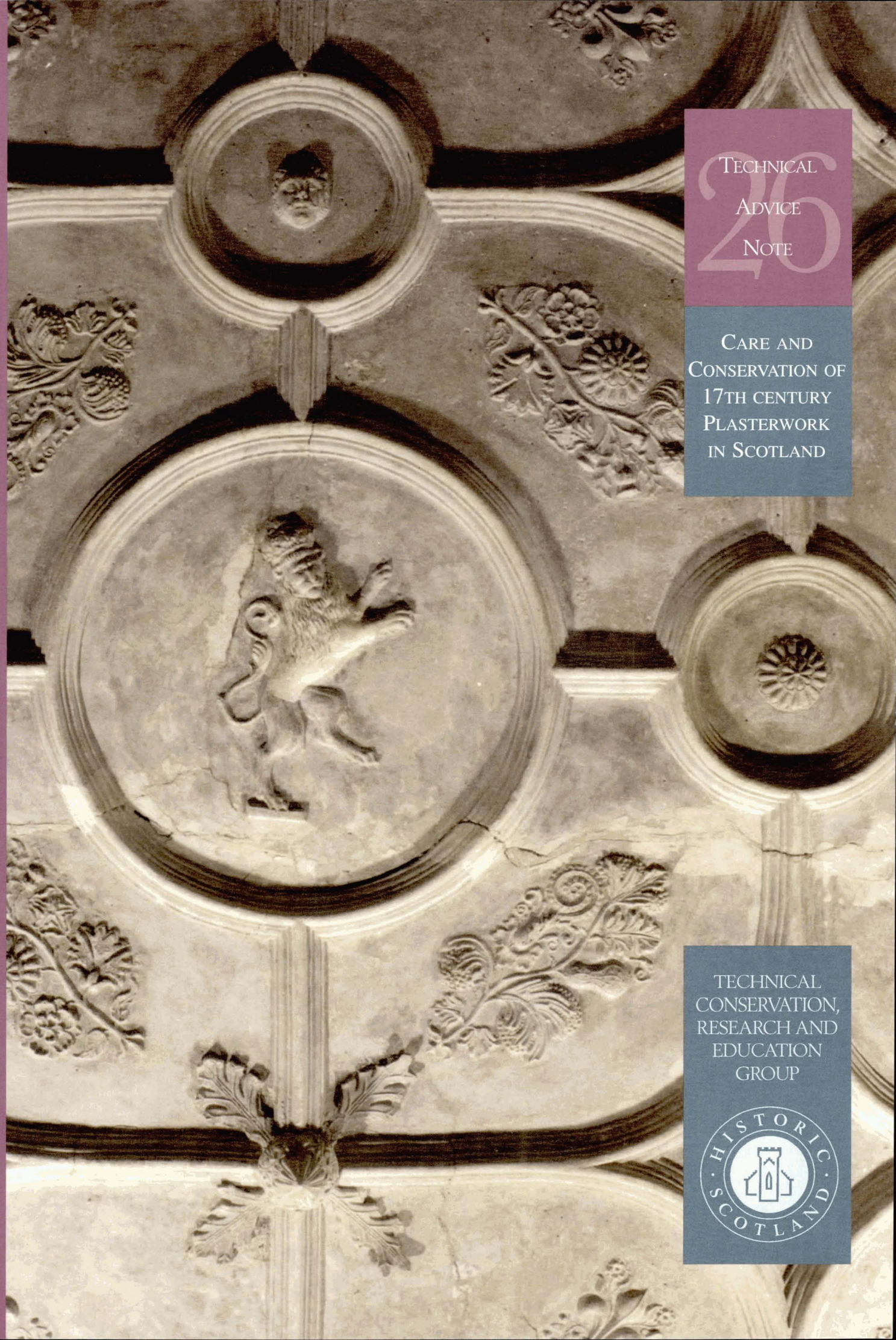

TECHNICAL ADVICE NOTE 26

CARE AND CONSERVATION OF 17TH CENTURY PLASTERWORK IN SCOTLAND

TECHNICAL CONSERVATION, RESEARCH AND EDUCATION GROUP

HISTORIC SCOTLAND

TAN 26 CARE AND CONSERVATION OF 17TH CENTURY PLASTERWORK IN SCOTLAND

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TECHNICAL

ADVICE

NOTE

CARE AND CONSERVATION OF 17TH CENTURY PLASTERWORK IN SCOTLAND

by
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Cover: Croft-an-Righ, Edinburgh; early C17 plaster ceiling.

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Illus 1. Balcarres House, Fife, first floor hall ceiling, c1630. © Crown copyright Historic Scotland

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Please note: examples showing later plasterwork have been used in a few cases to illustrate particular techniques. This is because repairs to 17th century ceilings are rare and appropriate photographs could not always be found.

Abbreviations used :- EAA for Edinburgh Architectural Association (*Details of Scottish Domestic Architecture*, 1922, reprinted by Heritage Press (Scotland); 1980), HS for Historic Scotland; LG&S for Leonard Grandison and Son, Plasterers; RCAHMS for the Royal Commission on the Ancient and Historical Monuments of Scotland; SLCT for Scottish Lime Centre Trust and SS for Scott Sutherland School of Architecture, Robert Gordon University, Aberdeen; CLPL for Country Life Picture Library; GM-C for the Hon. Gerald Maitland-Carew

FOREWORD

The repair and maintenance of historic plasterwork is as crucial to the conservation of the built heritage as the external fabric of a building or monument. Early examples of the craftsman's art are especially valuable as exemplars of changing style and fashion in the interior finishes and decoration of the grander buildings of Scotland. However, decorative historic plasterwork is particularly vulnerable to damage and deterioration, frequently through poor maintenance of the building fabric or by ill-conceived alterations or the insertion of later work. Therefore, although relatively few in number, the plaster ceilings of the 17th century in Scotland merit the greatest care and understanding when any repair or conservation work is planned. From this process, lessons can be learned that are equally applicable to traditionally-constructed ceilings of more recent date.

This Technical Advice Note addresses both principles and practice, and looks specifically at the care and repair of ceilings, overmantles and decorative elements. To set this guidance into its proper context it should be read in conjunction with TAN 2 *Conservation of Plasterwork*, issued as a revised edition in February 2002, which describes the basic materials and general methods of repair of traditional plasterwork.

This TAN develops that guidance into more specialised areas. The principal differences include the promotion of thorough historical research; the investigation, recording and assessment of what exists; and the application of appropriate craft skills and experience during the repair work. Central to this approach is the principle of minimal intervention lest the historical value and importance of 17th century ceilings becomes diminished in the process. The chapter on maintenance is especially important given the need to reduce the requirement for any subsequent repairs and conservation work in the future.

Ingval Maxwell OBE
Director TCRE Group
Historic Scotland
Edinburgh
March 2004

Illus 2. Early 17th century decorative plasterwork, detail

SUMMARY

This Technical Advice Note covers a range of issues in connection with the care and repair of decorative plasterwork dating from the first three quarters of the seventeenth century. The introduction includes some background information on this style of plasterwork and the aims and remit of this publication. Reference is made to Historic Scotland's TAN 2 *Conservation of Plasterwork (revised 2002)*, which provides all the information needed in general on lime plasterwork, and which should be used in conjunction with this publication when looking after 17th century plaster ceilings or overmantels. This document covers only supplementary specialist advice on this particular type of plasterwork.

The following sections make recommendations for an approach to the conservation and repair of the surviving plasterwork from this period, and look at the preliminary investigation, research and preparation needed before any repair work goes ahead. Information is given on original materials and techniques, and advice provided on the selection of appropriate matching or complementary materials and the specification of suitable working practices. There is coverage of the various aspects of repair, including advice on backgrounds and supports for particular features, on the principles of designs, running in-situ mouldings, taking squeezes and making moulds and casts, and hand-modelling.

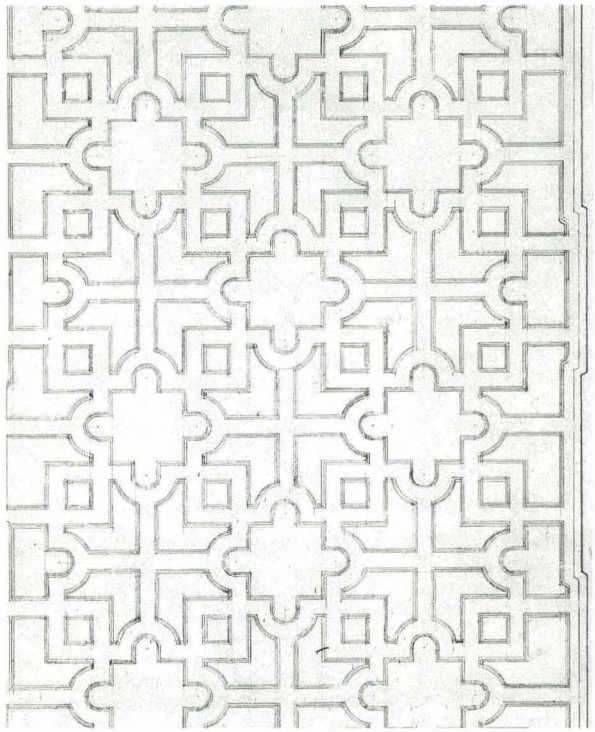
The final section comprises advice on routine maintenance, cleaning and redecoration, as well as advice on the introduction of services in the vicinity of historic plasterwork. It reviews how to plan for emergencies such as fire and flooding, how to avoid them and how to be prepared if they happen.

Appendices provide supporting information, including a glossary of the terms used, a bibliography of further reading, a short description of 17th century plasterwork style and development, and a gazetteer of Scottish examples known to survive, or recorded in photographic or drawn form.

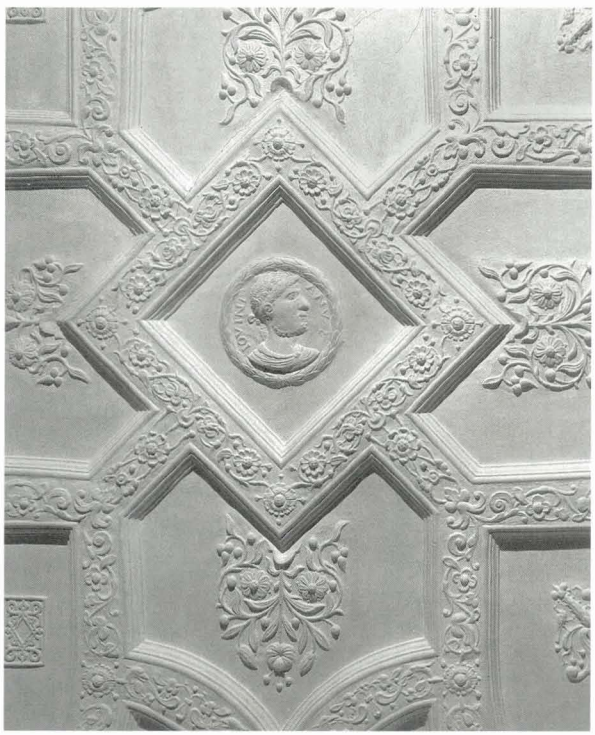
There are so few remaining decorative plaster ceilings dating from the seventeenth century that it is vital to conserve those that remain and to keep them in a good state of repair. Armed with this document and TAN 2, it is hoped that sufficient information and guidance will be available to support this aim.

Examples of plaster ceilings showing the range of patterns and forms

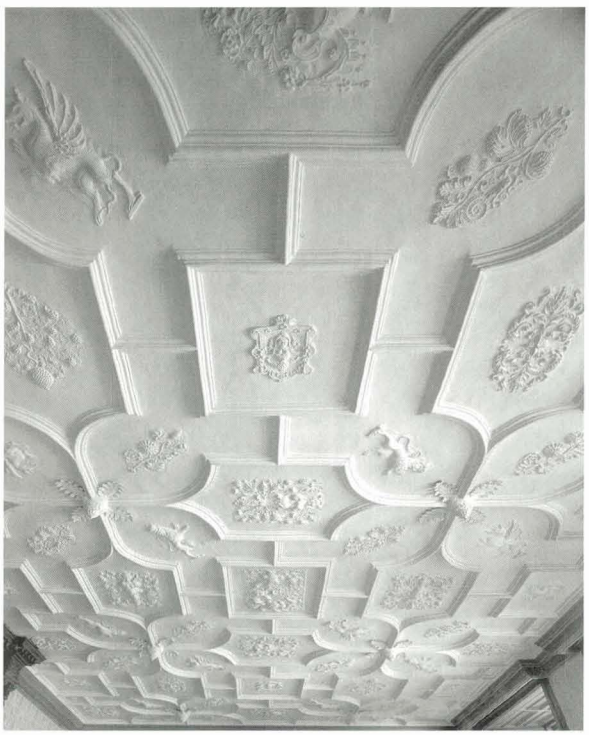
Illus 3. Pinkie House, East Lothian; possibly as early as 1613, the graceful design of this ceiling in the Green room is based on circles and curves, with delicate ribs entirely formed from cast floral enrichment without any underlying run mouldings. © Crown copyright Historic Scotland



Illus 4. Muchalls Castle, Aberdeenshire; by contrast with Pinkie, the ceiling plan in the Great Hall, dated 1624, is based on squares, overlapping and sub-divided, with indented semi-circles. © Crown copyright RCAHMS. Reproduced courtesy of the Scott Sutherland School of Architecture



Illus 5. Craigievar Castle, Aberdeenshire; the Blue room ceiling dated 1626 again employs squares, some set diagonally and some set inside quatrefoils, with linking semi-circles. © Crown copyright RCAHMS



Illus 6. Newbattle Abbey, Midlothian; the library ceiling, probably 1620s or 1630s, with a layout based on a different arrangement of squares and quatrefoils. The run mouldings forming the ribs are narrow and have no additional decoration. © Crown copyright RCAHMS

1 INTRODUCTION

1.1 Background to early decorative plaster in Scotland

During a relatively short period in the development of Scottish interiors - the first three quarters of the 17th century - a school of decorated, high-relief, lime plaster ceilings flourished. The designs were based on repetitive geometrical patterns, formed by a lattice of raised ribs (usually enriched with added decoration), framing panels within which other decorative devices could be displayed.

Although earlier forms of plasterwork were found in Scotland, before the 17th century plaster finishes appear to have been mainly restricted to plain wall surfacing, sometimes limewashed, painted with more elaborate designs or hung with tapestries. The ceilings of major apartments in houses of the 16th century (and into the 17th century) were often decorated by painting directly onto the underside of timber structural members and floor boarding.

The development of a distinctive style of plasterwork first in England and then in Scotland, at the end of the 16th and the beginning of the 17th centuries, was strongly influenced by Europe, particularly the Italian renaissance. In Scottish castles and mansions, the most concentrated period of activity was between 1617 and 1630, with the transfer of James VI and I's court to Edinburgh. But the style continued into the mid-17th century, with a slight resurgence in the 1660s after the end of the English civil war. A more detailed description of the style and its development and decline is included in Appendix A.

Mid-17th century ceilings often exhibited earlier forms and motifs, but fashions gradually changed, and by the last quarter of the 17th century a much more elaborate and highly decorated type of plasterwork had been introduced. The further development of new styles led to the early loss of many decorated plaster ceilings, as owners sought to keep up with European developments. Today only a few surviving examples remain. A list of known locations is given in Appendix D. These examples, and those which may yet remain undiscovered, form a unique and irreplaceable historic resource, each one demanding the highest possible degree of protection.

