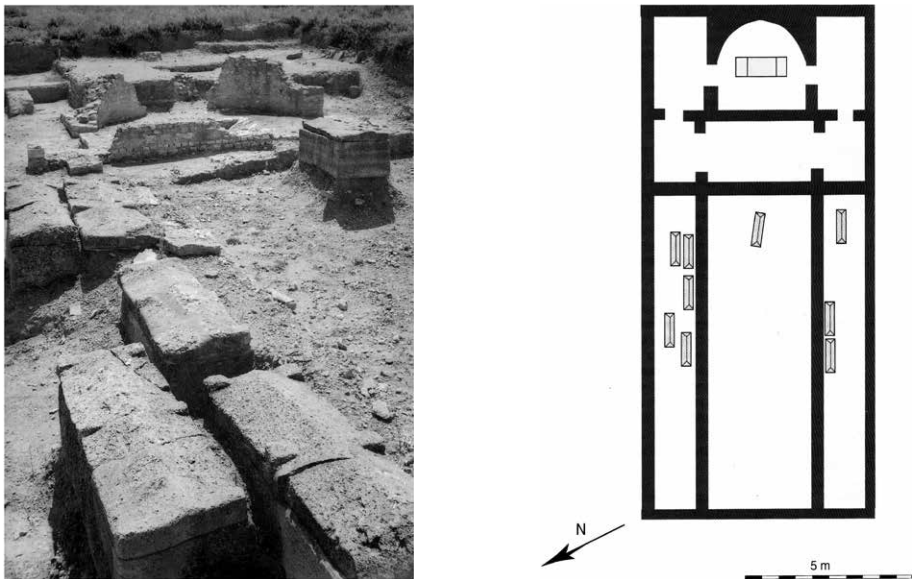

Figure 6. Narbonne–Clos de la Lombarde. Position of the sarcophagi inside the basilica (left, after Solier 1991; right, after Dellong 2002).

even before the use of slab cists reached its heyday: at Le Verdier, for instance, a number of surface graves are superposed to earlier underground graves (Raynaud 2010, 38, 51), thus suggesting that they became increasingly popular during the later period of activity at the cemetery (probably, during the first half of the 5th century).

A long-lived theory suggests that the origins of the Merovingian row cemeteries lay in the settlement area of barbarian newcomers in northern Gaul. Since then, the discussion has been focused primarily on the nature of the grave goods (*e.g.* Halsall 1992, 2000, 2008; Fehr 2008). If we move our attention onto other important aspects of the materiality of cemeteries, such as the organisation principles and the visual appearance, the example of Estagel and other early south-Gallic row cemeteries point to the nearby urban Christian cemeteries, mausoleums and churches as their main source. Curiously enough, these row cemeteries, set in open fields and not directly connected to any church, have often been suspected of sheltering pagan or heretic practices. Nonetheless, examples such as Estagel show that what set these cemeteries apart from those inside or next to a church, was the absence of the actual building, as they still shared basic organisation principles, overall visual appearance, similar burial practices and structures, as well as the same grave orientation.

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Worship and stones on the Cycladic Islands

A case study of the cult of Apollo and Zeus

Erica Angliker

Abstract

Until recent times, the study of Greek art and archaeology was dominated by an evolutionary approach that considered aniconic worship, particularly the veneration of stones, as a manifestation of an early, primitive stage of Greek culture. New studies, however, have changed our perception of the role of stones in Greek religion and art, and demonstrated that they served as foci of attention in cult practice throughout Greek history, and that their veneration occurred side by side with that of the gods represented in traditional—including classical—works of art. This paper discusses the importance of rocks in Greek religious life on the Cyclades by examining in detail how stones were integral elements in the worship of two gods: Apollo and Zeus. The study covers not only rocks with a highly specific function in cultic space but also ones that were worshiped in and of themselves and represented the aniconic veneration of a god. I begin my study with Apollo and how the rocks in Kea were integrated into his temple to form a suitable space for mantic activities. I then discuss the worship of Apollo with a focus on the altar rock at the Delion on Paros, which has parallels on Delos. In addition, I examine the aniconic cult of Apollo on Thera. The second part of my paper is devoted to Zeus. After demonstrating the close association of the god with aniconic worship in open air sanctuaries on mountains tops, I examine several examples in which his cult was focused on an altar rock. In the final part of the paper, I examine inscribed stones from Thera and Naxos, which not only delimited sacral space dedicated to Zeus but were also an aniconic form of the god's worship.

Keywords: aniconism, worship, Zeus, Apollo, Thera, Paros.

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Introduction

Although natural elements and their relations to cultic space and practices in ancient Greece have been studied by scholars for some time, only recently has the topic reached a turning point thanks to new theoretical frameworks (Calame 2007; Mylonopoulos 2008; Sporn 2010; Brule 2012; Mylonopoulos 2008; Gaifman 2012; Sporn 2015). Natural elements—water, plants, stones—are now seen as integral to cultic practices that were performed side by side with other forms of worship throughout antiquity (Mylonopoulos 2008). In addition to methodological studies of this issue, several scholars have been investigating sites in which rocks play the chief role in cultic activity (Diler 2000; Berndt-Ersoz, 2003; Fleischer 2008; Pedrucci 2009). Furthermore, a general re-evaluation of the role of aniconism in ancient Greek and Roman Art has pulled the veneration of rocks outside the sphere of primitive practices, where it had been relegated since Pausanias (*Description of Greece* 4. 32), who stated that '*the Greeks worshiped uncarved stones at an earlier stage of their culture*'. It was this statement, which J. J. Winckelmann (Winckelmann 1764) incorporated into his seminal work that led to an evolutionist interpretation of Greek religion and art—one that began with primitive practices and evolved into the splendour of Classical Art. A short while ago, M. Gaifman granted aniconism its rightful place through a clear demonstration of its pervasiveness and simultaneous existence with figurative art in ancient Greece (Gaifman 2010; 2012). Both rocks and standing stelae can now be said to be intimately related to the veneration of divinities (Gaifman 2012). Following the paths paved by these new theoretical approaches, this short essay aims to contribute to the understanding of the importance of rocks to ancient Greek religion in the Cyclades by examining examples of sites where they were integrated into cults.

Preserved in the Cyclades are rocks and stones that were either incorporated into a cult space, worshiped for their own sake, or, occasionally used as offerings or ritual objects. Stones could be offered as votives, as is known from crystals (most probably of apotropaic significance) recovered from the sanctuary of Artemis and Apollo on Kythnos (Mazarakis-Ainian 2005). Rocks were also an integral feature of several cultic spaces in the Cyclades, where they were used in myriad ways that illustrate the variety and complexity of this phenomenon. One of the most interesting cases comes from the sanctuary of Phlerio on the island of Naxos, where a cult of a female divinity linked to fertility came into being in the 8th century BC, reached a peak between the 7th and 6th century BC, and lasted on some level until Late Antiquity (Lambrinoudakes 2005; 2010). The importance of stones within this cultic space is manifest in various ways, beginning with the sanctuary's location; the village of Melanes, lies in a region full of marble quarries which played a key role in the development of early Greek sculpture and monumental architecture (Lambrinoudakes 2005; 2010).

The connection between stones and cults at Phlerio can equally be perceived in the massive stone integrated into the sanctuary's principal cultic space throughout its existence. Excavations at Phlerio have also revealed a great quantity of unfinished and/or defective items (*e.g.* a sphinx, the plinth and feet of a small *kouros*, a votive column). These served as dedications and were probably offered by quarrymen, for whom these less valuable items may have borne additional significance, given the effort and danger of handling huge stone masses (Lambrinoudakes 2005; 2010). The importance of the sanc-

tuary to quarrymen can also be surmised from an inscription from the quarry on Melanes that mentions the cult of the heroes Outos and Ephialtes. According to a mythological narrative, the twin-giants—children of Poseidon and Aloadae—possessed the power to move large masses of rock, as well as mountains (Lambrinoudakes 2005).

The examples mentioned here offer some idea of the variety of ways in which stones could be incorporated into cults, or worshipped in their own right in the Cyclades. As it is impossible to systematically analyse all relevant examples in this short essay, this paper is restricted to the examination of the worship of stones and rocks linked to the cult of two divinities, Apollo and Zeus. These two gods were chosen because their cult was practiced on several Cycladic islands over a long time-span. They also enable the examination of both rocks that were incorporated into cultic space, as well as the worship of rough rocks in themselves.

Rocks and the worship of Apollo

Kea: rocks and the cult of Apollo Pythios

One of the most fascinating examples of an incorporation of rock formations into cultic space can be seen on the island of Kea. Here, on the acropolis of the city of Karthaia, was erected one of the most important sanctuaries of the *polis,* with temples dedicated to Athena and Apollo. The temple relevant to this paper, that of Apollo, is the oldest building at the sanctuary and was constructed around 525 BC (Simantoni-Bournia 2007/2008) (Figure 1). Extensive and complex terracing was required to create space for this singular Doric temple, which boasts a wide front of six columns (Papanikolaou 1998). Among its conspicuous characteristics is a niche carved into the rock that adjoins with its north wall (Figure 2). This niche, which once held a statue of Apollo, is separated by a kind of door from the temple, while a table, probably for offerings, was erected before it. On this table are preserved the bases of stelae that most likely displayed the decrees of the city (Papanikolaou 1998).

The integration of this rock into the temple and the niche carved for it are features that have thus far received little scholarly attention. Yet the effort dedicated to this unusual construction may be of fundamental importance to the cult of Apollo on Kea, where the god was worshiped under the epiclesis Pythios. The niche connected to the temple by a small door would have constituted a confined space with low illumination. Cognitive archaeology shows that changes occur in the mental state of a person placed in an environment where a lack of light or spatial references causes disorientation (Faro 2013; Tyree 2013). The construction of such an artificial space in the temple of Apollo on Kea would have resulted in a space well suited to different perceptions and states of mind that were fundamental to divinatory activities. Given that Apollo was worshiped on Kea under the epiklesis of Pythios, it would not be surprising if he had been linked to oracular functions; the niche, in fact, would have been a perfect space for the performance of such functions. Recent research on caves has shown that some oracles occurred in caves. It is thus interesting, as Ustinova (2009, 109–153) has pointed out, that inscriptions at the two great oracular sanctuaries of Apollo (Delphi, and Claros) note that priests and priestesses utter prophecies inside a grotto.

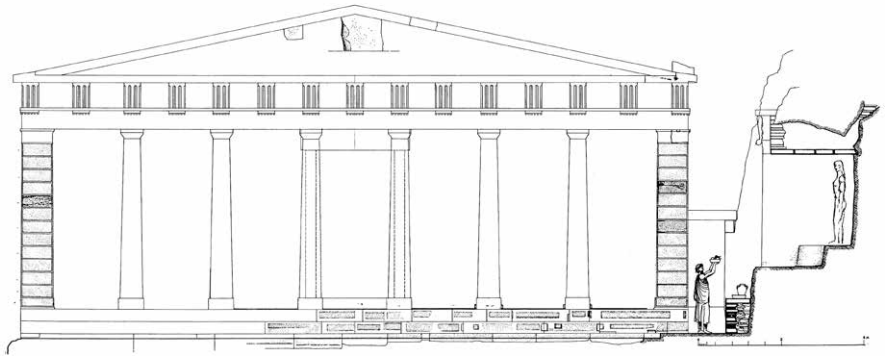

Figure 1. Temple of Apollo Pythios (c. 525 BC), Kea. View of naos with the statue of Apollo in the niche (after Papanikolaou 1998, 571, figure 12).

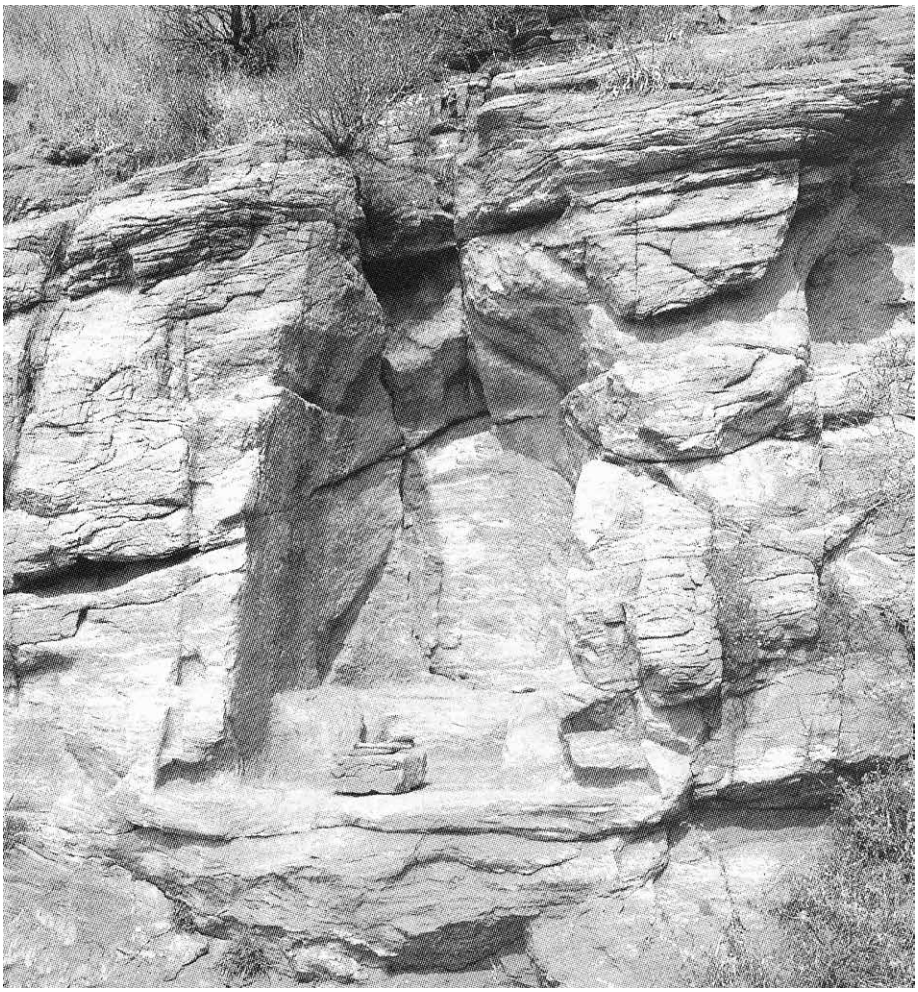

Figure 2. Detail of niche on the rock adjacent to the temple of Apollo Pythios, Kea (after Papanikolaou 1998, 571, figure 1).

Figure 3. Rock altar at the Delion on Paros (after Rubensohn 1962, plate 3b).

Delion on Paros: a cult of Apollo

Another example of the incorporation of rocks into a sanctuary of Apollo can be found at the Delion on Paros, a sanctuary located to the north of Paroikia on a hill with an excellent view towards Delos. There, a natural stone protuberance at the centre of the sanctuary was incorporated to function specifically as an altar (Figure 3). It is difficult to determine precisely when the rock began to be used as an altar. Ceramic evidence (Detoratou 2003–2009) shows that cultic activity at the site began in the Geometric period; the earliest use of the altar, which is the most basic structure needed for the establishment of a cult, certainly dates to that period. At some point, impossible to determine, the natural rock went through modifications: its surface was partly smoothed (Rubensohn 1962, 5–7) and slabs of marble, of which only a few survive today, were arranged around it (*ibid*.; Ohnesorg 2005, 31). The rock altar along with the marble slabs measure *c*. 3.5 m (Ohnesorg 2005, 31). Rubensohn (1962, 6) suggested that these slabs may have formed a wall the same height as the altar and thus constituted a structure that could have supported a slab of marble over the altar. Yet, as Ohnesorg (2005, 31) clearly demonstrates, this type of construction could not have served as the 'receiving cuboid' because it was irregular and not thick enough to support a higher wall.

Looking at the rock altar at the Delion on Paros, it is noticeable that the marble was actually combined with the roughness of the rock, whose irregular surface and natural shape was intentionally maintained. This deliberate preservation of the natural state of the stone is significant as it may be a sign that the rock was perceived as sacred and thus served not only a practical but also a sacred function. Distinguishing a rock as a locus of divine presence is not a simple or easy task, but as Gaifman (2012, 30–35) argues, whenever a stone is intentionally separated from its natural environment through epigraphy, an architectural structure, or carving, it can be considered to be related to a divine presence. It is difficult to determine the reasons why this rock was

deemed unique by ancient worshippers, but in some cases rocks were used as altars to signal the antiquity of a cult (Ekroth 2010, 149–155). In any case, not only does the clear separation of the rock from the natural environment indicate its holiness, but, as demonstrated below, the use of this natural rough material is a central feature in the cult of Apollo Delion and has close parallels to practices celebrated on Delos.

Amongst Greeks, the altar was the focal point of communication with divinities; through it offerings could pass from the realm of the mortals to the realm of divinities (Pironti 2009). In the case of the worship of Apollo at the Delion on Paros, however, the altar had yet another meaning. As the god was not given a temple or cult statue the rock altar was the main object of focus of the god's worship. An examination of the general context of the cults celebrated at the Delion on Paros clarifies the importance of the rock altar as the principal focus of the cult of Apollo.

Archaeological evidence shows that the site of the sanctuary of Apollo Delios was frequented as early as the Neolithic period (obsidian knives were found in the area, Rubensohn 1962,1–53). The oldest ceramic evidence, however, comes from the Geometric Period, appearing after a long hiatus (Rubensohn 1962, 6–7; Detoratou 2003–2009). The cult was organized only in the Archaic period, when a temenos-wall composed of gneiss was erected at some point before 490–480 BC (Schuller 1982, 81).[1] The cult initially celebrated before this simple temenos, revolved around a natural altar-rock. The sanctuary gained a monumental temple only between 490 and 480 BC, when a Doric temple housing a colossal statue of Artemis in its cella was erected (Rubensohn 1962; Schuller 1991). During this period, the sanctuary was also given an hestiatorion. A vast array of votives was set beneath the cella of the Doric temple.

Excavations at the Delion on Paros have also brought to light a number of marble statues, mostly kore, but no kouros. A second altar was erected in front of this Doric temple (Rubensohn 1962, 54–58). The rock altar was used at all stages of the sanctuary's existence and did not fall out of use even after the new altar was erected. The placement of the rock altar next to the new structure can be explained by the fact that each altar served the cult of a different divinity. While the new altar placed in front of the Doric temple was devoted to the cult of Artemis, the rock altar was associated with the cult of Apollo.

