# TECHNICAL PAPER 31

## HISTORIC EXTERNAL LIME FINISHES IN SCOTLAND

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

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TIM MEEK AND TOM ADDYMAN

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## TOM ADDYMAN

Tom Addyman is a partner at Simpson & Brown Architects, Edinburgh, where he directs their archaeological division, Addyman Archaeology. He specializes in the analytical study of historic buildings, and their construction history, and works throughout Scotland, the UK, and overseas. The latter includes involvements in Iceland, in North and Central America, the Persian Gulf and India, and in the Caribbean where he worked for a number of years, including time as a State Historic Preservation Officer for the Commonwealth of Puerto Rico. Following completion of an MA (with distinction) in Conservation of Historic Buildings at the University of York, Tom spent some years working in the field of building conservation specialising in masonry repair and the use of lime-based materials. Returning to archaeology this experience was applied to the analysis of historic structures and sites and in the development of specialist building recording methodologies. Since joining Simpson & Brown Architects in 2006 he has been instrumental in building a team of archaeologists and architectural historians that are closely integrated to the function of the wider architectural practice which is prominently engaged in historic building conservation and heritage planning.

In Scotland, Tom has led many major analytical and recording exercises, amongst others at Newhailes House and Estate; at Queensberry House; and at a wide range of castle sites such as Brodick; Doune; Craigievar; Castle Fraser; and in north-east England at Lindisfarne Castle, at sites in Newcastle, and most recently at Warkworth Castle. He has also overseen significant excavation programmes at the castles of Dunure; Sauchie Tower; and Mingary; the Neolithic and medieval settlement site at Dreghorn, Ayrshire; at Kirk Ness, North Berwick, and at Old College Quadrangle, University of Edinburgh.

Tom lectures widely and has published variously, co-authoring works including ‘Understanding and Analysis’ in *Measured Survey and Building Conservation* (Historic Scotland, Guide for Practitioners 4, 2003); *Scotland’s Parliament Site and the Canongate* (2008); *The Medieval Kirk, Cemetery and Hospice at Kirk Ness, North Berwick* (2013); and *The Archaeology of Old College, University of Edinburgh* (forthcoming).

# TIM MEEK

Tim Meek is a PhD researcher in the Department of Biological and Environmental Sciences (BES) at the University of Stirling and funded by Historic Environment Scotland (HES). He has a first degree in Combined Studies (Archaeology and History of Architecture) at the University of Newcastle upon Tyne and a master's degree in Building Conservation from the Institute of Advanced Architectural Studies at York University.

He is also an apprentice trained, award-winning bricklayer working within the family building business and later a larger house builder in York. Tim was a Society for the Protection of Ancient Buildings William Morris Craft Fellow in 1992. Major projects in Scotland include the Great Hall at Stirling Castle, Kilcoe Castle in South West Cork, Brodie Castle in Morayshire, and more recently harling works at Wormistoune House near Crail in Fife. Working on smaller vernacular buildings remains a crucial aspect of his work. International roles include providing practical advice and training for The Society for the Preservation of New England's Antiquities, Historic Harrisville NH, and Queens Royal College, Trinidad.

The current research project, 'Cultural and physical factors in the history and development of traditional external wall coatings in Scotland' is augmented by the combination of previous and cumulative practical and academic experience gathered throughout a career in the building industry. The objective of the research is to demonstrate that harl was ubiquitous and that it should also be recognised as a single element within a complete building system and should not be viewed in isolation to the other processes within the construction of the wall. Lime harl may be a powerful tool in response to future climate change scenarios.

## PREFACE BY HISTORIC ENVIRONMENT SCOTLAND

The external finish of a building is the first line of defence in protecting the masonry from the elements. Traditional solid masonry wall construction relies on a combination of robust building materials and techniques: outer skins of lime bonded masonry with a lime or earth/lime core and, historically, an external lime coating. This lime coating, whether flush lime pointing, harling or more formal pressed back and lined out render with limewash served a dual purpose: it protected the masonry from the driving rain, wind scouring and frost, and it presented a uniform finish, concealing rubble masonry and giving a bright, even finish to the elevations. Recent tastes have led to a loss of appreciation for this finish, with exposed masonry being popular since the late 19th century.

This Technical Paper sets out the historical background to external lime coatings on traditional buildings and provides a series of examples where the historic finish remains, either substantially or in part. The careful observation of buildings, seeking out sheltered areas such as under eaves, in window reveals or in the corners or return wall where buildings meet, has shown up vestiges of these finishes almost universally across Scotland. Raising awareness of the surviving traditional finishes, their composition, appearance and function, will help improve our understanding of how traditional buildings should be repaired, conserved and sometimes adapted to improve resilience to a changing climate.

This Paper is one of a series of Technical Papers published by Historic Environment Scotland which aims to assist building professionals in understanding the evidence for the historic use of traditional lime mortars and finishes, and their relevance to conservation practice. These examples show the robust nature of lime finishes and promotes a better understanding of how buildings were intended to be protected from the elements through external finishes. Other papers in the series put the material in a wider context, investigating the microstructure and functional performance of historic mortars, evidence from more recent lime applications in Scotland and specifying traditional hot mixed lime mortars in a modern context. It is hoped that a greater understanding of traditional mortars and external finishes will result in better quality and more appropriate specifications for repairs and contribute to a wider discussion about traditional lime mortars and finishes in Scotland.

# CONTENTS

# 1. INTRODUCTION

The external finish of a building is a significant part of its technical and aesthetic composition. Fashions in architecture change, but the focus of building conservation remains on maintaining the structure with appropriate repairs, using technically compatible materials. External finishes not only receive attrition from the elements, but they are easily changed and vulnerable to poor interventions, such as overpainting or re-pointing, especially when modern 'low maintenance' products are used. To improve our understanding of how traditional buildings were originally finished externally, Technical Paper 31 presents a series of illustrated examples of buildings with surviving original finishes and considers the evidence for how and why these finishes were applied.

The Technical Paper is in two parts. Part One presents an overview of traditional external masonry finishes in Scotland, with a focus on historic documentary evidence and changing practices and fashions in masonry and construction, as well as different approaches within building conservation. Part Two is a gazetteer that draws together a survey of a range of examples of surviving exterior lime finishes in various conditions, which have been identified on buildings throughout Scotland. Entries are grouped broadly chronologically.

This paper focuses on Scotland, but the tradition of protective external coatings is encountered all over the world on vernacular and traditional structures, and the observations in this paper may be equally relevant elsewhere. The gazetteer is by no means comprehensive, and readers will identify buildings with similar surviving finishes in their own locale. Such survivals sometimes seem to be against all odds, located in back closes, subsidiary buildings and concealed side and rear elevations of buildings. They are equally prevalent to the keen observer in both, exposed rural locations and sheltered towns and cities.

Examples have been selected for their varied geographical distribution and wide age range, and from a broad spectrum of building types of varying function and status. External lime coatings were a key element of the presentation of a building, as well as a factor in its defence against the weather. However, the tradition of protecting walls and masonry structures in this way, and the understanding and skill that went with it, has lapsed. It is hoped that this Technical Paper will provide an evidence base from which more informed decisions can be made about how to repair and reinstate external lime finishes appropriately and authentically.

## 2. EXTERNAL MASONRY FINISHES

The modern render and roughcast finishes commonly applied to buildings today are a contemporary version of the lime finishes of the past, but they should not be confused. They are often both made with gritty or 'sharp' sand, with the objective to cover roughly dressed or crude building materials. However, the similarity ends there. Cement-based finishes are hard, impermeable and inflexible and have a different surface texture and visual finish. It is also recognized that they are not good for the long term technical performance of traditional buildings. Lime finishes tend to be softer and regulate, or rather buffer, moisture ingress. They are vapour open and capillary active, drawing moisture out of a wall in dry periods. Lime finishes can also be very durable, as this paper demonstrates. In some cases, survivals are in exposed locations where it might be expected that a lime finish would not last ten years, let alone 300 years. An example of this is the extant areas of harl at Ormacleit House, South Uist, abandoned in 1715 (Figure 1). Over the course of the survey, it was observed that those finishes applied before the first quarter of the 18th century were particularly robust.

Surviving external finishes tend to be gently undulating and commonly preserve evidence of having been limewashed, although often the limewash, and sometimes the harl itself, is heavily weathered away. They provide seamless and seemly finishes to buildings, helping to inhibit water penetration and stone decay. External plaster and harls, when applied to 'polite' or formal buildings, are often relatively thin and sometimes survive as just a whisper over the surface of the stone or lined out to suggest ashlar masonry. Harl and plaster provide a contrast with architectural stone details, such as raised margins at door openings, windows (Figure 2), quoins and decorative carving. The shadows cast by the high points of the harl contrast with the crispness of the stonework and the soft dissipation of light - that is a property of the material - is complemented by other traditional material details, such as crown glass. These qualities collectively contribute subtly, yet significantly, to a building's character and appearance.

Figure 1. Ormacleit House, South Uist. Decayed harl surviving on the south-west gable.


Figure 2. Kilmorack Old Kirk, Beauly, Inverness. Fading harl and limewash against the raised margins of the window.

## 2.1 AVAILABILITY OF MATERIALS

The range of sands and aggregates in harling and finishes is considerable, and Scotland is particularly fortunate to have good, sharp, angular sands. It is also true that, what might be thought of today as inappropriate materials, have been used successfully in the past, in particular marine sands. In areas of surviving harling, there is ample evidence of aggregate having been taken directly from the beach (Figure 3).

Figure 3. Marine harl fragment from Orchardton Tower, Dumfries and Galloway.

Such a range of sands indicates the diversity of aggregate types that could be used, including local use of the most appropriate material. In areas with little timber for burning lime, such as the Western Isles, there are questions as to what the local supply chain for lime and fuel was and how it was used. Informal trials by the authors suggest that shells, burnt in maritime communities, produce a good quicklime that makes an excellent mortar.

During the survey, it was also observed that where a clay rich soil or pure clay is available, and particularly where lime is rare, there is a preference to use clay as the main building material for the wall core, and lime is used for tempering the clay mix, finishing, pointing and harling. Practice varies across Scotland, but the use of clay and earth mortars is far more prevalent than previously assumed. Particular concentrations are found on buildings in the Scottish Borders, Dumfries and Galloway, the Carse of Gowrie and the Black Isle.

## 2.2 IDENTIFYING HISTORIC LIME FINISHES – THE NATURE OF THE EVIDENCE

While bodies such as the Scottish Lime Centre Trust maintain important repositories of samples taken from historic buildings, for the purpose of the present survey, it was considered important that examples were sought where surface material still adhered to their buildings. The reason for this was that much can be gleaned from the building itself—whether the sample can be reliably identified with a particular phase, whether it is a secondary application or later repair, and so on. Being on site is also important for understanding the condition of a particular sample and to the extent it may have been sheltered or exposed.

Often, things can be hidden in plain sight. While for most conservation architects, buildings archaeologists or architectural historians, the remains of harls on ruined or derelict buildings would be a familiar sight, often they may not necessarily have paid it much attention or fully recognised its significance. However, with some reflection it becomes increasingly apparent that this type of evidence encapsulates key implications for understanding how such buildings were intended to be completed and, indeed, to be seen by their owners, architects and builders.

Sometimes it can be difficult to recognise historic lime finishes. They survive in differing forms; from a full harl or plaster to a very fine plaster or simply limewash over a flush point. They may be fragmentary, as is the case of a small sample clinging to a sheltered and undercut area at Dundrennan Abbey in Dumfries and Galloway (Figure 4), or almost wholly intact, such as at Brae House. To discover these finishes, however, requires some effort, although once identified, examples become increasingly apparent. It may also require the surveyor to look in areas that were once exposed, but have subsequently been overlaid by a later structure or different coating.

Figure 4. Limewash fragment over carved detail at Dundrennan Abbey, Dumfries and Galloway.

Townland's Barn, Cromarty is a good example of a hidden survival; a well-preserved area of early finish is revealed, where there was protection from an adjoining building which has since been removed. Re-harling in cement is clearly evident on adjacent areas (Figure 5). There are many other buildings such as this one; a 17th century house in Angus (Figure 6), shows a similar survival. In other cases, stone and remnants of lime harl may be covered in lichens or weathered back to expose the aggregate, and unless inspected closely, it is easy to miss the difference between the stone, the harl and the surface patination. For example, Figure 6 shows a detail from the masonry of St Clement's Church at Rodel on the Isle of Harris (Entry 12), where a small area of lime-rich mortar still adheres to the hard granite substrate.

Figure 5. Townland's Barn, historic harl revealed by loss of an extension.

Figure 6. The collapsing roof of a later lean-to revealing earlier exterior harl applied to the rear of a 17th century building in Angus.

Figure 7. Harl fragment from St Clement's Church, Rodel, Isle of Harris.

Today, surviving evidence of historic exterior finishes is mostly confined to buildings, structures and ruins that have had a lack of maintenance, or where there has been little or no modern work. These often lie in rural areas, in complexes of historic farm buildings, within the building stock of historic estates, in the more inaccessible closes and backland areas of historic towns that have not been subject to urban renewal and gentrification, or on monuments that have never had extensive repair strategies.

## 2.3 MAINTENANCE

Unless regularly maintained, all exterior lime finishes will slowly decay over time and can sometimes disappear almost entirely. Maintenance requires keeping the building dry, with the roof coverings and rainwater goods kept in functioning condition. It also involves protection of the wall finish itself by the regular application of limewash. The authors found evidence of the multilayering of limewash as a covering for harl on many buildings. Sometimes, this multilayering can give the impression of an original wall finish of some depth, but in reality the thickness is accrued over time. Such layering indicates ongoing, possibly seasonal maintenance (Figure 8), and sometimes preserves evidence of changing colour preferences (Figure 9).

Figure 8. Cullipool, Luing, Argyllshire. This shows seasonal limewashing as part of the annual cycle. From the Alasdair Alpin MacGregor Collection. National Museum of Scotland.

Figure 9. Multi-layered limewash at Gorstan Cottage, Garve.

## 3. REMOVAL OF HISTORIC FINISHES

Historically, the loss of lime finishes has been a natural consequence of neglect and a result of deliberate intervention. In the latter instance, the Victorian passion for exposed stonework, influenced by antiquarian interest in ruins and the development of the idea of the 'monument' created a fashion for bare masonry. Uncovered masonry was believed to create a fuller appreciation of the composition and evolution of a building. Indeed, between the mid-19th and early 20th century, new masonry buildings were increasingly designed deliberately with exposed stone exteriors. Ironically, they sometimes also incorporated anachronistic details such as raised margins, a feature originally intended to allow harl application.

This fashion was particularly evident in Scotland. During this period, historic buildings that retained their lime finishes were 'scraped' to expose the masonry beneath. Beyond what was considered the fashion at the time, there was also the more practical consideration that unmaintained or decaying lime finishes might be regarded as 'unsightly'. An example of this is recorded at Brodick Castle on the Isle of Arran, where extensions by the architect James Gillespie Graham in the mid-1840s effectively doubled the size of the existing medieval and post-medieval castle. The new work was built in neatly finished tooled red sandstone. Towards completion, it was decided that the exterior surface of the adjacent earlier building should be tooled back to fresh-faced sandstone, so as to better match the new work. An observer at the time noted:

> *The architecture of the new part is in perfect keeping with that of the old. The stone is of a dull, but warm red – and all that is wanting, is the production of a similar colour over the old part to make the whole harmonize.*[1]

By aggressively 'improving' the overall appearance of the combined castle and mansion, this work inevitably destroyed evidence for earlier exterior finishes, such as harl, and any early tooling details that may have survived.

A deliberately antiquarian approach is a feature of 'scrape'. In 1885 Alexander Ross, architect for St Clement's Church at Rodel.

> *The modern building is of very common material and workmanship, but the more ancient structure seems to have been of better material and more refined construction.*[2]

He goes on to describe the measures he took to secure the building and to ensure that its 'ancientness' was valued,

> *... the writer of these notes had the pleasure of having the walls cleaned and repointed'*[3]

Encapsulated in these notes are several subjective valuations and these are based on assumption rather than keenly observed, systematic data retrieval. The legitimacy of the removal of extant historic material and the wholesomeness of the result, from a 'cleaned down' analysis is, even within the context of the late 19th century, questionable. The modern-day conservation movement inherits a legacy that is problematic. There is no current analysis of what role surface finish played in the past and the inference is that, age is equivalent with 'good' and 'refinement'. The righteousness of the bare stone paradigm and negative overtone of the dialogue in respect of any coating - in this case harl - is clear.

In the mid-to-late 20th century monuments in the care of Scottish Ministers were similarly subject to well-intentioned repair, which frequently consisted of the comprehensive repointing of masonry. In some cases, this effectively transformed a 'building' into a 'monument'. Such repointing was usually with cement-based materials and detailed with recessed joints at the wall face; perhaps a conscious replication of the weathered finish of the 'monuments' taken into care at the time. Unfortunately, it is often those historic buildings and monuments where there has been the greatest and most well-intentioned effort to achieve long term preservation, that the least evidence for historic finishes survives today.