1.2 Limits of available knowledge and understanding

There is very little detailed knowledge to confirm our understanding of the way decorative plaster ceilings were created. Studies based on visual recording have demonstrated the degree to which patterns were repeated in a number of locations, and the use of motifs made from the same moulds can be traced in different combinations at many of the known examples. Information, either from written records or from transmitted plastering tradition, which confirms the technical development of the work, is scarce. The recreation of plaster ceilings at Edinburgh Castle in 1998, based on similar ceilings of the same date as the Edinburgh originals (1617), provided an opportunity, albeit limited, to explore the practical techniques originally used.

1.3 Craft skills and techniques

High quality plastering skills using traditional techniques are available in Scotland, but currently, levels of practical experience and specialist knowledge associated with the repair and restoration of early 17th century plasterwork in Scotland are limited. If guidance and training in the repair and restoration of this early plasterwork is provided, and adequate time is allowed for preparation, specialist plastering contractors should be capable of producing work of the necessary quality. However, situations requiring specialist conservation techniques should only be tackled by a suitably experienced conservator.

The unique qualities and conservation requirements of the decorative style developed during the short period under consideration have only recently been recognised. The next stage of the process should be further development of an adequate understanding of the materials and techniques involved and the skills required.

1.4 A brief explanation of recent work

In 1998 a replica of an early 17th century decorative plaster ceiling and frieze was installed in the royal apartments at Edinburgh Castle, recreating how the room is thought to have been decorated to celebrate the 'homecoming' of King James VI in 1617. It was based

on a fragment of the original plasterwork found in the Palace, as well as on other surviving examples in Scotland; themselves apparently copied from the original Edinburgh design. This was an extensive project which included research into many of the skills and techniques employed by craftsmen in the early 17th century. This project will be discussed in more detail in a future Historic Scotland publication.

Other recent work in Scotland to surviving 17th century plasterwork has been on a smaller scale, consisting of repair work carried out at Blair Castle and Thirlestane Castle; and replica ceilings have been created at Ballencrieff Castle.

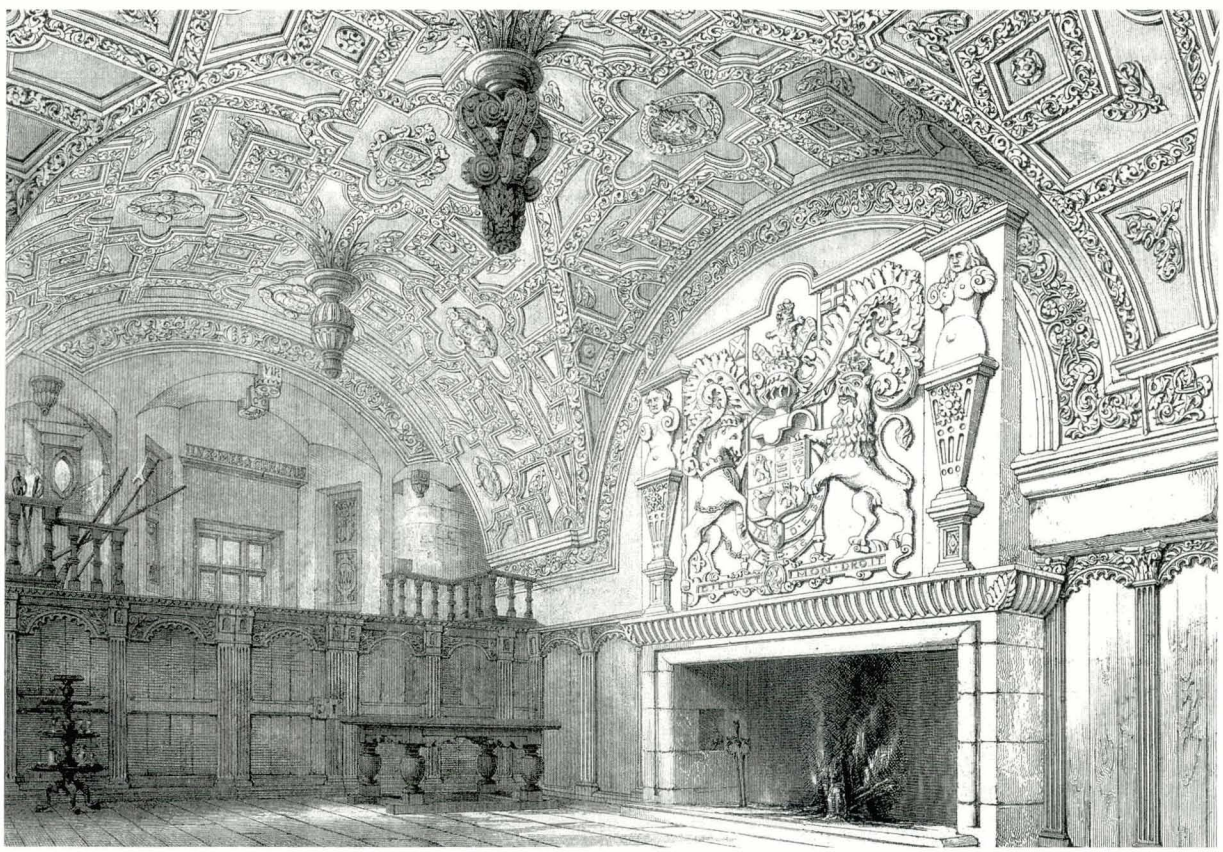
The current view on conservation stresses the need to retain all original plaster, and it is hoped that future work on early 17th century plaster will be only of a small scale, involving repair and maintenance, rather than large scale reinstatement of damaged or destroyed plasterwork. This policy places an emphasis on the need for careful monitoring of surviving plaster and its background, as well as the need to plan ahead to minimise the risk and impact of disasters (see Section 6).

This publication is essential reading for all those who will be concerned in the repair and maintenance of early 17th century plaster. For this work to be a success, the unique natures of the fabric and design have to be appreciated and the need for specialist skills acknowledged. Those programming, specifying and carrying out the work must be familiar with the nature of the materials and the length of time required for appropriate conservation.

A set of rules for the conservation of surviving early 17th century plasterwork would not be appropriate. Guidelines are provided here, but it is important that each case be considered on its own merits. The decisions taken about any necessary conservation work should include consideration of the scale of repair work needed, the condition of the surviving material and the context in which the work is located.

1.5 The purpose of this publication

This Technical Advice Note is designed as a guide to the conservation and maintenance of early 17th century decorative plasterwork, particularly ceilings, and offers advice on its special characteristics, and construction. It is aimed at property owners and managers, architects and craftsmen, and other conservation professionals.



Illus 7. Craigievar Castle, Aberdeenshire; the magnificent great hall, with an impressive overmantel and huge pendants, where a prosperous, self-made owner was seemingly intent on demonstrating and consolidating his new status. © Crown copyright RCAHMS

2 CONSERVATION & REPAIR OF EARLY 17th CENTURY PLASTERWORK

2.1 The finite number of examples remaining in Scotland

The number of examples of early 17th century plasterwork remaining in Scotland is finite and not extensive. Known examples number between 40 and 50. A list of surviving or recorded items, together with a summarised account of dating, condition and access availability, if known, can be found in Appendix D.

Further examples may be in existence but not yet identified. Fragments of plasterwork may lie concealed under later alterations or, indeed, entire decorative schemes may remain unrecognised. Those concerned with inspecting historic buildings should be constantly alert to the possibility of uncovering hidden or otherwise previously unknown early 17th century plasterwork.

Examples may be recognised by the presence, frequently on timber ceilings, but also applied to the underside of vaulted masonry, of elaborate raised ribs and a distinctive range of motifs, with decorative cornices and friezes. The ceiling motifs recorded to date all appear to derive from a limited number of unique moulds, which may have been utilised at each site by the same craftsmen.

If there is any doubt at all about the provenance of historic plasterwork, extreme care must be taken to avoid inappropriate decisions concerning alteration or repair. The rarity of this early plasterwork in Scotland gives every example unique value. Any proposed conservation work should be backed up by thorough research (see Chapter 3) and involve the least possible intervention.

Further advice on a general approach to conservation works can be found in the Historic Scotland *'Memorandum of Guidance'*.

2.2 A philosophy for conservation and repair

As noted above there is an over-riding requirement to protect, maintain and repair all surviving examples of early 17th century plasterwork.

The conservation approach requires every example to be assessed as an individual case. However, regardless of the aesthetic, historic or craft value of the fabric and its design, all surviving early 17th century work has enormous rarity value. This requires the fullest attention to the preservation of the original, authentic material. Conservation and, where appropriate, repair, therefore, are preferable to renewal or restoration of any part. This might mean leaving plasterwork unaltered when it is 'defective' in terms of visual appearance but is otherwise sound.

Only work that is judged necessary to prolong the life of the historic plasterwork should be undertaken, and it should be carried out with the minimum possible intervention to any historic fabric. Repairs should be carried out on a like-for-like basis, using appropriate materials compatible with the composition and strength of the original fabric.

Reference to Historic Scotland Technical Advice Note 2, *'Conservation of Plasterwork'* is recommended to anyone concerned with the conservation of early 17th century plasterwork. This publication contains a large amount of information about all types and ages of plasterwork, including the identification of defects and advice on general conservation approach, repair techniques and monitoring. This more general information continues to be relevant to work on early 17th century plasterwork.

2.3 Potential for harm to surviving examples

Loss of, or damage to, surviving examples of early 17th century plasterwork may occur inadvertently due to one-off catastrophic events, planned alterations or repairs, changes in local environmental conditions, or simply through neglect. Typical causes of damage might include an increase in visitor numbers - including visitor traffic on floors immediately above historic plaster ceilings; decay, including dry rot, in supporting timbers; damage from water, including burst pipes and penetrating rainwater; vandalism or accidental physical damage and inappropriate treatments, such as modern paint finishes. Changes in humidity, perhaps due to the introduction of higher levels of heating, can adversely affect supporting timbers and may give rise to cracking of the plaster. The introduction and maintenance of building services is also a potential source of damage.

With increased awareness of the nature and value of the plasterwork of this period, the occurrence of damage and neglect should be reduced. It should always be the responsibility of property owners, managers, inspectors, and all those involved in conservation work

to reduce the likelihood of the loss of any part of this important historical resource. Good building maintenance and management of building use are essential. Where possible, relocation of water-borne services away from the vicinity of the plasterwork is recommended, and the insertion of new services of any nature into buildings containing early plasterwork, as into any important historic interiors, requires very careful planning. Before redecorating, there should be a careful investigation by an experienced conservator to research appropriate materials and colour schemes. The application of anything other than a fully reversible coating, such as distemper, should be avoided. Alterations to the plasterwork should be avoided. All early plasterwork of this nature is likely to be protected by 'listing' and listed building consent will be required for any alterations. Repairs must be undertaken by suitably skilled craftsmen (see Section 3.5), using correctly specified materials (see Section 4), to ensure that no harm occurs.

Provision can be made for disaster planning in historic properties, where valuable fabric is at risk from fire and flood (see Section 6.7).

Illus 8. Sandgate, Ayr (later C17 or C18); damaged plaster, with cracks cleaned out ready for refilling. © William McVey

3 INVESTIGATION, RESEARCH & PRELIMINARY WORKS

3.1 Stating project aims

A clear statement of project aims at an early stage of any project involving the repair of 17th century plasterwork will be essential. It is important that this is preceded by an assessment of the cultural significance of the plasterwork and the building.

These statements would ideally form the basis of a conservation plan, which should be regarded as a useful and necessary management tool for any conservation project. Advice on formulating these documents is provided in *'Conservation Plans - A Guide to the Preparation of Conservation Plans'* available from Historic Scotland. A conservation plan should be treated as a 'living document', which allows flexibility for the development of project time scale, budgeting, specification and contractual arrangements for specific repair or conservation actions, within the context of an overall policy for the building as a whole.

The assessment of what is important and significant about the plasterwork and the building, and hence what is to be conserved, must be based on thorough research. This is discussed in the following section. Any proposal for work should include adequate time for this research, and for sourcing materials and skills, as well as preparing a realistic programme for carrying out the necessary trials prior to executing the work.

3.2 The need for proper historical research

Detailed historical research is essential if the materials and methods used in the conservation work, and the appearance of the finished work, are to have historical accuracy and authenticity. By its very nature, research is always incomplete and is generally limited by the resources available: time, money and skills of those organising and carrying out the research. Nevertheless, sufficient research to clarify materials, working practices and the overall finished design should be carried out before specifications are drawn up and contracts let.

Illus 9. Edinburgh Castle; fragment of a frieze, which was all that remained of the original 1617 plasterwork. It is identical to a frieze at Muchalls.

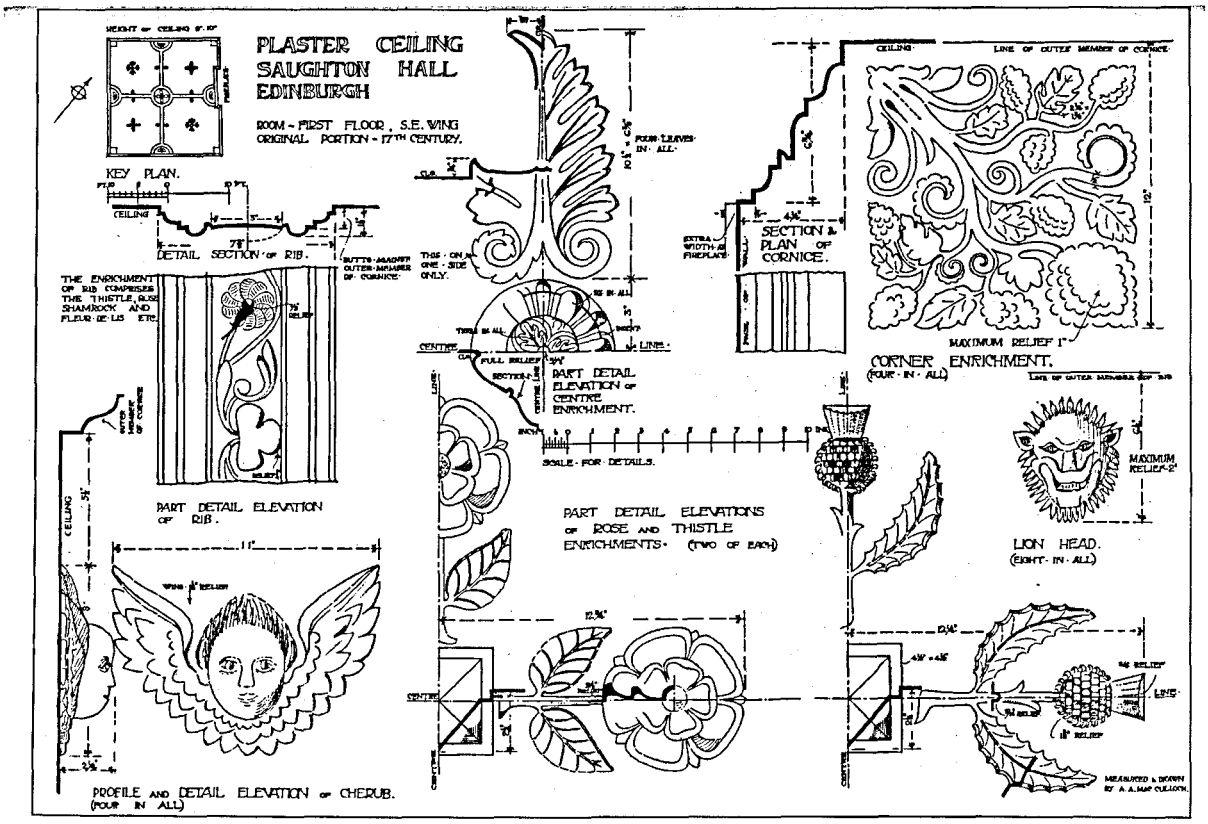
3.2.1 Literature research

For a number of the most important ceilings, documentary research has already been undertaken. If further investigation is required, primary sources, such as unpublished household accounts of the period and estate correspondence, can yield important information about the provenance and dating of surviving examples of decorative plasterwork. It is important that as full an understanding as possible of the historical background of surviving fabric is achieved prior to any conservation work. Some primary sources, including diaries and accounts of building works, have been edited and published in modern English and provide an easily accessible historical resource. Although requiring some interpretation and, perhaps, the services of a researcher accustomed to searching through historical manuscripts, documentary sources are invaluable. Details of technical facts and traditional skills, working conditions on the construction sites and the attitudes and social position of the craftsmen involved can all be gleaned, enabling a gradual understanding of the many factors which influenced the style of early 17th century plasterwork to be built up.