A badly preserved enigmatic song by Pindar (*FGr* 140a), possibly a paean, relates that Heracles, following the orders of Apollo Delios, founded an altar on Paros for the cult of the Delian god (Rutherford 2001; Kowalzig 2012, 95–97). Scholars have long linked this literary fragment to the rock altar at the Delion on Paros and used it to demonstrate the cultic links between this site and the island of Delos (Rubensohn 1962, 43–44). Their assumption appears to be correct as later epigraphic evidence does, in fact, confirm the cult of Apollo Delios at the site (*IG* XII.5 214). The presence of Apollo was therefore linked not to an image but to an altar attached to a natural rock.

Worship centred on an altar was not uncommon in Greece. To stay with examples from the Cyclades, one can consider the early cult of Apollo on the island of Delos. There, Artemis enjoyed a temple—Artemision E (*GD* 46)—already in

1 Schuller (1982, 81) remarks that the technique used in the construction of the temenos wall does not allow us to date the construction precisely; all that can be determined is the temple's *terminus ante quem* between 490–480 BC.

the early Archaic period, while no equivalent dedicated to Apollo has been definitively identified, despite the fact that various buildings have been proposed as such (Courbin 1980; Gruben 1993; Mazarakis-Ainian 1997, 180–181; Gruben, 1997; Etienne 2002, 292–293). The colossal statue of Apollo placed next to the *oikos* of the Naxians did not function as an object of worship, and was not the main focus of the god's cult. On Delos, the first temple dedicated to Apollo, the so-called *porinos naos* (*GD* 11), was erected only in the second half of the 6th century BC.

As the absence of the god's cult statue and temple seems odd and unusual, scholars have come up with various hypotheses to explain it. The most convincing being that the cult of Apollo was directed at the Altar of the Horns (*keraton),* the most sacred and important space of the sanctuary and around which the dance of the *Geranos* was performed (Tsakos 1999). The altar, which is mentioned in several literary sources (*e.g.* Callimachus, *Hymn to Apollo* 58–63 and *Hymn to Delos* 312–323),[2] was constructed from horns which—according to the legend—had been gathered by Artemis after a hunt. For centuries, the altar seems to have existed without any monumental structure until the 5th century BC, when it was granted one that scholars associate with the so-called Apsidal Monument (*GD* 39) (Bruneau and Fraisse 2002; Bruneau and Ducat 2005, 19–23). The 'primitive' aspect of the *keraton*'s building material—horns—so captured the ancient imagination that the altar came to be viewed as one of the wonders of the world. Clearly its singular material and form added to its perception as sacred.

The *keraton* shares many features with the Delion on Paros, where a rough stone was used to evoke divine presence. Although the idea may seem strange, it was common among ancient Greeks and cannot be dismissed as 'primitive'. Indeed, there are many instances of the coexistence of natural elements and iconic worship in Greece from the 8th century BC onwards. The Delion on Paros, where the cult of Apollo focused on a rock altar, is merely a representative example of this phenomenon.

The rocks in the quarries of Naxos

The worship of Apollo linked to the presence of stones is also manifested in a highly singular way on the island of Naxos. At the ancient quarry of Apollonas, located on the north end of the island, stands a rock with an inscription that may pertain to a cult of Apollo. The inscription (*IG* XII.5 43), which reads ὅρος χωρίου ἱεροῦ Ἀπόλλωνος, fills the top of the vertical surface of a stone 0.52 m tall and 1m wide (Kokkorou-Alevras 2013, 115) (Figure 4). After studying the inscription and the site of its discovery, Kokkorou-Alevras (2013) concluded that the inscription does not indicate the location of the extraction of the marble for a temple or statue of the god Apollo. Kokkorou-Alevras (2013, 115–117) observed that because the inscription reads ὅρος χωρίου ἱεροῦ, and not simply ὅρος ἱεροῦ, two interpretations concerning the sacred place are possible.

The first is that it refers to an area of the quarry belonging to the sanctuary of Apollo (exactly which one is impossible to determine) that was either directly exploited by the sanctuary or was leased by it to private individuals. Similar examples of inscriptions, Kokkorou-Alevras (2013, 117) claims, can be found in 4th-century BC epigraphic evidence from the sanctuary on Eleusis (Clinton 2005, 91–94) and in Herculaneum, where one inscription (*IG* XIV 645,137–138) mentions a prohibition on renting the

2 For a complete list of the literary sources mentioning the *keraton,* see Bruneau and Fraisse 2002, 6–68.

Figure 4. Rock with inscription pertaining to a cult of Apollo in Apollonas, Naxos (after Kokkorou-Alevras 2013).

sacred lands of Dionysos for the purpose of extracting stones. The other possibility, according to Kokkorou-Alevras (2013, 115–117), is that the inscription refers to the border of a sacred area devoted to the worship of Apollo. Worship at quarries was not that uncommon in Greece; it is known that shrines were carved into rock or even created from cavities left by the extraction of stone in natural rock. The worship of the divinity was generally carried out in a very simple manner; sometimes the niche received a pillar (*e.g.* quarry of Kythera; Kokkorou-Alevras *et al.* 2009a) or a relief (*e.g.* quarry in Lira Laconia; Kokkorou-Alevras *et al.* 2009b). The worship of Apollo at the quarry of Apollonas on Naxos probably took place in an open-air sanctuary. Although the remains of an oblong structure have been identified on the terrace directly above the inscribed rock, these have not yet been studied. The building may in fact have served as a house for quarrymen or else as a workshop (Kokkorou-Alevras 2013, 115–117).

While Kokkorou-Alevras (2013, 115–117) offers two interpretations without favouring either of them, it seems plausible to think that the inscribed stone of Naxos served as a boundary marker for the sanctuary of Apollo. The aforementioned inscriptions from Eleusis (Clinton, 2005, 91–94) and Herculaneum (*IG* XIV 645,137–138) consist of long decrees carved on stelae on which other regulations were included. The inscribed rock from Apollo differs significantly from these; its irregular letters and brief text are far more similar to those of rupestrian inscriptions, such as those in Thera or even on the island of Naxos. Indeed, three similar clumsily carved inscriptions cover the rock; at the top is one reading ΟΡΟΣ ΑΠΟΛΛΩΝΟΣ ('boundary of Apollo') and to its left are traces of a deleted inscription with the same phrase (Kokkorou-Alevras 2013, 115–117). All three inscriptions are rather poorly executed and their letters look very different from those usually incised on monuments. They were thus probably carved by men working at the quarry in order to define the boundaries of a site in which open-air worship of Apollo was taking place. The worship, which may have

occurred within a minimal structure (*e.g.* a portable altar), following the example of other shrines encountered at quarries. In any case, the cult of Apollo involving natural elements was a common practice in the Cyclades and present at important sanctuaries, such as the one on Delos or at the Delion on Paros.

Rocks and the worship of Zeus

The final god analysed in this paper, whose cult is intimately bound with the view of stones being holy, is Zeus. A conspicuous feature of his cult in the Cyclades is his veneration on mountaintops and other high places, in open-air sanctuaries. Mythological narratives, through which ancient cults were crystallized, reveal significant veneration of the god and his associations with the arrival of the Etesian winds, a cult normally celebrated on mountaintops.[3] Archaeological and epigraphic evidence equally attests to the cult of Zeus in elevated locations in several areas of the Cyclades, where he seems to have been worshiped in an open place, only with an altar.[4] Among the cults of Zeus celebrated on mountains several can be directly linked to rocks. On the island of Thera, at the site of Mesa Vouno, the cult of Zeus took place within the cluster of inscriptions; it later received a permanent architectural structure (Gaifman 2012, 149–152). Zeus was the primary divinity worshiped here and the engraved stones served as the focal point of a cult in which ephebes took part (Gaifman 2012, 149).

Zeus's name also appears scattered among several spots on ancient Thera; on the southern side of the hill he is mentioned in large inscriptions that may date to the second half of the 8th century BC (*IG* XII.3 Supp. 1313) (Gaifman 2012, 154). Inscriptions dating to the period between the 5th and 3rd century BC also invoke Zeus, who is presented in the company of his devotees (Gaifman 2012, 155–156). By inscribing the rock, the devotee made a kind of eternal offering to the god. The cult of Zeus evoked through inscribed rocks also appears at a rupestrian sanctuary dedicated to Zeus Damatrios (*IG* XII.3 418; Hoepfner 1997, 73–149 and 151–187), at a site discovered at the foot of the hill of Mesa Vouno on Thera, close to the chapel of Christos. The sanctuary is composed of a terrace and niches carved into rock. An inscription referring to Zeus (*IG* XII.3 425) was found at the nearby cave of Pilarou, which some scholars claim is associated with the terrace. A second inscription dating to between the 6th and 5th century BC was also found carved on a rock (*SEG.* 45 1108). Although it does not contain the name of Zeus, the word ΑΣΤΡΟΑΧ may be an epiklesis of the god. Aside from this inscription, many similarities can be noted to the cult of Zeus on Naxos, where a cave, a rupestrian sanctuary, and inscriptions carved into rock, mark a place for his worship. Although the sanctuary dedicated to Zeus on Thera is not on the summit of a mountain but on its foothill, its association with the mountain is obvious.

The island of Melos holds another interesting example of rocks associated with veneration focused on an altar. Here, on a small hill between Pereanti Pyrgaki and the Chapel of Prophet Elias, a 4th-century inscription (*IG* XII.3 1094) carved into an al-

3 Callimachus, *Aetia* (4.32–37), Apollonius of Rhodes, *Argonautica* 2.516–527, Hyginus, *De Astronomia*, 2. 4–6, and Cicero, *De Divinatione,* 57, 130.

4 For example, the cult of Zeus Ikmaios on Kea (*IG* XII. 5 543). See Welter 1954, 92–93; Manthos 1991, 62–63, 135.

tar-rock mentions Zeus Katabaides (lightning). A number of Late Geometric ceramics have been identified in the area, thereby indicating human presence at the site in this early period (MacKenzie 1897, 122–23; Brandakis 2002–2003).

Zeus was also celebrated at a sanctuary with a rock altar on Paros, on the high plateau on Mount Kounado. This exceptional site faces Delion and has a good view of both bays of Paros: Naoussa and Paroikia. Mount Kounados encompasses a group of sanctuaries from the Archaic period dedicated to Aphrodite, Eilithyia, and Zeus (Berranger 1992a, 82–83; Ohnesorg 1994b). The sanctuary of Zeus is located slightly beneath that of Aphrodite, but still on the summit of Mount Kounados, in an area containing two small chapels. The rock served as the altar and focus of the cult of Zeus, who was probably celebrated in an aniconic manner. Interesting to note, this cult, which began around a rock altar, underwent monumentalisation at some point. Remains of the ancient structure seem to have been incorporated into the present chapel of the Prophet Elias, no doubt the former sanctuary of Zeus Hypatos, whose cult is attested by a 5th-century BC inscription inside the chapel (*IG* XII. 5 183; Ohnesorg 1994b).

One of the most interesting associations between the worship of Zeus on the Cyclades and rocks, however, is found on Naxos. At the centre of this island lies a chain of mountains that divides the island north and south. The tallest peak of this range, known as Mount Zas (1004 m), has been traditionally associated with Zeus. Its stormy summit, submerged in clouds even on the sunniest day, suggests that Zeus was honoured on it, and an inscription from the island (*IG* XII. 5 47) confirms that Zeus was worshiped here as a storm god (Maimaktos). On the way to the summit are two inscribed rocks linked to his worship. One, known since the 18th century and located at a height of 500 m on the natural ascent to the mount's summit, reads 'ὅρος Διὸς Μηλωσίου' (boundary of the sanctuary of Zeus Melosios) (Savo 2004b).

In 1999, another inscription (4th century BC) with the same words was discovered on the mountain (Savo 2004a, 107–109). The epithet 'Melosios', which literally means 'the one dressed in sheepskin', is a rare one, and its meaning is complex. The epiclesis has traditionally been interpreted as a designation of the god as patron of shepherds.[5] However, recent research conducted by Savo (2004a, 107–109) proposed that the term be read as 'the one wrapped in the skin of a goat (μηλωτή)'. Savo (2004a, 107–109), who sees it as linked to the Zeus of elevated places and meteorological phenomena, claims that goatskins held special meaning on Naxos, where shepherds used them to protect themselves from strong winds and the cold winter. Although his interpretation is interesting, as Ustinova (2009, 189–190; 245–246) has rightly observed, animal skins had magical ritual significance and may have been used in complex rituals of purification or initiation, rather than simply by shepherds in their daily life.[6]

Yet these two inscribed rocks are important, not solely because they refer to a cult of Zeus essentially linked with the mountain and meteorological phenomenon, but also because together they transform the anonymous rock into a locus of divine pres-

5 *LSJ*, s.v. Μηλώσιος: 'Zeus guardian of the sheep'; Frisk, 1991, s.v. μῆλον: 'Der in ein Schaffell gehüllte'; Chantraine, 1974 s. v. μῆλον: 'peu de mouton'.

6 Ustinova (2009, 189–190) notes that on Diod. 5. 64, Pythagoras descended into the Idaean cave on Crete and 'having been purified with a thunder-stone by one of the Dactyls, Pythagoras first lay prostrate for a whole day, his head wrapped in the skin of a black ram. Then he entered the cave for almost a month, and on his return performed funeral rites for Zeus.'

Figure 5. Caves of Zeus Naxos (Photograph: the author).

ence, and, at the same time, mark the creation of a separate space that belongs to the deity. Not only do they delimit sacred space, but they also attempt to make the god present. Given that the veneration of Zeus in the Cyclades was probably associated with images of any kind, the god's evocation gains significance in being essentially aniconic. The inscription on the rock, along with other natural features commonly associated with Zeus (*e.g.* the altitude of the site, the clouds surrounding the peak, the steep paths leading up to it), all work together to evoke the divinity.

All the same, we are left to wonder whether the stone or the entire territory was viewed as belonging to Zeus. Given the fact that Mount Zas was also associated with the god, it seems reasonable to think that the inscription on the rocks is one of the marks used to designate a larger area belonging to Zeus, as, for example, a cave traditionally associated with the god. The cave located on Mount Zas shows indisputable signs of cultic activity and may thus have been included in the area dominated by Zeus (Morris 2007, 103–104). Other features of the cave suggest the existence of a cult (*e.g.* pathway to the cave, presence of water source, rock altar, internal structure) (Figure 5).[7]

The importance of the entire area of Mount Zas to pastoral activities is also revealed by 7th-century BC sherds of drinking vessels used for the celebration of ritual meals that were discovered on the mountain's summit (Morris 2007). A proper survey of the area remains to be done, but Cycladic-type tiles identified by S. Morris suggest that at some point a permanent structure was built here (Morris 2007). Zeus would therefore have been associated with the whole mountain, while the inscribed rocks would have been related to the entire area. In other words, Zeus was worshiped in a fundamentally aniconic manner.

7 On the characteristic of caves used in cults, see Sporn 2010.

Conclusion

Rocks are important elements in Greek cultic space, and the examples drawn from the Cyclades show that they were fully integrated into cult either by serving specific functions or by being worshiped in and of themselves. In the present paper, stones in cultic space were considered with respect to the veneration of two deities: Apollo and Zeus. First we saw that the cult of Apollo practiced at the Delion on Paros was centred around a stone that served simultaneously as an altar and focus of the cult. This type of cult dedicated to Apollo resembles the one on Delos, where natural elements were used to create a rustic altar that likewise served as the focus of the god's cult. Moving to Kea, here the rock itself served as an important element within the sanctuary of Apollo Pythios, where an artificial cave was built to simulate a confined environment propitious to mantic activity. In Naxos, the cult of Apollo was carried out simply through inscriptions on rocks bearing the name of the god and thus marking his presence. A similar phenomenon took place in Thera, where Zeus had his name similarly engraved multiple times on rocks that served as foci of his cult. Turning to Naxos, here we have encountered a cult of Zeus associated with rituals of purifications and the mountains themselves.

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All of a heap

Hermes and the stone cairn in Greek Antiquity

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Abstract

The cross-cultural phenomenon of the accumulating stone cairn (Muhonen 2012) persists to this day in many cultures, as hillwalkers and travellers leave markers of their journey for posterity, through the addition of their own stone to heaps at crossroads or on hills or mountains. These cairns signal the way forward for future wayfarers and can also function as boundary markers and provide a platform for expressions of intent or of prayer for protection and guidance through the medium of stone. In Greek antiquity, the practice was explained through an aetiological myth pertaining to the multifaceted and mercurial Olympian god Hermes, in whose very name the stone heap is implicit. In addition to presenting this mythical *aition* from which the practice is said to have derived in the ancient Greek world, this paper will further elucidate the inextricable relationship of the god and the stone heap from the earliest appearance of his name in Bronze Age Linear B texts. In this paper, I will also explore the physical aniconic manifestation of the god in the heap of stones and in the herm, examining the apotropaic and functional roles of these monuments. Of particular interest will be the archaeological remains of the Nekromanteion—the oracle of the dead—at Epiros in northwestern Greece. This site has yielded evidence of such stone heaps, which, it is likely, allude to the role of Hermes as *psychopompos*, or guide of souls, in Greek religion.

Keywords: cairns, herms, Hermes, boundaries, apotropaism, necromancy.

Introduction

Accumulating stone cairns, found in the landscape, on hillsides, roadsides and mountaintops, across many cultures and contexts, fulfil a purpose which has driven their construction for millennia. They signal to the passing traveller the comforting reassurance that they have not veered off the correct path, and this traveller will surely

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contribute a stone offering of his own, for posterity and in acknowledgement of the comfort this cairn will provide to future travellers on the same path. In doing so, he is perpetuating a very ancient custom—a custom which, in the Greek world, was performed in veneration and supplication of the deity Hermes, whose spirit or daimon was believed to be inherent in the stone heap (Casson 1974, 71,173–174; Burkert 1979, 41; 1985, 136). These piles of stones were frequently to be found on roadsides and at crossroads, acknowledging Hermes' role as deity of thresholds, boundaries and liminal spaces. However, these man-made waymarkers more practically referenced his aspect as guide and protector of wayfarers. The traveller who added his own stone to the pile in doing so expressed his own well-wishes for the safety and relief of future passers-by and could claim some responsibility for contributing towards their guidance. The protection and guidance sought in the god were therefore provided through the agency of the travellers themselves, who could thus engage in silent communication across time with one another, communication being another remit of Hermes. The stone added to the cairn was a durable manifestation of gratitude to the god for his guidance hitherto and an entreaty of continued protection for the journey's remainder.