The typical loss of early finishes is well illustrated by the following views of the Royal Palace at Edinburgh Castle. The mid-19th century coloured engraving clearly shows a harled, limewashed exterior, whereas a photograph from a century later shows the same exterior, following removal of the harling and repointing in a cement-based mortar (Figures 10 and 11). In the latter, the architectural features of the elevation are overwhelmed by the visibility of the rubblework. Other comparative imagery can be found in individual gazetteer entries for sites such as Castle Craig and Myrton Castle (Entries 3 and 4).

Figure 10. View of the Royal Palace at Edinburgh Castle with harl extant.

Figure 11. View of the Royal Palace at Edinburgh Castle with harl removed.

Today, the use of lime for external finishes has almost wholly died out, as has the knowledge of traditional maintenance regimes of the existing stock of historic buildings. This is a result of the wholesale loss of localised lime-based craftsmanship practice and its replacement with modern techniques of construction in the post–war period, including the widespread use of cement-based mortars, 'plastic' paints and other industrial products. In a modern context, the use of lime is generally limited to the specialist field of architectural conservation, and when lime is used it is often a modern product, quite different to the historic materials it seeks to replicate. It is common to see pointing repairs of historic walls in cement, carried out by building contractors who, though well-intentioned, have little idea of how inappropriate and damaging such materials can be. Such practices inevitably involve the loss of historic lime finishes. Documentary material has been gathered by Nigel Copsey and others, see HES Technical Paper 25,

## 4. THE ARTICULATION OF ARCHITECTURE

It is important to understand how changing cultural perceptions have gradually diminished the appreciation of harled and limewashed walls. To counter this, requires one to look at buildings with a different mindset, to understand what the physical evidence tells us; to see the architecture as incomplete without an external finish and; to appreciate the subtle juxtaposition between finely textured harl, and sharply-defined, dressed and limewashed stone that renders a wall seamless (Figure 12).


Figure 12. Wormistoune House, Crail, Fife. Seamless harl with limewash.

What is not often appreciated today about traditional Scots building practice is that, a principal function of a harl covering was not only the protection of the underlying walling fabric, but it also clearly articulated the architectural form and individual details of a structure. This was particularly the case with 'polite' architecture, such as the classical villa or country house. Being such a long-evolved and integral aspect of traditional Scots construction, however, exterior finishes embodied aesthetic characteristics, also well understood at a vernacular level.

The traditional plain and flat finish provides calm architectural articulation of an exterior, whereby principal openings, dressings, margins, string courses, cornices and the like contribute to a well-defined structure.

When harl is removed from a building, it can often create a visual distraction caused by joints and irregular rubble stone, which were not originally meant to be seen. This can particularly be the case when inappropriate pointing of darker colour has been used in the past.

The extent of the historic use of harl has also been emphasized by individual authors on the historic architecture of Scotland in recent years. Amongst these, Professor Charles McKean was one of the first to describe the architectural properties that harl conveyed to buildings, built in the Scottish tradition:

> *... rubble would have been coated by harl. which gave the building a monolithic appearance and highlighted its dressed or carved stonework. By concealing the layers of masonry and the relieving arches above windows and doors, harling transformed the building's proportions from uneasily horizontal to strikingly vertical. Harling was either the colour of local sand, providing a colour-coded regional identity, or had a pigment added to it ...*[4]

He went on to articulate the important point that:

> *Widespread evidence on the buildings themselves (particularly harling residues in the joints), supported by much visual record and plentiful documentary evidence, indicates that bare rubble was not intended to be seen.*[5]

McKean illustrated his *The Scottish Chateau* with historic or reconstruction views of various buildings where the harl was reinstated; images that strikingly reinforce his point. In this respect, his contribution was to raise awareness that it was commonplace for major masonry structures to be complimented with an all-embracing plain flat lime finish (limewashed renders and harls), that framed and emphasised carved elements and architectural features, and that rubble stone was almost invariably covered.[6]

However, it should also be observed that while the use of harl was particularly prevalent for higher status and residential buildings, at the more modest and vernacular levels there was a tendency for the existence of a wider variety of exterior wall treatments. This may, in part, reflect the survival of very locally based building traditions, that were often closely related to available resources or the lack of them. Where local sources of limestone were unavailable, the expense of importing lime would hinder

its use for lower status buildings, such as modest croft dwellings, steadings and other such utilitarian structures.  For these, there may also have been less of a need for harl; perhaps limewash or simply flushed mortar pointing would suffice for its functional purpose.

## 5. DOCUMENTARY EVIDENCE

Though beyond the scope of the present study, it should be noted that broad and varied documentary evidence survives for the historic practice of applying exterior lime finishes in Scotland.[7] This ranges from early building contracts, associated documents and architectural specifications, to contemporary commentary and topographical accounts that describe Scotland's townscapes and individual buildings, as well as to the rich collection of historic painted, engraved or early photographic views.

In a notable but not untypical account, the author Robert Louis Stevenson describes the burgh of Kirkwall in 1869:

> *The houses, white with harl, present crowstepped gables and picturesque chimneys to the street; while … through an arched gateway, one catches a cool glimpse of a paven entrance court. … The slates are greyish white without the slightest tinge of colour; so it is a great relief to the general whiteness of wall and roof, to see trees of a decent size spreading in the courts within.*[8]

An important early visual resource is provided by the topographical works of artist-antiquarians, such as Sandby (mid-late 18th century), James Skene of Rubislaw (early 19th century), James Giles (1830s-40s) who painted many historic buildings in the north-east, and by the Edinburgh-based James Drummond. The latter's numerous views of the historic closes of Edinburgh of the 1840s and 1850s, drawn at a time when many of them were under threat of slum clearance, are an especially valuable source of visual evidence of buildings in various states of decay, retaining lime surfaces (Figure 13).[9] As well as recording masonry construction, this source also demonstrates the common occurrence of timber-framed construction in early urban centers and demonstrates that, these too, were generally lime-plastered.

Figure 13. Bell's Wynd, Edinburgh painted in 1849 by James Drummond

The evidence from collections of early photographers such as George Washington Wilson, Erskine Beveridge and others are equally compelling. In some cases, they illustrate the continuation of an unbroken tradition, as is the case with the cottages at Corrie on Arran (Figure 14), whilst other record the consequences of the tradition's gradual demise and the effects of minimal maintenance, as is the case with the palace at Culross (Figure 15).

Such sources provide compelling and unequivocal evidence for the near universal use of lime-based exterior finishes on masonry structures in Scotland, that continued well into the 19th century. Their use was a self-evidently commonplace; simply what was done.

Figure 14. Village street, Corrie, Arran, by Erskine Beveridge, 1884, Image from Canmore.

Figure 15. Culross Palace, Fife, by Erskine Beveridge, c.1882-6, Image from Canmore.

In terms of historical visual evidence, where there are a number of representations of a single building over an extended period of time, the comparison can very effectively demonstrate the former appearance and subsequent fate of an exterior finish scheme.  The evidence of harl on the Royal Palace at Edinburgh Castle has already been noted.  A further such example is provided by the Tollbooth in Kircudbright. Here, some physical evidence remains on the building's walls, although the majority of the harl was removed, comparatively recently (Figure 16). Its former presence is recorded by a historic photograph from the 19th century that shows a very different wall finish on the main elevation (Figure 17).

Figure 16. Tollbooth, Kirkcudbright. Seen today without harl.

Figure 17. Tollbooth in the 19th century, recorded with harl (photo courtesy of the Stewartry Museum, Kirkcudbright).

The wall finishes shown in the 19th century photograph of the Tollbooth were further recorded by the Arts and Crafts illustrator, Jessie King, in her illustration of the building in a book published in the 1920s, which featured views of historic and traditional structures (Figure 18)[10]. In the case of the Tollbooth, only the high points of stone can be seen 'grinning through', suggesting that by this date the finish hasd already started to succumb to decay and lack of maintenance.


Figure 18. The front cover of *Kirckcudbright, a Royal Burgh* by Jessie King.

## 6. DATING

Applied exterior lime finishes have a long pedigree in Scotland, that possibly dates as far back as mortar-bonded masonry buildings in the early Middle Ages and onwards. The reliable dating of an external finish can be difficult, however. Since lime is a soft material that is subject to weathering, and external lime finishes were periodically repaired or renewed, this makes it relatively rare for reliably dated examples to be found.

One notable early instance may be in evidence at Rothesay Castle on the Isle of Bute. The earliest part of the castle, its circular enclosure wall that is usually dated to c.1200, appears to retain traces of some form of exterior finish, possibly harl, that only survived because a tower was built against it later in the same century. The construction of the tower provides fairly robust evidence for the earlier dating of the embedded surface.

Although accurately dating finishes was beyond the specific remit of this survey, a number of examples proved to be of particular significance in that it was possible to date them with a degree of confidence.

Dating proved possible by various means, such as through building records, association with known historical events or particular individuals, and/or from the evidence on the buildings themselves. Examples include Newhailes House, where there are known building periods of the 1680s

and c.1720-1740 (Entry 26); Ormacliet House, known to have been built in c.1703, burnt in 1715, and never reoccupied (Entry 21); and Bernera Barracks and Ruthaven Barracks, which are tightly dated to a campaign of military construction in the wake of the first Jacobite rising, thus c.1720 (Entry 30 and Entry 25). In some cases, dating was self-evident as with a villa in Golspie, where '1926' is emblazoned on its gable wall (Entry 74), though in other instances, reliance upon date-stones should be treated with caution.

Fairburn Tower (Entry 13) provided a good example of a site where exterior finishes could be associated with more than one phase of construction, as determined by their stratigraphic (layering) relationships – one building element abutting another and one surface application overlying another to give relative dating. Here, five individual applications of exterior finish were recorded, dating from the mid-16th to the 18th century.

The establishment of a reliable chronological framework, within which to understand the evolution of the use of exterior lime finishes in Scotland, is an important study that the present survey indicates it is quite possible and clearly desirable.

## 7. SURVEY OBSERVATIONS

During this survey, many sites were visited and numerous remains of finishes identified and assessed. Survival may have been generally fragmentary, but it was still possible to find traces of lime finish in even the most exposed of locations. Through the process of observation, common threads of evidence were noted, various insights made, and wider themes have emerged. The types of lime finishes encountered suggest their range and variety was greater than what may have been generally assumed.

### 7.1 VARIETY OF EXTERNAL FINISHES

Sometimes, the finish extended over carved or decorative work. Masonry finished in lime also encompassed more than just hand-cast harls. It included smooth plastered finishes, such as those found in the phases of the later 17th century to mid-18th century works at Newhailes House (Entry 26), where there are large areas of ruled, flat plaster and some without ruling.

Another example from a doorway in Douglas Row, Inverness (Figure 19) hints at what might have been applied to the front elevation of that building — smooth render lined out in imitation of ashlar work. A very similar application was recorded at an un-listed cottage at Kingussie of the 19th century (Entry 72).

Figure 19. A fragment of a plastered window front door lobby from Douglas Row, Inverness, showing the 'lining out' of flat plaster.

The survey also found samples of flush or 'sneck' pointing, where horizontal and vertical joints have been ruled out, giving an indication of formal masonry, possibly limewashed originally to enhance the uniformity. These practices hint at a tradition, now all but vanished, of lined-out or 'pointed' surfaces on elevations of various levels of formality. It may be that the more modern practice of lining out flat cement-based renders in some areas has its roots in historic external lime finishes.

## 7.2 LIMEWASH

During the survey, close examination showed lime mortar fragments on stone with their covering layers of limewash (Figure 20). However, the physical evidence also demonstrates a later Victorian/Edwardian trend towards the removal of complete harled coats and their replacement with limewash alone (Figure 21), or more recently, oil-based masonry paint. This trend demonstrates that the fashion of exposed stone was strong, but not ubiquitous at that time, and that there was a compromise of exposed stone, albeit with a protective coat of limewash. Latterly, this changed to the use of oil- or acrylic-based paints, with detrimental results to the fabric.

Figure 20. The Kirkcudbright Tollbooth, with harl clinging directly to the stone with many layers of limewash also visible.

Figure 21. High Street, Kirkcudbright. Coloured limewash fragment applied directly to stone.

The practice continues today; in some cases benignly with limewash, as with the National Trust for Scotland's Broughton House. Here, while the walls are not presented as smooth, they are functioning as technically intended, with a degree of water vapour dispersal (Figure 22).

Figure 22. Broughton House, Kirkcudbright. Limewashed masonry elevation with no harl.

Buildings on Kirkcudbright's High Street demonstrate the same trend - harl and its decline, then the application of limewash. In the example given in Figure 17, white limewash is overlain with a pink lime-based paint, clearly showing layers of application. It is also possible, however, that many buildings with well-squared stone and a flat face simply needed a flush point, and only limewash was required to complete the finish. Some nearby buildings, however, are shorn of harl and then painted with an oil-based gloss (Figure 23). No doubt this has been done to 'stop the water coming in', although most water enters the building fabric through high level defects in the masonry, especially at chimneys and skew copes. The greening of the skew copes in Figure 23 suggest that this is the case. Gloss painting the elevation is likely to have little effect on keeping the building dry and may even exacerbate the problem.


Figure 23. The Masonic Arms, Kirkcudbright. Newly painted stone with an oil based gloss.

## 7.3 HARD AND SOFT STONE

It was also observed, however, that soft sandstone tended to retain little in the way of extant finish and the remains were generally restricted to sheltered areas. A good example of this is the soft red sandstone of the

Dumfries area (Figure 24). Since external wall finishes serve as protection from water penetration and decay, the loss of finish from a softer surface may have accelerated the decay of the stone. This decay of the surface inevitably means that fragmentary remains will be lost with the sloughing off process. Harder stones do not suffer the same rates of erosion and thus may be overrepresented in the record. It is an area that is worth further investigation.

Figure 24. Harl clings to some areas protected by the string course of this mid-18th century steading. In other areas, where there is less protection, the surface of the sandstone has completely eroded away, taking with it any trace of finish.

## 7.4 INTEGRATED BEDDING MORTAR COMBINED WITH EXTERNAL AND INTERNAL FINISHES

In pre-industrial buildings, those built before the second half of the 18th century, several examples were found where there was no separation of finish from bedding mortar. It was concluded that the finish was applied at least in part, as the work rose from the ground and was thus, 'integrated'.

In the examples where this was most evident, such as Orchardton Tower (Entry 9), the mortar was robust and adhered to the stone very well (Figure 25).

Figure 25. Orchardton Tower, Dumfries and Galloway. The bedding mortar inseparably combined.

Integrated bedding mortar combined with external and internal finishes had been observed prior to this survey as part of a research for an unpublished thesis: 'The Economic Use of Lime In Building'.[11] Limited archaeological survey work was undertaken in a number of locations in northern Scotland in 1999 and, in particular, several significant observations were made at the Bernera Barracks (1717-23), Glenelg, in the Western Scottish Highlands. Here, the extremely hard extant harl, internal plaster and bedding mortars demonstrated the remarkable survival of a material that has generally been described as 'soft', allowing buildings to shift and 'breathe'. In addition, there was no apparent visual difference between the bedding mortar, the primary coat of internal plaster or the external coat of harl, and no evidence for a discontinuity between the three mortar elements.[12]

From the outset, the present survey made a closer scrutiny of the relationship between what had previously been generally considered to be disparate elements. Such fully integrated finishes were eventually recognised in a considerable number of the sites visited, including notably well-preserved examples at the Ruthaven Barracks (historically closely associated with Bernera, Entry 30) and at Fairburn Tower (mid-16th century and early 17th century phases, Entry 13).

In the buildings examined, the bedding mortar seems to have been generously pressed out from the joint by the placing of one stone beside or on top of another, at which moment it was then spread over the face of the stone. Internally, it was noted in some examples of earlier date that this mortar had been polished with a small trowel to produce a wax-like finish, as demonstrated at Kinneil House, Stirlingshire (Entry 17) or Orchardton Tower, Dumfries and Galloway (Entry 9). In some later examples, the coarse mortar surface was seen to have been overlaid with a very thin finished plaster, as observed at Kilmuir Kirk, Houghgarry, North Uist (Entry 39).

There are several technical considerations that arise from these observations. If the wall surfaces are fully finished as the masonry is built, then it can be assumed that the volume of water embedded within the construction would be considerable and that the drying of the wall would take time. Carbonation requires water ($H_2O$), carbon dioxide ($CO_2$) and calcium hydroxide ($Ca(OH)_2$ and time. The gaseous $CO_2$ can only react with $Ca(OH)_2$ when diffused in $H_2O$. This $Ca(OH)_2$ pore water must account for a specific water content within the mortar of between 80% and 20% to be effective. When the mortar is fresh, it is too wet. If completely dry, the $CO_2$ cannot access the reactive $Ca(OH)_2$ and, each time the mortar dries, the internal pore structure of the $Ca(OH)_2$ is coated with a thin film of calcium carbonate ($Ca\ CO_3$). Ultimately, this deposition of $CaCO_3$ blocks the pore structure of $Ca(OH)_2$, thereby preventing further carbonation. The mechanism is sometimes referred to as the Lime Cycle but this simplification does not describe the specific conditions required for the most complete carbonation process. A newly built wall with integral finish, slowly drying out over time, represents the best conditions in which carbonation can take place. The more complete carbonation is, the more robust the mortar is likely to be.