Secondary sources, the distillation of earlier research into book form, can provide references to historical plasterwork techniques and materials, the history of the development of styles and the underlying influences, and the location of relevant examples of existing plasterwork. It is important to bear in mind when using secondary sources that some of the information may be written to illustrate a particular point of view. Many recognised 'definitive texts' (such as some of those listed in Appendix C) draw heavily on previous publications or research and do not necessarily reflect current interpretations resulting from more recent research on the subject.

3.2.2 Site investigations

Investigation and examination of existing examples is essential in order to understand the methods and materials used to produce decorative plasterwork in the early 17th century. Studies made on site of surviving examples can provide information on the structure underlying the plasterwork and the materials and fixings used. An informed and observant study of the finished plasterwork - without any opening up - thus avoiding the risk of damage this can attract - will yield many clues about how the various elements of the plasterwork were created. This may enable identification of sections run in situ or those that were cast and applied, also those elements that were tweaked or adjusted by hand after casting, as well as the order in which the various processes were carried out.



Illus 10. Saughton Hall, Edinburgh; (from Details of Scottish Domestic Architecture, Edinburgh Architectural Association, 1922, reprinted by Heritage Press (Scotland) 1980) drawing of plaster ceiling, now demolished. Accurate historical records can sometimes be found even when the plasterwork itself, the primary source of information, has gone.

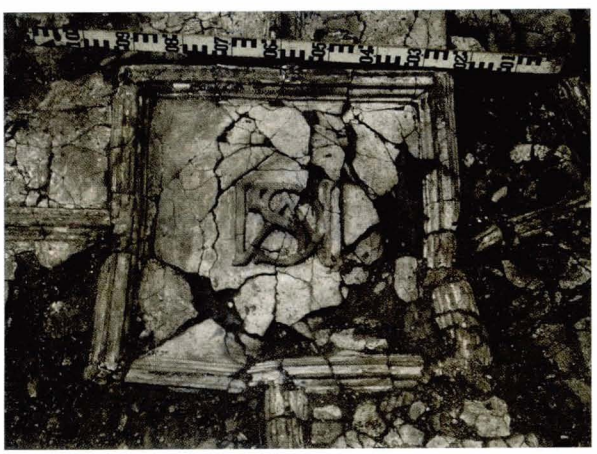
The design of the plasterwork as a whole and its relationship with other features in the room, such as a chimneypiece, can be considered. The study should observe the layout and style of ribs; the significance, if any, of the way the ornamentation has been used, both stylistically and in heraldic terms and the relationship of the ceiling or frieze to the existing wall surfaces.

Examination of the upper surface of a ceiling or behind an overmantel, if this is possible without risk to the historic fabric of the building, may yield further technical and dating information. The type of wood used for the laths, how they were produced (riven or sawn), how they are fixed, the depth of key of the plaster through the laths and how the cornices and pendants are supported, might all be deduced.

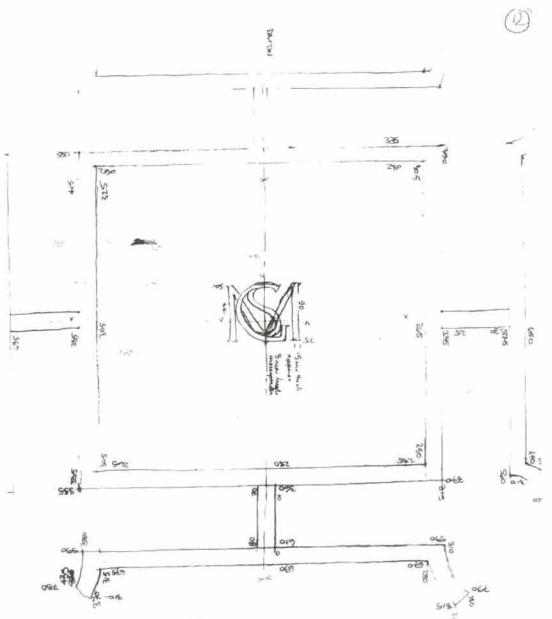
If access is not available a borescope investigation can sometimes provide useful information. Non-destructive analytical methods of investigation can indicate the presence and type of concealed fixings or supports in, for example, cornices, pendants or elements of sculptured overmantels. Further information on investigative techniques can be found in TAN 23 *'Non-destructive Investigation of Standing Structures'*, published in 2001.

Detailed photographic and sketched records are invaluable in building up an understanding of the design and construction of the plasterwork. A comprehensive set of photographs can be very useful.

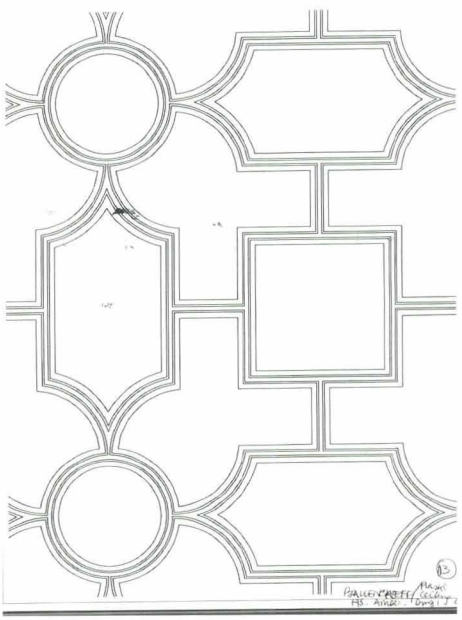
Illus 11. Sandgate, Ayr; there may be vital information hidden behind the plasterwork, as here, where there is an earlier (late C17 or early C18?) cornice behind the visible later one. © William McVey



Illus 12. Ballencrieff Castle, East Lothian; investigation and survey information. Archaeological excavation in the ruined Great Hall revealed part of the form of the ceiling which collapsed in the C19 when the roof fell in. © Crown copyright Historic Scotland



Illus 13. Ballencrieff Castle; survey drawing (by Historic Scotland Drawing Office) of archaeological remains. © Crown copyright Historic Scotland



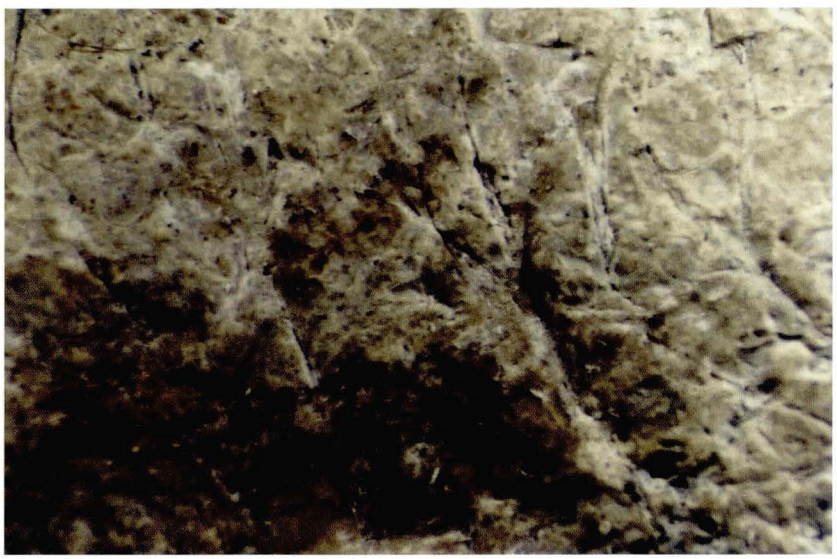
Illus 14. Ballencrieff Castle; reconstruction drawing (by Historic Scotland drawing office) for ceiling plan, based on archaeological evidence. © Crown copyright Historic Scotland

3.2.3 Plaster analysis

Any investigations of this nature must be carried out by a specialist laboratory with the necessary skills and experience of applying scientific techniques to historic materials. Furthermore, much of the information to be derived from laboratory investigation requires expert interpretation if the full value of the research is to be realised.

The availability of samples of historic plaster for analysis is limited but, where it is possible, detailed investigation and analysis of samples will provide invaluable information. Chemical analysis will give information about the ingredients of plaster mixes such as the ratio of lime to aggregate, the type of aggregate and range of particle sizes, any pozzolans used, and whether gypsum is present. It should be noted, however, that the scope of wet chemical analysis may be limited and may give misleading results unless the wider context is fully understood: for example, an apparent 1:1 ratio of lime to aggregate may well conceal a source of calcium carbonate, such as crushed limestone, within the aggregate. A totally reliable method of establishing whether organic additives such as urine or beer were used in early seventeenth century has yet to be devised.

The analysis of a section taken through a fragment of historic plaster using thin section petrography will show further important detail. This may include the make up of layers, the presence of un-slaked lime or other inclusions of carbonate material, the size and type of aggregate, the presence of pozzolans such as brick dust, the type of animal hair added to the mix, and the presence of paint or limewash. In some situations the use of electron microscopy will provide further information. The interpretation of the data from these investigations requires informed skills.



Illustrations 15 and 16. Edinburgh Castle; analysis of a plaster sample from the fragment of original frieze.

Illus 15. Macrophotograph at 40x magnification. No evidence of a surface coating can be seen, but the surface is covered by a thick, uneven layer of sooty dirt and white (lime?) consolidant. The plaster is a warm pink colour and fine gold hairs can be seen embedded in the surface.

Illus 16. Cross-section at 100x magnification. Part of the area appears to have been saturated by an oily or waxy substance. The plaster is deeper and darker; it is likely to have been accidentally contaminated during the making of the frieze. The cross-section confirms that discolouration continues below the surface.

3.3 Assessing the condition of existing plasterwork

In establishing the condition of existing plasterwork, and identifying defects, their extent and probable cause, a visual inspection should supply most of the relevant information. Symptoms of cracking, crazing, bulging, sagging, collapse, crumbling, staining, efflorescence and surface fungal growth can all be easily identified; the likely cause, whether a defect in the background or in the plaster itself, can be deduced and, if necessary, further investigated. Historic Scotland Technical Advice Note 2 *'Conservation of Plasterwork'*, provides a list of common symptoms in plasterwork and the defects that may cause them.

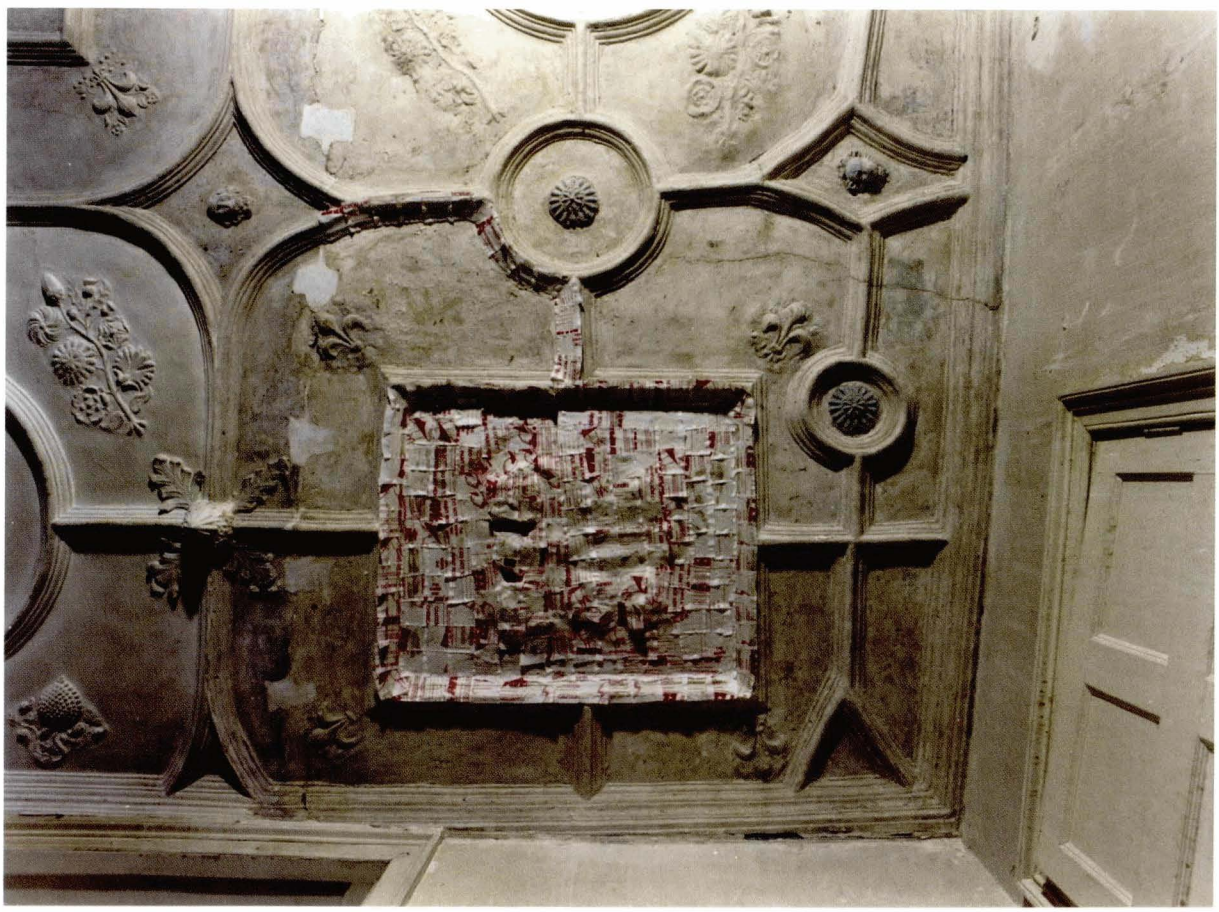
Other simple methods of inspecting plasterwork include touching to detect areas of springiness, damp or loose ornamentation; a little more pressure can indicate areas which have become detached from the lath (a hollow sound produced by gentle knocking suggests detached or boss plaster). It must be remembered that some distortion of the plasterwork can be attributable to settlement or adjustment of the building over the centuries, and does not necessarily indicate weakness or poor condition.