In this paper, I will explore afresh the phenomenon of the stone heap in Greek antiquity and its association with the god Hermes. The more primordial and chthonic aspects of this elusive and eponymously (in his Roman incarnation) mercurial deity are frequently eclipsed in wider perception by his associations with wiles and the Trickster archetype, the swiftness afforded him by his winged sandals, and his role as intermediary, effortlessly crossing boundaries, including those between the domains of mortal and immortal. He is, however, also *psychopompos,* charged with the task of escorting souls to Hades. I will present the aetiological justification for the pile of stones in Greek myth and the place of the monument type within Greek religion and society, as an aniconic manifestation of an Olympian deity and in relation to the herm. Finally, I will examine a specific site at which stone heaps have been found. This site has been postulated by some scholars as the *Nekromanteion*, or oracle of the dead, at Ephyra in northwestern Greece, in which case these stone heaps may represent invocations of Hermes as *psychopompos*.

Hermes and the stone cairn: the origins of the association

The association of Hermes with the heap of stones, or cairn, is given justification, as are so many other phenomena in Greek consciousness, by an aetiological myth recounted in the 5th century BC by Xanthos of Lydia (*FGrHist.* 675 Fr. 29). As is the case with so many other Greek myths, this story originates with an indiscretion on the part of Zeus: in a bid to shield the object of his affections from his wife Hera's jealousy, Zeus transforms the nymph Io into a heifer, denying having had any dealings with her. Dissatisfied still, Hera places her under the watch of Argus the all-seeing, or *Panoptes*, a giant with multiple eyes. At Zeus' bidding, Hermes throws a stone at the giant and then slays him, thereby acquiring one of his most notable epithets—*Argeiphontes*, 'the slayer of Argus'. In the ensuing trial, the other gods faced a dilemma: while Hermes had acted on Zeus' orders, he was nonetheless now tainted as a result of the bloodshed, the first of the gods to be thus contaminated. This type of contamination was known to the Greeks as *miasma*, which was a religious pollution incurred by engaging in actions which were taboo in some way (for the fullest exploration of this concept, see Parker 1983; see also Bendlin 2007), or

which had to be circumscribed by strictly observed rituals. Sacrilege incurred *miasma*, but so did certain natural rites of passage, particularly birth and death, as is illustrated best by the island of Delos, where these events were taboo on grounds that they were held to be polluting events (Bendlin 2007, 184). Bloodshed of any kind, as in the case of Hermes, was also a risk—not only with regard to homicide, but also pertaining to ritual blood sacrifice, within which sphere the blood spilled had to be carefully contained and properly handled by religious personnel.

By way of cleansing themselves of this pollution and simultaneously voting in Hermes' favour in order to appease Zeus, the assembled gods cast stones at him which accumulated in a pile before the god. In this way, the heap of stones commemorates the trial of the god at which he was acquitted. Burkert (1983, 165, n.16) notes that this may also offer an *aition* for the Greek practice of voting with pebbles, or *psephoi*, and suggests that the practice may have evolved from stoning rituals. Accounts of lapidation as punishment or means of execution are also known from Greek history (see, for example, several instances in Herodotus' *Histories*: 1.167.1–2; 9.120.1; 9.5.1–3; see also Steiner 1995) Furthermore, the heap of stones commemorates the death for which Hermes was responsible, the resulting *miasma* which polluted him and his fellow Olympians, and the means by which they rid themselves of the stain of this death through a symbolic stoning.

While this is the most generally accepted *aition* behind Hermes' heaps, there are other possibilities: A scholiast on Homer's *Odyssey* (16.471) explains that Hermes was credited with clearing streets and roads of stones. The stone heaps piled at roadsides acknowledge this, and clearing pathways is perfectly in keeping with Hermes' role as patron of travellers. A further possibility relates to Hermes' originating the first sacrifice to the gods in the Homeric Hymn. As a deity of sacrifice, these piles of stones could conceivably represent rudimentary altars. The famous 'Thalatta! Thalatta!' episode in Xenophon's *Anabasis* (4.7.24) recounts the construction of a cairn in celebration of the Ten Thousand mercenaries' first glimpse of the Black Sea *en route* to Trebizon after their failed expedition. On this cairn, they piled offerings in thanksgiving. We do not know to which god they dedicated the offerings, but regardless of which deity was the recipient of these sacrifices, Hermes is implicit in the cairn's construction and in the dedication. As interlocutor between man and god he is implicitly present at all sacrifices. As such, it is possible that, among other things, these stone cairns referenced this particular remit of Hermes, as makeshift platforms for spontaneous sacrifice and worship.

Etymology: Hermes, *e-ma-a*$_2$, and the antiquity of the stone heap

That Hermes is one of the most established and ancient gods of the Olympian pantheon is verified by the apparent occurrence of his name on a number of Mycenaean Linear B tablets (Gulizio 2000). To judge from the context of its appearances, the deity indicated by *e-ma-a*$_2$ is male and receives various offerings, including a man, on the Pylos tablet Tn316, which has received a good deal of attention as a potential reference to human sacrificial victims (Gulizio 2000, 107ff.). That *e-ma-a*$_2$ is in fact Hermes may be supported by Gulizio's observation that he does not appear to be associated with a designated sanctuary and that this may be in keeping with his character as god of boundaries. Sanctuaries exclusive to Hermes remain relatively rare in the Archaic and Classical periods. Furthermore, on this tablet the god is mentioned in association with

a number of female deities, foreshadowing, perhaps, his shared cult in the historical period with Aphrodite at Kato Syme on Crete (Lebessi and Muhly 1987) and at Locri in southern Italy (Marinatos 2003, 145f.), among other places.

Although disputed by some scholars, the established view is that Hermes' name is closely etymologically connected to the Greek word for the stone heap—ἕρμα—which can also mean a prop or support. This connection is suggested not only by the etymological similarity, but also by the god's early connection with this type of monument. While there are occasional depictions of stone heaps in the Bronze Age, as demonstrated by Chittenden (1947, 106, Pl. XVa; Pl. XVIb), whether or not these monuments are connected to *e-ma-a*$_2$ is unclear. Their appearance in glyptic art of the Bronze Age with lions, trees and wild goats bears testimony to Hermes' very early role as a deity of vegetation and his incarnation as a Master of Animals, and the apparent offering of libations to such heaps suggest that they were perceived as numinous. These facets of the god persist into the Iron Age and the Archaic period at the Cretan sanctuary of Kato Syme, at which continuity of cult is evident from the Bronze Age. An explicit connection between Hermes and the heap is made in the D scholia to the *Odyssey*. This scholiast—distinct from the one mentioned above, regarding the clearing of stones from pathways—offers a lexicographical explanation of the Ἕρμαιος λόφος—the Hill of Hermes named by Eumaeus at *Odyssey* 16.471, as a pile of stones constructed by passers-by in honour of Hermes as guide and protector of travellers.

Regarding the physicality of the accumulating stone heap in the Greek countryside, Nilsson (1978) envisages the custom as so ancient as to be almost innate in the Greek country-dweller, who may participate in the custom without even perhaps understanding why. Imagining a peasant passing through the countryside, he speculates:

> '*If our peasant passed a heap of stones, as he was likely to do, he might lay another stone upon it. If a tall stone was erected on top of the heap, he might place before it a bit of his provision as an offering. He performed this act as a result of custom, without knowing the real reason for it, but he knew that a god was embodied in the stone heap and in the tall stone standing on top of it.*' (Nilsson, *Greek Folk Religion* 1978, 8).

The idea that the stone heap was imbued with the *daimon* or *numen* of Hermes belongs to a strain of worship which has a long history in the Aegean world. Aniconic cult representations are in evidence from the Bronze Age civilisations of Minoan Crete and Mycenaean Greece, particularly in the practice of baetyl, or pillar, veneration (Evans 1921; La Rosa 2001). Besides Hermes, Apollo appears to have been the most frequent object of aniconic cult. The tripillar shrine at the sanctuary of Kommos on the coast of southern Crete is frequently cited as an example of baetyl-cult associated with Apollo (Shaw and Shaw 2001, 20ff.). While the shrine at Kommos may have been catering largely for the proposed community of Phoenician traders in the area, the *omphalos* at Delphi and the pillar which apparently represented the cult image at Bassae cannot really be said to target a similar market. Besides litholatry, the earliest Greek cult statues, or *xoana*, on occasion consisted reportedly of a plank or beam of wood, though were no less sacred for their simplicity. Indeed, their extreme sanctity may have derived in part from their unwrought condition and their perceived great antiquity.

Litholatry, aniconism, and the herms

Aniconic cult objects and their veneration appear to have been regarded as primitive even in the ancient world. Xenophon, in his *Memorabilia* (1.1.14) cites litholatry as, among other forms of devotion, evidence of extreme superstition or piety. Theophrastos, also writing in the 4th century, offers an excellent insight into popular folk customs in his character sketch of the Suspicious Man, who worships the stones at crossroads on his knees and anoints them with oil before he passes on. As Gaifman (2010, 70–71) points out, based on these passages, the practice of litholatry is clearly not unknown or considered completely eccentric in classical Attica. It is, however, the possibility of excessive engagement in such rituals that characterises a person as overly superstitious and pious. As such, we may surmise that they did indeed represent a strain of religious belief and practice that was very ancient and somewhat outside of a more structured and organised religious framework and therefore susceptible to being misunderstood or regarded with trepidation. It is in the context of such perspectives, perhaps, that we might understand the proliferation in the Archaic period of the distinctive monuments known as herms and the distinctly superstitious panic which gripped the Athenian people in 415 BC. when they awoke one morning, just days before the ill-fated Sicilian Expedition, to find all the city's herms mutilated (Thucydides, *History*, 6.28–29; 6.53).

The propagation of herms in the late 6th century BC is associated with the Peisistratid tyrant Hipparchos (Osborne 1985), although the monument type probably existed before he dispersed them throughout Attica. It is reported that herms stood at halfway points between Athens and its demes (Pritchett 1965, 160f.), and herms marked the boundaries of private homes and sacred spaces, stood on streets, at crossroads, shrines and in marketplaces. While they did not exclusively represent Hermes, they are always called after the god. The typical herm comprises a stele-like quadrangular piece of stone topped with a sculpted human head, most frequently that of Hermes, the pillar being ithyphallic but devoid of any other anthropomorphic attributes. Scholarship has not reached a consensus regarding the origin of the monument, or its relationship to the stone heap. However, the sense of a connection between the two is supported by the shared relationship to the god, the employment of both types of monument as boundary markers and at crossroads, and through the practice of placing a tall stone or pillar atop the stone heap. Rare archaeological evidence of this practice may be yielded by a stone inscribed with the word *EPMANOΣ* ('Ermanos'—indicating that the stone was sacred to Hermes) which was embedded in a stone heap on a hillside at Pikromygdalia in Lakonia, close to the Chrysapha Relief (Chittenden 1947, 94). Vase painting of the Classical period depicts herms rising from stone piles (Figure 1), and Babrius, writing as late as the 2nd century AD, refers to a herm, that is, a square with a stone pile at the base (*Fabulae* LXVVIII). The inextricability of the relationship between the god, the stone and the monument may be seen in Aristotle's example of potentiality, in his *Metaphysics*, when he says 'the Hermes is in the stone' (5.1017b). The herm continued in use concurrently with the development of naturalistic sculpture, and so we must acknowledge the deliberate choice behind Inv. Nr. 1347 (Photograph: Thomas Zachmann) the fusion of the largely aniconic in the quadrangular pillar and the figurative in the sculpted head and genitalia. As such, we cannot consign aniconism and abstract representation to primitivism and unsophisticated superstition. The pillar component of the herm

Figure 1. Depiction of herm on Attic red-figure skyphos (c. 425 BC). Tübingen, Eberhard Karls Universität, Institut für Klassische Archäologie Inv. Nr. 1347 (Photograph: Thomas Zachmann).

may have symbolically represented the consolidation or the imposition of permanence on the heap of stones, while the bearded head of Hermes and the phallic component, which probably represented potential and fecundity, constituted a figurative acknowledgement of the spirit or *daimon* of the god who resided in the stone itself. In perpetuating the aniconic element, the herm acknowledged and respected the primordial nature of the god's earliest physical manifestation, while also carrying the medium forward into the newer traditions of naturalistic sculpture. Furthermore, the practice of placing stones at the base of the herm was a further salutation towards the tradition from which the monument type may have derived.

The episode of the mutilation of the herms in 415 BC (Osborne 1985; Hamel 2012) can tell us a lot about the place of these monuments in the Athenian religious atmosphere and the extent to which they were an integral part of the city's religious identity and expressions of piety, in their ubiquity and the apotropaism with which they were imbued. Nonetheless, many questions continue to surround the affair. For example, the nature of the mutilation is unclear. While Thucydides mentions the herms' faces specifically, Plutarch's description of the incident (*Alcibiades* 18.3) implies the extremities were mutilated. In Aristophanes' *Lysistrata*—which recounts a sex-strike among Greek women protesting their husbands' involvement in the Peloponnesian war—the chorus warn a group of men to cover themselves so that the herm-choppers, or *hermokopidae*, will not notice them, implying that the priapic aspects of the monuments also attracted the destructive impulses of the perpetrators (1093–1094). The citywide extent and systematic flavour of the vandalism, not to mention the event's proximity in time to the Sicilian Expedition, indicated that a highly organised group were behind the desecration.

The ensuing panic in the city cast a spotlight on sacrilegious behaviour and its perils, and soon the affair of the herms became conflated with an accusation of sacrilege levelled at, among others, Alcibiades, one of the generals leading the Sicilian Expedition. Suspicion

and fear were rife, and the accusations levelled against Alcibiades of having profaned the Eleusinian Mysteries compounded the religious outrage and superstitious panic.[1]

What was it about the herms that rendered them particularly suitable targets for the actions of a group who can only, it seems, have wished to cause citywide chaos and instability? Certainly, as the city's fleets prepared for the Sicilian Expedition, anyone wishing to undermine such an undertaking could make a clear statement in targeting Hermes, as god of travel and communication. The archaic nature of the herms' composition and their association with boundaries and thresholds may have offered a target for any factions wishing to carry out religious terrorism, invoking transgression of taboo. Any statement could be all the more effectively driven home through the systematic destruction of a monument-type that was generally uniform, in its austere and semi-iconic nature, and ubiquitous throughout the city, and it may well be that this was ample reason for the choice of target. For the group of iconoclasts who wanted to efficiently make an unequivocal statement in a single night, the herms presented the perfect medium. The ancient perception of herms appears to have held them as particularly associated with Athens and Attica. It appears that these monuments were so enmeshed with Athenian self-identification and self-expression that their destruction constituted an assault on the people of Athens themselves. After the 5th century, herms came to bear the heads of other deities and eventually portrait heads of citizens. For Osborne (1985) this suggests that the viewer could literally see himself in the herm, that in confronting a herm, the citizen confronted himself. The herms of Hipparchos are reported to have been inscribed with moral maxims advising the viewer to 'know himself' or to think 'just thoughts' (Osborne 1985, 57). The traveller encountering such a monument on a roadside would be compelled to stop, face the herm and contemplate. The mutilation of the monuments' faces, Osborne says, was the mutilation of the 'face of every Athenian' (1985, 65), and the unmanning of the herms was to symbolically and psychologically render the Athenians impotent. While this may be a step too far, the culprits certainly did succeed in causing chaos and instilling religious terror into the Athenian people and in disrupting the civic and religious stability in the city at a crucial and vulnerable time.

Hermes Psychopompos, the cairn and the journey to the Underworld

Beyond Attica and throughout the Greek world, Hermes, as we have noted, is patron of wayfarers who demonstrate their gratitude for his guidance by depositing their own stones on heaps accumulated in his honour. This is true of terrestrial journeys,

1 A slave of Alcibiades, Andromachus, testified that Alcibiades, among others, had profaned the Eleusinian Mysteries in front of a group of uninitiated men (Andocides, *On the Mysteries*, 1.12–14). Few details are known to us about the rites observed at Eleusis, and that is as it should be: The Mysteries were to remain strictly shrouded in obscurity to all but the initiated. To Athenian superstition, that Alcibiades and others had re-enacted the Mysteries in drunken irreverence was insulting, outrageous and frightening. Alcibiades denied the charges and set sail for Sicily, to be tried on his return. Nonetheless, recognising that he stood at the centre of possibly the greatest religious outrage that Athens had experienced to date, and suspected not only of impiety but of attempting to destabilise the democracy, he went into hiding on the return trip and was sentenced to death *in absentia*. His subsequent defection to Sparta was a major factor in the ultimate failure of the Sicilian expedition and the massive plunge in morale suffered by the Athenians.

and an archaeological site in north-western Greece suggests it may be indicated for a symbolic journey as well, for the journey par excellence—the final one. His role as psychopompos is a prominent aspect of Hermes' cultic portfolio from the earliest Greek literature. The Homeric Hymn to the god documents Zeus' appointment of Hermes as intermediary between the upper- and netherworlds. A number of sites in the ancient Mediterranean housed oracles of the dead, or nekromanteia (Ogden 2001), generally in areas where the topography or distinct topographical features were conducive to the belief that they were places at which the veil between the worlds was thin enough to allow interaction with the Underworld.

I wish now to briefly look at the so-called Nekromanteion of Acheron, believed by its excavator, Sotirios Dakaris, to be the site of an oracle of the dead, notably mentioned in Book 11 of Homer's Odyssey, in which Odysseus makes his katabasis, his journey to the Underworld, to engage in a nekyia, a consultation with the shades of the Dead. Located in what once was ancient Thesprotia, now Epirus, in north-western Greece, the connection drawn between the Homeric episode and the site near Ephyra is based largely on the striking similarities between the topography of the area and the geography as described by Homer—namely, the rivers Acheron and Cocytus, which joined at a now dried-up lake, Acherousia. This similarity was not lost on Pausanias, writing in the 2nd century AD, who expressed his view that Homer named the rivers in his account of Odysseus' descent directly after the rivers in ancient Thesprotia (1.17.5). Herodotus also mentions the site as the location of Periander's consultation of his late wife Melissa (5.92).