It is recognised that other factors may affect the long-term strength and durability of mortar and finish, such as the slight hydraulicity of the raw limestone, hot-lime mortar production (sand combined with burnt limestone, shell or calcareous algae, CaO) or the quality of sand. However, the multiplicity of sites examined by this study where integrated finishes were recorded, takes one through several centuries of practice; a considerable body of data providing compelling evidence for the longevity and robustness of the technique, as evidenced by the resilience of the mortar that still remains.

It may be significant, given so many sites in northern and western Scotland and the Hebrides demonstrate clear evidence of integrated mortars and finish, that there is no specific term in Gaelic for 'harl'. The process of harling seems to be encompassed within the general term for building in stone, *clachairachd* and mortar *aol-tathaidh*. Lime is *aol*, limewash *aoladair* and limewashing is *aol-uisge*. Plastering is named and is called *aoladh*.[13]

## 8. CONCLUSION

The examples presented in this paper offer some surprising survivals of historic lime finishes, with examples in hostile environments, exposed situations, hidden corners, in urban back-lands and rural landscapes. However, it is in just such remote, out of the way or forgotten areas that survival is most commonly encountered. The greatest threat to surface finishes is far less the natural processes of decay and erosion, rather it is where historic buildings have received the ongoing attentions of home-owners and occupiers, institutional bodies, developers, or even the most benign of conservation repairers. This is hardly surprising; buildings must continue to have a life to remain viable. However, most modern work inevitably results in the loss of historic surface finish through the well-meaning, but sometimes misguided, acts of removal, repointing or covering up.

This paper has explored and highlighted the nature of the evidence for historic finishes, where it is to be found and what it may mean. It is hoped that it will also serve to demonstrate that such surfaces are both precious and delicate, and so easily lost. Perhaps more importantly, it presents a compendium of carefully chosen examples that are offered both, as an evidence base of past practice and as a compendium of precedents. These can guide good practice in the repair and renewal of Scotland's very extensive historic building stock and, beyond this, to inspire new construction that better comprehends Scotland's rich building traditions.

The present survey was in no way exhaustive and the potential value of a broader compendium of examples is both, self-evident and clearly desirable. With comparative ease, numerous further and excellent examples of historic exterior lime finishes could be added to this gazetteer; so ubiquitous was their use in Scotland up to the 19th century and beyond.

Through their own experience and local knowledge, other historic buildings professionals, architects, owners and recorders will certainly be aware of additional significant survivals, and further variety in their application will be discovered.

An expanded dataset with a more even geographical base would begin to permit some statistical reliability and make possible the assessment of geographical distributions and variations, as well as the examination of the influence of geography, geology and climate, and the mapping of the evolution of traditional practices over time.  Here, the importance of identifying reliably dated examples to develop chronological distributions becomes obvious.  The value of continuing allied historical research into building histories has been outlined and should similarly be encouraged and supported.

# PART TWO: GAZETTEER OF HISTORIC LIME FINISHES IN SCOTLAND

## 01. ST CORMAC'S CHAPEL, EILEAN MOR, ARGYLL & BUTE, C. 13TH CENTURY

Figure 01.1. The 13th century chapel on Eliean Mor, viewed from the northeast.

St Cormac's Chapel is a simple rectangle in plan, with an intact stone vaulted roof at the east end (Figure 01.1). The walls are formed of a shale rubble, lime bound, with simply shaped dressings of the same stone. It is a Scheduled Monument.

Evidence for a thin harl is prominent on the east and north walls and there are several square metres of nearly complete render in some areas (Figure 01.2). There are no traces of limewash. The mortar and the harl seem uniformly contiguous, and the coarse aggregate contains shell fragments. Records show that the chapel was reordered in the 14th century by John McDonald, Lord of the Isles and it is likely that the walls in their current state date from this time. It is difficult to precisely date the surviving render. However as the chapel, which was converted into a dwelling after the Reformation, was ruinous by the late 18th century, it is likely that the material is at least 250 years old.

On the more exposed elevations –the south side and west gable– the lime finish is greatly eroded, although a few traces remain. Despite this loss, the extant areas on the north and east elevations are significant, and testify to the durability of such coverings in the most exposed of locations. Also of interest is the internal plaster, which survives as a smooth covering on the walls and vault. This likely dates no later than the 17th century, when the chapel was converted into a residence, although it could quite easily be earlier, and so is also significant for its age and survival.

Figure 01.2. Areas of surviving render around the lancet window on the north wall.

Figure 01.3. The harl appears to be lime rich, with a marine aggregate occasionally showing quite large fragments of shell in the mix.

## 02. ST MARY'S CHAPEL, TEAMPALL MHOIRE, BENBECULA, MID 14TH CENTURY

Figure 02.1. General view of Saint Mary's Chapel from the west.

St Mary's chapel is still largely complete, although much reduced in height due to blown sand and silting raising the ground level. The floor level is believed to be about one metre below the present level.  It is of medieval date, probably mid-14th century. However, the subsequent history is unknown. In the burial area around the church are a number of modern and early graves in a variety of materials; the site is of some antiquity and significance. The structure was built of a gneiss rubble and a lime mortar, quoins and dressings are simply worked. For the most part the mortar has been washed out, and at first sight the chapel resembles dry stone building. However, in some areas there is sufficient remains to observe the construction details. An area of harl survives well on the north side of the east gable, and the wall core mortar is largely intact in many areas. Here, as in many earlier buildings of the Western Isles, the mortar and the harl are integrated. The mortar mix is uniform, being composed of a marine sand and aggregate. Given the possible abandonment at the Reformation the survival of some mortar and render is a sign of its tenacity and durability.

Figure 02.2. Integral bedding mortar and harl on the east gable.

Figure 02.3. Additional image of the mortar on the east gable.

## 03. CASTLE CRAIG, THE BLACK ISLE, HIGHLANDS, C. MID 14TH CENTURY

Figure 03.1. View of the castle from the north.

Built in the mid-14th century and situated directly above the north shore of the Black Isle, Castle Craig is now entirely ruinous. It is largely built of sandstone, with evidence of harl surviving on the sheltered north and east elevations. By contrast the incomplete south elevation has suffered heavy erosion and loss of masonry surface and harl. In some areas this is having structural implications. There is an outcrop of sandstone near the castle from which it is likely to have been built. The masonry is bonded with a lime mortar despite there being clay outcrops along much of the north shore of the Black Isle. There are limestone deposits in the area, however, and lime may have been imported from further afield. The carved stonework is of high quality at parapet level.

Figure 03.2. View of the north-east corner of the building.

Figure 03.3. Section of masonry with heavily eroded harl.

Figure 03.4. Castle Craig, east elevation. The harl that remains is well-bonded to the sandstone and is made with a relatively fine marine aggregate.

## 04. MYRTON CASTLE, PORT WILLIAM, DUMFRIES AND GALLOWAY, C. MID 14TH CENTURY

Figure 04.1. The tower looking south-east.

Figure 04.2. The tower looking north-east.

This is a small tower-house from the mid-14th century with additions dating from the beginning of the 17th century. It is a Scheduled Monument. The building was abandoned in c.1790 when superseded by a new mansion house nearby; the tower was partly dismantled and its remains retained both as a folly and a doocot. Extensive remains of exterior harl survive in spite of mid-20th century repointing in cement. It is likely that the harl dates to the original construction but, if not, then to the early 17th century works.

Figure 04.3. Well preserved area of lime harl still adhering on the west side of the tower.

Figure 04.4. 19th century photo showing the historic harl and providing evidence for how much has survived to the present day.

## 05. BORVE CASTLE (CAISTEAL BHUIRGH), BENBECULA, MID 14TH CENTURY

Figure 05.1. General view of the remains of Borve Castle.

This ruin is the remains of a mid-14th century tower house, formerly three stories high with unusually thick walls. It is thought to have been built between 1344 and 1363 by Amy MacRuari, and was a stronghold of the MacDonalds of Benbecula and was occupied until the early 17th century. It is constructed of large granite boulders, sometimes split, with rubble infill. The masonry used a very coarse mortar bedding and core mortar, up to 35mm in diameter aggregate, with whole cockle shells and other marine inclusions. The mix could be described almost as a concrete. This coarse mix extends out to the wall face (Figure 05.2). The Remains of the extant harl can be putatively dated to the original 14th century build by its relationship to the bedding mortar and thus the original construction of the tower. Significantly the two are contiguous. The bedding mortar and the surface finish or harl were done at the same time, and in some areas the harling is still adhering to the surface of the granite boulders (Figure 05.3). As might be expected, there is visual evidence of marine inclusions in the mortar. If the building was limewashed, no evidence of this survives. This a good early example that demonstrates the practice of creating the finished surface as construction takes place.

Figure 05.2. Detail illustrating the coarse nature of the mortar as it approaches the wall face.

Figure 05.3. Localised survival of areas of surface harl finish, with evidence of integration of the finish with the joint. Note also the marine inclusions.

## 06. CASTLE LACHLAN, LOCH FYNE, ARGYLL, EARLY 15TH CENTURY

Figure 06.1. Castle Lachlan, west elevation.

Castle Lachlan is a 15th century castle on the east shore of Loch Fyne. It was probably built by Clan MacLachlan in the 12th century, but that work was replaced by the tower extant today, dating from the 15th century (Figure 06.1), with an unusual internal arrangement of two rectangular accommodation blocks separated by a narrow courtyard, with evidence of corbelled structures above. The castle remained in declining use until the late 18th century, when a new mansion house was built nearby. The mortar is lime rich with a coarse aggregate; there is no sign of any marine aggregate. Examination of the bedding and harling mortars on all elevations shows that it is contiguous, and as expected there is better survival of the harl on the less exposed elevations.

Figure 06.2. Extant integrated harl and bedding mortar visible on the north west corner.

Figure 06.3. Area of surviving harl left, and right on one of the window jamb stones. Some more recent repair work visible centre right.

## 07. KISIMUL CASTLE, ISLE OF BARRA; MID 15TH CENTURY

Figure 07.1. Kisimul Castle from the south east. The surviving historic harl is visible on the walls of the tower and the masonry of the curtain wall to the right.

The precise construction date for Kisimul is unclear, but estimates place it from the mid-15th century, built on the instructions of the McNeils of Barra. It has been constructed on an exposed island of rock close to the port town of Castlebay on the Isle of Barra. There have been various alterations during its long occupation, but the form of this important fortress has remained more or less the same. The castle was vacated in the 18th century, but consolidated in the late 19th century and then partially restored from the 1940s. The 20th century restoration work was restricted mainly to the curtain wall on the south west side and inside the courtyard. The 19th century work included the application of an additional thin layer of harl in some places; of a grey colour but similar texture, and clearly distinct from the earlier layer. Given the ease of separating out later coverings, the external finish overlaying the original masonry almost certainly dates earlier than c.1700. This has survived in many places to a remarkable degree in this exposed location, unattended for at least 300 years. Not only is this significant as part of the history and record of the monument itself, but also in what it can tell us about the presentation of such structures and the durability of the materials used.

On nearly all the historic wall surfaces there is a partially complete layer of a thin lime harl. It is approximately 4mm thick, clearly lime rich, with an aggregate composed of a high proportion of marine components such as crushed shell. It is adhering well to the impermeable whinstone rubble and the shaped granite dressings. At some stage prior to the castle's abandonment in the early 18th century, a thin light grey harl has been applied in places on top of this original layer. The prevailing wind and rain is from the south west, so as expected and noted on the other sites, the survival is more complete on the east and north elevation of the keep and curtain walls, these being relatively more sheltered. The harl extends over all masonry associated with openings and the corners. This is easily observed at the main entrance to the tower (Figure 07.2) and the quoins on the north east corner (Figure 07.3). As has been noted elsewhere in this publication, this shows that historic practice included extending lime finishes over the masonry to give a unified aesthetic and a more complete weather finish.

Figure 07.2. The historic harl extending over the dressed stones of the tower doorway. The good condition of the historic harl can also be seen on the rest of the wall.

How this clearly very durable harling material was finished is less clear; there are no discernible traces of the limewash that is often used to close up and finish a traditional lime harl. We cannot rule out the possibility of there having been no limewash finish. A light coloured or white appearance was favoured in the medieval period, and a shell based lime and aggregate may have given sufficient quality of finish. Even on the fully exposed south elevation, with the full brunt of the weather, there is a good area of lime render which predates abandonment. By any standards this is an impressive survival (Figure 07.4).

Figure 07.3. The historic harl covering the quoins at the south east corner of the tower.

Figure 07.4. Even on the more exposed south elevation of the castle, the historic harl is still visible adhering well to the hard rubble and dressings.

## 08. LORDSCAIRNIE CASTLE, NEAR MOONZIE, FIFE, LATE 15TH CENTURY

Figure 08.1. The remains of the castle.

This tower house is believed to date from the late 15th century. The keep and associated remains have been in a ruined state for several hundred years. However, even in its ruined state with extended exposure to the elements, it is still possible to detect traces of early exterior lime finishes. These are small areas of a coarse thrown harl. As noticed in other parts of the survey, the lime rich harl adheres very well to the harder whinstones.

Figure 08.2. Small areas of remaining harl.

Figure 08.3. Detail of the remaining harl.

## 09. ORCHARDTON TOWER, NEAR PALNACKIE, DUMFRIES AND GALLOWAY, C. LATE 15TH CENTURY

Figure 09.1. View of the tower and remains.

This tower and associated remains were built in the late 15th century, and inhabited until 1785. It is a Scheduled Monument and is noteworthy as Scotland's only round tower house, and contains unique, well-adhered fragmentary remains of harl. The stonework is crude and dense, with the face of the masonry often far from square with the general plane of the wall. This discrepancy is compensated for with a thick coarse lime-rich harl using a marine aggregate.

In places there seems to have been an overlay of harl that was made with a rounded, gritty mixture. There have been changes to the tower, demonstrated in the alterations to the doorway at first floor level, and this gritty mix may have been part of the repair process. The marine mix contains shell, and in some places there are what appear to be fragments of charcoal. These fragments, while of interest in terms of composition and manufacture, create the potential for radio carbon dating. This is important as it could provide a more exact date for the harl. In places there is clear evidence that the bedding mortar is the same as the harl and that the harl was applied at the point of build, similar to Ormacleit (Entry 21), and the Bernera and Ruthaven Barracks (Entry 30 and 25). The harl has been applied to all areas and extends into the door and window openings.

The internal plaster is made from the same marine aggregate. It is interesting that some effort has been made to conserve the internal plaster, and yet none has gone into retaining the external harl. This suggests a lack of recognition of the importance of the external wall finishes.

Figure 09.2. Overlay of harl demonstrating a round, gritty mixture.

Figure 09.3.  Marine mix harl, with fragments of shell and remnants of charcoal.

## 10. NEWARK CASTLE DOOCOT, ST MONANS, FIFE, MID 16TH CENTURY

Figure 10.1. General view of the exposed cliff-top location of the doocot.

This Scheduled Monument preserves extensive remains of exterior harl that may be original to its construction, likely of the mid 16th century. However, given the exposed location of the structure and the common longevity of use of such structures, it is possible it continued to be maintained up to the 19th century. The harl application is coarse and thick (5-10mm aggregate). Little of the final surface itself now survives, so establishing the outer finish lays is not possible.

Figure 10.2. Large area of harl; the remains of Newark Castle are visible in the distance.

Figure 10.3. Detail of the remaining harl.

## 11. MACLELLAN'S CASTLE, KIRKCUDBRIGHT, DUMFRIES AND GALLOWAY, C. LATE 16TH CENTURY

Figure 11.1. View of the castle from the north elevation.

This late 16th century 'L' plan castle is a Scheduled Monument that sits on the south side of the River Dee overlooking the town. It has been roofless since the mid-18th century. The masonry is mainly a basalt rubble with sandstone dressings and modern deeply-recessed cement pointing. Despite a sequence of repair programs with modern materials, it is still possible to find fragments of historic lime render on every elevation, including on the quoins. On the south west elevation a larger area of harl, though still less than a square metre, survives. Traces of what is presumed to be limewash can be seen in the broken surface. The survival of this area of harl on the exposed elevation, subject to prevailing winds and rain, says much for its durability.  The harl has a yellowish hue and the limewash, if indeed it is limewash, has brown and orange tones. However, this could simply be iron washing out of the stones.