Any opening up in order to access the inside of a wall or the upper part of a ceiling must be done with extreme care and kept to a minimum, avoiding damage to historic material (see Section 3.2.2).

3.4 Technical preparation and trials

In developing the programme for conservation or repair works, it is essential to allow enough time in the programme, and resources in the budget, to carry out preparatory tests and trial samples. These might include: -

- where there is uncertainty as to the make up of the original materials, more extensive testing of potential mixes to establish a compatible mix.
- providing exemplars where there is any replacement work to be carried out, to confirm mixes and techniques of application of plaster, running of mouldings, and casting and applying ornamentation.
- making up initial samples of potential mixes to evaluate their workability and setting characteristics. Minor modifications might be necessary, based on the plasterer's experience of the materials in particular environments.



Illus 17. Croft-an-Righ, Edinburgh; damaged plasterwork temporarily supported by water-based adhesive paper.

3.5 Obtaining the appropriate craft skills

Any contractor chosen to undertake work on historic plasterwork should have either an in-house team of skilled plasterers, or have access to skilled sub-contractors with experience of ceilings of this age, whose work is known and respected. The repair and conservation of this important and finite resource of early plasterwork is not an appropriate way for plasterers to learn new skills. Plasterers skilled in fibrous plasterwork, or even those currently working with run and cast work utilising gypsum gauged lime plasters, will not necessarily have the skills for creating decorative lime plaster but, for relatively simple jobs, if experienced and skilled craftsmen are not available, tradesmen skilled in general plasterwork might be given the opportunity for specialised training before undertaking the work. If the size and scope of the project allows, the inclusion of apprentices on the team could assist in developing the necessary skills for the future.

The plasterwork contractor should be able to call upon plasterers who are not only skilled and experienced in creating decorative lime plasterwork but who are also sympathetic towards, and show enthusiasm for, historical accuracy. The size of a project team will depend on the nature of the project and the organisation of the programme. On all but the smallest jobs both site and workshop based staff may be required and it is essential that everyone involved in the work demonstrates a commitment to good conservation principles.

Several contractors skilled in the application of lime plasterwork are presently operating in Scotland, but generally speaking their current experience and working practices are based on the use of gypsum (or gypsum-gauged) materials for casting and for finishing coats on run mouldings. If such contractors are to be considered for work to early 17th century decorative ceilings, where the work involved will normally utilise well matured and beaten lime materials without a gypsum gauging, as was common in early 17th century Scottish plaster, it is likely that a period of skills development will be required. Techniques of run mouldings, casting or modelling in plain un-gauged lime plaster may have to be developed and confirmed. The advantages of employing local contractors should be considered, with the aim of cutting certain costs and encouraging local skills and enterprise. A 'conservation database' listing contractors and craftsmen experienced in the conservation and repair of historic buildings is available, and this lists a number of plasterers with some lime plastering skills. (Contact the Scottish Conservation Bureau at Historic Scotland for further details.)

Illustration 18. The craftsman at work, the plasterer in his workshop. © L. Grandison and Son

4 MATERIALS

There is to date only limited knowledge of the exact specifications used in the creation of early 17th century plasterwork. Care will be required to ensure replacement materials match the original as closely as possible in all respects, to avoid any further loss of surviving work.

Original work will generally be found to be supported on timber laths (on ceilings and to a lesser extent, on wall surfaces where strapping and lath was often used as a base for plaster). Plaster may also be found applied directly to the internal faces of external walls or on other solid (usually masonry) backgrounds. Investigations of original materials and decisions on repair/replacement materials should include both the background materials and the plasterwork itself.

4.1 Investigation of original materials

Investigation of backgrounds, plain plasterwork, moulded work and surface finishes, as described in Section 3.2.3, will provide information on the materials used in the original work, on methods of application, and the number and make up of the plaster coats and applied finishes.

Early 17th century plasterwork will probably be found to be based on non-hydraulic or slightly hydraulic limes, often locally produced, although it is also possible that other materials, valued for specific working properties or appearance, may have been transported some distance for more prestigious projects. Scottish plasterwork of this period does not appear to utilise gypsum but, bearing in mind the contemporary use of gypsum in England, this possibility should always be considered. The sand content of plasters will, in all probability, be found to be from a local source.

Investigation of the backgrounds is also important; these will include both timber lath and solid walls, as well as specially formed armatures for relief work. A variety of types of lath and supporting structures have been found, and it should not be assumed that all examples will follow the more or less established tradition of later lath and plaster work. See Section 4.2.2 for further details.

Any unusual or unexpected findings from investigations should, if possible, be notified to Historic Scotland, to increase the knowledge base of 17th century plasters. (For example the extent, if any, to which gypsum and other additives were used is at present unknown.)

4.2 Backgrounds

4.2.1 Masonry or other solid backgrounds

Where lime plaster was applied direct to masonry backgrounds it appears that the surface of the masonry was dubbed out or roughly levelled up first, often using a coarse lime mortar. If repairs are required to plaster on masonry, the background should be prepared in the original way before reapplication of the plaster.

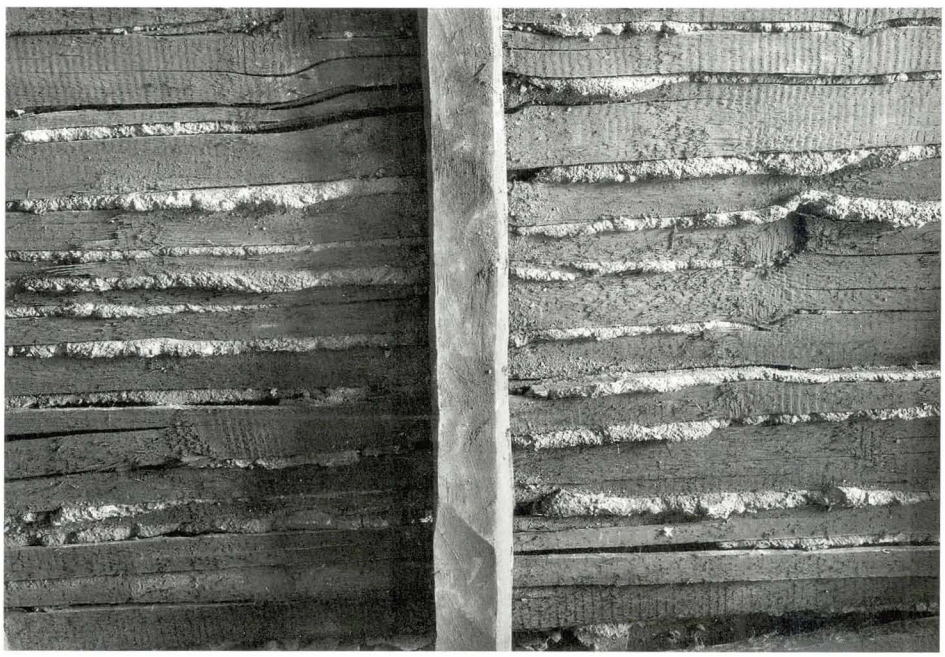
Illus 19. Dubbing out on a rubble stone background to provide a base for application of plaster. © Scottish Lime Centre

Illus 20. The base coat of coarse plaster or mortar (scratch coat) is 'scratched' to provide a key for the next coat. © Scottish Lime Centre

4.2.2 Lath backgrounds and timber supports

The introduction into Scotland of timber lath as a background material at the end of the sixteenth century enabled the new plasterwork to be applied to both walls and ceilings. Early 'laths' included split boards and other materials. As plastering techniques developed laths were produced from straight-grained timber, riven or split into narrow strips - generally about 9mm thick and 25 to 38mm wide, but they could be as wide as 100mm in early work. Laths were generally spaced at least 8 to 10mm apart. Early laths were produced from oak or, sometimes, beech and also, quite commonly, from native Scots Pine; later red Baltic fir was used. Plasterers carried out the lath splitting and fixing; lengths of lath were fixed with staggered joints to avoid creating a break line, and were held by wrought iron nails about 18mm long. Often the head of the nail was turned over after it was driven to improve the plaster key.

Mouldings, including those run along wall surfaces for the build up of decorative friezes, were either run in solid plaster or might be supported on timber framing or armatures. Sometimes iron nails were driven into the timber work to provide support for the plaster. More substantial, specially shaped, timber supports or armatures were used for the more elaborate, heavier decorative work (see Section 5.6 and 5.7).



Illus 21. Neidpath Castle, Scottish Borders; plastered partition seen from behind, showing softwood boards split to form 'laths' and cut nails used for lath fixings.
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Illus 22. Timber lath background for plaster, with framing built up as the support for a cornice.
© Crown copyright Historic Scotland

4.3 Types of plasterwork

4.3.1 Plain lime plasterwork on masonry

Decorative plasterwork is applied to, or built up from, a base of plain lime plaster. The earliest lime plaster was applied 'on the hard', normally directly to a masonry background of stone and lime mortar, to walls and vaulted soffits. The overall thickness of the plaster varied according to the number of coats applied, which was usually three (although single-coat work for plain lime-plastered walls was common in and before the early 17th century). In general, the first and second coats - in this context known as the 'first' and 'straightening' coats - were often each no greater than 9mm thick. Sometimes the first coat appears to be combined with the dubbing out resulting in quite thick applications of mortar. The lime mortar used for the first and, sometimes, the straightening, coat can often be seen to be the same mix as the construction mortar, containing lime (probably from a local source) and coarse sand and other materials, producing a complex mix. The first coat provided the 'key', and the straightening coat (or coats) provided a true plane.

For finishing coats, the lime was often slaked to a putty and matured for up to three months or longer, before being well beaten, to improve workability and ensure that slaking was complete. This process would produce the most plastic, workable materials, especially for modelling work, and it is possible that, where resources allowed, the finest free-slaking non-hydraulic limes were obtained, even if this meant bringing them from some distance. The 'finishing coat' was smoother and thinner, usually 2 - 4mm, and usually comprised well beaten lime putty with a small proportion of fine sand.

It would seem that until about 1600 lime plasters in Scotland may have contained no hair, but that thereafter (as in England from the late 16th century) animal hair was commonly used as a reinforcement for background coats. Plaster containing hair had better tensile strength, was more flexible and consequently less inclined to crack than a straightforward mix of lime putty and aggregate.

4.3.2 Plasterwork on lath

The materials used for plastering on lath were much the same as for plastering on the hard. The use of slow setting (e.g. non-hydraulic or feebly hydraulic lime) materials for the undercoats was particularly important on a timber lath background, as these materials were more able to accommodate the movement of the laths as they dried out.

Plaster was normally applied to lathing in three coats. The first coat of coarse plaster was known as the 'scratch' coat. Usually two more coats of plaster, the 'straightening' and 'finishing' coats, were applied using the same material and technique as for plastering on the hard. As in plastering on the hard, hair was commonly added to the scratch and straightening coats to improve the tensile properties of the plaster, which effectively had to be self supporting between the laths.

4.3.3 Plaster mixes for moulding and casting

Lime putty, presumably well matured, and well beaten together with a filler such as sand, was the basis for plaster mixes used to build up the run mouldings, castings and modelled work. Again the material might be a local feebly hydraulic or non-hydraulic lime. A small degree of setting would assist in handling the materials for casting and running, and this might have been provided by the use of a naturally feebly hydraulic lime or by the addition of brick dust or lime-ash (kiln waste), forge waste, air slaked (and, therefore, partially carbonated) lime, or even recycled lime plaster. Some of these materials have been identified in samples of early 17th century plasterwork. Small quantities of gypsum might also be present in samples of plaster, although there is some doubt as to whether gypsum was used in Scotland before the middle of the seventeenth century. Crushed limestone or marble aggregates would have increased the setting effect and may have been used, although no direct evidence for the technique has yet been identified. Tradition and documentary evidence suggest that other materials, such as beer, urine, etc, were also used in plasterwork to improve workability and reduce shrinkage, but again there is currently no firm evidence available from analysis for their use.

Finishing coats for run mouldings, and mixes for fine casting, were generally based on well matured non-hydraulic lime putty, with a small proportion of filler such as fine sharp sand or limestone sand and, possibly, a setting additive. It is possible that, although the roughing out and core work of the run mouldings was done in a local material, the fine finishing stuff and plaster for casting the best quality decorative work was produced by, or specifically for, the master plasterers, who might have supplied their own material. Although it does not occur naturally in Scotland, there is a possibility that powdered chalk could have been used as a filler for fine finishing coats, and it is known from documentary sources that gypsum was added to the finishing coats of the plain plaster in the interior of Stirling Castle great hall.

4.4 Selection of matching or equivalent materials

The starting point for selection of materials for repair of historic plasterwork will always be an understanding of the surviving original materials. At present (2004) there is no commercial production of lime in Scotland.

The basic lime for repair mixes will therefore normally be selected from one of the English non-hydraulic limes on the market, or might, if expertise and resources are available, be specially burned from a local Scottish source. The aim will be to match characteristics, such as permeability and density, to the original work, whilst using a mix with appropriate working properties to allow the repairs to be completed effectively and with no damage to the historic plaster. For these reasons an *absolutely* exact match may not necessarily be the most appropriate specification for repair.

Selection of a local, coarse sand will generally be appropriate for the plaster undercoats and roughing out of run mouldings. For the fine finishing and casting mixes, selection of suitable fine, sharp sand will be important. Other ingredients, where required, such as brick dust, limestone sand, hair, gypsum, etc, are all readily available from specialist suppliers.

Traditional timber laths are also available from specialist suppliers. Quality of modern split lath can vary and samples should be checked to ensure suitability. Nails or screws for fixing timber laths should be of non-ferrous material to avoid rust staining from the wet plaster. Where possible replacement laths should be screw fixed to avoid impact or vibration damage to surviving plaster. Where nails are used they should be cut nails or split blued tacks to avoid splitting the laths.

Some modern timber preservatives are known to adversely affect the curing and performance of lime plaster and it is recommended that preservative treatments should not be used. If, exceptionally, it is decided to use a preservative, a water-borne system is likely to be less damaging than one employing solvent-based agents. Any preservative treatment must be fully dried before plaster is applied to the timbers.

Illust 23. Materials ready for plaster consolidation by Historic Scotland specialists. © Crown copyright Historic Scotland

Illus 24.Coarse stuff; lime plaster mix with animal hair ready to be mixed in. © William McVey

Illust 25. Mixing lime plaster for application. © Crown copyright Historic Scotland

5 PRINCIPLES OF CONSERVATION AND REPAIR

The need to protect all remaining examples of early 17th century plasterwork is described in Section 2.2 above. Repair is preferable to renewal of any part and accurate assessment of the condition of the surviving plasterwork will be essential before any decisions are taken on the scope and methods of repair. Repairs should generally employ techniques that ensure the new work does not cause damage to surviving plasterwork, either during execution or in co-existing with it. Whilst it might be desirable for other reasons to blend new work into existing, where there is a risk of damage, cosmetic repairs should be minimised.

In other situations, the replacement of missing or defective parts of a decorative panel may be acknowledged as an essential part of the repair process if this enables the meaning of the panel to be read.