The archaeological evidence from the site, however, renders the situation far from clear: despite the Homeric and Herodotean accounts, the material remains do not predate the late 4th century BC, and the complex, excavated by Sotirios Dakaris between the late 1950's and late 1970's (Dakaris 1958; 1960; 1961; 1963; 1964; 1975), is now believed by some scholars (Baatz 1979; 1982; 1999; Wiseman 1998) to have been a Hellenistic farmstead, based on agricultural equipment, grinding stones and large storage *pithoi.* The latter contained quantities of carbonised foodstuffs which cannot be easily explained away through the interpretation of the structure as a sanctuary. The presence of a tower and catapult ratchets and counterweights, seem to indicate that the complex was fortified. However, the construction of a church in the 18th century on top of the ancient monument may indicate that an awareness of a certain sanctity was preserved on the site and in the area.

Some vessels which may be of a ritual nature, such as *phialai, rhyta* and *unguentaria*, were found at the site, in addition to a number of figurines thought to represent the goddess Persephone, queen of the Underworld. Further Persephone figurines were found on the nearby hill, dating from as far back as the mid-7th century BC. Below the central hall of the Hellenistic building was a vaulted crypt (Figure 2), which was most likely the focal point of the cult in earlier times. As the site of a chthonic cult with Persephone at its centre, it is not beyond the bounds of possibility that the agricultural aspect of the site was linked to its cultic functions: such systems are known, for example, from Eleusis, where Persephone is venerated with her mother Demeter and with Triptolemos, in a merging of agrarian and chthonic religious practices. If, as Dakaris believed, a particular diet was integral to the procedure of incubation at the oracle, it may have been the case that the necessary foodstuffs were farmed on site.

Figure 2. Vaulted crypt at 'Nekromanteion' of Acheron, Epirus, Northern Greece. (Photograph: courtesy of Dr Maeve McHugh, University College Dublin).

Dakaris, of the firm belief that this was indeed the Thesprotian *Nekromanteion*, reconstructed the putative incubation of the supplicant at the oracle (1993). The visitor would remain for an unknown duration in the lodging rooms to the north of the building, where he would eat food appropriate to the location, that is, food associated with the *nekrodeipnon*, or feast in honour of the dead. These included broadbeans, found at the site, which, if eaten in their intoxicating green state, may have contributed to an altered state of mind and fuller immersion in the experience. At the appropriate time, the visitor would make his way down the eastern corridor before arriving at a labyrinthine passage. Reaching the end of this labyrinth, he would be led into the central hall, where Dakaris envisaged his being met with puppets or effigies of the dead, operated by the personnel of the oracle via a crane. A number of ratchets were found at the site, in addition to counterweights, which Dakaris took as evidence in support of his suggested *deus ex machina*-type apparition. They have subsequently, however, been shown to be components of catapults which appear to have been kept at the site (Baatz 1982).

The visitor to the oracle, before leaving the north passage, may have had to undergo a ritual purification, washing his hands in a louterion which stood to his left just at the threshold. To his right, as another part of this purificatory ritual, prior to progressing to the next stage of his visit, he cast what Dakaris (1993) described as an 'apotropaic stone'. This was inferred from a pile of stones found opposite the louterion just before the doorway (Figure 3). A second pile of stones was found just inside the central hall, after the labyrinthine passageway, indicating another possible apotropaic gesture at the most crucial moment in the rite. The presence of these stone heaps at two thresholds within the complex is amongst the strongest pieces of evidence that at least one of this site's roles was associated with chthonic cult (van Straten 1982, 224).

Both stone heaps at the site occur close to doorways or thresholds, areas under the remit of Hermes. These may have been associated with progression between stages of the ritual, and, as a deity of transitional states, invocation of Hermes would also be ap-

Figure 3. View of a stone heap (left) at 'Nekromanteion' of Acheron, Epirus, Northern Greece. (Photograph: courtesy of Dr Maeve McHugh, University College Dublin).

propriate here. In casting a stone, the visitor may have flung from himself any *miasma* of impurity or impiety which might hinder or shadow his progression to the next stage. Hermes, as we have noted, is also a *psychopompos*, an escort of souls in the Underworld. The template of the *katabasis*, the hero's journey into the Underworld, may have lent itself to the necromantic rites which may have taken place at this site, culminating in the simulated descent into the Underworld. As a wayfarer on a perilous journey of a spiritual nature, the supplicant would have sought the protection and guidance of Hermes.

In comparison, Pausanias' account (9.39) of the oracle of Trophonios at Lebedeia may be cited, at which youths called *Hermai* escorted and anointed the supplicant. This is not a *nekromanteion,* though it does have a distinct chthonic flavour, as the visitor to the oracle would descend through a cave to the oracle, and Hermes, in the form of these youths, would have been present at the beginning of the journey. Another striking parallel may be seen in Book 24 of the *Iliad*, in which Priam travels to Achilles' quarters to ask that Hektor's corpse be released to him. This nocturnal journey has been acknowledged by many scholars as structurally emulating a *katabasis*. As the old man begins his journey, Zeus sends Hermes to escort him, and Hermes again escorts him back as he returns with the body. The stone heaps, evocative of Hermes, thus may mark a beginning and culmination of a progression at the Ephyra *nekromanteion.* The stone pile in both the upper- and underworlds invokes Hermes and implores his guidance and protection. In the case of the descent into Hades, however, it further defines the space as one of liminality and transition, and appears to compliment additional purificatory rites.

The properties of stone which lend themselves to the construction of architectural monuments, and more informal and perhaps ephemeral ones—such as the stone heap—include its durability and ready availability. These characteristics may seem at odds with

the elemental nature of Hermes himself, who is as swift as wildfire, as slippery as water and as elusive as the wind. Nonetheless, the durability of stone allows for the definition of space and the delineation of boundaries in a manner which is visible and robust. The element and medium of stone offers another aspect that is highly appropriate to its association with Hermes, and that is its chthonic nature—that it is derived from the depths of the earth itself, the place to and from which Hermes alone can journey with ease.

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Is it from the Dreaming, or is it rubbish?

The significance and meaning of stone artefacts and their sources to Aboriginal people in the Pilbara region of Western Australia

Edward M. McDonald, Bryn Coldrick

Abstract

The Dreamtime—when ancestral beings created form and brought natural and social order to the featureless, empty world—is central to the worldview of Aborigines of the Pilbara region of Australia. Myth explains the origin of different types of stone, and artefacts manufactured from different stone sources may have mythological, ritual or more mundane significance. Although Aboriginal people now also use European tools, stone blades are still routinely manufactured for male initiation rites. Alternatively, blades or flakes manufactured by the 'Old People' (*i.e.* the ancestors) are retrieved from quarries for ritual use.

Development of the Pilbara region, a major mining province, has resulted in significant numbers of archaeological and ethnographic surveys associated with project approvals. During surveys, Aboriginal people are routinely asked to comment on the significance of artefact scatters, reduction areas and quarries, among other archaeological features. Some of these are interpreted as being of mythological/ritual significance and imbued with spiritual power; others as being of little or no significance, even as 'rubbish'. Both kinds are considered to have been manufactured and used by the 'Old People' and belong 'on country' where they were left. However, our investigations suggest that changes have occurred in recent years in the significance and meaning attributed to archaeological features in response to development and continuing archaeological research.

This paper draws on ongoing research with Aboriginal people in the Pilbara, particularly with the Eastern Guruma and Nyiyaparli peoples, and examines how meaning and significance are attributed to stone assemblages and their sources. We highlight the ongoing emergence of shared 'communities of practice' between archaeologists and Aboriginal people and how this process influences the latter's engagement with stone.

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We note, for example, that archaeological terms such as surveying, test-pitting or their colloquial equivalents are now an integral part of Aboriginal heritage vocabularies.

Keywords: Aborigines, stone, significance, Ethnography of Archaeology, heritage

Introduction

> '*I'm not interested in manmade things; it's what comes from the Dreaming that's important*'. (Nyiyaparli Elder, Jimblebar, 2010)

In this paper, we examine how meaning and significance are attributed to stone assemblages and their sources by Aboriginal people in the Pilbara region of North-Western Australia. In doing so, we draw on ongoing ethnographic research mainly with the Eastern Guruma and Nyiyaparli peoples of the Central and East Pilbara respectively, though our investigations are also informed by our work with other Pilbara groups such as the Palyku, Banyjima, Nyamal, Kariyarra, Yinhawangka and Thalanyji groups (Figure 1).

Our research work is principally undertaken in the context of heritage assessments which we conduct as consultants to both proponents (such as mining companies) and Aboriginal communities to ensure compliance with Western Australia's *Aboriginal Heritage Act (1972)*, the stated aim of which is to protect Aboriginal sites and objects.[1] As ethnographers, we are typically involved both with recording what is commonly referred to as 'intangible' heritage (sacred, ritual and ceremonial sites and so on), and with the recording and analysis of Aboriginal cultural assessments of archaeological sites following archaeological surveys. We thus address changing conceptions of cultural heritage as influenced by the political economy of Australian society, particularly the dynamic resource mining industry and related developments in North-Western Australia.

The Pilbara region, which covers approximately 508,000 sq. km, is one of Australia's major mining provinces and produces the majority of the country's iron ore, with major mines located around Tom Price, Marandoo and Brockman (traditional lands of the Eastern Guruma people) as well as Mt Whaleback and Jimblebar (Nyiyaparli country), Mining Area C (Banyjima country), Yandicoogina (Banyjima and Nyiyaparli country) and Bonney Downs (Palyku country) (Figure 2). Other major mineral resources are also found, including gold, manganese, tantalite, tin and so forth.[2]

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1 The Western Australian *Aboriginal Heritage Act* (1972) seeks to preserve '*places and objects customarily used by or traditional to the original inhabitants of Australia or their descendants*'. Preservation is provided '*on behalf of the* [Western Australian] *community*' rather than for Aboriginal people per se. For Aboriginal people, 'heritage' is not, as Kockel (2007, 21) suggests in another context, '*cultural patterns, practices and objects that are either no longer handed down in everyday life … or used in ways significantly removed from their historical trajectory*'. Rather, heritage is understood as part of an ongoing tradition and has an inalienable quality '*to which one is obviously and undeniably connected and from which one is inseparable*' (Macdonald 2013, 114). This in some ways closely reflects the Irish Gaelic notion of dúchas (dualchas in Scots Gaelic), which, as Macdonald (2013) highlights in respect of Gaelic Scotland, involves a 'disposition': an innate quality of persons and a way of going about things.

2 Details about the Pilbara, its resources and mining economy can be found on the Pilbara Development Commission website: http://www.pdc.wa.gov.au/our-region/region-pilbara.

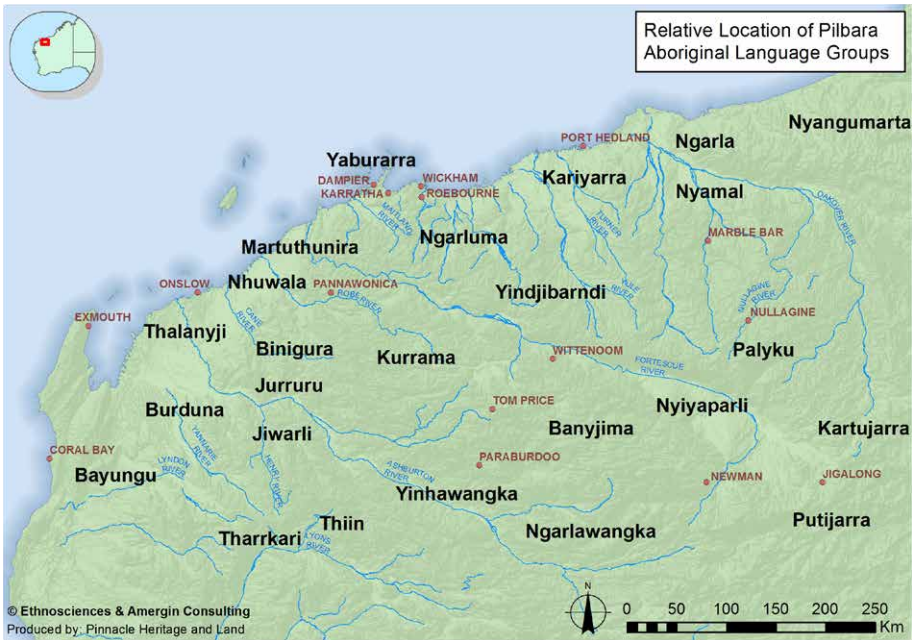

Figure 1. Relative locations of Pilbara Aboriginal language groups.

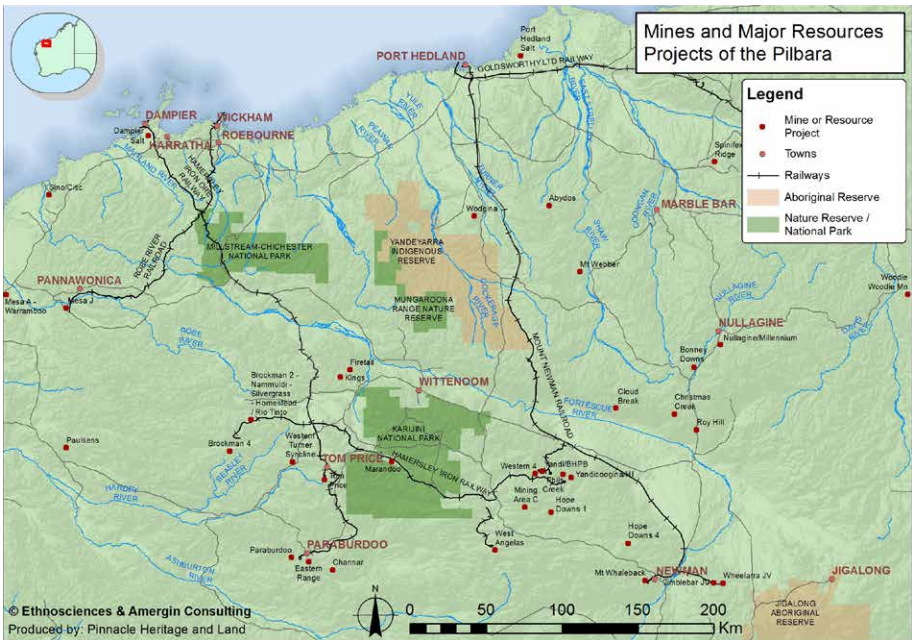

Figure 2. Mines and major resources projects of the Pilbara.

The development of the Pilbara region has resulted in a significant number of archaeological and ethnographic surveys being undertaken as part of heritage assessment processes associated with project approvals. Assessments of the significance of archaeological sites and objects have typically involved both scientific (*i.e.* archaeological) assessments and Aboriginal community assessments of cultural significance, though the Act gives evaluative primacy to '*sacred beliefs, and ritual or ceremonial usage, in so far as such matters can be ascertained*'. The recording and analysis of Aboriginal community assessments of archaeological sites are typically the province of ethnographers such as ourselves, and we see this work as contributing to the ethnography of archaeology (see, for example, Edgeworth 2003, 2006; Casteñeda and Mathews 2008; Mortensen and Hollowell 2009; and Garrow and Yarrow 2010).

The Dreaming

The Dreaming refers to a complex set of beliefs and behaviours not only embracing the creative past and the ordering of the world (often described by Aboriginal people as the time '*when the world was soft*'), but having, as Tonkinson (1991) notes, great relevance to present and future Aboriginal presence.[3] The Dreaming is as central to the worldview of the Eastern Guruma and Nyiyaparli peoples as it is to other Pilbara Aborigines and to those in other parts of Australia. In the creative period, the creative spirits or culture heroes brought form and natural and social order to the soft, featureless, empty world. Together, they created everything: the mountains, hills, valleys, rivers and waterholes, the plants, animals and humans. They left elements of their power in the places they visited and transformed themselves into landscape features where their spirits continue to live, or went into the sky and became stars. The creative spirits laid down the '*Law*',[4] which sets out the rules of how people and animals should live and how the world should operate, and humans' ritual and ceremonial responsibilities in that operation.

The natural world, including stone and the activities of animals and humankind, is constantly interpreted through the lens of the Dreaming which also frames the attribution of meaning and significance to archaeological sites and artefacts. Myths may explain the origin of different types of stone, and artefacts manufactured from different stone sources may have mythological, ritual or more mundane significance.

For example, a Nyiyaparli/Palyku myth describes how a giant was killed and burned by two Dreamtime spirits. His body exploded and his liver fell down at Mt Purrulana and turned into *karntama* [knife/blade]; his heart turned into a stone suitable for making tools to manufacture shields; and his lungs, which dropped further south, turned into *tjimarri*, that is, stone for the manufacture of ritual blades for male initiation rites (von Brandenstein n.d.). Comparable myth is, or would have been, found among

3 As Stanner (1979, 24) notes, though the notion of the Dreaming conjures up a past '*sacred heroic time*', '*One cannot "fix" The Dreaming in time: it was, and is, everywhen*'.

4 Aboriginal people typically use the word 'Law' to denote the normative order that is derived from the Dreaming. Sanctions, involving both spiritual and human agency, may be applied to breaches of the 'Law'. The term 'Lawman' is used to denote a man who has been '*through the Law*' (that is, initiated).

other Pilbara Aboriginal groups.[5] In the Yanyuwa context, Bradley (2008, 634) records how artefacts from a particular quarry are understood to be the 'fat' of the ancestral Dingo. Godwin and Weiner (2006, 125) report how the Yolngu of Arnhem Land were concerned that visiting researchers might '*unwittingly disturb the spiritual essence*' of a well-known quarry or '*capture some of its* mali *(shade or power) in the course of filming it*', which would have terrible consequences for both the Yolngu and non-Aboriginal people. A *Nhamarnhamarra* (Robe River) Guruma man made similar comments on a visit to a quarry near Pannawonica in the West Pilbara in early 2015, noting that the quarry was a '*ceremonial sacred site*' and was '*very significant*', and he warned that '*if anything happens to this, we might get hurt; we might get sick*'.