By the mid-19th century the castle had lost its roof and was covered in ivy. In 1887 MacGibbon and Ross describe the castle, 'The whole building is a mass of ivy, giving it the appearance of a huge haystack of a green rather than yellow colour.' This statement raises two considerations. Firstly, the covering of ivy may have helped to protect any lime finishes but its removal, given how tenacious ivy is, is likely to have pulled those finishes away. The second consideration is the comment on the '...yellow colour.' It is unclear whether they were referring to the yellowish mortar or the limewash.

Figure 11.2. Remaining harl on the south west elevation.

Figure 11.3. Possible trace of remaining limewash.

## 12. ST CLEMENT'S CHURCH, ISLE OF HARRIS, WESTERN ISLES, EARLY 16TH CENTURY

Figure 12.1. General view of the church.

The Category A Listed church was described by Mary Miers as 'the finest pre-Reformation church in the Western Isles'. It was originally built in the 1520s but had many subsequent phases of building. It attracts many visitors, and is still used for occasional weddings and funerals. It is famous for its four-storey tower, ornamental stone detailing, and its internal monuments, including Alasdair Crotach's table tomb and decorated voussoirs.

It has deeply recessed cement mortar pointing. The harling was removed in 1913 and, consequently, the church has been presented for generations as a stone monument internally and externally. However, traces of the former harl can still be located around the building. What at first glance appears to be lichen, moss or the surface of the stone itself, is actually fragments of a former complete lime finish. The mortar samples are coarse and contain fragments of shell. The mortar is found on all elevations; it transcends the flat plane of the walls and is taken around the details and into the windows. There appears to have been a conscious decision to refine the mortar as it reaches the glazing groove. The mortar in all cases looks lime-rich, possibly 1.5 part sand to 1 part lime. There are several burial enclosures within the graveyard, also with evidence of a harled finish. The removal of the harl and its replacement with cement has caused the walls to take in water. The interior of the church is green with mould in places, and has water running down the walls.

Figure 12.2. Detail of remaining harl, showing its coarse nature and tenacity.

Figure 12.3. The building's interior which has problems with damp exacerbated by the incompatible cement pointing.

## 13. FAIRBURN TOWER, MUIR OF ORD, ROSS-SHIRE, MID 16TH CENTURY

Figure 13.1. View showing the third and fourth stories of the early tower to the left and the later stair tower to the right.

This tower house was built around 1545 by a Murdo Mackenzie, with a later stair tower and kitchen range to the west added in the early 17th century. By the late 18th century the tower was abandoned, although the kitchen range remained in occupation into the early 20th century. The site is exceptional for the wealth of evidence it preserves of early finish treatments over more than one building sequence. Archaeologically the understanding of the sequence of these finishes and the variety of their application has been important for understanding the tower's development. The building displays very clear evidence for three discreet phases of exterior finish treatment. The original 16th century tower preserves areas of an original integral harl finish, creamy-brown in colour. The general bedding mortar had been brought up flush to the interior and exterior wall faces and, on the exterior – showing a full integrated harl. The indication is that the exterior had been limewashed.

Figure 13.2. Detail of the south east angle of the early tower showing in situ remains of external finish. Note the covering of the quoins with the harl.

The stair tower was built with an integrated finish of similar character, what might be called ‘phase 2’. Some instability of the stair tower necessitated structural repair, probably in the later 17th or early 18th century.  Major cracks and pre-existing openings were infilled and the whole of the stair tower then harled over in a thin whiter high-lime finish that was taken over all of the repair interventions, blockings and termed ‘phase 3’. This final harl application which employed a marine aggregate with high variation in aggregate size, also extended to parts of the main tower where various modifications had been made. There is good historical photographic imagery for the site, taken in the later 19th century and earlier 20th century; these show extensive survival of the phase 3 exterior finish.

Figure 13.3. Detail from the later stair tower, showing the showing the integrated mortar with overlying secondary thin white harl.

## 14. CARNASSERIE CASTLE, KILMARTIN, ARGYLL, LATE 16TH CENTURY

Figure 14.1. General view of Carnasserie Castle.

A ruined tower house built in 1567 built for John Carswell, Bishop of Argyll (Figure 14.1). It was constructed in a single phase and remained in use until 1685 when it was captured and sacked by the Macleans and the MacLachlans during the Earl of Argyll's failed rebellion and largely abandoned thereafter. There is considerable surviving evidence of external harled finish on all elevations; this is further supported by the evidence of historic sources, including drawings and photographs from the 19th century available on Canmore. Particularly there is an early 19th century artist's view indicating complete coverage of an area still roofed at the time, and a photograph of about 1870 that shows the tower ivy clad but with extensive areas of complete harl clearly discernible. From the limited survey there are indications that both the external harl and the first coat of internal plaster are integral to the building process. Carnasserie described it as 'a fashionable residence incorporating many of the latest Renaissance influences'. The surviving evidence clearly demonstrates that the building's fine carved detailing was intended to be emphasised by the application of surrounding harl (Figure 14.2). Even though the general rubble stonework is of high quality and very flush, it was nonetheless intended as a surface to accept a harled finish.

Figure 14.2. Extensive surviving areas of exterior harl finish on the South elevation.

Figure 14.3. Harl running up to the corbelled feature on all sides

## 15. BARN AT BURRAY, ORKNEY ISLANDS, LATE 16TH CENTURY

Figure 15.1. Principal elevation of the barn.

This barn at Burray on mainland Orkney sits adjacent to the shore. It is a fine survival and contains ample evidence of a former lime finish, in this case a gritty harl made with marine aggregate. The harl still adheres to quoin stones at lower levels. It also appears that the harl preparation is contemporaneous with the building works as there is no discernible difference between the bedding mortar and the harl, and no obvious break between the two. There is no direct evidence of limewash on this barn but, as is seen in other locations, limewash was used externally on Orkney.

Figure 15.2. Visible traces of harl on the left side of the window.

Figure 15.3. Detail of harl.

## 16. COXTON TOWER, ELGIN, MORAY, EARLY 17TH CENTURY

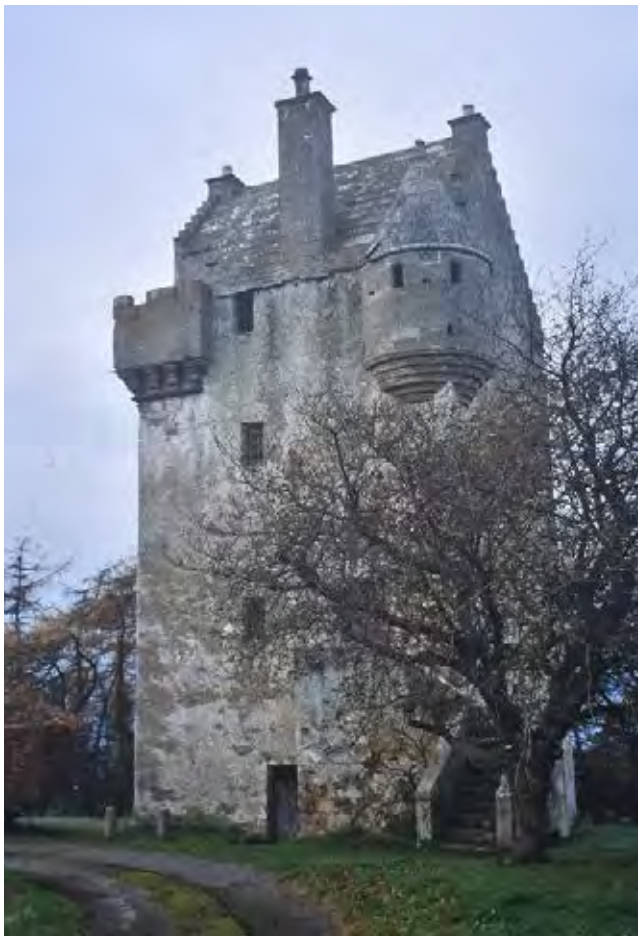

Figure 16.1. Side elevation of the tower in 1993, prior to re-harling.

This early 17th century Category A Listed tower belonged to the Innes family. It was first surveyed by the authors in 1993. It is not known whether the harl examined in 1993 was contemporaneous with the build, but it was certainly made with lime. The coat was thin and finely textured, fading out towards the chamfered margin and, as can be seen, folded around the margin into the window frame. The images taken in 1993 were from the ground, so there is no record of how the bartizan and parapet walkway were treated in the past.

Coxton Tower was re-harled and limewashed in 2010, leaving bare the parapet walkway and bartizan. The modern work has successfully followed the traditional lime idiom, and the new work is very similar in detail and spirit to what was there before. However, it is failing in many parts due to poor rainwater goods.

Figure 16.2. Harl returned around the margin into the window frame. Image taken in 1993, prior to re-harling.

# 17. KINNEIL HOUSE, BO'NESS, MIDLOTHIAN, MID 17TH CENTURY

Figure 17.1. Kinneil House in 2013. Some vestiges of lime finishes remain.

Kinneil House is an early site, with surviving fabric from the medieval period and a later principal elevation added in the mid 17th century. The medieval section is well known for the different phases of impressive painted plasterwork. The discovery of this plasterwork is what saved the building from demolition in the 1930s after being transferred to the local authority. By this time the building was more or less a shell, but several subsequent phases have reinstated the roof to protect the remaining fabric. Today it is Category A Listed.

An image from the end of the 19th century (Figure 17.2), just before the building's decline, shows a structure presented entirely as a rendered and limewashed building. It is not clear how much of this render and finish was removed, but the contrast between the building then, and its appearance now is significant. Close examination of the surfaces shows different approaches. On the ashlar work to the main façade the covering is largely made up of limewash, with a gritty fine component (Figure 17.1). To the rear elevation, on the rubble, it is a single slightly thicker layer designed to smooth over the undulations in the rubble (Figure 17.3).

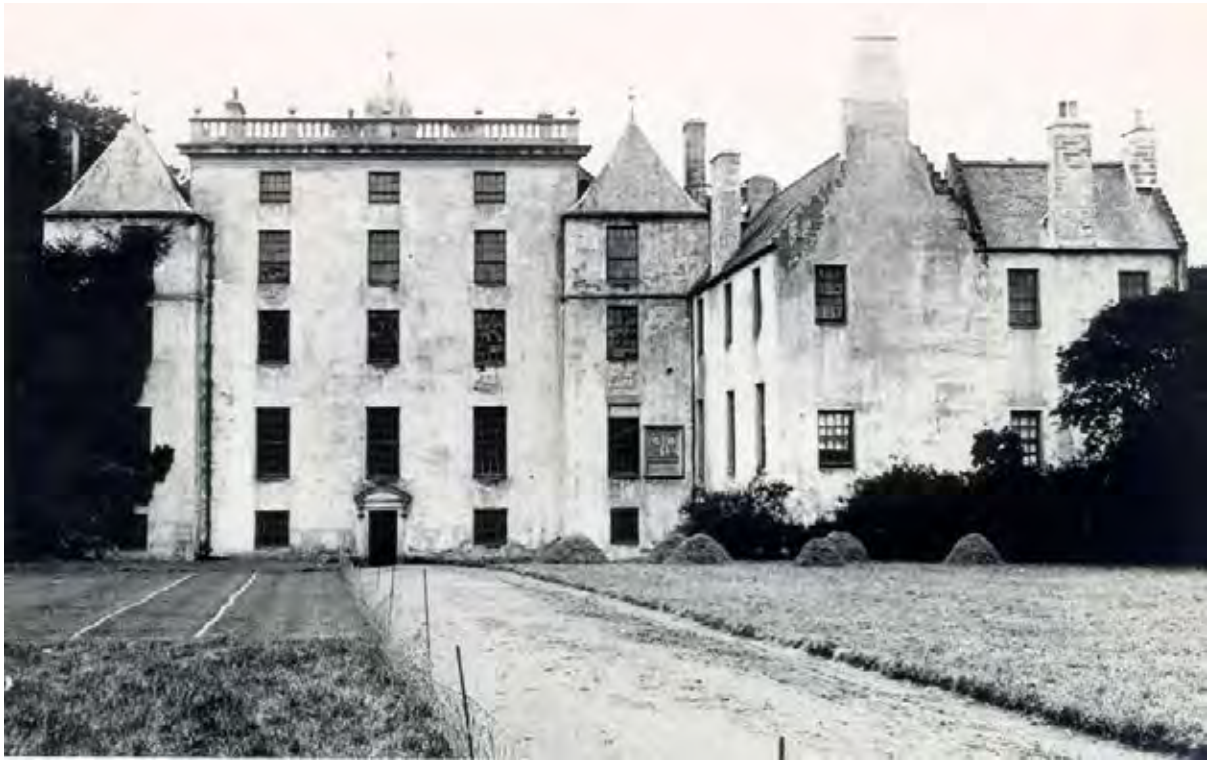

Figure 17.2.  Kinneil House in about 1890, with its original lime render and limewash.

Figure 17.3. Surviving lime finish to the main elevation to the right of the front door. It is largely made up of limewash layers.

## 18. HOWAN, EGILSAY, ORKNEY ISLANDS, C. LATE 17TH CENTURY

Figure 18.1. The north elevation of Howan.

Howan is a late 17th century domestic building with 18th century alterations.  It is Category B Listed. It has been abandoned for many years but the building and its external finishes are a rare survival in a harsh environment. It has chamfered margins at some doors and windows, and detailed carving internally.

The bedding mortar and harl likely were made with a marine sand that includes a high percentage of a calcareous algae known as maerl. There is a maerl beach approximately 50 meters from the site. It is likely the maerl that was burnt to produce calcium oxide, and thus it may have been both binder and aggregate for the mortar. The mortar is finely jagged and the maerl is clearly visible. Given that Orkney has little timber and no coal, it is reasonable to assume that any burning of maerl sand was undertaken with peat. It is also possible that the mortars at Howan were prepared with sea water since there are no fresh water lochs or rivers on Egilsay and burns are scarce.  The lime finish extends over the full extent of the masonry, including chamfered margins and chimney heads. In some cases it is hard to detect any separation between the bedding mortar and harl.

The general building uses local outcrops of Orkney sedimentary stone while all detailed work was undertaken with a more compliant buff coloured sandstone. With the exception of the sandstone for the more detailed work, it would seem that all the building materials that went into the construction of Howan were local to the area.

Figure 18.2. Area of harl surviving on a chimney top.

Figure 18.3. Area of harl surviving around window detail.

Figure 18.4. Detail of harl with inclusions of maerl.

## 19. OLD SOUTHDEAN CHURCH, CHESTERS, SCOTTISH BORDERS, LATE 17TH CENTURY

Figure 19.1. Old Southdean Church from the south. This 17th century building fell out of use in the 1860s. The area of a surviving render is on the west gable, to the left of the picture.

Old Southdean Church is a small village church which was constructed in 1690. Like many churches of its time, it is oblong in shape with a small bell cote atop the west gable. It was constructed using a mixture of ashlar blocks (spoils from an earlier church nearby) and rubble on the west gable. By the mid-19th century a growing parish population and the poor state of the existing building led to the construction of a new church close by in 1874. The building was partially dismantled and used as a burial aisle for the Cumminghams of Abbotrule. It is Category B Listed.

The surviving render on the west gable is of interest as it is largely complete and shows the details of finish to the margins as well as the nature of its composition. Its survival is largely due to protection from the westerly weather by trees, some protection by the ivy, and a lack of modern mortars used in repairs. The harl itself is lime rich with a soft aggregate. It is also of note that the harl is taken over by the quoin stones on the corner, in contrast to the modern assumptions that these would have been exposed.

Figure 19.2. A detail of the well preserved lime render on the north corner, showing the quoins still largely covered.

Figure 19.3. A detail of the harl on the west gable, showing a tight junction with the window margin.

## 20. VICTORIA STREET, KIRKWALL, ORKNEY ISLANDS, LATE 17TH CENTURY

Figure 20.1. General view of the building.

This small, possibly late 17th century, building has been largely hidden behind a newsagent in Victoria Street for many years. It retains its harl with the limewash fills in the hollows, as well as interstices of the thrown material, and the way in which the harl is flattened out as it returns around the window jamb and into the frame. Surveying it was difficult to assess the lime to sand ratio or the coarseness of the aggregate without sampling the harl and limewash. The large overhang of the relatively modern cement asbestos roof covering has helped keep the elements off.  While there are no deposits of limestone on Orkney the island does have very good deposits of shell sand and a calcareous algae called maerl. In some cases these deposits can be over 90% calcium carbonate and can be burned to make a quicklime. There are also deposits of lime on Shetland and the north coast of mainland Scotland.

Figure 20.2. Well-preserved areas of harl displaying multiple limewash coats.

Figure 20.3. Detail of harl running up to the aris of an entrance, flattened out where it runs into the ingoe.

## 21. ORMACLEIT HOUSE, SOUTH UIST, WESTERN ISLES, EARLY 18TH CENTURY

Figure 21.1. View of the ruins, with remnants of harl still visible. Heavy growth of lichens is also evident.