The use of modern materials and techniques will almost never be acceptable as a repair for early 17th century plasterwork. The use of materials such as plasterboard as a replacement for lath and plaster, or of cast gypsum or fibrous plaster sections for repairs to run, cast or modelled work originally executed in lime plaster is not acceptable, both because these materials and methods cannot reproduce the subtlety of original work and because the materials themselves can react differently to changes in environmental conditions and thus put the surviving original work at risk. Similarly the technique of taking a mould from a surviving section of ceiling in order to reproduce damaged or missing elements in cast gypsum plaster is not acceptable for work of this age and importance, although replacement of lime plaster cast elements using matching compatible materials is clearly acceptable where appropriate.

Where previous poor quality or otherwise technically inappropriate repairs are found it will be necessary to assess whether this work is causing actual harm to the surviving original work and whether, in its removal, further damage might occur, before any decision is taken to replace it with a new repair.

For any works to decorative plaster ceilings (or other elements) special provision will be required for good access to the work, and control of the working environment, including enclosing the work areas to provide an appropriate environment. Good levels of lighting for close work are particularly important.

Illus 26. Thirlestane Castle, Scottish Borders; restoration of missing and damaged surface decoration (run mouldings and cast/ modelled applied decorations). The finished ceiling is seen after the repair. © L. Grandison and Son

5.1 Repair of common defects

Decisions on the need for, and methods of repair of, common minor defects will depend on the location of the work, the background material and the precise problems. Defects can include varying degrees of surface cracking, and localised damage arising from physical contact or abrasion. Care will be required to ensure that future damage to existing plaster is minimised during the course of repairs.

For filling cracks and small patches, the edges of sound surviving work should be carefully cleaned to remove any friable material, then limewater or a weak 1:10 PVA solution, can be applied to the edges to stabilise them and to reduce suction between new wet plaster and the old material. The principles of achieving the

correct lime mortar mix to be used in such situations are the same as those for larger and more fundamental repair work. The degree to which cracks have to be raked out prior to filling should also be carefully considered. Thin hairline cracks are probably best left untreated or, where appropriate, they could be flooded by applications of limewash. (See also TAN 2, Section 3.13.)

Illus 27. Supporting ceiling from below while repairs take place. © William McVey

5.2 Repairing timber supports and backgrounds

If it is found, on detailed investigation, that there is a defective substrate supporting otherwise sound plasterwork, then methods of repair will be required which protect the valuable finishes while allowing the substrate to be made good. In extreme cases this may require large intact sections of plaster, together with any sound existing lath backing, to be carefully detached from the wall or ceiling whilst repairs to underlying timber framing, ceiling joists or masonry are carried out. Such work should only be undertaken by experienced conservators.

Methods of providing temporary support to detached but in situ sections of plaster are described in detail in TAN 2.

5.3 Repair of lathing

Defects which may be found in lath include timber decay resulting from damp environmental conditions, or insect infestation, as well as physical impact damage. If impact damage has occurred, then it is likely that the plaster finish will also have suffered damage, and will be in need of repair.

Methods of repair, including screw fixing to secure loose lath, and adding mesh to reinforce weak panels are described in TAN 2, Section 3.13. Nailing should be avoided, to minimise any vibration that might cause further loss of security. The selected method should be designed to minimise damage to surviving original material and be appropriate to the original construction. It is important that any patching in of replacement lath is of the same type as the original, to ensure uniform moisture content and response to varying environmental conditions.

Illus 27 and 28. Crawfurdland Castle, East Ayrshire; repairs by William McVey.

Illus 28. Backjacketing ceiling from above. © William McVey

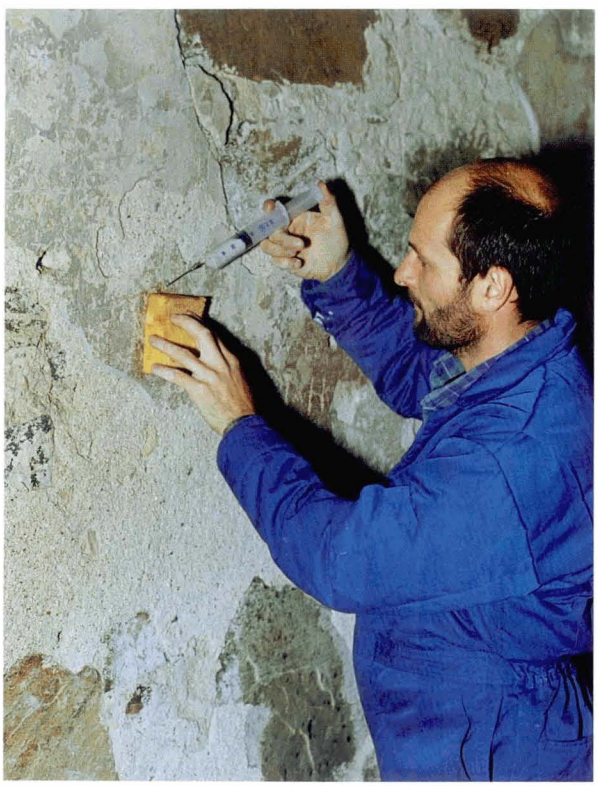
A typical repair specification might call for the following: -

Coat	Thickness	Composition	Hair (if appropriate)
First coat.	8 - 10mm	2.5 parts sand, 0.5 part chalk,* 1 part lime putty. (1:2.5) mix gauged on site with 10% hydraulic lime.	Varies according to type of hair used, about 2 kg/m³ for goat hair. When examining blobs pulled out from the mix on the tip of a trowel for regular and even distribution of hair, about 1mm apart is a good rule of thumb.
Straightening coat and roughing out for ribs.	8 - 10mm	As above	Less than first or scratch coat.
Running and finishing coats.	3mm	1 part fine sharp sand, 1 part lime putty. (1:1 mix)	None

* In this situation the lime content of the mortar comprises a mix of putty and chalk, bringing the physical characteristics closer to those of an historic mortar, where the lime content would be less highly processed than modern lime.

5.4 Conservation of lime plaster

Because of the special value attached to the few known remaining examples of early 17th century plaster of any kind, greater efforts should be made to ensure their survival than might be the case with later work. Even where an area of plain plaster has become damaged or detached from its background of lath or masonry, techniques of grouting, or re-fixing by other means, should be considered before any decision is taken to remove and replace it. Specialist advice should be sought on the techniques listed in Section 5.9, which are also described in outline in TAN 2, section 3.15.



Illus 29. Historic Scotland conservator grouting loose plaster to give a better bond to its backing. © Crown copyright Historic Scotland

5.5 Renewal of lime plaster

The principles of repairing or restoring early 17th century plasterwork are essentially the same as those described in TAN 2. The mixes will, however, be carefully selected to ensure they are compatible with any surviving original material.

Unless there is other evidence to suggest otherwise, the plaster should normally be applied in a minimum of three coats. Each situation will be different and the design of the exact mixes and build up of coats should be based on detailed investigation of surviving material wherever possible.

5.5.1 Renewal of plain lime plaster on masonry

The background should be prepared by clearing away old loose material from the face of the masonry, and raking out the joints only if necessary to provide sufficient key where suction may not be adequate, and by thoroughly wetting up to reduce the suction on absorbent masonry. This is to ensure that water is not drawn out of the wet plaster into the dry masonry too rapidly. If the background is very uneven or in poor condition, the joints may need to be dubbed out or brought forward in stages by filling with coarse stuff and pushing and hammering in small snecks and pinnings. When the wall is ready for plastering, it should be a more or less straight plane, with the larger stones and only some of the snecks and pinnings still exposed.

Large areas of mortar should be scratched, and larger smooth stones might need to be stugged, to provide an effective key. The whole wall is then wetted again before applying the first or scratch coat with a steel trowel. When firm but not set, the surface should be lightly scratched, without cutting through, with a lath scratcher or similar wood-toothed instrument to provide an undercut key for the next coat. Where additional thickness is required, further coats must be applied, each not more than 10mm thick and each

thoroughly wetted and keyed as described. After sweeping off any dust, and further wetting, the straightening coat should then be applied and, when it has set sufficiently, the wall should be wetted again and vigorously 'scoured' or compacted with a wood float. This may be necessary at least twice and sometimes as much as four or five times, not just to level the work but to consolidate it as it shrinks on drying. This process is essential if cracking and crazing in the finished work are to be avoided. Providing the sand used is really coarse and sharp, the final scouring will leave a good open-grained finish which is itself sufficient key for the finishing coat; alternatively delicate keying with a fine nail float may be necessary.

Each coat of lime plaster must be allowed to dry before the next coat is applied in order to provide sufficient suction and to ensure that shrinkage is complete. The interval between coats is normally between one and three weeks, but this will vary according to temperature and humidity. If sufficient time is not allowed for plaster to dry and harden between coats the cumulative shrinkage may result in significant cracking and crazing, and delamination of coats may also occur.

After further wetting, the finishing coat should be applied in a single operation, sometimes requiring two or three applications to obtain a high quality flat, and polished, finish. The finishing coat should also be scoured, taking care not to overwork any particular area. At this stage any minor imperfections can be patched by scouring small quantities of fairly dry finishing stuff into the surface.

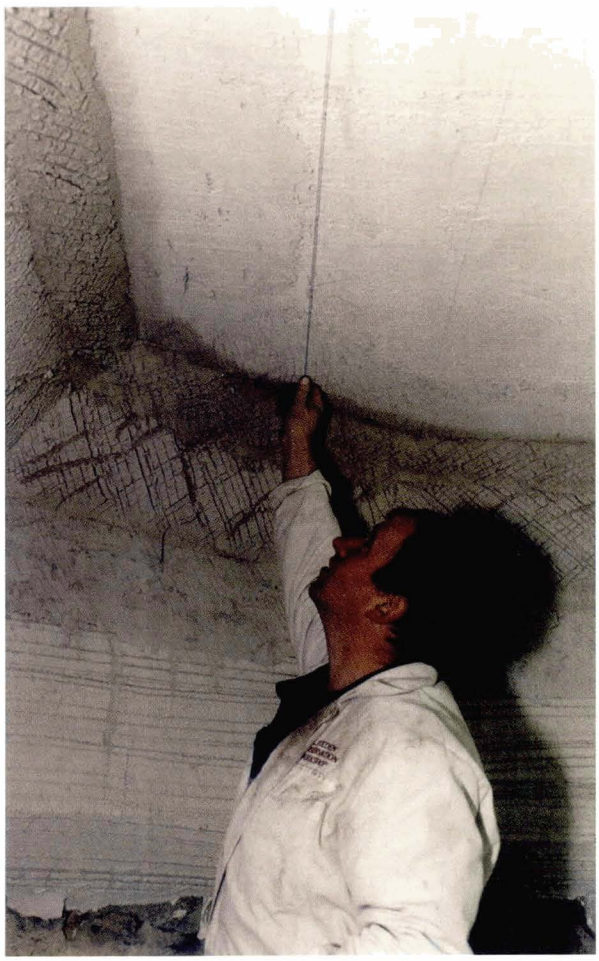
From the limited information available, and experience of the recent work at Edinburgh Castle, it appears that the cast panel decoration of a decorative plaster ceiling should be applied prior to applying the finishing coat.

5.5.2 Renewal of plain lime plaster on lath

The procedure for plastering onto timber lath is identical to that described for masonry with the exception of the application of the scratch coat. The lath background should be wetted up to prevent excessive suction of moisture from the wet plaster and the plaster applied across the laths using sufficient pressure diagonally and in one stroke to force it through the gaps in between to form a mechanical key. Because there is less suction from the laths than from masonry, the scratch coat might require to be left longer before keying for the next coat.

New plaster may successfully be applied to old lath, providing the lath is in good condition, is securely fixed, and has been thoroughly cleaned of all old plaster, dirt and debris, and well wetted beforehand.

As noted above, the use of plasterboard as a replacement for damaged sections is not appropriate.



Illus 30. First coat of plaster for walls, ceiling and cornice. The plasterer is measuring and marking on positions for the ceiling pattern. © Crown copyright Historic Scotland

5.6 In situ run mouldings

Usually the cores of run mouldings for cornices and plain ribs were built up in situ in coarse plaster on lath and, in some situations on timber bracketing. The final profile was run in fine plaster by means of a metal or wooden template mounted on a 'horse' and moved along a guiding timber rail. To apply the base coats the template was 'muffled' with felt or other suitable material to allow for later application of the finishing coat to the correct profile. Repair or replacement work should follow the same procedures. As noted above modern techniques utilising cast gypsum or fibrous plaster are not appropriate.

Substantial run mouldings, such as ceiling ribs, were often run over a background of iron nails (sometimes bound with twine) which were spiked through the background plaster along the intended line of the moulding. Smaller profiles were built up directly over the straightening coat after scratching to form a key.

Illus 31. Taking a profile from the original cornice in order to renew part of it (in this example the plasterwork is much later). © William McVey

5.6.1 Repairing run mouldings

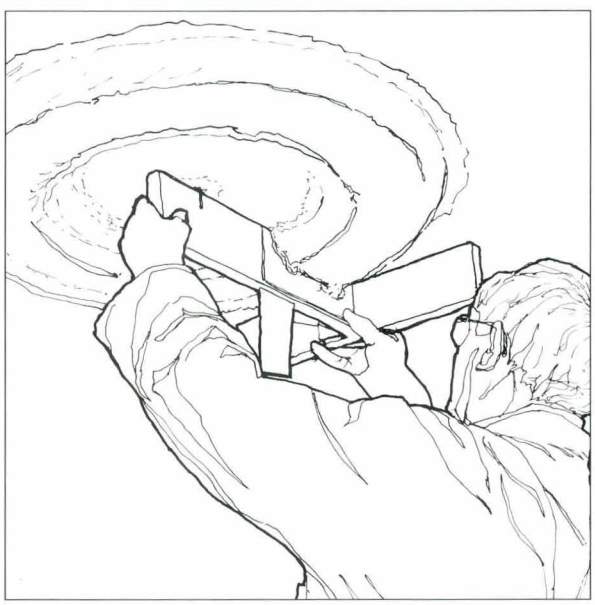
Once a metal or wooden template has been made to exactly match the existing moulding profile, the repair of small areas of localised damage can be carried out by repeating the technique described in section 5.6 above.

5.6.2 Renewal of run profiles

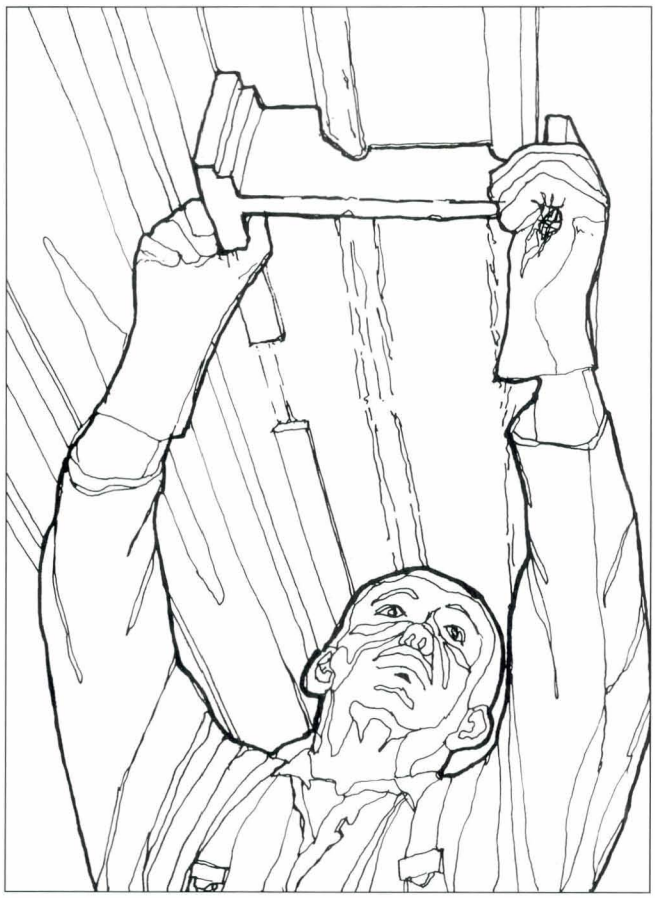
Base coats of coarse lime plaster, normally no greater than 10mm thick, should be run using a 'muffle', formed by padding out the template to the extent required to accommodate the thickness of the finishing coat. Each coat should be well keyed and cured before the next is applied. For small profiles, the work can be built up direct on the plain scratch coat. For larger girths it should be applied to laths on bracketing. Nails or spikes should not be used to form an armature or key in repair work since driving these will cause significant impact and vibration, and is likely to destroy the integrity of surviving plasterwork. The basic technique can be replicated using carefully inserted screws.