Blades/flakes from such quarries are still routinely made by Pilbara Aboriginal men for ritual purposes (*i.e.* circumcision and subincision). As an Eastern Guruma man reported in the course of an assessment of a quarry site in 2008, for men's business (ceremonies) '*they'll take heaps with them … like a big stone*[s]*, you know? And they just break him up…. They'll sit down like that and just chip away*'. Alternatively, blades or flakes previously manufactured by the 'Old People' are retrieved from quarries for ritual use. The same Eastern Guruma man reported in March 2014 during an assessment of another quarry: '*It's too important this stuff… I can maybe take a blade home for this year's ceremony*.' Indeed, members of the groups we consult with regularly request that mining companies and other proponents not only avoid impacting 'ritual' quarries, but ensure that the community continues to have access to them so that they can obtain stone for knapping or retrieve blades/flakes for ritual use.

The Old People, land use and identity

Another frame of reference is provided by an understanding of the traditional land use patterns of Aboriginal people's ancestors, commonly referred to as the 'Old People'. In this context, Pilbara Aboriginal people distinguish between 'good camping country' and 'passing through country' (that is, country with little water and/or other resources).

The 'Old People', whose spirits are still considered to inhabit the country and remain an integral part of it, are believed to '*still hear the living singing*' when Aboriginal people visit sites (Rose 1996, 71).[6] Long (2008, 131) makes a similar observation when he notes that at '*some places the "old people" are not just remembered but their past actions are sensed and experienced*'. As an Eastern Guruma man reported to McDonald in 2014 regarding

5 As would be expected, the colonisation and the continuing development of the Pilbara have had major and deleterious impacts on Aboriginal life and on the continuity of traditions. There has been an attenuation of traditional knowledge in various groups across the region. In some places, sacred sites are still known but the accompanying mythology might be lost; in other situations, the mythology is recalled but knowledge of the site(s) referred to is lost. However, the region has seen Aboriginal resistance both in cultural and economic domains, accompanied by a renaissance in traditional religious practices (see, for example, Wilson 1979 and Tonkinson 1974).

6 Aboriginal people may sing a song relevant to a particular sacred site or more generally 'call out', colloquially referred to as 'singing out', to the country and its sprits, including the 'Old People' when visiting places. Such activities are part of what Rose (1996) calls '*rituals of wellbeing*'. Knowing the appropriate songs, however, also serves to '*indicate one's own right to be there*'. As one of our Eastern Guruma consultants explained, '*When you know the songs for the country you show it's yours*'. Songs are part of a cognitive map of country, '*while at the same time describe and explain metaphysical interpretations of that world*' (Hume 2002, 93).

the presence of the 'Old People' at an archaeological site, '*You can feel their presence there you know…. So it's home for these people. We're talking about thousands of years, you know*'.

In the Pilbara landscape, archaeological sites may be directly associated with known ancestors; for example, places of birth, death or burial. In other places, the commonly understood patterns of traditional land use (camping, hunting, ritual activities and so on) give rise to an understanding of the presence of the 'Old People'. Today's Aborigines' personal, social, ritual and ceremonial identity has typically been linked to the places the 'Old People' used and left their imprints, which are characteristically focused on waterways and other water sources. In this way, the 'Old People' emerge into the Dreaming. Godwin and Weiner (2006, 131) note that many contemporary Aboriginal people refer to archaeological sites as '*footprints of the ancestors*'. Although this is not a term used by the Pilbara people we work with, it does nevertheless reflect their sentiments.

Community assessments of archaeological significance

When interpreting Aboriginal community assessments of the cultural significance of archaeological sites and objects, it is important to recognise that the Aboriginal people we work with, and indeed their compatriots in other groups, see themselves as direct descendants of those who created the archaeological sites and manufactured the artefacts found in them. They therefore see a direct connection between themselves and the archaeological record which they are asked to evaluate (McDonald and Coldrick 2008).

Aboriginal people are generally concerned about their archaeological heritage and its protection, and in their discourse about heritage we have found that their assessments of cultural significance reflect an 'ethno-methodology' (techniques of assessment) or 'practical reasoning', typically based on the presence or absence of a number of key characteristics.[7] As would be expected, groups are primarily concerned with sites they consider to be of a sacred/secret religious dimension (*i.e.* sites from the Dreaming) as opposed to the mundane or profane. Archaeological material and their sources may be seen as part of the sacred, ritual and ceremonial landscape and particular types of artefacts or lithic material may have special significance, being associated, for example, with male initiation rituals. As the senior Nyiyaparli elder who gifted us with the epigram for this paper remarked a number of times during consultations at the Jimblebar mine site in the East Pilbara, '*I'm not interested in manmade things; it's what comes from the Dreaming that's important*'.

We have also noted above that artefactual material may be seen as being imbued with spiritual or supernatural power (Godwin and Weiner 2006; Kearny and Bradley 2006; and Bradley 2008 discuss this concept in other parts of Aboriginal Australia). In this context, quarries which are perceived to have been the source of blades used in male initiations are typically considered to be of high cultural significance. The same Nyiyaparli elder also commented in another heritage assessment: '*what worries me is these main ones; main quarries where they* [the "Old People"] *been getting the stuff* [ritual

7 We are not indicating here a commitment to a full-blown 'ethnomethodological' analysis as articulated by Garfinkel (1967) or its later proponents (*e.g.* Livingston 2008). Rather, we are highlighting the need to attend to the methods used to evaluate cultural phenomena, in this case by Pilbara Aborigines evaluating the significance of archaeological features. As Atkinson (2015, 121) argues: '*All methods or techniques for everyday living and for specialised practice are folk methods, … all such techniques can be called ethnomethods*'.

blades] *from*'. He went on to suggest that such sites '*had been given to us*'; that is, that they hold sacred religious significance, having been 'given' to their ancestors in the Dreaming and passed down to the present generation. Eastern Guruma elders also invariably refer to quarries as 'main sites'. Similarly, sources of ochre (which may or may not have archaeological or ethnographic evidence of past extraction and use) are often considered to be of cultural significance, with Aboriginal people generally concerned that the ochre may have been, or in future could be, used for ceremonial purposes.

This primary concern with mythical/ceremonial/ritual sites does not exclude an interest in other archaeological sites and material. In the non-sacred sphere, there is often an emphasis on what are typically referred to as 'main sites'/'main camps'; that is, archaeological sites that show evidence of long-term or recurrent habitation. While the archaeological material at 'main camps' is valued in its own terms, such sites are also considered significant because of known historical or other commonly understood associations with the 'Old People'. Archaeological sites with large, complex assemblages, grinding stones and/or patches and those with engravings or paintings may also be considered 'main sites' and of high cultural significance. So too are rockshelters with artefactual material, especially grinding stones and evidence of cultural deposits which may contain dateable material. Indeed, there is a growing interest in the Aboriginal community with dating processes and particularly with sites that have returned early dates (*e.g.* 40,000 years BP or more). Sites such as non-ritual quarries and rockshelters with evidence of recurrent habitation are sometimes colloquially compared by Aboriginal people with their modern equivalents ('*hardware stores*' and '*hotel rooms*') and are considered significant because they were frequented and used by the Old People.

In contrast, small artefact scatters, or rockshelters with few artefacts and little evidence of deposit, are frequently seen as everyday, commonplace and even as 'rubbish'. For instance, small scatters may be seen as the worthless by-products of toolmaking undertaken while the Old People were '*passing through*' the country. This is reflected in comments by Aboriginal people such as '*you get these little scatters everywhere*', '*nothing much here*', '*nothing to worry about*' or (referring to a rockshelter) '*it's only somewhere people stopped when it was raining*'. However, although archaeological *sites* may not in themselves be considered of cultural significance, they may nevertheless contain archaeological *material* that is perceived to be of intrinsic value (*e.g.* blades, grinding material, *etc*.) and therefore of cultural significance. As a senior Eastern Guruma man once proclaimed: '*Those sites are not so significant but there's still artefacts there*' (McDonald and Coldrick 2008). Hence, the frequent request by Aboriginal people for archaeological material to be '*picked up*' (*i.e.* salvaged) and '*put somewhere safe*' (*i.e.* stored temporarily). Artefacts are understood to have been manufactured by the Old People and belong 'on country', where their ancestors had left them. Taking archaeological material away from the country without appropriate, culturally-sanctioned approval is thought to have potentially serious consequences, resulting in ill health or even death for those involved and their families.

Archaeological sites also have additional functions and significance given that many communities now live off country in regional towns, often hundreds of kilometres from their traditional home country. Communities want to preserve a range of archaeological sites for a number of reasons including respect for the 'Old People'; teaching the young

people about their country and their culture;[8] continued use of the sites for cultural practices (*e.g.* sourcing lithic blades from quarries to put young men through the Law); and in order to highlight their traditional, pre-colonial connections to country.

We stress, however, that cultural assessments of the significance of archaeological sites are not given once and for all. Rather, they are always emergent and contextualised in response to particular situations both in terms of the specific assessment situation (*e.g.* for the purpose of informing the statutory approvals process prior to the eventual destruction of a site) and the wider social context (*e.g.* the impact of other projects on the country, inter- and intra-group tensions and disputes and so on). Consequently, assessments of the significance of archaeological sites can and do change. Important here, for example, is the element of rarity/commonplaceness. Perceived impacts and destruction of a large number of sites in a particular area may result in the perception that what was once commonplace may become increasingly rare and therefore more significant, a notion that might be shared by professional archaeologists. Comments such as '*they are taking all our sites*' and '*we'll have no sites left if they destroy all of those*' reflect such a view and are heard from time to time. Conversely, we have found that mundane (*i.e.* non-ritual) quarries in Palyku country, for example, tend not to be attributed the same level of significance as they might be on Eastern Guruma country, partly it would seem due to the large number of these sites identified on Palyku territory in recent years, though the community still routinely requests salvaging of artefacts nevertheless.

Additionally, the Dreaming or the spiritual world may impact unexpectedly on the assessment of the significance of an archaeological site. In the course of one Eastern Guruma heritage survey, for example, a 'willy willy',[9] which are often associated with spirits, moved across the area being examined and passed a short distance in front of an elder who interpreted this as a spirit (one of the 'Old People') checking to see who was visiting the 'campsite'. Initially, he had said that he was satisfied with a proposed water bore here. However, he later said that the proposed bore site should be moved further away from the 'campsite' as the spirit was not pleased with the intrusion. Because of the movement of the 'willy willy' and the way in which Pilbara Aboriginal people interpret their movements, the archaeological site went from having minor significance to being a place of importance. Similar anecdotes have been reported by non-Aboriginal archaeologists and mining company employees, as well as members of the Aboriginal community, with regards archaeological sites in other parts of the Pilbara. Hence, there is always the potential that the spiritual world (the Dreaming) will influence assessment of the significance of archaeological sites.

Changes in the cultural significance of archaeological sites

Observations by archaeological and anthropological colleagues, as well as ourselves, indicate that changes have occurred in recent years in the significance and meaning attributed to archaeological sites by Aboriginal people. For example, in 1993, a senior Nyamal

8 Here Aboriginal people are expressing a simultaneous responsibility with regard to the protection of their heritage; that is, a responsibility to their ancestors (the 'Old People') and a responsibility to their descendants (the young people), in contrast to the situation in Hawai'i where Daehnke (2009) has noted a perceived responsibility by community members to either the ancestors or descendants.

9 A spiralling wind or mini-tornado, usually short-lived, which collects dust *etc*. as it moves across the country.

Lawman who was respected across the Pilbara remarked to a mining company employee that '*These other areas we have been talking about* [referring to mundane artefact scatters as opposed to a nearby quarry for ritual blades] *are … just like you mob out camping and leaving rubbish behind, same thing*'. In contrast, during a more recent conversation about the management of artefacts within artefact scatters and non-ritual quarries, a Palyku man commented rhetorically '*they're artefacts so they're important, eh?*', highlighting the intrinsic value now attributed to artefacts generally by Aboriginal people. An Eastern Guruma man also recently reported, '*All artefacts are important to Aboriginal people, regardless of how old they are*', a comment that received support from others present. This is clearly a departure from the Nyamal Lawman's 'rubbish' comparison, and indeed the Nyiyaparli elder's more recent comment about not being '*interested in manmade things*'.

Differences of opinion amongst individuals aside, these changes/variations would in part seem to be a response to factors including sustained development; the unprecedented level of consultation with Aboriginal people in respect of heritage that has resulted from the approvals process; the increased level of Aboriginal participation in continuing archaeological research; and recently settled or ongoing Native Title (land) claims where claimants are required to demonstrate their connection to country. As one of our anthropological colleagues commented:

> '*When I first did fieldwork in the Western Desert in the 70s, people were less concerned with archaeological remains ('old people's places') than with mythological places of current significance. There was also an interest in the recent past—former family camps, burial sites of ancestors, initiation places—but I got the impression that this was because it was part of an individual's biographical and genealogical past. When attention was drawn to lithic material, people expressed an interest, especially if the archaeological significance was explained, but it was not seen as significant on its own if there was no wider mythological-familial association. That changed over time, partly I think because it became evident that archaeological sites in general were, or could be, important in negotiations about the control of land*'. (pers. comm.)

These impressions were mirrored by an archaeologist whose career has spanned a similar lengthy period and reported that she thought Aboriginal people's '*interest in archaeological remains has changed radically from when I first started work in* [Western Australia]' (pers. comm.). Interestingly, she referred to what might be called the 'Time Team effect' (that is, a general increased familiarity with archaeology by non-archaeologists) and recalled '*wonderful moments when people explained to me that having seen Time Team they understood the sort of thing we were trying to do!*' She continued:

> '*It's a funny swing, from those earliest days … when some of the older people had actually made stone tools, through to their grandchildren or great grandchildren who understand them more through the framework of TV, consultancies and the politics of having to articulate connection with country*'. (pers. comm.)

Both commentators note that archaeological sites came to be perceived as an important resource in the '*negotiations about the control of land*' or '*the politics of having to articulate*

connection with country', as is required in the context of Native Title claims.[10] However, also highlighted by our colleagues are the influences of television and other mass media, the work of heritage consultancies and so on. As a Nyiyaparli elder commented in relation to recent archaeological investigations on his country, '*I seen them kinda things in the movies, like Indiana Jones you know? But now we're seeing it in our own backyard!*' .

It is evident from ethnographic research over recent years, including our own, that there is a continuing sharing of understandings between archaeologists and Aboriginal people and a 'merging' of communities of practice, which arise out of the pursuit of shared enterprises over time, such as undertaking heritage surveys (Lave and Wenger 1991; Wenger 1998; Engeström and Middleton 1998). This mergence was illustrated by the comments of a Nyiyaparli elder in 2007 concerning the assessment of a rockshelter:

> '… *he* [the archaeologist] *showed me a lot of things that fella…. I didn't know, but the wind used to blow and sand and things come in, you know, and cover it* [the cultural material] *up. And one time ago we found all these sorts of these things* [pointing to the artefacts in and around the rockshelter] *about four-foot deep, down. And I said, hey, that's true alright, there is something down there. I learned something too.*'

Another elder from the same group made similar comments in 2012:

> '*They told me … that things get buried and decayed in the ground….* [There's a] *lot of factors like weather, rain, and* [getting] *burnt…. I didn't know things get buried until I said 'what are you doing excavating for*?'

Surveying, test-pitting, excavation, salvaging, archaeological monitoring, residue analysis or their colloquial equivalents (*e.g.* '*walking*', '*digging him up*', '*picking him up*', '*putting him somewhere safe*') are now an integral part of Pilbara Aboriginal vocabularies relating to their heritage. Archaeological surveys are frequently referred to colloquially as 'walking surveys' and ethnographic surveys as 'talking surveys'; however, the dominant meaning of the term 'survey' for Aboriginal people is an archaeological survey.

In addition to being an important source of earned income, Aboriginal people learn a number of skills from participating in archaeological surveys, excavations and so on. Though many of the older Aborigines are familiar with archaeological material from the time they have spent in the bush (indeed, as we have noted, Lawmen still knap blades for ritual purposes), many others, particularly younger members, have to *learn* what artefacts are and how to *see* them in the field, much like the archaeologists they work alongside.[11]

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10 Native Title refers to '*the communal, group or individual rights and interests of Aboriginal people and Torres Strait Islander people in relation to land and waters, possessed under traditional law and custom, by which those people have a connection with an area which is recognised under Australian law*' (National Native Title Tribunal).

11 Learning occurs through participatory practice and is a by-product of practice rather than an explicit goal in itself. Participants are incorporated into a community of practitioners from periphery to the centre (Lave and Wenger 1991; Wenger 1998). As Grasseni (2008, 152) notes, 'situated learning' *'plays a vital role in imbuing everyday practical contexts with skills: practical, cognitive and social'.*

'Seeing' artefacts or other cultural material is not a transparent 'natural' ability possessed either by Aborigines or archaeologists for that matter. Rather, 'seeing' artefacts on open archaeological sites or in excavation contexts is a '*socially organised element of culture that is instantiated within, and sustained by, a community of practice*' that in turn is tied to '*participation in action*' (Goodwin and Goodwin 1998, 69). Goodwin (1994; 2006) refers to that practice as 'professional vision' and Grasseni (2007; 2008), drawing on a wide range of research, as 'skilled vision'. Edgeworth discusses how members of an archaeological team 'see' artefacts in an excavation setting, noting how artefacts are described as '*leaping out*' at the excavator (Edgeworth 2003, 55). Similarly, on field surveys in the Pilbara, artefacts are typically said to '*jump out*' at a survey participant, but usually only after he or she has '*got their eye in*'. As Edgeworth (2003) also importantly notes, '*the discovery of artefacts always occurs in a context of action*'; for example, in the course of excavation or survey (Edgeworth 2003, 54).

Aboriginal participants also learn how to undertake archaeological field surveys in cooperation with (generally non-Aboriginal) archaeologists and other survey participants, as well as learning how sites are identified and recorded. In turn, archaeologists are drawing on Aboriginal people's understanding of the country, the Old People's use of it and contemporary practices in developing their interpretations of the archaeological record. This is what we mean by a 'merging of practice'.

Despite this mergence, and the increased cognisance of the need to account for Aboriginal perspectives on the archaeological record, gaps nevertheless remain (Barker 2006; McNiven *et al.* 2006). As one senior Eastern Guruma man remarked in late 2014, '*We think differently from archaeologists*'. For instance, definitions of what constitutes a site and its boundaries might at times be contested. Because many Aboriginal people tend to see artefacts as important in themselves, they are typically concerned that such cultural material is salvaged and removed from areas of impact, often regardless of the archaeological or cultural significance of the 'site'. Members of the groups frequently talk about the need to collect the '*important artefacts*', the '*main pieces*', the '*significant ones*', or simply the '*nice pieces*', indicating aesthetic value as another factor in play.[12] In contrast, artefact scatters which are perceived to have no '*important artefacts*' are not necessarily considered to be worth salvaging. Archaeologists, on the other hand, tend to emphasise the salvage of 'representative samples' or the collection of material on different criteria, including artefacts that Aboriginal people might not see as important. When it comes to conducting archaeological investigations, therefore, Aboriginal people and archaeologists continue to belong to two different 'communities of practice'.