Built in 1703 as a laird's residence on an exposed headland on the Isle of South Uist, Ormacliet was burned in 1715 and has not been occupied since. This allows for a degree of certainty with dating the harl. The harl surviving today is almost certainly the first and only coat. It is a Scheduled Monument. The harl is coarse and made with a marine aggregate. It is full of shells and large rounded aggregate. It is thicker than many harls surveyed, and there is the faintest hint of limewash in a few isolated places. The harl appears to have a high lime content, and there are some shrinkage cracks that likely took place shortly after application. This thickness and shrinkage do not seem to have adversely affected its performance; it adheres to the hard stone very well and in its robustness has similarities with Bernera and Ruthaven Barracks. The harl is also similar to the two barrack blocks in the suggestion that there is no break with the bedding mortar of the stones and the flush point. This indicates that at least the preparatory work for the harl was executed at the same time as the building work. It is clear from the extensive remains that the building was harled all over. There are no raised margins as on some buildings of this period, and the harl was swept around the corners and into the ingoes. There is degradation of the harl at the quoins, where the thin layer has weathered back from the sandstone. Heavy exposure to weather has also caused the tops of some gables and eaves to lose their surface finish.

Figure 21.2. Detail of the remaining harl, which is coarse and made with a marine aggregate.

Figure 21.3. Detail of one section of quoining, where the harl is greatly degraded.

## 22. MANSE STEADING, URRAY, HIGHLANDS, EARLY 18TH CENTURY

Figure 22.1. Principal elevation of the barn.

This barn of the early 18th century lies close to the former manse of Urray. It is Category B Listed. The roof is steeply pitched with detailed narrow crow steps at the gables and a simple eaves cornice. It is possible that the roof was once thatched. The building is a remarkable survival that retains extensive harl and limewash, as well as evidence for the continued tradition of repairing lime finishes.

The first layer of harl, presumably the original finish, is fine and thin, painted with white limewash. Where the harl has degraded there have been subsequent repairs. The harl has weathered away from the crow steps and the quoins; it has also suffered around the doors and at ground level. In short, the damage and repair have occurred in the areas of the greatest exposure, the greatest wear, or where there is the transfer of soluble salts from the ground. The repair strategy has been to apply a similar finely graded harl to the exposed areas then to unify the old and the new with limewash. In this case the limewash has a yellow pigment added.

Figure 22.2. Weathering of harl apparent where it has been thinly applied on the dressed stonework.

Figure 22.3. The original thin harl coat with its pale limewash finish overlain by an area of repair harl, with yellow limewash.

Figure 22.4. Harl taken over the door jamb.

## 23. THE DROVERS INN, INVERARNAN, ARGYLL AND BUTE, EARLY 18TH CENTURY

Figure 23.1. The front elevation of the Drovers Inn.

This 18th century inn is reputed to have been operating since 1705 and consists of a central core of 3 bays over 3 stories, with subsequent additions to the east in 1825-30 and again in 1853 (Figure 23.1). At one stage it was called Inverarnan House.

At present the inn conforms to the image of a 'rugged stony Scottish building', but even a cursory examination reveals that in the past the presentation of the building was very different. It was almost certainly harled, with areas of historic harl still visible to the rear (Figure 23.2 and 23.3). In addition to the surving harl, the limewash finish is still well preserved in sheltered areas. The areas of surviving limewash are significant in that they show pigmentation of the limewash, and that the numbers of layers, possibly up to ten, applied show repainting over many years. Early coats appear to be white, then an ochre tint, and later ones white again. As in many parts of Scotland, the harl and limewash finish was more than just decorative; it was an important means of keeping the water out of the walls. Of additional interest is a blind window to the rear of the property finished with painted glazing bars onto lime plaster. The use of brickwork for these dormers opposed to stone masonry suggests this might be the 1853 works.

Figure 23.2. Extensive survival of extant harl and coloured limewash to the rear of the structure.

Figure 23.3. Extant harl to the dormer; note the plastered and painted blind window.

## 24. BOATH DOOCOT, AULDEARN, HIGHLANDS, C. EARLY 18TH CENTURY

Figure 24.1. The doocot following removal of the cement harl.

A well-proportioned doocot dating from the early 18th century. During recent repairs for the National Trust for Scotland, the cement harl of the later 20th century was removed and a study for evidence of the bedding mortars, harls, and limewashes used in the original construction was carried out. This study found that the wall masonry was clay bonded with what was probably a locally sourced clay or earth mortar. Externally the walls were pointed and smoothed out with a hard lime mortar. They were then prepared for harling with limewash to form a bond and coated with a sharp marine harl, using crushed shells. This harling may have been partly intended to even out some of the irregularities of the wall surface and in some areas more than one application was apparent. The marine harl was then overlain by a thin application of a finer harl with an aggregate of sharp river sand in one or two coats. Very slight traces of a further application were recorded which used a similar river sand aggregate.

Figure 24.2. Detail of the build-up of external finishes.

## 25. RUTHAVEN BARRACKS, KINGUSSIE, HIGHLANDS, EARLY 18TH CENTURY

Figure 25.1. Ruthaven Barracks, general view looking south east.

This large and complex structure is a significant example of a Hanoverian Fort. It was completed in 1724, but burnt and abandoned in 1746. As with Ormacliet, it is important because its abandonment means the harl remains can be dated with some certainty. Today it is a Scheduled Monument.

The harl is visible on the lower exteriors of the two barrack blocks, the exterior perimeter and elsewhere. The harl is robust, and is extremely hard and firmly adhered to the underlying stone. It is possible that there was an additive in the mix, but this is unconfirmed. The absence of a distinguishable boundary between the harl and mortar substrate suggests that the harl was applied when the latter was still wet. This also implies that harling turn took place as building progressed, presumably on a lift-by-lift basis.

The robust nature and application of the harl is similar to the Bernera Barracks at Glenelg which dates from the same period (Entry 30). This suggests a specific practice common to the early Georgian military engineers.

Figure 25.2. The absence of a visible boundary between the harl application and the bedding mortar suggests the former was applied when the latter was still wet – thus presumably in lifts.

Figure 25.3. One of the barracks blocks with harl traces adhering to the lower frontage.

Figure 25.4. Well preserved harl remains on the exterior of the perimeter.

Figure 25.5. A well preserved area of harl on the exterior of one of the barracks.

## 26. NEWHAILES HOUSE, EAST LOTHIAN, 1685 WITH EARLY 18TH CENTURY ADDITIONS

Figure 26.1. Newhailes House, entrance elevation on the west side, following lime-based repairs in the lighter areas in 2001-2002.

This substantial mansion house started as a more modest villa in 1685, and was enlarged in the early 18th century. It is Category A Listed. The exterior finishes are an important and rare survival, representing a good example of the application of exterior lime surfacing on the principal elevations. In contrast to most thrown exterior lime coatings, here the lime was pressed back for a smooth rendered plastered surface. Newhailes actually preserves two types of lime application, offering evidence of a hierarchy of finishes depending on the status of the elevations.

The three principal elevations to the east, west and south were detailed with a pressed-back render of creamy hue that was brought to a smooth finish and then ruled out to simulate regular ashlar construction. In contrast, the subsidiary north frontage was finished with a plain pressed-back application, the slightly uneven surface of which presents a gently undulating finish. Well preserved areas of this surface application still survive upon the house; however evidence for a painted finish has mostly disappeared. During conservation works between 2001-2002, there was some debate as to whether the building's exterior had been painted. Due to this uncertainty, the exterior was left un-painted following repair.

The types of exterior finishes found on Newhailes House are likely to have been comparatively common in the 18th century for this sort of building. They represent an inexpensive way of suggesting a much more expensive finish and method of construction. On all elevations, the application respects the raised margins, rustication, and other architectural features.

Figure 26.2. Detail of the plain plastered exterior of the north frontage.

Figure 26.3. Detail of ruled-out plaster finish.

Figure 26.4. The subsidiary north elevation.

## 27. ST NINIAN'S KIRK, LAMINGTON, SOUTH LANARKSHIRE, EARLY 18TH CENTURY

Figure 27.1. General view of the church.

St Ninian's Kirk is a largely 18th century church with medieval elements within the fabric. It was remodelled in 1721, but incorporates a rare survival in the form of a Romanesque arch.

The building has been extensively repointed with broad cement ruled pointing. This is a technique where the pointing covers much of the face of the stone and a line is struck horizontally and sometimes vertically. On closer scrutiny, however, there is evidence on all elevations that there has been a lime harl. The extant lime harl is visible below the cement work on the face of the dressed field stones, and on the tooled sandstones that form the windows, doors and quoins. There are several remains of limewash or fine lime plaster on the 13th century arch.

Figure 27.2. Area of remaining harl.

Figure 27.3. The 13th century arch with remains of limewash or fine plaster.

Figure 27.4. Detail of the remaining limewash or fine plaster on the arch.

## 28. OLD VALLAY HOUSE, BHALAIGH, NORTH UIST, EARLY 18TH CENTURY

Figure 28.1. Old Vallay House centre; Vallay Farm House, built later, to the left.

Located on a tidal island off North Uist's north coast this is one of two buildings built close together at different periods. Together they show an interesting development in building design and technique during the 18th century. The older building, Old Vallay House, was built in 1727 for Ewen Macdonald and is described as a Tacksmans House. The house is traditionally detailed with crowsteps and employing narrow openings with chamfered margins, characteristic of an earlier century. The masonry is lime bedded rubble with sandstone dressings. Inspection of the walls of Old Vallay House shows that they were built up and harled at the same time. The integrated bedding mortar and lime harl is made with marine sand. The harl is often thick, up to 30mm in depth as single coat, dying out at the chamfered window margins and folding into the window frame as a thin lime plaster. The harl varies in grading from very coarse to reasonably fine shell-rich sand. It has proved to be durable and long lasting, and covers extensive areas of the remaining walls. No traces of limewash survive. One gable, the east, has partially collapsed; it is interesting to note that this gable had been cement rendered, the consequent water retention may have contribute to its collapse. Internally there are extensive areas of plaster on the hard, the lower coat of which seems to be integral with the bedding mortar.

Figure 28.2. Old Vallay House – detail of surviving harl and its relationship to the window opening.

Figure 28.3. Detail of the harl dying out at the chamfer and terminating at the window frame.

Figure 28.4. Old Vallay House – integrated mortar and harl, with crude use of pinnings.

## 29. ICE HOUSE, BALBLAIR, HIGHLANDS, C. EARLY 18TH CENTURY

Figure 29.1. Entrance to the ice house.

This early 18th century ice house has lost most of its external finishes and appears to be a simple rubble built structure. However, on closer inspection, behind vegetation, there is a marine harl still fully bonded to the sandstone.

Figure 29.2. Evidence of surviving marine harl behind vegetation.

## 30. BERNERA BARRACKS, GLENELG, HIGHLANDS,  EARLY 18TH CENTURY

Figure 30.1. Principal elevation of the barracks.

Completed in 1723, but ruinous by the early 19th century, this a good example of an 18th century barracks. It is a Scheduled Monument. The masonry and detailing is of a high standard. It has a decorated archway on the west wall, ovolo moulded skew putt, segmental arches, scarcement and raised margins at the doors, windows and quoins. Areas of stone have been robbed at lower levels.

The harl has decayed at eaves level, where the saturated wall head has resulted in decay and loss. Below this area there is a gradual improvement in survival until the harl meets the scarcement. Below this level survival of the harl is poor. Examination of the robbed areas shows the harl preparation was contemporaneous with the building work, with the bedding mortar for the stone pressed out of the joints as it was laid and pushed back into the face of the wall, forming what might be described as a ‘rivet’ of mortar. This suggests that at least the harl preparation is cotemporaneous with the building work.

The quoins were harled up to the margins, and the pronounced decay of the harl at the quoins can be explained by water discharging down the skew and onto the quoins below. However, some harl fragments do survive on the quoins.  The scarcement widens the wall at foundation and ground level, making a solid platform from which to build. It would have also allowed for the regular maintenance of harl, and possibly limewash, in an area that is subject to water discharge from the roof, and from the transfer of soluble salts up the wall.

Figure 30.2. The harl is very lime-rich and coarse, with what appears to be quartz included in the aggregate.

Figure 30.3. All the architectural details appear to be formed from a blue-green limestone containing many fossils.

Figure 30.4. Large area of surviving harl.

Figure 30.5. Surviving fragments of harl near the quoins.

## 31. BALMERINO CLOSE, CUPAR, FIFE, C. 18TH CENTURY

Figure 31.1. Balmerino Close

Within these two closes, there are numerous neglected corners and wall surfaces that retain early external finishes that are so far unaffected by modern ‘repair’ and the processes of urban renewal and gentrification. As with Black Bull Close (Entry 34), this retention of finishes is often found in historic Scottish burghs. Both closes are within the town centre and comprised of the side and rear elevations of buildings of the 18th and 19th centuries.

As one might expect in a continually occupied historic town, evidence for a variety of surface finishes can be found. There is a fairly typical general harl application in Balmerino Place, but a roughly straightened mortar finish (as opposed to a harl) with ruled bed joints seen in Temperance Close. Multiple coats of limewash are evident in both closes.

Figure 31.2. Harl application in Balmerino Place.

## 32. HOUSE NEAR BLAIR ATHOLL, PERTH AND KINROSS, MID 18TH CENTURY

Figure 32.1. General view of the principal elevation.

Derelict laird's or tacksman's house dated 1728. The building is mostly finished with a cement-based harl dating from the 20th century. Traces of what appears to be the original creamy lime harl finish survive where protected within the roof-space of a later rear range. The harl is a thin coarse high-lime application with river sand aggregate, limewashed over in white.

Figure 32.2. Detail of remaining harl.

## 33. KILMORACK FORBES GALLERY, BEAULY, HIGHLANDS, MID 18TH CENTURY


Figure 33.1. Rear elevation of the building.

This former kirk is situated near Beauly, Inverness-shire. There is a suggestion that the building was once covered in limewash, and that the present finish is later. This can be discerned by close observation of the mortar, where small traces of limewash are visible. The lime pointing is spread over the joints and largely intact. It is coarse in texture with a good angular, gritty sand. It is crudely ruled out, showing that this flush point was the finished level of the mortar.  Subsequent pointing repairs have covered traces of limewash, indicating a change in how the building was presented.

Figure 33.2. Area of remaining mortar, with traces of limewash.

## 34. BLACK BULL CLOSE, DUNBAR, EAST LOTHIAN, BUILDINGS FROM MID 18TH CENTURY

Figure 34.1. Surviving areas of masonry finish at Black Bull Close.

Black Bull close is a pedestrian access route leading south from the Dunbar high street, passing between the ruins of two dwelling houses to an area of garden called a 'backland'. These walkways, known as 'closes,' branch perpendicularly from a principal street frontage, and are a defining characteristic of late-medieval Scottish burgh architecture. Although frequently there has been much re-building of the façades on the street elevations, the rearward buildings of the closes often did not receive so much attention and alteration. Abandonment of the close dwellings in the 1950s has allowed traces of early lime finishes to survive in some areas.

The buildings in Black Bull Close are difficult to date for certain, but are likely from the mid-18th century, or possibly earlier. Consistent with other entries, the masonry finish on these subordinate elevations appears to consist of a flush point in lime, with several layers of limewash. This layering is readily visible on the edges of surviving areas along the line of the close (Figure 34.2). The survival of these finishes seems to be due to relatively good shelter within the close, since more exposed elevations have lost nearly all traces of external finish.

Figure 34.2. Closer image of surviving areas of masonry finish at Black Bull Close.

Figure 34.3. More exposed elevations have lost nearly all traces of lime finishes.

## 35. WEENS STABLES, HAWICK, SCOTTISH BORDERS , C. MID 18TH CENTURY

Figure 35.1. The north range which is the earlier part of the stable courtyard. Flush pointing and limewash are largely intact on this elevation.

This stable courtyard was formerly part of Weens House and is believed to date from the mid-18th century. While it is much altered following its conversion to dwellings in the late 1950s, the range on the north side of the courtyard retains some well preserved historic finishes. The north range was formerly much smaller, with the earlier section being referred to as ‘the old stable’ (Figure 35.1). The walls are constructed of local red sandstone, bound with a clay mortar and pointed with lime finished with multiple layers of limewash (Figure 35.2). The masonry style is a coursed squared rubble, flush pointed. The limewash finish is fragile but still shows how the original presentation would have been, with a relatively flat surface of a bright off-white hue. The window margins or ‘bands’ were painted in an oil based paint in 1958. Traces of flush pointing survive on other elevations to a lesser degree, with well-preserved layers also on the south range.

Figure 35.2. Detail of the south wall of the north range. The coursed rubble has been flushed out and lime washed; while most lime wash has weathered away, traces are easily identifiable.

Figure 35.3.  Detail of the north range that shows the combination of red sandstone, clay mortar and multiple layers of limewash.