The finishing coat on run profiles is generally no more than 3mm thick. If enrichment is to be fixed to the run moulding, the finishing coat should be scored before setting to ensure a good key.

Illus 32. Building up coarse plaster as a base for a circular rib moulding run in-situ; note the central nail acting as a guide. © Crown copyright Historic Scotland/EA Whitfeld



Illus 33. Running first coat of a circular rib moulding with muffled template mounted on a horse, using central nail as guide. © Crown copyright Historic Scotland/EA Whitfeld

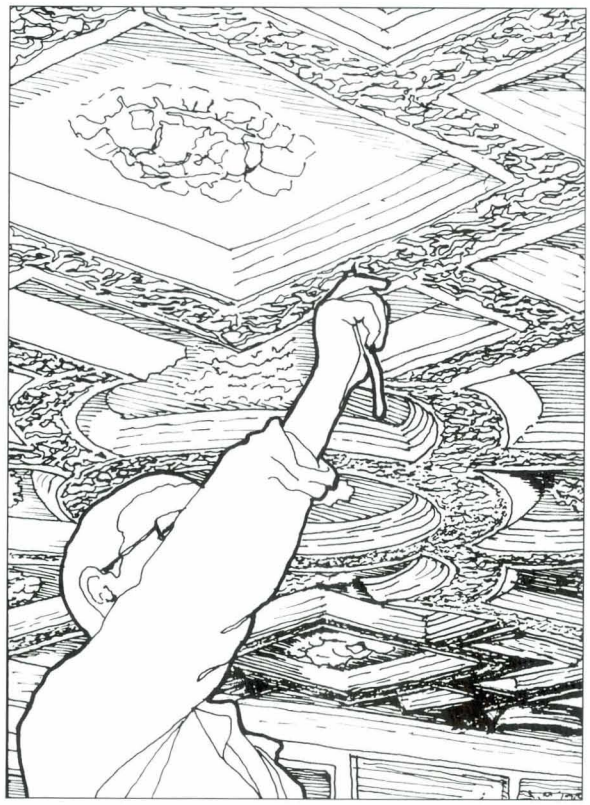


Illus 34. Running base coat for straight in-situ rib with muffled template mounted on a horse, using battens as edge guides. © Crown copyright Historic Scotland/EA Whitfeld

Illus 35. The finishing coat has been added and run in-situ to semi-circular mouldings. Nails and string at centre points provide guidance. © Crown copyright Historic Scotland

Illus 36. Pre-cast sections of rib have been inserted to link in-situ run ribs. The junctions will be finished by hand.
© Crown copyright Historic Scotland

Illus 37. Cast rib enrichment positioned on soffit of in-situ run ribs, using fresh plaster as the adhesive.
© Crown copyright Historic Scotland



Illus 38. The plasterer fills between cast enrichment (and cast rib sections) and the run mouldings. © Crown copyright Historic Scotland/EA Whitfeld

5.7 Casting work

Techniques of casting used in the 17th century are not fully understood at present. The experience of the casting work carried out at projects such as the Laich Hall at Edinburgh Castle suggests that 17th century plaster casts may have been reproduced from a single positive wooden pattern of each design, carried from job to job by the craftsmen. From each of these patterns a greater number of negative moulds would be made that allowed sufficient numbers of repetitive castings to be produced in a relatively short time.

Although some elaborate work would have been modelled by hand, most ornament, such as medallions, pendants, animals, flowers and figures, was formed on the plasterer's bench by beating stiff lime plaster into moulds. This beaten lime plaster stiffens relatively quickly and the casts could be de-moulded whilst still green and left to finish curing before being fixed in place. The cast ornament was fixed in position using a thin layer of fresh plaster against the keyed plain background and supported until secure.

There does not appear to be any firm evidence, in examples studied so far, of the use of dies being used to press motifs directly into wet plaster applied to the surface of the wall or ceiling.

Illus 39. Casting table with casts, rubber gloves, saw and bowls for plaster. © Crown copyright Historic Scotland

Illus 40. Negative mould and cast. This is a modern flexible mould. Originally wooden moulds would have been used.
© Crown copyright Historic Scotland

Illus 41. Cast rib enrichments ready for application to the soffit of ribs. © Crown copyright Historic Scotland

Illus 42. A decorative cast moulding being put into position (from scaffolding) on an overmantel. © Crown copyright Historic Scotland/EA Whitfeld

5.7.1 Repair of cast plaster enrichment

The principles of repair and renewal are basically the same. Provided sufficient evidence exists that will allow an impression to be taken from a surviving example, whether on the same site or from a known identical design found at one of those properties listed in Appendix D, then a replacement casting can probably be made, using the traditional techniques (see 5.7.2 below). Cast gypsum replicas should not be used for the replacement of missing lime castings since they will produce a much more mechanical appearance, lacking the subtlety of the lime castings which were handled and, in some situations, slightly adjusted, or 'tweaked', before fixing, and will also react differently to varying environmental conditions.

Where localised damage to an existing casting has occurred, then it is recommended that a superficial patch repair should not be attempted.

5.7.2 Renewal of cast plaster enrichment

If existing decoration is to be matched, a 'squeeze' may be taken in situ, from which a gypsum replica of the original is formed, from which in turn a reverse mould may be produced (the mould cannot be cast directly from the original without causing damage).

This method is useful if most of the original remains intact, or if work in a comparable building is to be used as a source for missing design. Alternatively it may be done on the bench, a much more convenient method if complete sections of broken ornament survive, or if, for other reasons, sections have had to be removed.

Small squeezes are quite simple to take; larger ones are possible, but they can be awkward and may require elaborate support until set. Most cast decorative panels in early 17th century plasterwork are based on relatively small repeated motifs and, if possible, new casts should be based on this module.

It is essential to clean the surface of the original ornament back to the bare plaster finish to obtain an accurate impression. The squeeze is formed by painting a number of coats of latex or similar material reinforced with muslin scrim onto the required area, and allowing each coat to dry until a smooth surface has formed. An outer case is then built up over the squeeze in scrim and plaster of Paris. When the case has set and has been removed, the latex is peeled off and placed in the case, ensuring that it holds its shape.

Into this squeeze, the 'preliminary' or replica may be cast. The replica should be removed when firm but not set, and adjusted as necessary by hand to produce an exact match of the original. For making moulded lime plaster casts, a reverse mould should then be cast from the replica in a rigid material, such as glass-reinforced plastic.

The final lime plaster casts are made by placing well beaten and plastic lime plaster into the rigid reverse moulds. The lime mix for casting should be mature, well beaten and stiff, with minimal water content. Depending on the analysis of existing material, fillers may be added. After chopping and beating thoroughly the lime mix should be pounded well into the mould, building up the mass but avoiding any layering or core/surface separation which will lead to weakness. When fully pounded, and after perhaps 15 to 20 minutes, the plaster mix will start to stiffen up. When sufficiently stiff the work should be turned out and left on the bench to set.

It is possible that some degree of undercutting will be found in existing castings. Whilst this can cause additional complications, it will normally be possible to remove an undercut casting from its mould while it is still 'green'. The final shape can be achieved by careful hand work on the bench with the plaster still in a soft state. For complex three dimensional shapes a two part mould is required.

Where large enrichments are to be applied on top of plain plaster or run profiles, the finishing coat should be omitted locally, to allow the castings or mouldings to be set in place with a thin adhesive coat of wet plaster. The back of the enrichment may need to be

scratched in the mould, and for heavier elements, mechanical fixing may be necessary in addition to the adhesive layer.

Heavy enrichment, including pendants, will almost always require positive fixings. Where repair or conservation work is being undertaken the opportunity might be taken to check and, if necessary, introduce discreet additional fixings. This can be done by careful drilling through an inconspicuous location to allow screw or wire fixing to the background timber structure. A mesh washer will normally be required, countersunk into the depth of the plaster and filled with matching plaster.

5.8 Repairing hand-modelled work

As an alternative to bench casting, heavy enrichments such as pendants may have been built up in situ over a lath structure. Smaller enrichments might be built up over nails with twine or wire strung between.

The most difficult elements to repair are undoubtedly parts of the more elaborate freehand modelled work. If parts are robust and have become detached, or can readily be detached from the background plaster whilst retaining their integrity, they can be re-fixed to a sound background by mechanical means after conservation. An additional adhesive layer can also be applied. This occupies the thickness of the setting coat, which would need to be cut away to accommodate it. It is important in such cases to ensure that the flow of the design is not disrupted, leading to disjointed, shaky curves.

Small missing sections might be replaced by a suitably skilled plasterer. Mixes for this work will generally be in the order of 1:1 mature, well beaten lime putty to fine aggregate, possibly with a gauging of powdered chalk. The setting coat may be prepared to receive the freehand enrichment by scratch keying. Heavier elements of the modelled decoration should be formed around screws driven into the background plaster, generally at an angle to the horizontal. Larger work requires a more substantial armature such as mesh (which is flexible and readily modelled) on screws.

5.8.1 Renewing hand-modelled work.

If lost original modelled work is to be replaced, it will usually be necessary to commission a new piece to be made. Ordinary plasterers, however skilled, cannot normally be expected to reproduce what are effectively works of art and, if the decision is taken to reproduce a missing piece, an artist should be commissioned to model and create it. The techniques involved should exactly follow those used in the 17th century. The finished work will never be an exact replica piece, and there will always be scope for some degree of individual interpretation by the artist.

5.9 Specialist Conservation

In addition to the methods of repair outlined above, various more complex techniques of consolidation and repair are available. These include biocide treatment to remove fungal or surface algal growths, limewater treatment to stabilise loose or flaking plaster surfaces, edge filleting to secure surviving parts against further loss, filling small holes, and grouting to secure areas of plaster that may have become detached from the background. Only specialists who have suitable experience should undertake this work.

Illus 43. Croft-an-Righ, Edinburgh, moulded plaster ceiling at first floor with reliefs of animals, figures, fruit and flowers.

6 MAINTENANCE

6.1 The need for maintenance procedures

While it is likely that surviving early 17th century plasterwork will have undergone at least minimal maintenance during its life, as and when defects became visible, it can not be assumed that all is well. Any number of undetected defects may exist, each of which have the potential to cause damage, ranging from minor or superficial deterioration to significant loss of original fabric. It is therefore essential that a system of regular inspections is instigated, coupled with an overall maintenance regime that seeks to remove all possible threats to survival of the plasterwork.

Owners and others responsible for maintenance of properties containing 17th century plasterwork should, in addition to any existing system of building inspection, carry out a specific check, on at least an annual basis, of each item or room. A written record should be made of any missing detail, cracks, bulges or other visible damage. This could be aided by a sketch plan and photographs, and should be retained in a building register for reference at the next inspection.

6.2 Housekeeping procedures

6.2.1 Routine care of early decorative plasterwork

The few remaining examples of early 17th century plasterwork surviving in Scotland deserve a level of care and attention that might not be accorded to other plaster ceilings. In addition to the regular monitoring and inspections discussed below, efforts should be made to ensure that the plaster is not affected by significant changes in humidity and temperature. The use of apartments should be carefully considered including, where appropriate, visitor numbers.

Activities which generate a smoky or dusty atmosphere should be avoided, as should activities which generate excessive vibration or loading over ceilings. Where there is a build up of dust, etc, intermittent careful use of, for example, a feather duster to remove dust from surfaces may be appropriate and a regular visual check should be made for any changes in the condition of the plaster. Maintaining environmental conditions appropriate to the survival of support structures and the materials of the plaster finishes is critical. Therefore any proposals to alter a structure or surface, or to alter the use and facilities within the room concerned, and in immediately adjacent rooms, must be considered in the light of the potential effect on the environment for the surviving plasterwork.

When redecoration is required, the nature of existing paint coatings should be determined, and consideration given to the need or feasibility of removing any existing inappropriate coatings.

6.2.2 Ventilation

Original construction usually provided a degree of natural ventilation, through the voids behind the lathing of external walls and into floor voids, which assisted in keeping these areas dry. Such provision should be maintained, and any work that is likely to disrupt an existing arrangement needs to be fully considered before being implemented. Even where walls are plastered directly onto the masonry, there may be other sources of air movement, perhaps through butt-jointed boarding, or at perimeter skirtings. Similarly the provision of room ventilation through windows or fixed or adjustable vents should not be altered without specialist advice.

6.2.3 Heating

Where installing a new heating system, it is necessary to consider the likely effect on plaster finishes. Fluctuations or changes in ambient temperature may affect adjacent timbers, leading to shrinkage. Some heating devices can also cause staining of adjacent surfaces by creating localised conditions liable to attract dust or dirt (pattern staining). In high-ceilinged rooms a significant temperature increase may be experienced at ceiling level when comfortable temperatures are established at lower levels. This can cause distress to plaster ceilings through shrinkage of supporting timbers and laths.

6.2.4 Moisture control

The siting of appliances such as heaters, or those where moisture is employed or generated (e.g. sinks and associated plumbing, and electrical fittings such as humidity controllers, refrigeration equipment, etc) requires special consideration. Wooden support laths and structural timbers tend to alter their dimensions in the presence of moisture, and could cause failure in the adherence between plaster and its supports. Lime plaster will also absorb moisture from its environment,

and whilst this in itself is unlikely to affect its stability, it too may convey moisture to adjacent timbers. Gypsum plaster, which may be present in the form of a localised repair, can fail if water is introduced in sufficient quantities.

Water tanks, wc's, showers, etc should never be located above important plaster ceilings and, if possible, any such existing fittings should be relocated. Regular inspection and maintenance of any water bearing fittings should be an essential part of the maintenance routine.

Effective maintenance of the exterior fabric of the building is of particular importance to avoid either direct damage to plasterwork from penetrating water, or indirect damage through associated timber decay.

6.2.5 Loading and vibration

The placing and movement of heavy items of furniture in rooms directly above those containing 17th century plasterwork will also require thought; as will subsequent loads from items they might contain, such as books or other relatively heavy items.

6.2.6 Visitor traffic

Special activities not normally taking place in a building can place additional stress on the structure or building fabric. These might include visits by large parties of the public, congregating within a room and causing vibration or deflection in floor timbers supporting a plaster ceiling. The loading of roof timbers with scaffolding and repair materials may cause ceiling ties to deflect.