Conclusions

In this paper, we have discussed how the heritage approvals process associated with mining and other resource development in the Pilbara region of Western Australia has brought about regular Aboriginal participation in heritage assessments, including archaeological

12 The aesthetic value of places and objects is one of the evaluative criteria in the Western Australian *Aboriginal Heritage Act* for evaluating their importance (section 39(2)(d)). However, in practice, aesthetic values in relation to stone artefacts have received little attention from heritage consultants or the regulatory authority.

surveys and excavations, as well as ethnographic research. By routinely being asked to comment on the significance of archaeological sites and features, Aboriginal people are called upon to attribute meaning and significance to stone assemblages and their sources.

Our ongoing research shows that the Dreaming continues to be central to the worldview of Aborigines in the region, with myth explaining the origin and significance of different types of stone and the artefacts manufactured from them. Primary concern surrounds features interpreted as being of mythological/ritual significance (*e.g.* quarries that were, are or are perceived to be the source of blades for ritual practices). In the non-mythic/ritual realm, Aboriginal people are primarily concerned with 'main sites' or 'main camps' (*i.e.* archaeological sites that show evidence of long-term or recurrent habitation). In contrast, small artefact scatters, or sites otherwise not considered 'main sites', are characteristically assessed as being 'nothing much' or even 'rubbish'. However, both sorts of sites are considered to have been manufactured and used by the 'Old People' and the artefacts may have intrinsic value. We contend, however, that the assessment of sites is emergent and contextualised within specific situations and the wider social context, and that Aboriginal understandings of how the 'Old People' used the country, as well as intrusions of the spirit world, may at times influence their assessments.

We have also highlighted how in recent years changes have occurred within Aboriginal communities in the way the significance of the archaeological record is assessed and meaning attributed. These changes, we suggest, have their roots in a number of trends including Native Title claims and other land-based negotiations where Aboriginal people are required to demonstrate their connections to country; the detachment of younger Aboriginal people from the traditional lands of their ancestors; and the merging 'communities of practice' between archaeologists and Aboriginal people. We have also noted that the greater prevalence of archaeology in the public domain, together with increased Aboriginal involvement in survey work, has brought about an increasing awareness of, and interest in, archaeology generally.

While Aboriginal people may still '*think differently from archaeologists*', there is a continuing sharing of ideas and practice as archaeologists work alongside Aboriginal people in the Pilbara and elsewhere to record, assess and, where possible, preserve Aboriginal heritage. These emerging 'communities of practice' and their ongoing influence on archaeological significance assessments require further research.

Our research to date highlights the point that suggestions of an unchanging 'heritage' are not viable. Aboriginal people, like all others, bring engagements with wider discourses to the assessment and meaning attribution processes (McDonald and Coldrick 2008; McDonald, forthcoming). We hope more of our anthropological colleagues will take up the challenge and contribute to this important aspect of the growing field of the ethnography of archaeology.

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Looking through the crystal ball

Ethnographic analogies for the ritual use of rock crystal

Thomas Hess

Abstract

During the last few years, there has been increasing evidence for the utilisation of rock crystal by prehistoric groups in Europe, including mining and long distance exchange. The fascination with this transparent and geometrically formed mineral seems to be almost a universal phenomenon throughout history. Even nowadays that we are aware of the geochemical processes leading to the formation of crystalline quartz, this attraction remains unbroken. Furthermore, rock crystal plays an important role within cosmological belief systems of recent traditional societies. Based on an in-depth study of ethnographic literature from North America, this paper presents examples for the ritual and symbolic use of rock crystal, including gift exchange, hunting magic, and the expression of identity. Combining different scales of analysis, the paper is on the one hand concerned with specific artefact types, and on the other hand, illustrating general patterns on an intercultural level. The knowledge gained through the examination of ethnographic data is of significant value for the study of rock crystal in an archaeological context, as it increases the range of possible interpretations. In a more general sense, the paper argues for the analysis of lithic materials from a substantivist perspective.

Keywords: rock crystal, ethnoarchaeology, ritual, mining, substantivism, symbolic behaviour, practice theory, materiality, exchange, lithic sourcing.

Introduction

The following paper is concerned with ethnographic examples for the ritual use of rock crystal among traditional societies in North America. It is based on an MPhil dissertation submitted in 2011 at the University of Cambridge, aimed at opening

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Figure 1. Fluid inclusions in an alpine rock crystal (Photograph: the author).

a new theoretical field for the study of lithic materials (Hess 2011). During the last few years, there has been increasing interest in the scientific study of crystalline quartz as a lithic raw material for the production of tools in prehistoric times. Archaeological surveys in alpine regions have yielded several lithic assemblages, dominated by rock crystal (*e.g.* Della Casa 2000, Hess *et al.* 2010). In high-altitude zones, it served as an alternative to flint and chert. The recent evidence of a rock crystal mine at Riepenkar (A) in the Tyrolean Alps (Leitner 2008), at an elevation of more than 2700 m above sea level, shows that crystalline quartz was quarried in remote areas under highly risky conditions. Furthermore, a number of studies (*e.g.* Schäfer 2012) have proved that it was part of long-distance exchange networks, crossing the main chain of the Alps several thousand years ago.

Rock crystal is frequently encountered in circumalpine lakeside settlements and sometimes even in burials, dating to the Neolithic and Bronze Age. Retouched arrowheads made of this material show highly sophisticated knapping skills. From Pliny the Elder's *Naturalis historia* (liber 37.9), it is known that during the Roman period, the mineral was believed to be petrified ice and people linked it with supernatural forces. In medieval times and during the Renaissance, alpine rock crystal was sold to North Italian glass workshops for the price of gold, where it was used for the production of containers for relics and other ritual paraphernalia (Rykart [1989] 1995, 336–344).

As the fascination with this transparent and geometrically formed mineral seems to be almost a universal phenomenon throughout history, the paper argues for a multidirectional approach, considering symbolic and ritual aspects of rock crystal. The examination of ethnographic data is of high value in order to broaden the range of possible interpretations. Furthermore, it leads to a better understanding of the dynamic processes behind archaeological observations and prevents researchers from developing ethnocentric models.

Petrography

Rock crystal is an idiomorphic, mostly transparent form of quartz (SiO_2). It belongs to the trigonal crystal system and occurs in a variety of geometric forms. Its hardness on the Mohs scale is 7, indicating that it is able to scratch glass. Due to its conchoidal fracture, it is suitable for the production of chipped stone tools. Common varieties of alpine rock crystal are the dark coloured 'smoky quartz' as well as pieces that appear completely black.

The crystal lattice of quartz is composed of SiO_4-tetrahedra responsible for the piezoelectric properties of the mineral (Whitley *et al.* 1999, 236). The application of mechanical stress leads to charge transfers causing an electric potential. This effect is utilised in radio-frequency engineering, computers, navigation systems, quartz watches, *etc*. Another interesting property of rock crystals is the phenomenon of triboluminescence. This term describes a light emission produced by rubbing or striking quartz rocks in the dark. It is a consequence of lattice defects in the crystal, allowing stimulated electrons to change their energy level by sending out a photon flash after mechanical shocks (Whitley *et al.* 1999, 236).

In alpine-type fissures, quartz crystals are formed by hydrothermal processes. They precipitate out of a solution due to changes in the chemical equilibrium during the orogenesis. Remains of this fluid are captured in the quartz crystal, building small bubbles (so-called fluid inclusions, Figure1). In the Swiss Alps, it is possible to distinguish several fluid zones (Mullis 1993). These are the consequence of varying temperature and pressure conditions during regional metamorphoses, between northern and southern parts of the mountain range. As it is assumed that the density of the bubbles remains steady, the composition of the fluid can be used to work out under which temperature-pressure-conditions and in which geographical area the crystal was formed. This information turned out to be useful in the framework of provenance analyses (see Della Casa 2000 and Cousseran 2000).

Theory and methodology

The results presented here are aimed at opening a new theoretical field for the study of rock crystal, combining ethnoarchaeological inference with empirical, geological methods. Such a holistic and multidimensional approach sheds light on aspects of stone artefacts, going beyond the functional and profane realm, thereby broadening the range of possible interpretations.

According to Arthur and Weedman (2005, 249), there is no universal approach concerning the formation of ethnographic analogies. Rather, each material or archaeological question requires its own theoretical considerations, which have to be employed in a situational and flexible way. In consequence, this study was inspired by various theoretical concepts. Rather than applying them in the sense of exclusive and static generalities, different theories were considered as a toolset to approach specific topics. The term 'ethnoarchaeology' is used in the sense of Michael Schiffer (2010, 89) who expanded it to the study of ethnographic literature.

By studying ethnographic work focusing on four different regions in North America, including the Northwest Coast, the American Southwest, California, and ancient Iroquoia, the use of rock crystal among indigenous hunter-fisher-gatherers and farming communities was documented. These areas were selected on the basis of

formal similarities, such as a mountainous environment, social structure, or a similar subsistence level to prehistoric communities in alpine and circumalpine regions. North America was chosen over Australia, because of the widespread use of bow and arrow for hunting. In addition, there are greater similarities concerning the local fauna.

Whenever possible, multiple sources were taken into account, in order to minimize the risk of inaccurate information. It goes without saying that the paper is not intended to equate traditional societies with prehistoric groups. Therefore, it is important to consider differences between the archaeological subject and the ethnographic sources as well. Another difficulty encountered in the context of cross-cultural comparison is the so-called 'Galton's problem' (Hodder 1982, 61). It describes the fact that cultural traits observed among different societies have not developed independently, but can be traced back to a single origin and are supposed to be a consequence of diffusion. It is certainly possible that the belief systems of various groups in the Southwest and in California were influencing each other (cf. Hohenthal 1950 and Reichhard 1950). In order to avoid this scenario, sources from a range of distant geographical regions were included. Linguistic evidence and cultural peculiarities like the *potlatch* support the view of independent phenomena. Moreover, the fact that rock crystal is also used in ceremonies among Australian Aborigines (*e.g.* Campbell 1978) does not support a diffusionist explanation of this behaviour.

By combining different scales of analysis, the work is on the one hand concerned with artefact homologies of single objects, and on the other hand, trying to identify general patterns on an intercultural level. The study was strongly influenced by agency-based concepts of materiality (cf. DeMarrais *et al.* 2004), emphasising the active role of material culture for the expression of abstract thoughts. An example are ritualized exchange networks, governed by reciprocal principles, such as the *kula*-ring in the Western Pacific (Malinowski 1922).

This theoretical background contrasts with the idea that it becomes increasingly impossible to draw inference from analogy as one moves from functional aspects—such as subsistence or technology—to symbolic systems of prehistroric societies. Rather, the approach breaks with binary opposition and it is assumed that ideology and religion entangled every dimension in life. Following the work of Polanyi (1944), a substantivist view concerning the use of lithic raw materials in prehistoric times is proposed, including principles of reciprocity and redistribution, as well as the coalescence of functional and symbolic aspects. Similar theoretical approaches have already been developed in the field of zooarchaeology and archaeobotany (*e.g.* Miracle and Milner 2002).

In a complex sphere of interaction—in which material culture builds a cornerstone, together with the environment, the cultural structure, and involved individuals or groups—the type of raw material used for the production of specific artefacts, is contributing to the cultural habitus of agents (Figure 2). As physical properties of a raw material include opportunities as well as technological constraints in terms of its processing, they have a considerable influence on human behaviour. This is also evident in the fact that geometric surfaces of rock crystal are sometimes included in lithic artefacts, as they form a natural crest (Hess *et al.* 2010). Therefore, groups using the same materials could develop similar cultural strategies. These actions in turn, are interlinked with environmental and social factors (*e.g.* the exploitation of resources, concepts of wealth, gender- and kin-specific aspects, the expression of identity or taboos). Bearing this in mind, the results presented in this paper could contribute to the formulation of empirically testable hypotheses, as proposed by processual and new archaeology (*e.g.* Binford 1978).

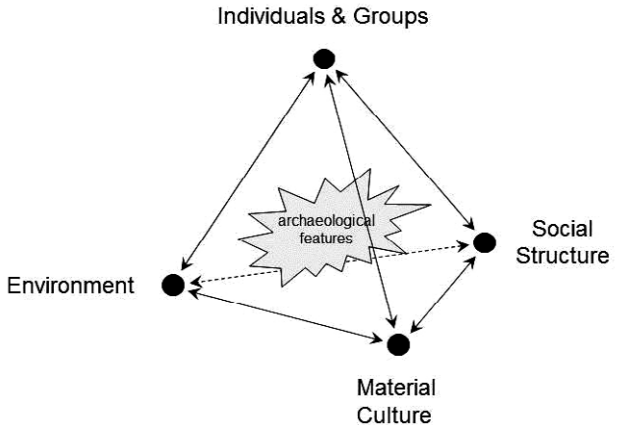

Figure 2. Chart inspired by the crystal lattice of silicates, illustrating the interdependence of social, material and environmental factors (Hess 2011).

At the same time, a causal relation between the symbolic significance of rock crystal and its physical qualities, such as transparency or geometric structure, can be postulated. As the points mentioned above are a direct consequence of natural laws, the conditions for a 'relational analogy' *sensu* Hodder (1983) and Wylie ([1985] 2002), or a 'complex analogy', (Bernbeck 1997, 102), are equally given. The latter involves combining various relational analogies for the study of a single attribute, leading to a recombination of elements that is not observable in the same form among the studied societies. Its aim is to reduce problems, deriving from the possibility that the postulated causalities are the product of a modern point of view, which is not bias-free. Such a strategy is especially suitable for the study of large-scale processes on a synthetic level (Bernbeck 1997, 102).

Examples/results

In several cultures (Figure 3), rock crystal plays an important role in the framework of shamanistic rituals, including healing, soothsaying, and the control of weather forces. They form an integral part of the shaman's kit and are sometimes passed from one generation to the next. The Hopi and Zuni, living in the Four Corners Region of the United States, used them to magically detect diseases and to identify the character of strangers (Malotki 2002, 19). Furthermore, they were aware of the phenomenon of triboluminescence. During rain ceremonies they were beating their drums to symbolize thunder, and produced light flashes by striking two quartz crystals (Ball 1941, 31). The Hopi and Zuni also built gourd or raw hide rattles filled with small crystals, in order to create flashes and smoke in the dark (Roediger 1941, 146). Their neighbours, the Navajo (Diné), used quartz crystals for ritual body painting (Reichhard 1950, 645). During a ceremony, the bodies of female individuals were painted with solid colour. Using a medicine bundle crystal, cosmological symbols like the sun or the moon were applied on the individual's torso. The Navajo acquired these pigments by crushing turquoise and gypsum (Ball 1941, 31).

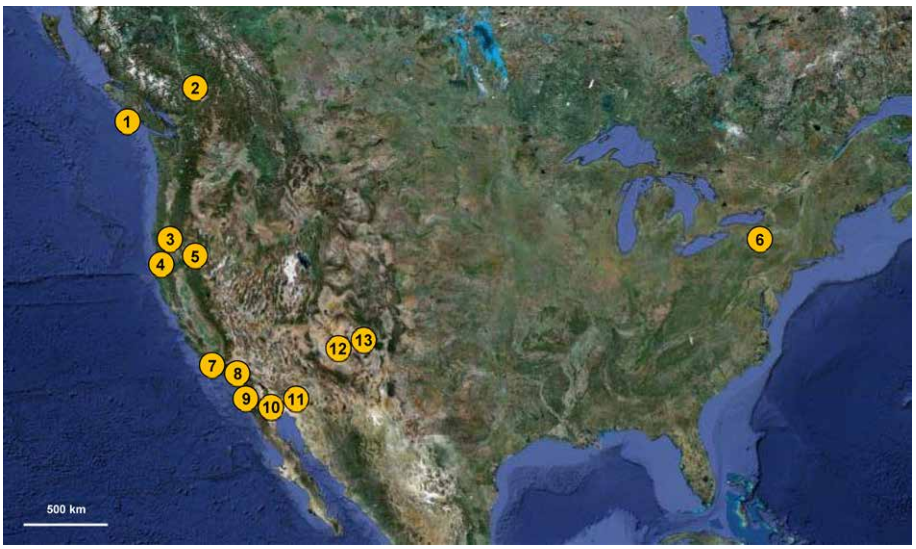

Figure 3. Map showing the study area. 1. Nuu-chah-nulth, 2. Lillooet (St'át'imc) and Thompson (Nlaka'pamux), 3. Yurok, 4. Yuki, 5. Yana, 6. Iroquois (Haudenosaunee), 7. Chumash, 8. Luiseño, 9. Southern Diegueño (Tipai), 10. Yumans, 11. Tohono O'odham, 12. Hopi and Zuni, 13. Navajo (Diné) (after http://maps.google.ch/).

Among the Yuman-speaking groups of the Colorado Valley, there are legends of 'living rocks' (Levi 1978). Only very experienced shamans and sorcerers were able to control them. Most other people feared the crystals and kept them away from children (Levi 1978, 44). The powerful stones were acquired through dreams, which showed the future shaman the location where his crystals could be found (Levi 1978, 48). The linkage between a Yuman shaman and his crystal can be compared to an interpersonal relationship in various ways. There was a reciprocal tie between them, allowing the shaman to communicate with the supernatural object in his dreams. It was crucial to engage with the spirit and to look after it (Levi 1978, 50). In return, the stone brought great fortune and power to its owner. Using the stones, shamans were able to transform into an animal, travel with incredible speed and become invisible.

Black crystals or smoky quartz are associated with male spirits, whereas red pieces are associated with female ones. The former were considered to be more dangerous and the Yumans used them almost exclusively to perform malevolent magic. Female crystals, on the other hand, are likely to become 'jealous' and the owner had to be very careful when he wanted to sleep with his wife (Levi 1978, 46). It is important to note that not all quartz crystals were considered to be 'alive'. Only those that were found within the rock matrix and additionally showed particular inclusions or optical effects, were believed to contain spirits (Levi 1978, 46). There were several taboos related to these crystals. The magical objects were only talked about at night, and sometimes people avoided mentioning they possessed them at all, as they were afraid of being accused of witchcraft (Levi 1978, 45).