## 36. FORMER MANSE, ABERDEENSHIRE, MID 18TH CENTURY

Figure 36.1. The principal elevation of the manse.

This manse, in a rural location in Aberdeenshire, is a well-proportioned building of the mid-18th century. There is nearly complete lime render on the front elevation (north east facing) and also on the rear of the building, facing south west. It is a thin lime harl that covers the quoins and goes up to the window bands. On the front elevation it is wearing well, with some repairs below the window openings, and spalling on the quoins (Figure 36.2) probably due to a blocked downpipe. . It is hard to say exactly when it was put on, but probably early 20th century at the latest, and probably earlier.

Figure 36.2. The harl covering the quoins on the north east corner, showing some flaking.

The south west side of the building, facing the prevailing wind, is not so complete, but still largely sound. There has been some decay due to the run off from the skew cope (Figure 36.3), and a bit of mechanical impact along the south east gable.

Figure 36.3. The rear elevation of the house. Some decay of the render evident from the run off from the skew cope.

Figure 36.4. The harl is adhering relatively well to the quoins, but some spalling.

Given the exposed nature of the south west corner the covering is performing very well. The other gable has been re-done in the past.

## 37. OLD LINTHILL STABLES, BERWICKSHIRE; MID 18TH CENTURY

Figure 37.1. The stable block at Old Linthill.

Old Linthill is a 17th century laird's house located to the west of Eyemouth in Berwickshire. While the house is of interest as an important example of this house type in Southern Scotland, extensive modernisation works in the 1960s means that there is little in the way of historic finishes to record. However, as is often the case, the associated outbuildings were not included in the modernisation works, and evidence of early finishes survives on the old stables (Figure 37.2). The stable block is a modest rectangular structure aligned east west axis about 100 yards above the house. From the difference in architecture and buildings techniques that can be seen it appears to have been built sometime after the main house, around the 1750s. It is constructed of random rubble, bonded with lime and finished with sandstone quoins. There is evidence of a traditional harl over most of the surface, indicating that once this harl covered the entire building. There are some areas of more complete survival on the south elevation at low level. The mix is lime rich with a coarse aggregate and is still fairly robust. As happens frequently with sandstone, the harl has come away from the quoins. There does not appear to be any shell in the mix.

Figure 37.2. Detail of the surviving harl on the south elevation.

Figure 37.3. Detail of harl showing some of the coarse aggregate.

## 38. STIRLING CASTLE, BARRACK BLOCK, MID 18TH CENTURY

Figure 38.1. The east side of the military offices; the extant render is visible middle right.

At the south west end of Stirling Castle, two buildings sit close to each other. On the west side, facing the weather, is the gable end of the Kings apartments, dating from the 16th century. The other side is a building from the Hanoverian period alteration of the castle (Figure 38.1), where a range of accommodation and storerooms were built in the mid-18th century as part of the concentration of military resources in Scotland following the 1745 conflict. While the building itself is fairly plain, the sheltered location, and the absence of modern interventions means that this is an important survival of a masonry finish at the castle. The maintenance arrangements for monuments in state care in the early part of the 20th century have resulted in the loss of much of the historic finishes from buildings of all types. Here, the surviving harling seems to be reasonably thick, about 15mm, and seems to be made up of one coat (Figure 38.2). Adhesion to the largely whinstone masonry is good, although the harling is now soft and friable. It is unknown if the harling dates from the construction, or from later repair work. This building is one of a number from the Hanoverian period in Scotland where the external masonry finish has survived very well; Glenelg and Ruthaven Barracks are two other good examples of this type of work in this Technical Paper.

Figure 38.2. Detail of the extant area of harling. The surface is weathered back but to the right of the downpipe some original surface shows as a light grey.

## 39. KILMUIR OLD KIRK, HOUGHGARRY, NORTH UIST, MID 18TH CENTURY

Figure 39.1. General view of Kilmuir Old Kirk.

Kilmuir (Cille Mhoire) kirk is a rectangular structure built in 1764 whose mason-architect was John Arbuckle of South Queensferry; it was also known as St Marys Church and is on a well-established Christian site dating back to the early middle ages with a historic burial ground adjacent. The church was in use until 1894 when a new church was built. The masonry is a lime bonded local granite rubble, with shaped quoins and little formal coursing. There are extensive areas of well-preserved external harl, and internal plaster. There is no sign of lime-wash. Examination shows these layers to be integral to the bedding mortar, and are the same mix (Figure 39.2). Internally the relatively recent date of abandonment means that the internal plaster is also in good condition, and it appears that the final coat was directly onto the flushed bedding mortar (Figure 39.3). It is significant that imported construction and architectural influences, from a mainland architect, precipitate little change to this common traditional construction practice which does seem prevalent in the Western seaboard. On a wider point of observation, the lime finishes of the Hebrides appear be united by the common theme of robust, marine sand mortars that in spite of the harsh environment and long dereliction have nonetheless survived well into the 21st century.

Figure 39.2. Remains of integral exterior harl.

Figure 39.3. Remains of integral interior plastered finish.

## 40. GRAVE DIGGERS' HOWF, KILMORACK GRAVEYARD, HIGHLANDS, MID 18TH CENTURY

Figure 40.1. The front elevation of the building.

This small building, associated with the graveyard at Kilmorack and probably dating from the mid 18th century, survives well, particularly considering it is not maintained and has no rainwater goods. It is in close proximity to the Kilmorack Old Kirk and the harl is very similar to that of the kirk.  This harl is a  single layer composed of a medium to coarse angular aggregate, producing a soft but robust harled finish. On this building there is no visible evidence of limewash.

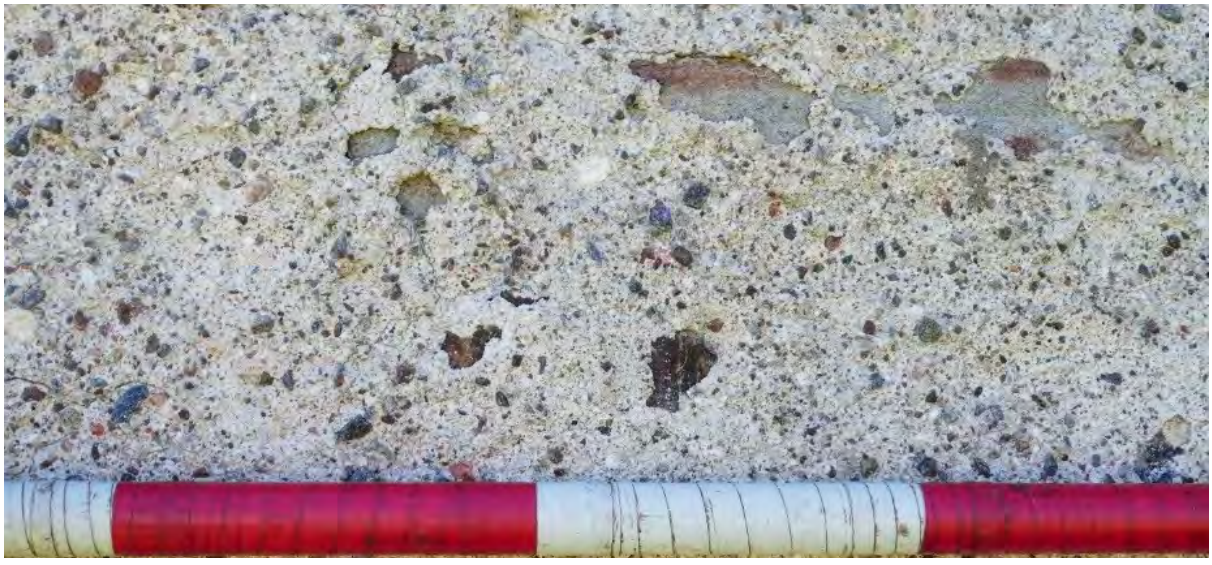

Figure 40.2. Detail of the harl.

## 41. CORF WAREHOUSE, OLD HARBOUR, PORTSOY ABERDEENSHIRE, MID 18TH CENTURY

Figure 41.1. View of the east gable.

Built in c.1765 by John Adam incorporating masonry from an earlier Corf (salmon) house, belonging to Lord Findlater. The building comprises of a narrow, four-story, seven-bay granary built with random rubble with ashlar dressings and formerly harled on all elevations. There is 'cherry-cocked' or 'galletted' packing of the lime mortar (Figure 41.2). However, it is clear from the evidence on the east elevation that the packing is not decorative but functional, possibly to resist the effects of shrinkage in the mortar. Where the harl is still complete there is no evidence of the packing but in places where there has been sloughing off of the outer surface of the harl the cherry-cocks or galletts grin through (Figure 41.3). The wear pattern on the eastern gable is clear at the ground level in the evaporative zone and the quoins (Figure 41.4). Elsewhere, the harl remains complete and obscures the packing pieces

Figure 41.2. Cherry cocks or galetts pushed into the harl.

Figure 41.3. Detail of the harl.

Figure 41.4. Evaporative zone near ground level.

## 42. DUNROBIN CASTLE POLICIES DOOCOT, GOLSPIE, HIGHLANDS, MID 18TH CENTURY

Figure 42.1. The south side of the structure showing the 19th century rebuild of its upper parts.

Figure 42.2. The east frontage showing well-preserved harl taken over the dressings and quoining.

Originally a lectern doocot built in a rectangular plan, it is of probable early to mid-18th century origin. It is Category B Listed. At some point before 1873 (when it was OS map surveyed) it was reduced in size, its upper parts extended, a pyramidal roof formed and a circular interior installed. This building is instructive because of the extensive surviving areas of well-preserved exterior harl that likely date to the earlier 18th century phase of its existence. When the building was reduced and its upper parts extended no attempt was made to perpetuate the original harling scheme. The original harl appears to have been applied in two thin coats of about 10mm thickness, with a pale-cream coloured limewash. The structure preserves important details, such as the harl taken over all dressings including, notably, the chamfered surround of the entrance and onto its jambs.

Figure 42.3. Upper harl coat eroding over the dressings of the entrance and returning over the aris to the jamb and frame.

## 43. VALLAY HOUSE, BHALAIGH, NORTH UIST, LATE 18TH CENTURY

Figure 43.1. Vallay House, centre right, dating from the late 18th century, with Old Vallay House to the left. Crown Copyright HES.

Vallay Farm House, dating to c.1797 is classically proportioned and more regularly built than its older neighbour. It was built for the MacDonalds of Sleat, described as 'The Chamberlin's House' and its design, although very standard, is attributed to James Gillespie Graham. By contrast to the older building next door, this building represents a change in building practice. While the masonry work is much as would be expected, indeed of a good standard with very tight joints and neat pinnings, the application of the harl is a post-construction operation. This might indicate a greater desire for flat walls, further smoothed with a separate render coat. This separate application, even though applied some eighty years later, has arguable not lasted so well, and is delaminating on the west gable. This change in constructional technique might indicate the imposition of a non-native building tradition in place of vernacular practice – a late Georgian package focussing on cleaner lines and flatter walls. This indicates a changing social and architectural world, with a newer type of island economy.

Figure 43.2. Integral harl on the gable wall of Old Vallay House (left). In contrast to the delaminating harl on the gable wall of Vallay Farm House (right).

Figure 43.3. Vallay Farm House, the newer separately applied harl coming away from the wall.

## 44. WEDDERBURN CASTLE, BERWICKSHIRE, LATE 18TH CENTURY

Figure 44.1. The rear or courtyard elevation of the Castle, showing the lime harling.

Wedderburn Castle was built between 1771 and 1775 by James Nisbet for Patrick Home under a design from the Adam Brothers. It was a development of a medieval laird's tower house improving it with classical proportions in Robert Adam's Castle style. The building is significant as it is one of two of Adam's Castle Style in the Scottish Borders. The materials of the building display comfort and wealth under the pretence of castle-like motifs in the form of towers, crenulations and rustication all constructed from blonde ashlar. While this is the predominant theme on the front façade, to the rear of the property the north and east walls of the courtyard shows evidence of a lime render (Figure 44.1). Now eroded, the render appears to be a single coat applied to existing flush pointing (Figure 44.2). There is no evidence for limewashing. This is of interest as although architecturally the focus was for ashlar to the principal elevations, there was still continued use of lime harls to subordinate areas. This seemed to have included the render covering of the quoins as can be seen in Figure 44.3.

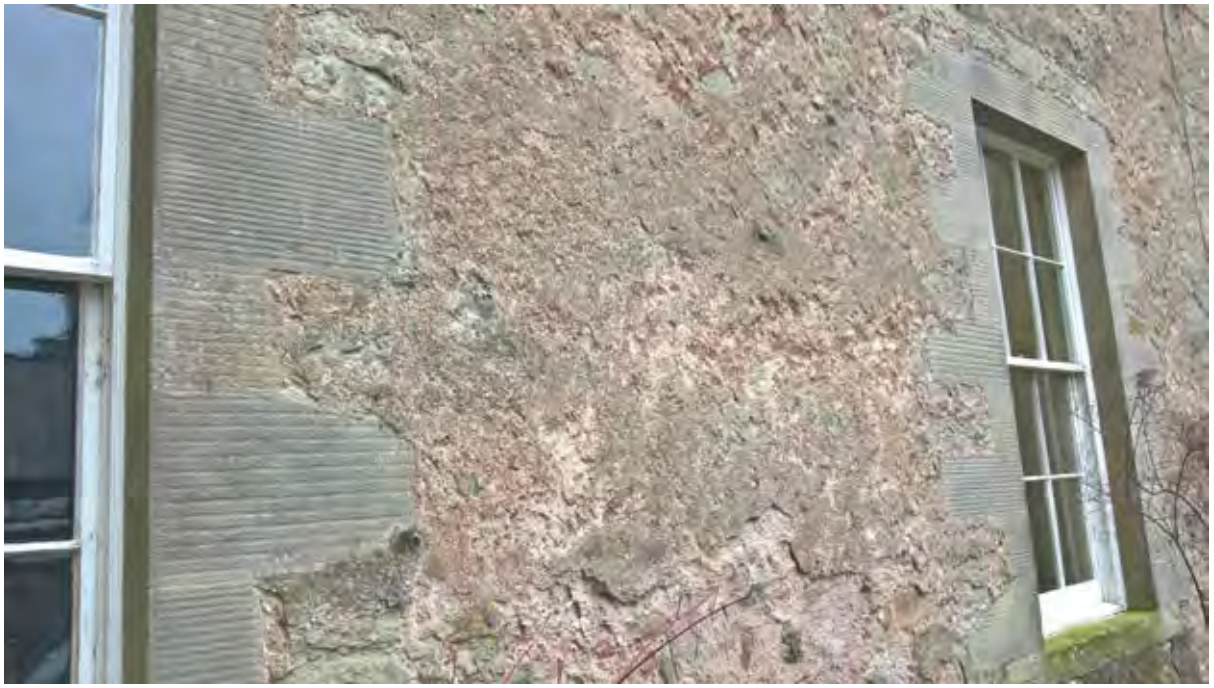

Figure 44.2. The surviving render on the east wall of the courtyard.

Figure 44.3. Detail of render around the rybits.

# 45. LITTLE FRYRISH MONUMENT, EVANTON, ROSS-SHIRE, LATE 18TH CENTURY

Figure 45.1. General view of the monument.

This unusual structure is a substantial gothic monument built in 1782 (Figure 45.1) near Alness by Sir Hector Munro as a palliative to the clearances, one of three edifices representing the gates of Ngapatam in India where Munro was involved in various conflicts. This building is unique within the context of the Gazetteer survey in that the monuments were built unroofed with no domestic, religious, or defensive purpose; they are follies, and therefore do not have the detailing and protection that even an unroofed building would have once had. They are described has having been 'originally been painted white' (Highland Archive Centre. Fryrish Monument, Jane Durham papers) and given the amount of extant lime harl on this particular one, the statement seems very likely. This was built mainly with local sandstone the harled material of the finish is clearly integrated with the underlying bedding mortar and therefore all part of the same construction operation. The exposure of the site, and the sandstone substrate means that much has been lost, but enough survives, to clearly indicate the construction method (Figure 45.2).

Figure 45.2. Detail showing harl remnants, some harl visible on the quoins.

## 46. TARBAT HOUSE, MILTON OF KILDARY, HIGHLANDS, LATE 18TH CENTURY

Figure 46.1. View of Tarbat House from the south east. Courtesy of Canmore.

Dating to 1787 but incorporating elements of a late 17th century predecessor, this Category A Listed mansion is primarily finished with ashlar work, but on the rear elevation the construction is harled rubble. This is an example of the hierarchy of surface treatments, where less formal elevations are finished with lower-cost materials.

On the rear elevation substantial areas of well-preserved harl still remain, these appear to be of the original phase of construction. The harl has been applied in two coats, a thicker base coat of a creamy white mix, and a thinner finish coat that was pigmented pale yellow, likely to blend with the hue of the ashlar work on the other elevations.

Figure 46.2. Area of remaining harl, with evidence of its yellow finish coat.