6.2.7 Activities of building occupants

It can be seen from visual evidence that the behaviour of the occupants of a building can affect its environment. Plaster finishes are liable to be coated with nicotine from tobacco smoke. Open fires burning resinous timber or sulphurous coals also generate tarry deposits. These coatings require effort to remove and it is desirable to avoid the presence of smoke from either cigarettes or from open fires in rooms containing decorative plasterwork.

In buildings containing valuable plasterwork, owners and managers should consider setting 'house rules' constraining activities that are likely to adversely affect the building fabric. These might include limiting the numbers of visitors, to reduce otherwise invisible wear and tear through impact on the structure, and to minimise the effects of variations in local relative humidity. Tobacco smoking should be totally banned, to avoid both the contamination from smoke and the associated fire risk.

6.3 Cleaning

Routine cleaning of plasterwork should not be necessary. When redecoration is required, or exceptionally, where the condition of the plaster is likely to be adversely affected by the presence of excessive or inappropriate layers of paint, then careful cleaning might be required.

Unless the ceiling itself is in a sound condition, removal of excess paint layers should be delayed until after any necessary remedial repairs have been undertaken to the plaster itself.

Removal of old distemper is generally required before re-coating. This can be done by very careful hand washing with warm water. Where there is a build up of several layers of distemper, application of simple warm water poultices may be necessary to soften the material before very careful removal with a plastic, not metal, scraper blade. This technique may also work where early water bound (but not oil bound) emulsion has been used.

Limewash coatings can be very difficult to remove and expert advice should be sought if removal of limewash is necessary. In some situations very careful, patient picking off of multiple layers of limewash, particularly on decorative relief work, might be required, but this has the potential for physical damage to the plaster.

Similarly, techniques for removal of oil bound or acrylic finishes require expert advice. *The use of paint strippers, whether acid or alkali based, has the potential for serious damage to the plaster.*

6.4 Decoration

The extent to which colour was used on early 17th century plasterwork is uncertain and, in the absence of clear evidence of authentic decorative schemes, a slightly off-white finish is likely to be nearest to the original colour .

The most appropriate finish for decorative plasterwork is traditional water- or size-bound distemper. These materials are applied in thin coats and are relatively easy to wash off before redecoration, thus avoiding the unsightly build up of coats that will obscure the detail of the plasterwork.

Suitable distempers can be obtained from a number of specialist suppliers. Manufacturers and suppliers can also provide advice on their use and application. The use of other paint types is not recommended, because of the difficulty of subsequent removal and because they may inhibit the permeability of the plasterwork, making it more vulnerable to damage from condensation or other moisture-related problems.

Illus 44. Crawfurdland Castle, East Ayrshire; brushing down the ceiling to remove dust and old limewash in preparation for renewing limewash. © William McVey

6.5 Monitoring and maintaining substrates and structures

Because of the unique and irreplaceable nature of early 17th century plasterwork, and its vulnerability to damage from water, heat and structural movement, the monitoring and upkeep of the enclosing building fabric becomes even more important than would normally be the case in a historic building.

The need for regular inspection and routine maintenance is clearly set out in BS 7913:1998, *'The principles of the conservation of historic buildings'*. Early action can often prevent decay and avoid the need for major intervention later. The following procedures should be included: -

- Annual checking, testing and servicing of building services installations.
- At least twice-yearly cleaning of gutters and checking roofs, rainwater disposal systems and drains.
- Regular checking of all rooms, particularly little frequented areas such as attics, cellars, roof spaces and other voids.
- Regular sweeping of chimneys, window-cleaning etc (which also allows a check to be kept on the weather tightness of these elements).
- Checking of underfloor vents and other natural ventilation.

Faulty roof coverings and movement or failure in structural elements such as walls, internal support beams and framing are all likely to have an effect on internal plaster work.

In addition to maintenance of the building fabric, special precautions should be taken during unusual activities which might include, for example, building operations. Special care must be exercised to ensure the total exclusion of water, for example during roofing works, and impact and vibration which might affect plasterwork must be avoided. Owners should also be aware that other less obvious changes might also have an adverse effect, such as changes in floor loading distribution when heavy furniture is re-located.

6.6 Introduction of services

Many historic buildings have suffered from the careless installation of services. Apart from the increased risks of damage to the fabric emanating from the condition of the services themselves, new routes are often driven through walls and floors without proper consideration. Significant damage is caused to plaster ceilings by the activity of installing or maintaining services above the ceiling. Any activity or movement in, for example, roof spaces above plaster ceilings can have a significant adverse impact on the stability of the plaster. Strict conditions and controls must be enforced if access and/or work are necessary. Adequate lighting should be available to avoid accidents, walkways must be provided and no fixings should be made to the ceiling timbers or joists, etc supporting the ceiling structure. Impact and vibration, especially from nailing into timbers, will cause unseen damage to plaster keys, leaving the ceiling vulnerable to future collapse.

Those responsible for the design and installation of service pipes, cables and equipment need to be made

aware of the special nature of any plasterwork, and new services should not be routed through or adjacent to important plasterwork. Serious consideration should be given to re-routing existing services away from the areas concerned.

6.7 Planning for emergencies

For any room or building containing a known example of early 17th century plasterwork a plan should be prepared, indicating methods of protection to be implemented in the event of an emergency. It may be that many large organisations or institutions will already have made plans to safeguard the buildings in their care. These should aim to protect the occupants, contents, and specific parts of the fabric which have enhanced historic value. However, many owners will not yet have provided these plans, and it is essential that some degree of planning be done in anticipation of the occurrence of a catastrophic event.

6.7.1 Water damage

Damage may occur due to a single event or may be due to an undetected continuing problem leading to saturation. Leaks due to faulty roof coverings, flashings or rainwater goods are likely to be the most common source of damage, but leaks from domestic plumbing are also a common occurrence. Flooding might occur in certain situations. Old plasterwork will be particularly susceptible to water damage and early action is required to avoid a major loss. This might mean having emergency contact arrangements with plumbers or roofing contractors, to deal with external sources.

The best method of preventing domestic plumbing damage is to remove the threat completely by locating any pipes or fittings well away from the area concerned. Leaks from thawing ice or snow from roofs and gutters might be avoided by installation of a roof trace-heating system.

Whilst in some cases damage to the plaster itself might not be immediately apparent following wetting, the saturation and subsequent drying of timber laths will cause them to expand and contract, resulting in a weakening or fracturing of plaster keys. This will leave the affected ceiling very vulnerable to future collapse if it becomes stressed by other causes.

6.7.2 Fire

'Fire is the greatest single threat to the fabric and contents of any building.' (BS 7913, 'Guide to the principles of building conservation'). Historic Scotland Technical Advice Note 11, *'Fire Protection Measures in Scottish Historic Buildings'*, contains an appendix concerned with planning for damage control and the preparation of fire action plans.

Involvement of the local Fire Prevention Officer as the Fire Action Plan is developed should highlight the special value of any plasterwork, and the fire action plan should identify acceptable the fire-fighting methods which might be employed. Thus the usual practice of removing lath and plaster from ceilings at the perimeter of the spread of a fire could be replaced with an alternative approach such as lifting floor boards above the affected area, or using non-invasive means of viewing the enclosed zone to detect smouldering combustible material. The use of deluge water hoses should also be avoided in favour of spraying from an appropriate high-pressure nozzle, which can give equal fire-fighting efficiency.

6.7.3 Sprinklers and alarm systems

The installation of adequate fire detection and alarm systems in particularly sensitive locations should also be considered (but see comments at 6.6 above). This would allow smouldering fires to be detected and dealt with before any significant damage is caused. The introduction of any new systems should be carefully considered to avoid damage to historic fabric. TAN 11 *'Fire Protection Measures in Scottish Historic Buildings'*,and TAN 14 *'Installation of Sprinkler Systems in Historic Buildings'* provide detailed advice on suitable methods of detection, alarm and automatic fire suppression systems.

6.7.4 Structural collapse

It is quite common for plaster ceilings to lose their bond to the lath supports over time, particularly if they have been subjected to vibration or wetting in the past, often with sudden and dramatic effect. Even repeated significant changes in humidity might cause expansion and contraction of timber laths resulting in damage to plaster keys. In many cases there is little or no obvious warning that collapse is likely to occur, and the fall of a large part of a ceiling without any immediately apparent reason is not unknown. However, it should be possible to detect the warning signs if a thorough inspection is carried out as described above (see Section 6.5). If there is potential for failure of the support system then precautions should immediately be taken to temporarily secure the affected area until more permanent repairs can be carried out. Such temporary measures might include providing timber props with soft material in direct contact with the plaster. This is described more fully in TAN 2. Owners of buildings with early 17th century plasterwork may consider it worthwhile to have such temporary props in store in preparation for such an emergency.

APPENDIX A
17TH CENTURY PLASTERWORK STYLE AND DEVELOPMENT

With the introduction of flat ceilings below the roof timbers, rather than rooms open to the roof, lime plaster came to be used more widely as a ceiling finish. Once the fireplace was enclosed, the upper floors could be used for additional rooms; initially the ceiling joists and soffit were painted, but gradually lime plaster on a lath base became the more usual material in wealthy homes. 15th and 16th century plasterwork seems to have been flat in the main (often plastered straight onto a stone wall), and decorated by painting rather than relief enrichment (see illustration 46, Amisfield Tower). The developments of modelling, running cornices and decorative ribs, and using moulds to produce numbers of ornamental casts which could be added to the wet plaster of the ceiling, cornice or frieze, were creative ideas exploiting the plastic nature of the material.

The origins of the distinctive decorative plasterwork style for ceilings, friezes and overmantels, which arose in Britain at the end of the 16th century and the beginning of the 17th century, are probably diverse. However, certain influences can be cited, the Italian Renaissance particularly, and also N European (Dutch and Belgian) engravings and art publications (ref. John Touche and Geoffrey Beard).

Some ornamental details and motifs can be found both on painted ceilings and on plaster ceilings. For instance: peacock and fruit; a long spray with twirl, rose crescent or fleur-de-lys; vase of flowers; dolphin head scroll; double scroll; bird, serpent and squirrel rib enrichment; lion rampant or couchant; lion passant and unicorn; lion mask; rose, thistle, harp, fleur-de-lys, torso (long or short), mermaid, bearded head in profile, star or virgin. The basic models for most of these

Illus 45. Collairnie Castle, Fife; painted timber ceiling, C16. Many of the motifs used in plaster ceilings had been seen previously on painted timber ceilings; note the coat of arms, stars, crescents, lion rampant, scroll with inscription, and floral decoration, particularly to the ribs. © Crown copyright RCAHMS

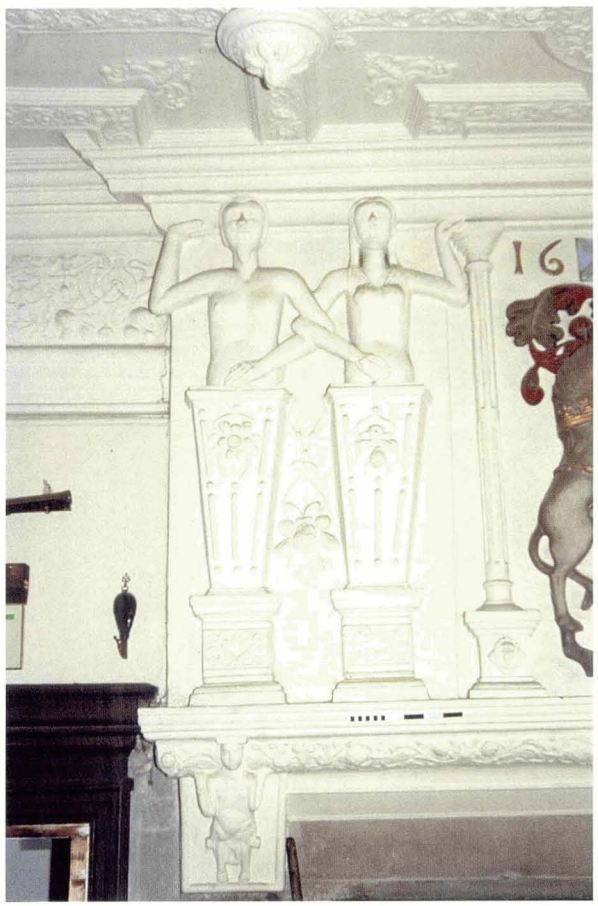
Illus 46. Amisfield Tower, Dumfries and Galloway; late C16 painted decoration on flat plaster showing lion heads and other medallions, framing with columns, floral enrichment etc, motifs which recurred in moulded plasterwork. © Crown copyright RCAHMS

patterns can be found in Italy from the 1st century AD, but it was not until the Renaissance that they spread widely through Europe (ref John Touche and Geoffrey Beard).

In Scotland the use of paint on timber ceilings and on flat plaster continued to be popular longer than in England (well into the 17th century), and decorative plasterwork came into fashion later (at the beginning of the 17th century). One major difference between painted timber ceilings and decorative plaster ceilings was that the latter appear to have been left uncoloured during the 17th century. The plaster ceilings would have been limewashed or whitewashed but, except on overmantels, there is no evidence of any colour other than the natural off-white, and the enrichments and casts do not appear to have been picked out in a different colour.

Advances in the skill and creativity of the plasterers must have played their part in the development of the style (for example the work of the Worshipful Company of Plaisterers of London as described by C Gapper, 2002). Immigrants from Italy and other parts of Europe may have spread ideas and new fashions. Decorative plasterwork can be seen in buildings in London and the south and south west of England from the mid-16th century, but the earliest remaining examples in Scotland are probably at Huntly Castle in Aberdeenshire (a moulded frieze said to date from 1602-10, see illustration 47), and Pinkie House in Musselburgh, in East Lothian (1613). Kellie Castle must also have had decorative plasterwork in about 1616, as there is a reference to plasterers taking moulds from Kellie for use at Edinburgh Castle in 1617 (J.Imray and J.G.Dunbar, 1982).

Illus 47. Huntly Castle, Aberdeenshire; this frieze is probably the earliest moulded plasterwork extant in Scotland, said to date from 1602-08. A Historic Scotland specialist consolidates this plaster which is now exposed to the weather. © Crown copyright Historic Scotland



Illus 48. Muchalls Castle, Aberdeenshire; hand modelled figures used on either side of the coat of arms on this overmantel. © Crown copyright Historic Scotland

Some of the earliest English relief plasterwork included hand-sculpted compositions, often classical or biblical scenes. There are no obvious examples of these in Scotland, the nearest parallel being sculpted figures on overmantels, such as those at Auchterhouse, Muchalls (illustration 48) and Craigievar, or unusually, individually modelled ceiling panels as at Saughton Hall (illustration 49). Instead, the use of casts for repetitive decoration expanded, possibly as the potential was realised and then exploited. This was a highly expensive and sophisticated type of work, relying on the skill, training and experience of the individual craftsman (and his team). The early examples, both in England and in Scotland, were in Royal palaces and the great houses of the richest families.