In several cultures, it was common to hide the powerful crystals, in order to keep their existence secret. The Yana of Northern California stored them at secluded places in the mountains and woods (Sapir 1994, 535). Female members of the

tribe manufactured small baskets made from twigs and needles of Douglas spruce. Similar to a bird's nest, such containers were deposited high up in the crown of trees and the magical objects were only removed for special occasions. Among the Yana, luck stones or quartz crystals were not directly worshipped and there is no evidence of a belief in spirits that inhabited the object.

However, rock crystal formed a part of shamanistic rituals and was sometimes heated in order to release its curing effect (Johnson 1978, 364).

Underhill's (1946, 25) ethnographic work among the Tohono O'odham provides a potential explanation for the phenomenon of leaving important sacral objects behind. The semi-nomadic group inhabited the Sonora desert of Southeastern Arizona and Mexico. Rock crystals were traditionally stored in ceremonial baskets. In the context of winter migrations, these baskets were buried together with other property not taken along. Furthermore, they were often hidden in the hills and kept in a certain distance from the village to avoid negative consequences, such as floods or diseases.

In addition to lithic artefacts for the manufacturing of bows, several Californian tribes produced ceremonial quartz tools for rituals, such as blood-letting, or to cut the umbilical cord of newborn babies (Kroeber 1976, 45).

Of particular interest are status symbols, used by chiefs for the announcement of seasonal gatherings of different groups. The Luiseño or Payómkowishum, an indigenous group living along the coast of Southern California, manufactured ceremonial batons (*paviut*), made of wood or bone and a tip consisting of quartz crystal, a large flint or a haliotis shell (Koerper *et al.* 2002, Kroeber 1976, 665). Of interest from a substantivist point of view, is the fact that ceremonial batons were sometimes exchanged for food and circulated between different villages within the Luiseño territory, thereby facilitating inter-community trade (Hoover 1975, 108). A similar type of artefact, was used among the Chumash, a tribe whose territory encompassed both sides of the Santa Barbara channel in the coastal area of Southern California (Figure 4). These hunter-fisher-gatherers were involved in an interregional trade network in which shell money served as currency. Quartz crystals were often fixed with tar to a shaft made of organic material, which was sometimes painted with red ochre or incised with geometric patterns (Hudson and Blackburn 1986, 255). A chief that wanted to announce a feast was obliged to possess a certain number of these 'sunsticks'. Serving as status markers, they were of high value within the Chumash society. Interestingly, a less wealthy leader could borrow a stick from his neighbours (Hudson and Blackburn 1986, 255).

The Nootkan-speaking groups inhabiting the American Northwest Coast used supernatural quartz crystals (*hai'na*) for the announcement of *potlatches*. When a chief was going to hold a *potlatch*, he first organised a meeting of the most important tribal or confederacy chiefs, several years prior to the event. Here, a supernatural crystal was metaphorically 'sent' to all the intended guests (Drucker 1951, 367). Such a ceremony involved the chief dancing in front of his tribe, along with the display of the sacred objects. This form of invitation was not restricted to male members of the Nuu-chah-nulth and sometimes the *hai'na* was presented by a woman (Drucker 1951, 418). Every time the crystal was shown in public, small gifts were exchanged between the involved parties. By displaying the powerful objects, leaders continuously reinforced their social position (Drucker 1951, 369).

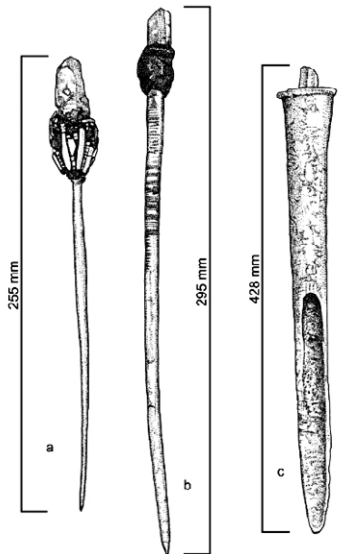

Figure 4. Chumash sunsticks. a–b: Santa Cruz Island. c: Santa Rosa Island. (Koerper 2002, artist: Joe Cramer).

Ethnographic sources about the Nuu-chah-nulth also contain information on how the crystals were acquired. Of great interest—in terms of archaeological implications—is the fact that it was taboo to remove the largest crystal within a fissure, in order to prevent darkness overcoming the world (Drucker 1951, 157–163).

Other First Nations along the American Northwest coast, such as the Lillooet (St'át'imc) or the Thompson (Nlaka'pamux) used quartz crystals for the production of nephrite axes (*e.g.* Teit 1906, 203). Large blocks of greenstone or steatite were cut with quartz prisms. Additionally, they were used to groove the smooth surface of the rock, into which a sandstone saw was later inserted. As certain greenstone artefacts are interpreted as status markers, which probably played a role in public ceremonies, there might also have been a symbolic reason for using rock crystal tools.

Another important aspect of the ritual significance of rock crystal is related to human-animal transformations in the context of hunting magic practices. The Nuu-chah-nulth of Vancouver Island in British Columbia used 'supernatural crystals' for sea otter hunting. For this purpose, the hunter took a bath in seawater, wearing a headband of red cedar bark to which a quartz crystal was attached. The latter was passed to him by an ancestor and believed to possess magical power. Wearing this, he swam along the shoreline, imitating the typical movement of the sea otter (Drucker 1951, 169). A similar example is given by Marcel Mauss (1950, 371) in his famous work on body techniques, where he describes a Tasmanian hunter holding a piece of rock crystal in his mouth, in order to give him the strength to rest in the tree and kill a possum.

Furthermore, quartz crystals are part of cosmological systems and myths among several of the observed cultures. Especially interesting is the case of the Iroquois. The term 'Iroquois' (Haudenosaunee) refers to a confederacy of different tribes, speaking a similar language and sharing other cultural features, such as the longhouse. The original Five Nations of the league included the Seneca, Cayuga, Onondaga, Oneida and the Mohawk. By the time of the first contact with Europeans, their territory run almost 200 miles across what is nowadays New York State (Engelbrecht 2003, 3). A prevalent feature of Iroquois cosmology is the principle of *orenda*, a spiritual

force inherent in every part of the world (Engelbrecht 2003, 135). This force was of high importance for the ritual exchange between different groups and it is likely that quartz crystal was endowed with a particularly concentrated form of this energy. Among the Iroquois, the precious stones were supposed to bring good luck to their owners in activities like hunting, courtship, or warfare.

A common feature of the creation myth shared among all the tribes, is that the daughter of Sky Woman was visited by a man (or a turtle) who placed two arrows in her body, one of them containing a flint arrowhead (Snow 1994, 2–5). Soon after, the woman gave birth to twins. One of the brothers was born in the normal way. He was associated with positive forces and created the sun, human beings, rich rivers and forests, as well as maize, tobacco and other plants. The younger twin, who was called 'Flint', in contrast, killed his mother when he was born through her armpit. The young man, whose body was composed of flint, was an excellent hunter. He was linked with destruction and created all kinds of monsters and weeds. Furthermore, he was responsible for storms. In some versions of the myth, the older twin defeated Flint by lighting a fire under his body while he was sleeping and smashed him with deer antlers.

The mentioned story, once again, illustrates the close relationship between symbolic and functional aspects among traditional societies. It is possible that the destruction of the younger brother refers to ancient mining techniques, such as fire-setting (Hess 2011, 35). This practice was observed by early ethnographers in various parts of North America (Ball 1941, 12). According to the stories of the Iroquois, flint and chert nodules, which served as raw material for stone tools, are parts of the body and the congealed blood of Flint (Hamell 2011; 1992). Interestingly, among the Mohawk and Oneida, which are linguistically close to each other, the nominal root of the term describing the evil twin also refers to crystalline quartz or ice (Hamell 2011). Likewise, the tales of the northern Iroquois speak of 'stone giants', who are able to predict the location of game. When a hunter succeeded in killing one of those mythical creatures, he burnt the body to obtain its 'ice-stone heart', which consisted of quartz crystal (Hamell 2011). Among the Iroquois the word for 'white' also means 'transparent', and it is possible that the 'white flint' lodges that are the home of Seneca witches, actually refer to quartz crystal. Similar to the bodies of mythical stone creatures, the heroes have to destroy them by fire-setting (Hamell 2011).

Finally, the Mohawk are a remarkable example of a group that links its cultural identity with a particular lithic material. They call themselves *'Kanien'kehá:ka'* which is translated as 'people of the crystal' (Engelbrecht 2003, 124). This name likely refers to the so-called 'Herkimer diamonds' (double-ended quartz crystals) found in the Mohawk Valley and in the Genesee Gorge at Rochester (NY) within the Seneca country. They are traditionally believed to possess spiritual forces related to ice or winter power, responsible for animal hibernation and bird migration. Sometimes they are found within Iroquois settlements, mostly in combination with other ritual paraphernalia, such as pipes. (Engelbrecht 2003, 124, Snow 2012). Frequently, these items are associated with the longhouse of political leaders (Snow 2012).

The significance of rock crystal among the Iroquois illustrates the ambivalence of supernatural forces, associated with positive and destructive attributes. Of importance is furthermore that the terms 'flint' and 'rock crystal' are used as synonyms. Despite the fact that there is evidence for arrowheads made of rock crystal within

the Iroquois territory, these artefacts seem to be a rather exceptional phenomenon. This could also stem from the fact that the traditional stone points were replaced by copper arrowheads from the 17th century AD onwards (Engelbrecht 2003, 150). However, bearing the symbolic meaning of the material in mind, it is also possible that implements made of rock crystal were only used for specific tasks.

Archaeological implications

The analogies mentioned above, improve our understanding of rock crystal in the archaeological record. On the one hand, they illustrate that there are certain cross-cultural similarities. On the other hand, it is possible to compare single objects in the sense of an artefact homology. Among many of the investigated societies, rock crystal is associated with ice and the control of weather forces, in particular rain and thunderstorms. As this phenomenon occurs independent of the geographical area, it is probably linked to the mineral's physical properties (*e.g.* the refraction of light). Furthermore, rock crystal was used in the framework of shamanism in almost all of the investigated societies. Therefore, it seems likely that quartz crystals were part of the equipment of religious specialists during prehistoric times and were used for hunting magic and other rituals.

Medical treatment including blood-letting and tattooing (Angas 1847, 234), as observed among traditional societies, also frequently involved crystal quartz. A freshly knapped rock crystal implement is much more sterile than other materials and it is additionally associated with purity on a symbolic level (Hess, 2011). Moreover, the material in question is often used to predict future events. This is potentially a consequence of optical effects and inclusions inside the geometrically shaped mineral.

Of great interest, especially in combination with provenance analysis, is the fact that ceremonial objects made of rock crystal were sometimes exchanged between different groups. As the stones are frequently passed on from one generation to the other, they additionally bear evidence for migration and kin membership. In most cases, the objects were associated with the residence of high-status individuals and kept in special locations. Consequently, an emphasis should be laid on spatial analysis concerning the distribution of artefacts on an intra-site level. The example of the Yana illustrates why highly-valued objects were left behind under certain circumstances, a behaviour that does not coincide with our Western concept of wealth.

A comparison of particular objects allows a better understanding of the dynamics behind archaeological features. As prehistoric cultures were probably aware of the phenomenon of triboluminescence, it would be interesting to test unworked crystals for scratches deriving from rubbing or striking. It is important to consider that parts of rattles and ceremonial sticks consist of organic materials, which are often subject to decomposition processes. Otherwise, such artefacts could easily be overlooked. The same is true for organic containers used to protect the precious objects. Without the knowledge deriving from ethnographic analogies, it would be difficult to distinguish archaeological remains of rattles from simple knapping debris. It is also possible that the latter were secondarily used for the production of these implements. As the crystals on top of the Luiseño batons and the Chumash 'sunsticks' were fixed with asphaltum (Koerper *et al.* 2002, 65) and frequently show manipulations on the base of the stones, residue analyses are of further importance in order to identify such objects.

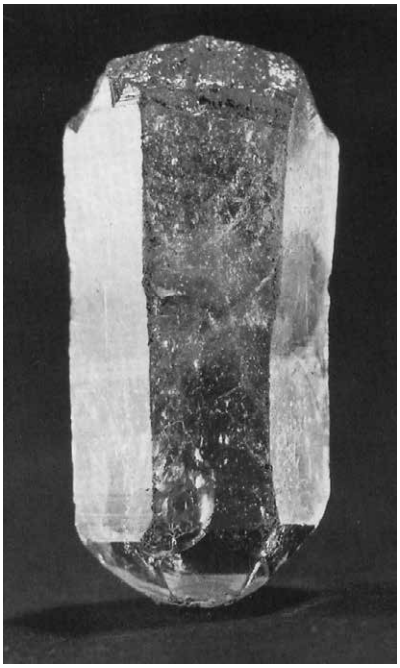

Figure 5. Rock crystal containing traces of birch tar from the Horgen lakeside settlement Muntelier-Platzbünden, Switzerland. (Photograph: Service archéologique de l'état de Fribourg, Ramseyer and Michel 1990).

Interestingly, there are a few finds from Neolithic lakeside settlements showing remains of birch tar. Originally interpreted as pendants (Ramseyer and Michel 1990), they could also have been hafted to an organic shaft (Figure 5). Another promising example in terms of material remains that are visible in the archaeological record is body painting. Depending on preservation conditions, it should be possible to detect traces of the pigment on the crystal surface. Ground stone working with quartz crystals—as observed among the Lillooet and Thompson—builds an interesting analogy for the study of Neolithic lakeside settlements. It is possible that certain greenstone artefacts were processed with crystal tools in addition to sandstone saws. Especially in the case of workshops that are situated in areas lacking larger sandstone formations, this possibility has to be considered (cf. Darwent 1996, 34).

Summary and conclusion

To sum up, it is important to highlight that rock crystal was frequently associated with supernatural forces and powerful spirits among the observed groups. It forms an integral part of cosmological systems and shamanistic rites in many traditional societies. Furthermore, ethnographic sources illustrate its role in the framework of ritualised trade-networks and feasting. In addition, they show that stones are considered to be endowed with spirits and that people even express their identity through lithic materials. The selection of raw materials with a particular colour, gives us a glimpse into prehistoric systems of chromaticity. Based on the examples mentioned in the text, it is possible to propose a substantivist perspective for the study of lithic raw materials, considering symbolic and ritual aspects of stone tools.

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Afterword: The flexibility of stone

Gabriel Cooney

Introduction

In dictionary definitions stone is described as the hard, solid, non-metallic mineral matter of which rock is made (*e.g.* Soanes and Stevenson 2003). So when we think of stone as a material our first reaction is perhaps, understandably, to talk about it as being hard and permanent and in terms of the durable, lasting qualities of stone; something that is fixed and unchangeable, sentiments captured by Hugh MacDiarmid in his poem 'On a Raised Beach' (see Riach and Grieve 1992) when he said that everything else is born more recently than stone.

These are the reasons we give for stone being the chosen material with which to create memorials that link the past, present and the future. It is in this context that stone is thought of as the ideal material to commemorate and materialise ancestors (*e.g.* Parker Pearson and Ramilisonina 1998). Stone is seen as something that endures and that can tend over time to become or to be seen as permanent, and also in some cases perhaps somewhat anonymous (Maleney 2019). But on the other hand the term 'stone' covers and reflects the reality that because of global geological diversity, the world's rocks have a very wide range of petrographic and geochemical character, which is reflected in the diversity of textures, colours and other properties of stone that people encounter, work and live with. Indeed, the complexity of the human interaction with a very wide range of things could be seen as being built on and developed from the initial engagement with stone as hominids created stone tools (*e.g.* Malafouris 2013). In this sense, stone has always been central to the making of the human world (Brown 2001).

Providing us with a sense of both the contemporary relevance of this engagement and its importance in the context of global cultural heritage, we could look to the inscription onto the UNESCO World Heritage List in 2019 (UNESCO 2019) of the Krzemionki prehistoric striped flint mines in Poland, the Megalithic Jars in Xieng Khouang-Plain of Jars, Lao Peoples Democratic Republic and the Writing-on-Stone/

#hier komt de referentie naar dit boek, Leiden: Sidestone Press, pp. 303–314.

Áísínai'pi site, Alberta, Canada. These three properties recognise the outstanding universal value of a European Neolithic flint mine where a visually distinct flint was used to make objects, particularly axes (*e.g.* Lech 1995); an area in southeast Asia where over 2000 tubular-shaped megalithic stone jars were used for funerary practices between the 9th and the 13th centuries AD (O'Reilly *et al.* 2019) and a landscape in north America held to be sacred by the Blackfoot people where engravings and paintings on sandstone outcrops created over the last three thousand years are said to bear testimony to messages from sacred beings (*e.g.* Keyser 1977). Hence, these places illustrate the global character and the chronological depth of the human engagement with stone and the complexity of uses of stone and the meanings attributed to it in that interaction, and why stone is such an important element of the archaeological record.

It is that understanding that underpinned the conference in 2014 entitled Cultures of Stone: Interdisciplinary Research on the Materiality of Stone held in University College Dublin organised by the editors of the volume, and which is strongly reflected in the papers here discussed. In reflecting on the volume it seemed appropriate to follow its structure in terms of considering the quarrying and moving of stone; making, building and re-imagining with stone and stone in ritual space and practice. Of course this structure broadly reflects an object biography approach. As Kopytoff (1986) suggested just as we write human biographies we could think of objects in the same way and give them agency; being born (produced), having an active life (used) and dying (discarded or deposited). And as we have come to more fully recognise the enmeshment of people and things (*e.g.* Olsen *et al.* 2012); their entanglement as Hodder (2012) has put it, there has been a greater focus on the inter-connectivity of the lives of people and things.

This volume then provides us with the opportunity to explore a central unifying theme in material culture studies; that people make and use things and that things make people (Tilley 2006), by focusing on a medium that is tremendously diverse and that has been central to the human engagement with the material world.