Figure 46.3. Area of remaining harl over rubble masonry.

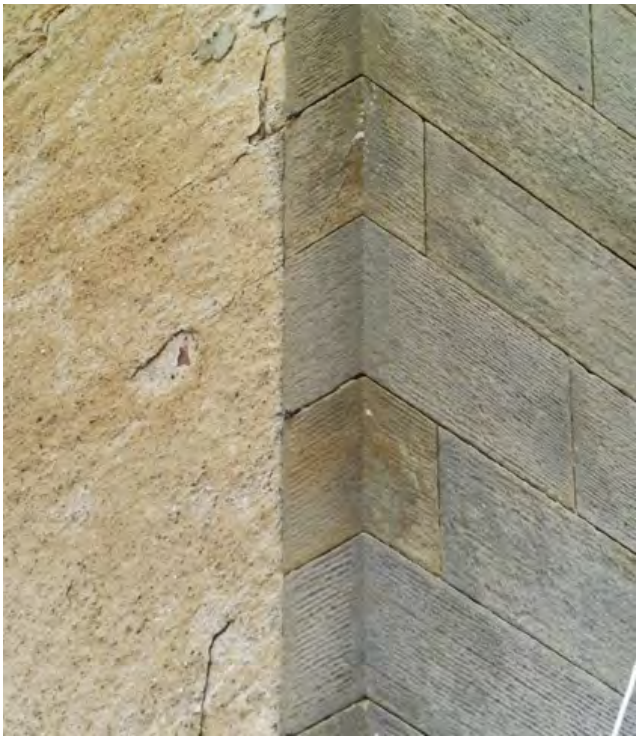

Figure 46.4. The harl blending in hue with the ashlar masonry of the principal elevations.

## 47. NEWMILLS, BALBLAIR, HIGHLANDS, LATE 18TH CENTURY

Figure 47.1. Rear elevation of the cottage.

Newmills is a complex of vernacular buildings comprising of a cottage, mill, and kiln, and probably dates from the late 18th century. The complex reveals a hierarchy of materials, and a general sense of economy in construction.

The cottage and mill buildings are built with sandstone dressings at the quoins, windows and doors. These details are bedded in lime mortar. The more general rubble work of sand and field stone are laid in a clay mortar, clay being available locally. These have been flushed out with a coarse lime mortar, which has subsequently been harled and limewashed.

On the south elevation of the mill the harl has graded away from the high points of the stone; there is a greater level of decay one metre from ground level, and also on the corner where the skew discharges water from the roof down the face of the wall. This degradation at ground level is associated with the transfer of salts to the wall face, where these salts crystallise, expand and break down the surface of the limewash and harl.

The more formally-cut masonry blocks of the mill gable end are laid in lime mortar. This presumably gives them a greater robustness from the outset to absorb vibration and loading from the mill wheel and machinery, and recognises that clay mortars only work in areas where they are not subject to continuous water penetration.

Figure 47.2. Detail of sandstone quoins.

Figure 47.3. Degrading of the harl close to ground level.

Figure 47.4. The mill gable end, with more dressed masonry blocks laid in lime mortar.

## 48. COTTAGE, GLENELG, HIGHLANDS, EARLY 19TH CENTURY

Figure 48.1. Cottage in Glenelg that overlooks the Bernera Barrocks in Glenelg.

In its present form, this cottage has probably been raised and enlarged, and the gabled dormers added. The ground floor level appears to have been constructed with stone and earth. It was not possible to examine the construction of the later dormers to see if they were constructed in the same way, or whether they had been built with lime mortar. It has been harled on the exterior, and plastered 'on the hard' internally.

This render shows how tenacious a traditional harl is, even with long term neglect and with water discharged from the decayed corrugated iron down the wall face at critical points. There is evidence that a marine sand was used for the harl and, as with the nearby Bernera Barracks (Entry 31), there is limestone available locally.

Figure 48.2. The harl exhibits no evidence of complete limewash, but does resemble the neighbouring barrack blocks in terms of texture and robustness.

Figure 48.3. Area of remaining harl around the cement windows.

## 49. DORNOCH CASTLE, DORNOCH, HIGHLANDS, C.1500 WITH EARLY 19TH CENTURY ADDITIONS

Figure 49.1. General view of the south range of the north frontage.

Formerly the south range of the palace of the Bishops of Caithness, Dornoch Castle is a complex building of various phases of construction, from the 16th century onwards. It is Category B Listed. Extensive traces of a harl application still survive on the central part of the north elevation which dates to a specific period of alteration of a pre-existing range, carried out between 1810-1814 for the Countess of Sutherland. The exterior of the range was harled with an even flush-pointed preparation. The harl coat is thin and neat in its application; its aggregate is a sharp shell sand. Generally the harl respected the quoining and jamb-stones of the window margins, though in some areas it fades out over the dressings. In all likelihood this finish was intended to receive limewash that extended over the dressings.

The east and south elevations have now mostly had their traditional finishes removed, however, an early view shows them harled. This is likely to date from the same early 19th century works as the north elevation. The image also shows what seems to be a much earlier harl application on the 16th century tower. The older application seems slightly more uneven and thicker, taken fully over the dressings.

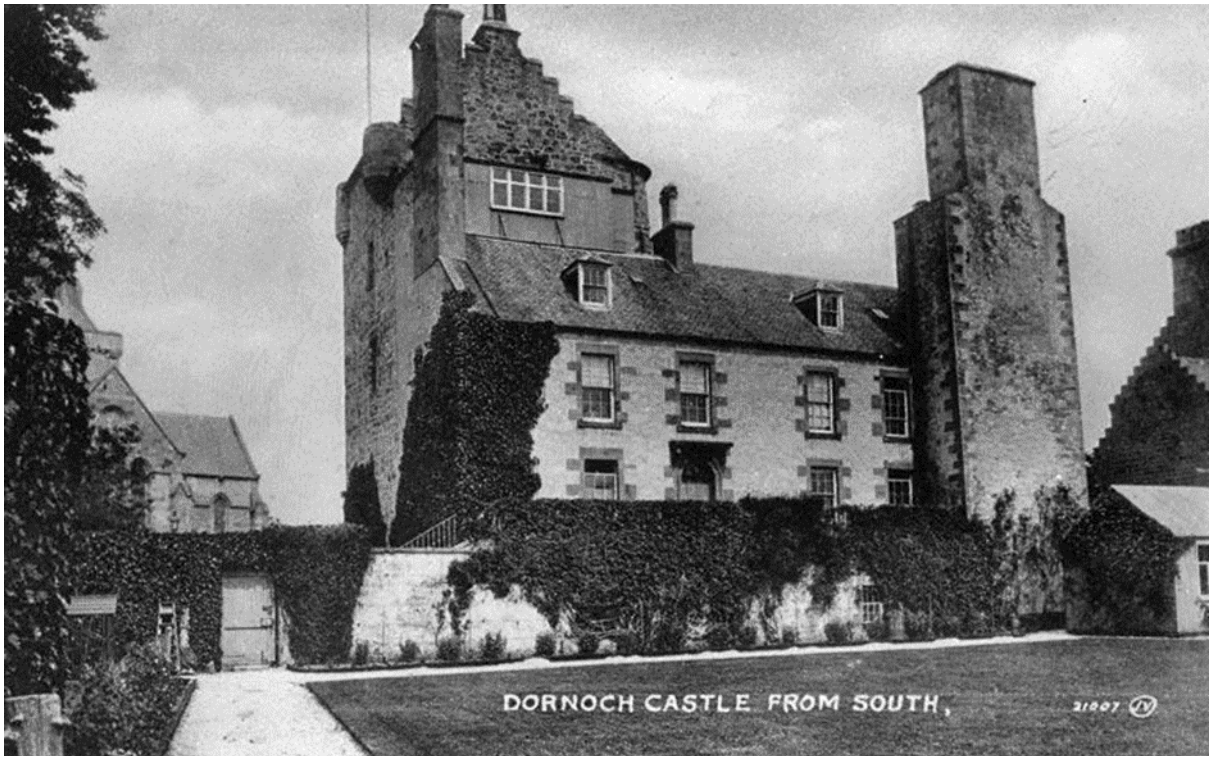

Figure 49.2. South frontage and west side of the castle in the early 20th century. Image courtesy of SCRAN.


Figure 49.3. Detail of harl running up to quoin.

## 50. STORE HOUSE, ISLE OF HARRIS, WESTERN ISLES, EARLY 19TH CENTURY

Figure 50.1. General view of the store house.

This early 19th century storehouse was built for fishing but is now derelict. It retains a good overall covering of a marine type harl. The harl is surviving well, despite roof defects resulting in regular wetting of the front wall. Due to the covering of lichens it could easily be overlooked as a cement harled building. As elsewhere in this survey, it is apparent that the lime rich marine harl has bonded effectively with the harder stones, especially the whinstone rubble areas. The harl is thin, in the style of a sneck harl, with the tops of some stones left uncovered. In some areas traces of limewash are still extant.

Figure 50.2. Remains of the thin harl.

Figure 50.3. Detail of the harl with traces of limewash.

## 51. INCHRYE ABBEY HOME FARM, LINDORES, FIFE, EARLY 19TH CENTURY

Figure 51.1. General view of the exterior of the steading complex.

This site is an extensive steading complex of the early 19th century, built of whinstone with pale sandstone dressings.  Its construction is probably contemporary with the now demolished Inchrye House built in 1827. In spite of its current dilapidation there are areas of surviving harl. The harling consists of a coarse mix with a large angular aggregate that appears to be a lime-rich mix of quartz and whin. It was applied in a single layer, quite thick at 10mm (Figure 51.2). Despite the thickness of the harl it is still contained by the raised margins on the sandstone quoins and rybits (Figure 51.3). Its application appears to be a separate operation from the construction of the wall, but contemporary. It is now quite soft and friable and crumbles when rubbed. This might explain its almost complete loss. Historic images on Canmore from 1900 show a complete covering of harl to all surfaces.

Figure 51.2. The thick single coat harl.

Figure 51.3. Context view of a surviving area of harl showing its relationship to the raised margins of the dressings.

## 52. GARVIES INN, KINCARDINE-ON-FORTH, FIFE, EARLY 19TH CENTURY


Figure 52.1. Front elevation of the inn.

This early 19th century building appears to be of reasonable quality ashlar work on the front elevation. However, behind the rhone pipe on the right hand side there remains a vertical band of oil paint, which in turn covers limewash. A detailed look at the masonry also reveals traces of limewash in the broaching marks left on the stone.

Kincardine is remarkable for the range of materials used to make mortar. The survey identified three examples, within a fifty metre radius, of harl made with lime and brick dust and waste. The use of this combination of materials can be traced back to the Romans, but it occurs throughout history at regular intervals where a 'set' rather than carbonation of the mortar is required. It is sometimes referred to as *opus signinum.*

Figure 52.2. Traces of limewash on broaching marks and behind the rhone pipe.

## 53. TAIGH NA SQUARE, CASTLEBAY, ISLE OF BARRA, EARLY 19TH CENTURY

Figure 53.1. The front elevation of the shop

This three-story terrace dates from the early 19th century and has been a focal point of the town of Castlebay for many years. Originally a kelp store and later converted a mix of commercial and residential use, the building is constructed of a local whinstone bound with a lime mortar; the detailing is standard for the period with skew copes and chimney heads. At some stage the building has been harled with a hard cement layer on top of a previous softer lime based layer. This lime based layer is thin and appears to be of a marine aggregate (Figure 53.2).

It seems that the re-pointing often carried out prior to harling works was done with a cement based mortar, and the harl used a more traditional mix and thin application style. Photographic evidence indicates that the thick cement render which was applied over on top of this cannot predate the 1960s. This has largely come away from the front elevation and parts of the gables. Meanwhile, the lime base material below seems in reasonable condition and still adhering well to the stone and mortar base. Evidence for lime washing is less clear. There is plenty of an orange coloured pigment on the ingoes of the windows, and photographs indicate that this may have extended over the walls as well, in a band around the base of the building.

It seems likely it was power-washed off before the cement was applied. Despite the probability that the render work is early 20th century, it has retained the style and texture of earlier work, and is therefore of note. The durability of this harl must also be acknowledged, despite being later enclosed under a thick cement layer which suffered failure, while the lime based harl has not.

Figure 53.2. The thin traditional render still adhering well.

## 54. TORABHAIG FARM AND STEADING, ISLE OF SKYE, EARLY 19TH CENTURY

Figure 54.1. The steading prior to removal of the harl, with extensive areas of harl still visible.

This 19th century steading is built from lime mortar and basalt stone, a dense stone. The wall plane is flat, but dished in profile where accuracy in cutting or bedding the stone has been difficult to achieve. This has resulted in the formation of ledges and troughs where one level of stonework meets another. The original construction rectified this problem with harl. The harl was gritty, with an even distribution of rounded and angular grit, and some marine aggregate. The mortar was generally soft, but adhered well on most surfaces. Recent work as part of a conversion, however, has removed the harl and substituted recessed pointing. This has changed the wall's appearance and likely its performance.

Figure 54.2. The steading after removal of the harl.

## 55. CASTLE LACHLAN HOME FARM, LOCH FYNE, ARGYLL, EARLY 19TH CENTURY

Figure 55.1. General view of the farm steading.

This fine steading court of the beginning of the 19th century preserves many significant early features and is partly built of late medieval stonework recycled from nearby Old Castle Lachlan. There are extant remains of harl in many areas but these differ from Castle Lachlan in several ways. The application appears to be post-construction and the bedding mortar seems to be a mixture of lime and earth. In general, the harl is thinner in profile than at the old castle and this thickness is commensurate with the shallow raised margin, ensuring that the harl sits behind the margin and that shadow is cast by the margin on to the harl. With no sign of preparatory work it was concluded that the harl was thrown as a single coat of varying thicknesses, a practice that is generally unfavourable because of differential shrinkage problems. However the method does not seem detrimental to the general performance in this case. The application of a single coat has allowed the mason to thin the dash at the margins securing the shadow line. The sand appears to be pit sand rather than marine. There is no sign of a limewash surviving. Some post-application repairs were discernible and in some cases these were done with a cement based harl.

Figure 55.2. The single coat of lime harling, with the earth mortar showing through where the harl has detached.

Figure 55.3. The harl coat coming up against a window band.

## 56. ST PETER'S KIRKYARD, INVERKEITHING, FIFE, EARLY 19TH CENTURY

Figure 56.1. General view of the rear of the townhouse (the building with the crow-stepped gable) and adjacent dwellings, all of which display remains of historic exterior lime finishes.

The small burgh of Inverkeithing preserves a good stock of historic town buildings. The rear wall of the townhouse and adjacent buildings on Townhall Street back onto the kirkyard of St Peter's Church. Here, in an area set apart from the surrounding streets, there is extensive survival of historic lime finishes on structures dating from the 18th to later 19th centuries. This entry was included to show that the remains of historic lime finishes may actually be more abundant than it first appears.

A variety of lime applications are evident, of varying dates and detail. There are fine, thin harl applications and coarser mixes with larger aggregate, as well as a spectrum of lime mixes, from a pure creamy white to a medium brown. This variety reflects differing lime production methods and kiln fuels.

At window openings, formal details such as chamfers and raised margins were formed in lime mortar or pressed harl, upon angles made by course brickwork and rubble stone.

## 57. MACLEAN'S MANSION, TAIGH MÒR CHLANN MHIC EACHAINN, LOCHMADDY, NORTH UIST EARLY 19TH CENTURY

Figure 57.1. General view of McLeans Mansion from the north east.

This waterfront property is a well-proportioned merchant's house of a type common in the 19th century (Figure 57.1). It is understood to have been built for John Maclean of Boreray around 1800, and is thus known as McLean's Mansion, although it is also called Lee View. There is an indication from tusking on the east gable that a further range was planned (Figure 57.2). It has its own pier and a brick outbuilding. It has similarities with the former store at Castlebay (Entry 50) . It has had many uses, being a general store, a tenement and from 1950, the Masonic Lodge. The house has been roofless since 2008. While of a standard design, what makes it special is that it retains an almost complete covering of shell-rich, marine aggregate lime harl. Much of this work is likely to be part of the original covering while other areas date to alterations of c.1852. The earlier finish was integral to the build and well-adhered; the later work may have been applied either in relation to modification of the original building or in response to salt-related surface decay (Figure 57.3). Both harl applications are of a much finer mix than is generally recognised in other parts of the Uists, and this apparent refinement may reflect an aspirational aspect to achieve a smooth surface finish. Notwithstanding this, some of the early application is clumsy and thick which has led to possible areas of slumping and some shrinkage cracking though. However, this has not led to further decay. There is no sign of any limewash, although buildings of this period were generally finished in this way.

Figure 57.2. General view of the front and west elevation, showing the tusking for an unbuilt addition.

Figure 57.3. Detail of the original application with remains of overlying secondary applications.

## 58. COTTAGE AT GROSEBY, ISLE OF HARRIS, WESTERN ISLES, EARLY 19TH CENTURY

Figure 58.1. The west corner of the cottage at Groseby.

This traditional cottage is of standard build with well coursed rubble and extensive remains of a traditional harl. While the more exposed elevation is heavily weathered there are larger areas of harl on the more sheltered east side. The harl appears to have a significant marine aggregate component. As is often encountered, the adhesion to the hard granite substrate is very good.

Figure 58.2. Detail of the surviving harl on the more sheltered east elevation.

## 59. COTTAGE AT MANISH, ISLE OF HARRIS, EARLY 19TH CENTURY

Figure 59.1. The south west elevation of the cottage at Manish.

This building shows a good example of a well adhered harl in an exposed location on a dense hard substrate. On this cottage the harl seems to use a fine marine aggregate with shells clearly visible. Despite its durability, the harl is not surviving evenly, possibly due to the pattern of decay of the roof.

Figure 59.2. Detail of the harl on the south west elevation of the cottage, note the shell fragments.

## 60. COTTAGE AT PORT RAMSEY, LISMORE, ARGYLL, EARLY 19TH CENTURY

Figure 60.1. The West elevation of the cottage showing the nearly intact lime harl.

Derelict mid-terrace cottage at Port Ramsey, Lismore. This building has a well adhered harl nearly complete with traces of limewash. The building is believed to date from around 1810. The limewash has been covered with a modern masonry paint that is now flaking off.  The colour of the harl and traces of limewash match the colour of the burnt limestone produced close by during a recent lime burning trial (Figure 60.2).

Figure 60.2. Detail of the harl, showing the dark cream colour characteristic of the Lismore lime.

## 61. NEWHALL MAINS, BALBLAIR, HIGHLANDS, EARLY 19TH CENTURY

Figure 61.1. Front elevation of the steading.

Newhall Mains, dated 1830, is part of the Newhall Estate and associated with Newhall House, dated 1805. This courtyard steading has been much neglected over the years, but plans are in place to convert it into housing. As a first phase an associated coach house has recently been repaired and converted into a dwelling space. However, this conversion highlights the problem with not having a full building archaeological survey prior to consent; the coach house has been recessed pointed when there is ample evidence of a former full-flush harled finish.

The walls are generally built with local sand and field stone bedded in lime mortar, with extant remains of lime harl on the external surface of the walls.

Figure 61.2. Detail of remaining lime harl.

## 62. GORSTAN COTTAGE, NEAR TORE, HIGHLANDS, C. EARLY 19TH CENTURY

Figure 62.1. Front elevation of the cottage.

This empty building appears to date from the early 19th century. Its front elevation reveals harl with limewash, and limewash banding around the windows which mimics stone and could suggest an aspiration for a greater building with raised margins. As the harl has decayed, further coats of limewash have been applied, but these successive coats are thicker and less fine. This later application has cracked and not survived particularly well. Only the front elevation was regularly limewashed, the rear and gable ends have been allowed to grade away. What remains of the harl is not as lime-rich as many others surveyed. It is, however, made with good sharp sand and with large angular aggregate. Harl clings to many areas, but subsequent limewash has been applied to both stone and harl.

It was noticed throughout the survey that there was a 19th century trend towards harl and limewash being superseded by limewash alone, with limewash applied directly onto the stone and decaying harl. This trend demonstrates an interest in the tradition of the past and the benefits of a complete covering of stone walls. However, as the stone still reads through the limewash, it also shows an increasing desire for the construction to be visible.

Figure 62.2. Evidence of the different coats of limewash which have been applied to the building.

Figure 62.3. Area of remaining harl.

## 63. COTTAGE AT CULLICUDEN, THE BLACK ISLE, HIGHLANDS, MID 19TH CENTURY

Figure 63.1. General view of the collapsed structure.

This is a small mid 19th century agricultural bothy at Upper Ferryton on the Black Isle. While it is now in an advanced state of collapse, it reveals all aspects of its construction. This is a good example of a modest building where the construction demonstrates economy in the use of lime mortar.

The building is built of local field-stone, probably gathered as part of the agricultural process, bedded in local clay (outcrops are 500m away, to the north of the shore of the Cromarty Firth). Large stones have been used at the quoins and are simply squared. The masonry was flush-pointed in a coarse clay-lime mortar, and then flat-harled in lime in a simple fashion and limewashed. The limewash has filled some of the hollows and interstices, leaving a full, flush appearance. The later repairs are without limewash and simply spread onto the surface of the older harl.

Figure 63.2. Flushing-up over the clay-bonded wall core at the wall face with clay-lime mortar.

Figure 63.3. Clay-bonded wall construction.

Figure 63.4. Detail of remnants of lime harl finish.

## 64. POSTAL SORTING OFFICE, GARVE, ROSS-SHIRE, MID 19TH CENTURY

Figure 64.1. General view

This is a Victorian terraced row, and the end cottage has been converted into a Post Office sorting office at some point. The buildings of the row are detailed with raised and chamfered stone margins with deep rebate to contain the harl. The harl aggregate is fine (6mm and down) and is overlain by a remarkably well preserved gingery pink limewash on the principal frontage and sides; this has been extended to cover the stonework as well. Some patches of an earlier white lime-wash remain at the rear of the building. The whole building is lime harled but the condition varies and some areas are in need of repair, particularly at ground level within the zone of evaporation. The adjacent building is similar in detail but is now derelict. As with the cottage at Fortrose, this shows that when the detailing and protection is correct, lime finished elevations can remain in good condition for decades.

Figure 64.2. Limewashed harl on the principal elevation at the edge of the margin.

Figure 64.3. White limewashed harl to rear elevation.

## 65. TULLICH STEADING, MUNLOCHY, ROSS-SHIRE, MID 19TH CENTURY

Figure 65.1. General view of the farm offices at Tullich.

This small block (Figure 65.1) was probably built as a farm Stewards Offices and storage, and is constructed from local sandstone and field boulders, bedded and harled in a lime mortar. It probably dates from the early 19th century. They are sited on a high ridge. The building has extensive areas of a multi-layered limewash over harl surviving, representing 20 or more maintenance cycles. At least one phase of limewashing has been pigmented, a soft pink. The underlying finish is of an integrated coarse harl through to bedding mortar with large angular or sub angular grit of up to 18mm in diameter (Figure 65.2). At higher levels the harl has survived well; lower down capillary draw of water has resulted in progressive loss of harl. These buildings face east, which probably account for the survival of the lime-wash on the principal elevation (Figure 65.3). While close to the sea, this is not always significant in terms of exposure, as the prevailing winds are mainly from the south west. Limewashing of farm buildings was a common activity during quiet periods before labour costs increased in the early 20th century. Quicklime for the limewash would have been readily available as it was used extensively to lime the fields, and this is likely to account for the number of coats.

Figure 65.2. Detail of integrated harl finish.

Figure 65.3. Extensive build-up of limewash coats, some pigmented.

## 66. FALKLAND ESTATE COTTAGE, FALKLAND, FIFE, C. MID 19TH CENTURY

Figure 66.1. Front elevation of the cottage.

Mid-19th century cottage on the Falkland Estate which retains well-preserved areas of a neatly snecked lime finish. This was then ruled out to resemble regular squared rubble construction, and the joints picked out in black. There was no evidence that limewash had been employed.

Figure 66.2. Area of snecked lime finish.

Figure 66.2. Lime applied as a harl running up to a window surround whose raised margin is modelled in mortar.

Figure 66.3. Detail of soot-encrusted, limewashed harl running up to a raised margin formed in mortar.

Figure 66.4. A thin harl taken over the dressed stones.

## 67. MACKENZIE COTTAGE, FORTROSE, ROSS-SHIRE, MID 19TH CENTURY

Figure 67.1. General view of the cottage.

This cottage, is built from sandstone and rubble, dates from the mid-19th century (Figure 67.1). There is an almost complete covering of a traditional lime harl on the front elevation, in good condition (Figure 67.2) and to a lesser degree on the gable end. The harl is lime rich with a fine aggregate. From examination of cracked areas on the lower part of the gable, it is clear that the bedding mortar and the harl are the same and fully integrated (Figure 67.3). There does not appear to have been any limewash. The masonry is detailed in a standard way, with raised margins at the quoins and windows.  While the surface finish on the front elevation is in good condition, the harling on the gable is damaged at ground level due to the tarmac and road salts. The upper part of the gable is showing some damage from water run-off from the skew copes, showing clearly that when lime render is properly protected as it is on the front elevation it will last very well. Where it is under excessive water stress as on the top and base of the gable, this material will not last so well, although it will clearly show the source of the defects; a harder harl of more modern composition will simply hide the defects.

Figure 67.2. The complete lime harl in good condition on the front elevation.

Figure 67.3. Detail of integrated finish seen at a damaged area on the gable; note the bedding mortar and harl are the same mix.

## 68. WAREHOUSE, STORNOWAY, WESTERN ISLES, MID 19TH CENTURY

Figure 68.1. View of the warehouse from the main entrance.

A mid 19th century warehouse in the heart of Stornoway on the island of Lewis. It has a fine gritty lime harl, with no sign of limewash. This covering is surviving well, with occasional areas of decay on the margins.

Figure 68.2. Detail of the harl.

Figure 68.3. Area of harl decay.

## 69. SEAFORTH LODGE, LEWS CASTLE, ISLE OF LEWIS, WESTERN ISLES, MID 19TH CENTURY

Figure 69.1. Historic view of Seaforth Lodge from 1798.

The mid-19th century castellated mansion of Lews Castle, overlooking Stornoway harbour, incorporates the remains of a pre-existing lodge of the Earls of Seaforth that dates from the 18th century. The original appearance and harled exterior of the lodge is known from historic painted views, some of which clearly show it to have been painted or limewashed a yellow hue.

It was revealed during a major works programme to the castle that one of the former exterior wings retains well-preserved, long-protected areas of exterior harl. Examination of this external coating showed a single coat of a coarse application using a gravelly river sand aggregate. Extensive areas of pale yellow limewash were also revealed, supporting the historic documentary evidence.

Figure 69.2. View of the early lodge's exterior wall as revealed following removal of a later extension.

Figure 69.3. Area of remaining harl with traces of yellow limewash.

Figure 69.4. Detail of harl, showing a coarse application with traces of yellow limewash.

## 70. MANSE, URRAY, HIGHLANDS, 1814 WITH MID 19TH CENTURY ADDITIONS

Figure 70.1. General view of the manse, with extensive ivy coverage.

The former manse dates to c.1814 with mid-19th century additions. It is Category B listed. The harl has long been protected by a Virginia creeper but some limewash has etched away and the grit of the harl is ‘grinning’ through.

Figure 70.2. Detail of harl underneath the ivy.

## 71. COTTAGE AT SAILEAN, LISMORE, ARGYLE AND BUTE, LATE 19TH CENTURY

Figure 71.1. Limeburners Cottage, Sailean. A thin harl and limewash survives around much of the building.

This cottage is on the western side of Lismore and is believed to date from the late 19th century (Figure 71.1). It is said to have formed part of the limeburners accommodation at Sailean and is shown on the OS map of 1871. This is the last remaining roofed building at Sailean which was one of the centres of limeburning on Lismore. The cottage is of modest size and the walls are constructed of local limestone rubble, with some granite that must have been transported from further afield. Inspection of the pointing mortar shows that it has been flushed pointed and then finished with a lime based render with beach gravel and shell as aggregate (Figure 71.2). The masonry style is a rubble, flush pointed. The harl and limewash finish are fragile but still shows how the original presentation would have been, with a relatively flat surface of a bright off white hue (Figure 71.3). The window jambs have been rendered with a cement at a later date. The cottage is mentioned in a report for Historic Environment Scotland by on the lime kilns of Lismore by Colin and Paula Martin.

Figure 71.2. Close up of the flush pointing. The coursed rubble has been flushed before being harled and limewashed, here shells can easily be identified as part of the aggregate.

Figure 71.3. One of the few remnants of harl and limewash that survive together.

## 72. MARYBANK, STRATHCONAN, MID 19TH CENTURY

Figure 72.1. General view of the villa.

This late Victorian villa has a complete covering of traditional lime harl on the south and the east elevation. It is a lime rich harl with fine aggregate, taken neatly up to the margins of the jambs and quoins. There is no evidence of limewash. The has been some degradation of the covering at low level due to damp and frost damage, but overall this covering is in good, sound condition.

Figure 72.2. Detail of the lower part of the front elevation showing some spalling of the harl due to damp and frost.

Figure 72.3. Detail of the front elevation showing the neat junction with the window jams.

## 73. COTTAGE IN KINGUSSIE, GRAMPIAN, LATE 19TH CENTURY

Figure 73.1. General view of the exterior.

This unlisted cottage in Kingussie, probably late 19th, is an exceptional survival that preserves the exterior rendering of its street frontage and the same finish returns onto the gable wall (Figure 73.1). This example is of interest for the complete scheme of lining out of the render in imitation of regularly coursed ashlarwork. The fragility of this finish is illustrated by the adjacent cottage, where the render has been removed and rubble cement pointed to give what is presumed a 'more old look'. The underlying masonry had been flushed out with stone pinnings and lime mortar facilitating a single coat of external plaster to be applied approximately 15mm thick. The latter is flat-plastered and then pebble-dashed and ruled rather than simply harled and ruled. The ruling-out is made with a shaped tool some 15mm thick although the width of the depression varies with the amount of pressure applied and the variability in the thickness of the mortar. The relationship between the pebbles and the plaster suggests that the ruling-out was applied after the pebbles were thrown. The areas of damage are restricted to the zones of evaporation on the street side which is predictable given the winter gritting on the road and pavement.

Figure 73.2. Detail of a well preserved area of the ruled-out dashed plaster. Note the junction with the next door property where the render has been removed.

## 74. LINKSIDE HOUSE, NAIRN, HIGHLAND, EARLY 20TH CENTURY

Figure 74.1. Front elevation of the house.

Linkside House is a Category B Listed Arts and Crafts building in the Highlands. It was enlarged in 1905 to fulfil its present L-shaped plan with crow stepped gables and round turret. At that time it was also harled with lime mortar. The process of harling is selective; the harl is taken round the window arrases as is traditional practice, but the crow steps are offset. This affords the harl protection and keeps the crow steps crisp and clean. However, it means the crow steps present differently than is typical as they are usually flush with the plane of the wall.

The harl is a single coat, fine in texture, but gritty. There is no limewash and the harl has darkened with age. The original decision to harl may have influenced the later alterations; the ability to alter buildings is easier when the building is harled because the harl allows old work to be unified with new. In this case, the work was carried out towards the end of the regular use of lime, when labour was still relatively cheap.

Figure 74.2. Detail of the harl on the building's tower.

Figure 74.3. The harl offset on the crow steps.

## 75. VILLA AT FOUNTAIN ROAD, GOLSPIE, HIGHLANDS, EARLY 20TH CENTURY

Figure 75.1. Front elevation of the villa.

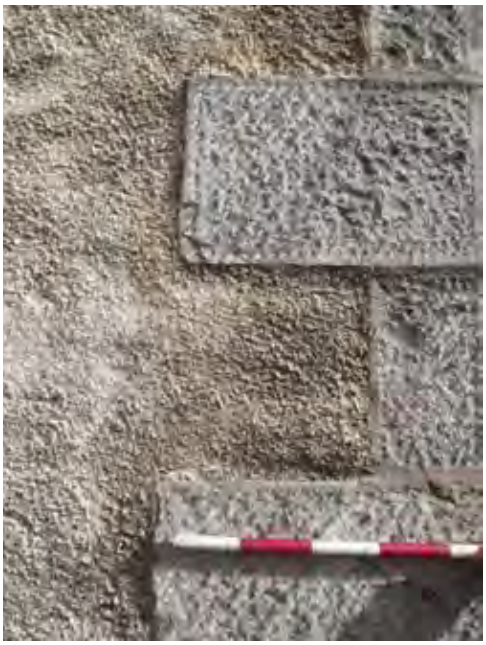

Figure 75.2. Detail of harl running up to the quoins.

A medium-sized suburban villa on Fountain Road dating from 1926. The harl is a good example of the continuing use of lime harl into the 20th century. The harl has an even, slightly undulating application with a medium-fine mix, unpainted. It has been neatly brought up to the regular quoining at the angles and to the arises of the windows.

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13. We are grateful to Andy Laing and his family, native Gaelic speakers who helped with these definitions and to all those who we sought advice on Gaelic building terms.

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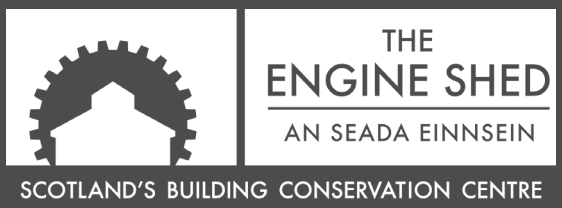


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