Quarrying and moving stone

While considering a wide range of materials and social contexts in which stone was used, the papers by Fracchia, Glumac and Fitzpatrick, Dodge and Beghelli illustrate a number of important themes in considering the rationale and processes involved in the extraction and movement of stone. This includes the interesting trend that is still visible in the literature of a tendency to see the quarrying of stone for objects and the quarrying of stone for building or monuments as quite different fields of study. But as Mens (2008) demonstrated in discussing the quarrying of outcrops to provide material for megalithic tombs and related structures in Neolithic Brittany, the sequence of activities and decisions can be similar in both cases, it is the *scale* that is different. This point can be usefully considered when reflecting on Fracchia's paper about the quarries in Texas, Maryland where the quarried limestone was used for building monuments and structures and as a raw material for industry and Glumac and Fitzpatrick's discussion of the quarrying of 'stone money'; large circular or ovoid-shaped disks in the Palauan archipelago, Micronesia.

An important point which all four papers in this part of the volume make is that people working stone have an intimate knowledge of the properties of different rocks. In many cases the choice of stone is not just based on functional grounds but the symbolic and social values attached to particular types of rock, often in the context of a wide range of potential sources being available, some of which could have been more easily used and which would have served just as well, if functionality was the only consideration. In considering the sources of the raw materials for early medieval sculptures in Europe, Beghelli makes the important point that sculpted elements are made out of locally-supplied stone, either freshly quarried or taken from ancient (Roman) buildings and that on the rare occasions when stone is transported it almost always involves re-using ancient architectural elements from prominent locations such as Rome and Ravenna. Dodge points out that in the Roman Empire, particularly from Augustan times on, the movement of red granite obelisks quarried at Aswan from Egypt to Rome, as well as the quarrying and manufacture of new ones, alongside the Roman quarrying of grey grano-diorite from Mons Claudianus and purple porphyry from Mons Porphyrites in the Eastern Desert to provide materials for buildings and monuments, reflected both a focus on particular sources and imperial power and ideology. And the focus of Glumac and Fitzpatrick's paper is whether local marble on Yap might have provided the inspiration for the quarrying of a speleothem flowstone variety of limestone in the Palauan archipelago over 400 km to the southwest to carve large circular or ovoid-shaped disks; 'stone money' which was transported back to Yap.

Fracchia's discussion of the impact of 19th- and 20th-century quarrying of limestone on the town of Texas demonstrates how quarrying can transform landscapes. And what Glumac and Fitzpatrick illustrate is that a complement to the idea of quarries transforming landscapes is the movement of the quarried material to the locations where it is required. This happened in very different social contexts. In the case of Yap, the movement of the stone money over 400 km by sea was to satisfy the need for valuable objects that could be used in exchange ceremonies and as symbols of cultural traditions. The movement of Egyptian obelisks of red granite from Aswan and of columns of Mons Claudianus grey grano-diorite and blocks of Mons Porphyrites red porphyry which required an enormous investment, is described by Dodge as a singular Roman phenomenon. By contrast, Beghelli argues that in the specific context of the post-Roman Early Middle Ages in Europe—where the evidence for large-scale quarrying and systems of transport seems absent—the best explanation for the similarities in sculptures, which can be thousands of kilometres apart, is the movement of itinerant craftsmen. Now the power of the elite could be demonstrated not by access to exotic stone, but to the best of those with the skill to shape stone.

A final point to make relates back to the permanence of stone; this provides it with the ability, in many cases, to outlast the society which was initially concerned to procure and use particular lithic sources. It can be literally given a new social life; revived, in very different contexts and inspire new cultural forms. In this sense the focus on stone provides us with important insights into the concept of temporality and how the material remains of monuments and sculptures themselves may have played an active role in the ways they were re-used and re-interpreted *(e.g.* Cooney 2015). Furthermore, it throws light on Hodder's (2012) discussion of temporality as a com-

ponent of entanglement and the importance of understanding the differing lengths of the lives and biographies of objects.

For example, Glumac and Fitzpatrick point out that the production and transportation of 'stone money' from Palau to Yap continued post-European contact, using metal tools and ships. But the most striking and complex example is provided by Dodge's discussion of the 19th-century cultural appropriation of obelisks as 'trophies of conquest' and demonstrations of imperial power and pride. The greatness of the city of New York was expressed by the transport and erection of a red granite obelisk from Egypt, originally erected as one of a pair at Heliopolis by Tuthmosis III, moved to Alexandria by Augustus about 10 BC, recorded as 'Cleopatra's Needles', and placed in Central Park in 1881 (the other one was erected on the Thames Embankment in London in 1878). In the case of Washington DC, the concept was further developed by the construction of the Washington Monument on the National Mall to commemorate George Washington and the world's tallest obelisk. It was built partially of Cockeysville marble or limestone as discussed by Fracchia, coming from close to the town of Texas, Maryland and providing a very nice material and metaphoric link between the two papers.

Making, building and re-imagining with stone

The six papers in this part of the book cover a very interesting range of topics and approaches to understanding the role of stone as a key material in the engagement of people with the world. An interesting way into the papers is to consider that they share an explicit or implicit concern with dualities at the heart of thinking about the materiality of the stone. As pointed out above on the one hand we think of stone as permanent; as O'Neill puts it, '*stone has an enduring quality which suggests permanency*'. However, as King points out in considering the early medieval High Cross in Downpatrick, Northern Ireland, the deliberate use of granite to create an enduring monument has come up against both the impact of the environment in the form of weathering and the deliberate actions of people to dismantle the cross in the 18th century, so there can be an element of impermanence to stone as well. In discussing the photographer Josef Sudek's documentation of the stone iconography of the city of Prague, Tutter refers to the dialectics of permanence and impermanence peculiar to stone. And as Pratt argues in discussing the Penwith Peninsula in West Cornwall, part of the attractiveness of stone monuments is that in our human perception they share a sense of permanency with geological formations and outcrops. This introduces us to another important duality; 'cultural' stone and 'natural' rock, and of course this duality can be blurred. As one of Pratt's interviewees puts it; '*there is a big crossover between the stones that were placed and shaped by humans, and the natural weathered landscape with granite*'. Another complexity is that the definition of what is 'cultural' and what is 'natural' varies over time and depends on social beliefs and traditions.

Challenging the notion of stone as permanent, enduring and representing the value of authenticity is our human ability to replicate and design stone objects and monuments experimentally. This is a theme central to Ganchrow's consideration of the design of hand-axes and to King's paper, which features discussion of the creation of a granite replica of the original High Cross at Downpatrick so that the latter could be

re-located to Down County Museum. Ganchrow suggests that the digitising or scanning of artefacts and structures has been revolutionary; for example in the realm of 3D printing. At one point he makes the intriguing suggestion that we could be working on a 3D Eraser that while scanning an object actually destroys it, transferring it from the physical realm to the digital one and in the process leaving our homes less cluttered!

At the heart of these dualities is the relationship of people and the stuff that they create their social worlds with, our specific concern being stone. In this context it is interesting to bear Tutter's observation in mind that monuments made of stone can be powerful symbols of the values, endurance and strength of social groups, particularly at times of conflict and change. This can be directly related to O'Neill's carefully argued discussion that the impressive Neo-Classical Parliament building at Stormont, Northern Ireland represents the ideals of the then dominant Unionist party, determined to remain part of the United Kingdom when the building was being commissioned and designed in the 1920s, perhaps most emphatically illustrated in the deliberate choice of English Portland stone for the façade, sitting on a plinth of local (Mourne) granite.

While the social significance of specific stone monuments and buildings has been the subject of considerable discussion, perhaps we have underplayed another duality that is central to the human:stone interaction. This concerns the reality that alongside these symbolic monuments and buildings stone is frequently used in an understated, cumulative manner by people to create the landscapes and places they inhabit. In this case the importance of stone may not be recognised simply because it is ubiquitous. This idea is at the heart of Madail and Malheiro's paper where they discuss the role of stone structures that form a key part of the fisheries on the Minho river valley in northern Portugal. They argue that these medieval stone structures made of quarried granite blocks arranged on the riverbed, characterise the riverine landscape in a unique way. Similarly, Pratt refers to the Penwith peninsula, particularly West Penwith, as a lithic landscape, with a time depth of over 5000 years where the granite bedrock, monuments dating to different periods and the stone field boundaries define the landscape and local peoples' understanding and interaction with it.

We also have to be careful that we do not separate out the use of stone from other materials. As it is clear from Madail and Malheiro's paper we have to set the stone fisheries of the Minho river valley alongside the use of other materials for the fisheries and fishing gear. Hence, in considering the entangled nature of people and things, it is important to see stone as part of the ensemble of things which people use (Lemonnier 2012) and to think of Ingold's (2007) image of life and things consisting of a meshwork of interwoven lines along which materials flow, mix and mutate.

And as a final point, a concern with re-imagining, re-working and the complex relationship between materiality and temporality runs through the papers. Ganchrow specifically places the experimental design of hand axes in the context of the evolution of technologies and tools, using a design approach to raise new questions about the uses and hafting of this long-lasting hominin tool form. Madail and Malheiro reflect on the changing landscape of the Minho river valley where the medieval stone fisheries that had such a key role in shaping the cultural landscape are now largely redundant and in need of conservation but still reflect the richness of material associated with river fishing and the knowledge that underpins it. Tutter's discussion of Sudek's engage-

ment with and documentation of the city of Prague through his photographs focuses on his ability to capture the character of this complex historic urban landscape, built of chalk and stone and to convey the essence of the place (Banville 2003).

Writing this just after the UK general election in December 2019 when the Democratic Unionist Party (DUP) lost its bargaining power in providing voting support to the UK Tory Government for its Brexit strategy, and against a background of ongoing discussion about the nature of future economic, social and political arrangements on the island of Ireland, O'Neill's depiction of the building stones of Stormont as material proof of the Unionist determination to remain part of the United Kingdom continues to have a powerful resonance, ironically at a time when the building itself has not functioned for almost three years due to the collapse of the Northern Ireland Executive (and Assembly) in 2017 (see Patterson 2019). Pratt's concern is to understand how people in the present relate to and receive the prehistoric lithic monumental inheritance in the landscape of West Penwith. She presents a nuanced argument indicating that recognition of the importance of megalithic monuments is ambiguous because of the blurred duality and recognition by people today of what is a 'cultural' form or a 'natural' form.

And finally King, in discussing the cultural biography of the early medieval Downpatrick High Cross, illustrates the complex life and afterlives of this monument and how it was valued, or not, at different times. From its construction around AD 900 it had a key location initially in a monastic context, situated at the outer entrance to the monastery of Down. It then became the centre of the life of the medieval town before being fragmented in the 18th century, re-assembled and re-located in the late 19th century and now has pride of place as a museum exhibit in the Down Museum while a granite replica has been placed in the same location as the original cross recently had outside Down Cathedral. A complex story indeed of making and re-imagining with stone.

Stone in ritual space and practice

A thread running through the book and indicated in its title is the human engagement with stone. This theme is perhaps most specifically addressed in the papers in the final part of the volume, as is the importance of the relationship between materials and materiality. Lewis Williams and Pearce (2005, 25) define the three interlocking dimensions of religion as experience, belief and practice. Religious practices lead people into religious experiences and they manifest beliefs. It is this arena of practice and the deployment of stone in practices that are the foci of discussion. What underpins the importance of stone as a material in this context, and is central to understanding its materiality, is that it is an expression of the sacred world; an embodiment of religious belief. Both Angliker, writing about the cult of Apollo and Zeus on the Cycladic Islands, and Doyle, discussing the deity Hermes and his association in Greek tradition with the construction of heaps or cairns of stone, refer to this phenomenon in speaking about litholatry and aniconic worship.

We might see this as reflective of particular cosmologies, but the extent to which stone is either physically or metaphorically at the heart of a wide range of religions, including the major religions of the world, is striking. Just to take one example the Ka'ba, which is the focus of the *hajj*: the Muslim pilgrimage to Mecca

in the twelfth month of the Muslim year, incorporates a black stone (a meteorite) embedded in a wall. Coleman and Elsner (1995, 60) suggest that this may originally have been a sacred rock embodying a deity which before the time of Muhammad was moved seasonally by people. Fixing the stone in the Ka'ba reflects a statement of the close and permanent association between Islam and Mecca.

It is not surprising in this context that stone can have such a rich and varied range of symbolic values. In her discussion of the symbolic role of the stone used in the construction of early-medieval round towers in Ireland, Kerr cites Stalley (1999, 59) as stating that for an early-medieval audience almost every aspect of life was seen in terms of symbol and allegory and that the form and materials of buildings were associated with specific Christian beliefs. The value of stone was that it could be both sculpted into forms reflecting specific beliefs and that it could also be read as a blank canvas, open to different or changing meanings over time.

Many of the papers also demonstrate the importance of place and setting. Rituals work to demonstrate belief and to engender religious experience when they are carried out in specific places, at pre-ordained times and in set, repetitive sequences. It is in this context that we can set the use of stone, whether it is the contrasts in the lithologies, working and decoration of Irish round towers within early medieval monastic sites discussed by Kerr (and that would have been observed as part of the living fabric of the monastery as a sacred place), or the striking repetitive form of schist slab graves in the cemetery at Estagel in the Pyrénées-Orientales, France detailed by Pinar Gil over the period from the early 5th to the mid-7th century AD. The procurement of the slabs from a source immediately adjacent to the cemetery, the shaping of the slabs to encase the individual who was being buried, the deliberate, repetitive decision to make the graves visible above ground all indicate the importance of stone in the interaction of the living and the dead.

Pinar Gil's observation that the measurements of the schist slab graves at Estagel would have been adapted to the body size of the deceased is a nice introduction to another thread of argument that is woven through the papers in this part of the book. This is the idea that in terms of belief and practice a linkage is often deliberately created between the human body and stone. This link is mentioned in earlier papers, for example by Tutter in talking about the close relationship of Josef Sudek and Prague, but the papers here discuss it from a number of different perspectives. For example, the Roman cinerary urns that are discussed by Brent were designed to hold the cremated remains of individuals. In death the bones of the person were reassembled so, as Williams (*e.g.* 2014) puts it, the urn becomes the 'skin' of the person. Hess in his discussion of the ritual use of rock crystal in traditional societies in North America points out that in Iroquoian oral tradition flint and chert nodules, which served as the raw material for stone tools, are regarded as parts of the body and congealed blood of the Flint man-being. McDonald and Coldrick in talking about the significance of stone artefacts and their sources to Aboriginal people in the Pilbara region of Western Australia discuss the importance of the Dreamtime, when ancestral beings created form and brought order to the world. A Nyiyaparli/Palyku myth describes how in the Dreamtime after his murder, various parts of a giant's body turned into a range of types of rock suitable as sources for different tools.

This brings us back to the concept of blurred dualities and contradictions and the attempt to match the short-term nature of human lives and the certainty of mortality with

the permanence of stone and the sacred. A very nice example of this are the contradictions that Brent points out in the depictions of torches or flames; depicting live flame, on sculpted marble Roman cinerary urns. She argues that the discordance between these representations and the reality of fire is subsumed by the recognition of fire as a connecting and transformative element in funerary ceremonies, particularly in the process of cremation.

Perhaps not surprisingly, given the focus on *practice* in the papers, a strong thread running through this part of the volume is the richness and diversity of the intangible meaning of stone recorded orally or in historic records. This is always a challenge for a prehistorian; we have the evidence of practice and ceremony, but how do we confidently move from that to talk about experiences and beliefs? As Hess nicely puts it; how do we understand the active role of material culture (and in the context of this volume, stone specifically) for the expression of abstract thoughts? One approach is to learn from the treatment of stone in societies where we have historical documentation or living oral traditions. In this way we can link the papers by Angliker and Doyle, which deal with the Greek world, and the very different early medieval contexts that Pinar Gil and Kerr discuss. The papers by Hess and McDonald and Coldrick represent quite different ethnographic approaches to understanding the importance of stone in traditional, small-scale societies. Focusing on four different regions in North America, Hess deals with the important role of rock crystal within cosmological belief systems in recent traditional societies. By contrast, McDonald and Coldrick draw on ongoing research with the Aboriginal people in the Pilbara region of Western Australia. What emerges from this is the importance of myth in explaining the origin and importance of different types of stone. The paper deals with the fascinating question of how shared communities of practice are emerging between archaeologists and Aboriginal people, while at the same time there is continued belief in the power of stone for certain practices, such as the stone blades used in male initiation rites. Echoing the relationship between stone, the human body and social groups discussed above, there is a concern that damage to ceremonial sacred sites might impact on the health of people.

Conclusion...the lives of stone

The volume is clearly structured with the object biography approach in mind and this has proved to be a very useful perspective in engaging with the wealth of evidence for the use of stone in a wide variety of cultural and chronological contexts. As we have seen, there are interesting challenges posed by the wide agreement that the social and cultural value of stone is based on the notion that it is fixed, permanent and therefore capable of conveying meaning into the future. So the question is, when does the life of stone end? One answer to this, as many of the papers in this volume recognise, is that the social life of stone was often deliberately ended as human action 'smashed it to piles of rubble' (Anonymous; see Thwaite 2006). But the stone was still there to be re-used and re-interpreted, to be given a new life. And it is this complex temporality in the use of stone that makes it such an important element of the material world. It is people who inscribe stone with meaning, set against by comparison and contrast with other materials. By contrast with those other materials the character of stone makes it possible to draw on it long after its original life. McDonald and Coldrick provide a nice example where Pilbara Aboriginal men retrieve blades or flakes made in the long distant past for ceremonies today.

I wanted to end by referring to Doyle's paper looking at the association of the Greek god Hermes with the stone heap or cairn. The broader point she makes regarding the cross-cultural phenomenon of accumulating stone cairns is that they are the result of travellers leaving markers of their journey at key points, to provide a platform for expressions of intent or prayers for protection and guidance through the medium of stone, signaling the way forward for future wayfarers (*e.g.* Matthiessen 2010, 109). The contributors to the volume have all very usefully added to and enriched our understanding of the use of stone and provided guidance and a clear path for future researchers.

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CULTURES OF STONE

This volume establishes a rich cross-disciplinary dialogue about the significance of stone in society across time and space. The material properties of stone have ensured its continuing importance; however, it is its materiality which has mediated the relations between the individual, society and stone.

Bound up with the physical properties of stone are ideas on identity, value, and understanding. Stone can act as a medium through which these concepts are expressed and is tied to ideas such as monumentality and remembrance; its enduring character creating a link through generations to both people and place.

This volume brings together a collection of seventeen papers which draw on a range of diverse disciplines and approaches; including archaeology, anthropology, classics, design and engineering, fine arts, geography, history, linguistics, philosophy, psychology and sciences.

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