Although there were a few previous works in Scotland (noted above), the first major stimulus which resulted in new decorative plasterwork was the homecoming of James VI and I, when he returned to Scotland in 1617. The plasterers who worked at Kellie and Edinburgh Castles were probably employed at the palace of Holyroodhouse and Ballencrieff as well; their skills and knowledge, and those of the two plasterers who

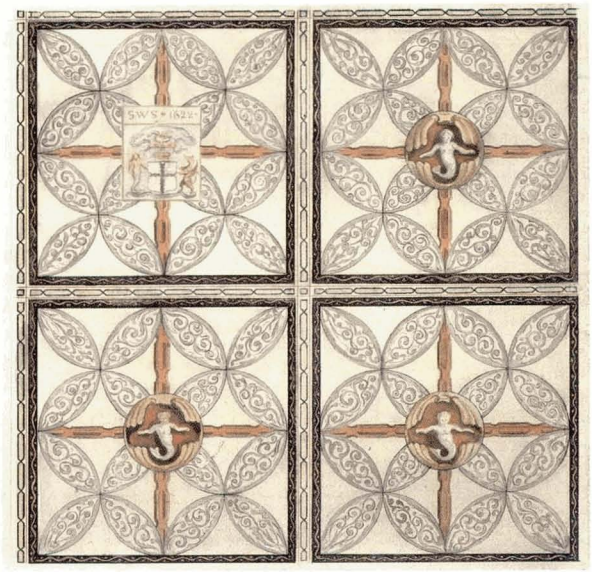
Illus 49. Saughton Hall, Edinburgh; mounted knight with hound, framed and used as a motif. Unusually, this appears to have been hand modelled rather than cast, which was the more common method. © Crown copyright RCAHMS

came from York to Edinburgh in 1617, must have spread to local craftsmen. Some of the same moulds used at the Old Palace of Bromley-by-Bow in 1606 (for James VI and I) reappeared much later at Balcarres, Glamis, Muchalls and Craigievar. Decorative plaster ceilings were certainly being installed in Edinburgh Castle, and most probably in Ballancrieff Castle and Kellie Castle around 1617; the palace of Holyroodhouse and possibly Lennoxlove had new plasterwork in 1618, Auchterhouse and Thirlestane in 1620, Glamis in 1620-21, Roslin in 1622, Baberton in 1622-23 and Kinneil House in 1621-24. Very high quality plasterwork in Muchalls dated from 1624. Apart from the royal castle and palace, these great houses were owned by some of the wealthiest families in the land, many with royal connections.

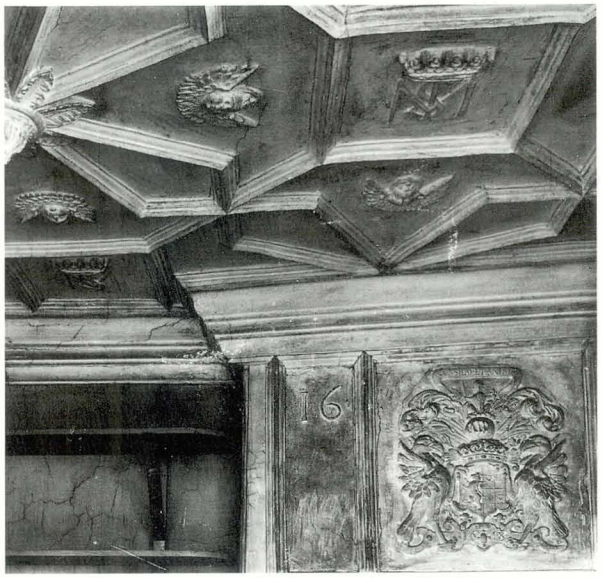
Similar extensive and fine plasterwork is found at Craigievar (1626) and in Moray House (c1628, see illustration 50). Moray House was perhaps the first town house to be furbished with decorative plasterwork, but the next decade saw more town houses treated in this way.

The design of early decorative plaster ceilings was structured around a lattice of raised ribs or coffers, dividing each ceiling space into a number of compartments. The layout was always symmetrical in principle; it was focussed on a central panel or occasionally a pendant, with a geometric pattern of panels (enclosed, and usually linked, by ribs) and spaces between the panels. Circles, squares, quatrefoils

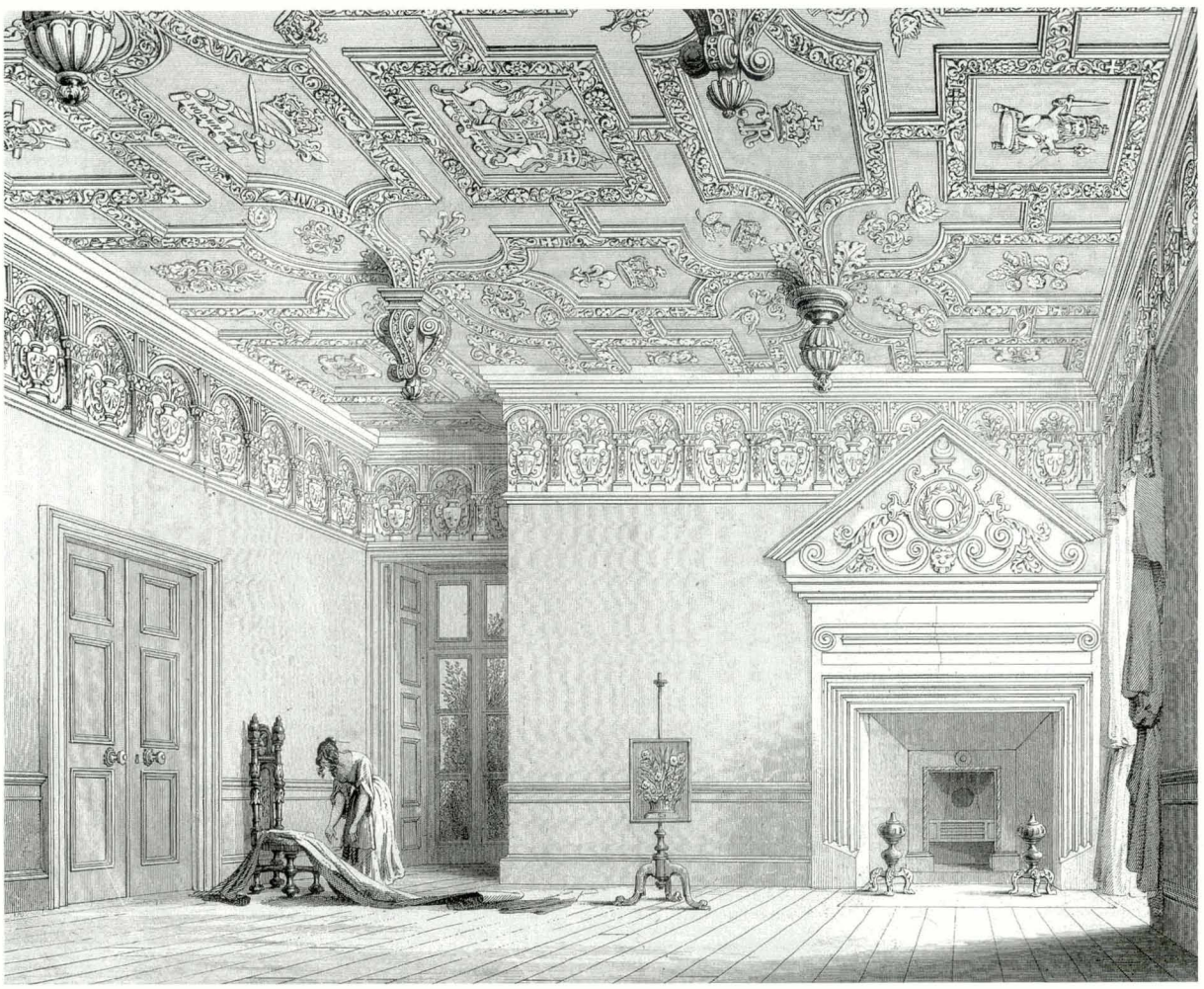
Illus 50. Moray House, Edinburgh; a domed ceiling from a town house of the late 1620s. © Crown copyright RCAHMS



Illus 51. Roslin Castle, Midlothian; a coffered ceiling, perhaps echoing the designs of timber ceilings. © Crown copyright RCAHMS



Illus 52. Lennoxlove House, East Lothian; might this fan pattern with a central boss have been imitating medieval fan vaulting? © Crown copyright RCAHMS. Reproduced courtesy of Country Life Picture Library



Illus 53. Winton House, East Lothian; view of the King Charles Room from a drawing in The Baronial and Ecclesiastical Antiquities of Scotland by RW Billings, showing strapwork within a pedimented overmantel and also a rather fine colonnaded frieze. © Crown copyright RCAHMS

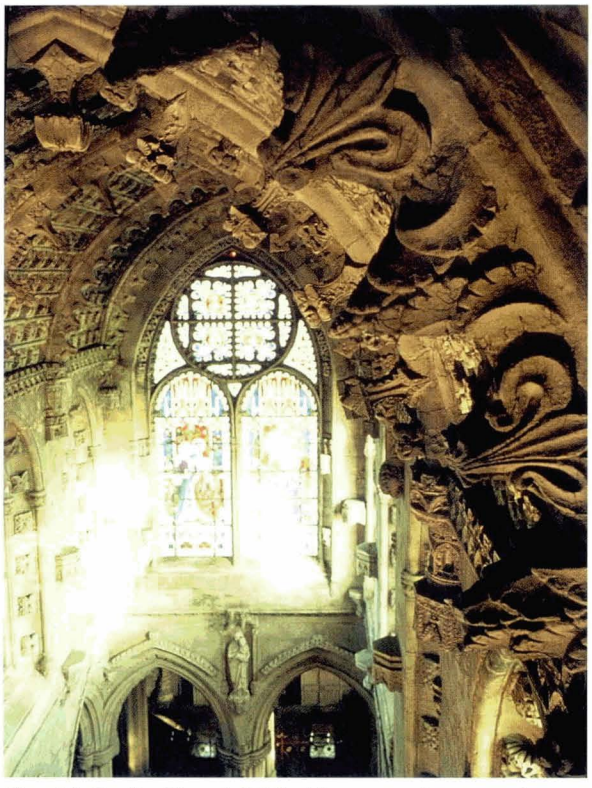
and 'lozenges' – or parts thereof – were the most common shapes (see illustrations 3 to 6, showing various ceiling designs). The ribs took various forms, on a run moulding, sometimes wide and shallow with floral enrichment, sometimes narrower and unadorned, or occasionally without a run moulding as a base, just a build-up of repetitive cast decoration defining the rib. There was also a run moulding forming a cornice along the junction between walls and ceiling. A coved ceiling was used as an opportunity to capitalise on the extra planes with panels reflecting the shapes (see illustration 50). One theory is that the shapes of the ceiling panels developed from the straight lines and coffers of timber ceilings, another that the ribs sometimes imitated medieval ecclesiastical fan vaulting (ref. Beard?), many of the early ceilings having radiating patterns, as well as pendants. Both these ideas can be traced in some of the forms (for example coffers at Roslin, see illustration 51; and fan shapes at Lennoxlove, see illustration 52).

Strapwork was much more characteristic of English ceilings, and was only occasionally used in Scotland as a framing device for motifs in the cast reliefs (see illustration 53). Pendants, although they are also found in England, became a particular feature of Scottish ceilings, and appear to have been developed from medieval timber or stone ceiling bosses (see illustration 55).

Within the panels and the intermediate spaces, cast ornamentation was added, usually individual motifs. These included portrait medallions, royal regalia and emblems, and family heraldic devices, national symbols, fruit, flowers and foliage, figures and heads, etc.

The use of portrait medallions (see illustrations 56 and 57) can be traced from portrait heads on metal shields in Greece (c 90BC), on metal and wooden shields in Imperial Rome, and on stone or terracotta medallions in Renaissance Italy. This fashion spread throughout Europe in the 15th century and 16th centuries. Examples in Scotland are the stone medallions on the exterior façade of Falkland Palace (1533) and the wooden ceiling roundels (Stirling heads) at Stirling Castle (c1540). A tempora ceiling representing the nine worthies was made in 1602 for Sir Thomas Burnett of Leys, who later commissioned plaster ceilings with portrait medallions at Muchalls (John Touche, whose articles are at the RCAHMS, went into the subject of portrait medallions and regalia in some depth).

Specific characters were used for the 17th century plaster cast portraits. One particular group of 'heroes', the nine worthies, first mentioned in a 14th century French Chivalric book, included three pagans (Hector of Troy, Alexander the Great and Julius Caesar), three biblical characters (Joshua, David and Judas Maccabeus) and three Christians (Arthur, Charlemagne



Illus 54. Roslin Chapel, Midlothian; stone bosses and pendants which almost certainly influenced the development of bosses and pendants in plasterwork. © Crown copyright Historic Scotland

Illus 55. Auchterhouse, Angus; a moulded plaster pendant. © Crown copyright Historic Scotland

and Godfrey de Bouillon). There was also a slightly later group of nine virtuous ladies, but only Lucresia found much popularity. A set of engravings of the nine worthies by Nicholas de Bruyn was published in Antwerp in 1594, and these formed the basis for the plaster moulds used in ceilings in England and Scotland for Alexander, Hector, David and Joshua. Later Georgian portrait medallions were unconnected with these (ref. John Touche, Geoffrey Beard).

The earliest surviving cast plaster medallion heads in Britain were at the Old Palace of Bromley-by-Bow in London (1606), now in the V&A, but plaster casts were soon afterwards used in Scotland at Thirlestane Castle (1620), Glamis Castle (c1620), Muchalls Castle (1624, see illustration 56), Craigievar Castle (1625), Balcarres House (c1630) and the House of the Binns (c1630). Later, rougher versions, were used at Merchiston Castle and Woodhall House, Edinburgh.

Other repeated portraits used in Scotland were of Tarquin and Lucresia (at Kellie Castle, Glamis Castle, Muchalls Castle and Craigievar Castle). Additional heads were also used, such as a crowned or coroneted lady (known as Queen Margaret) at Pinkie House, Muchalls Castle, Craigievar Castle (see illustration 57) and Arbuthnott House. A different crowned lady can be found at Kellie Castle.

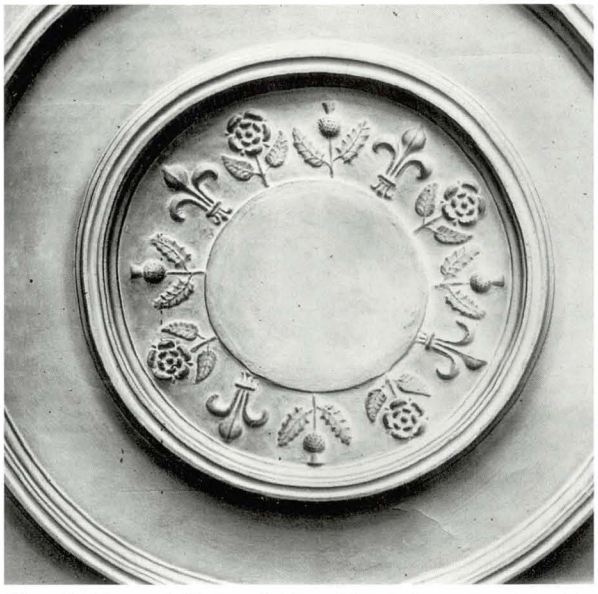
National emblems were also very popular (see illustration 58). These included the thistle (Scotland), the rose (England), the harp (Ireland), the fleur-de-lys (because even at this time the English still laid claim to a part of France), the portcullis (England), the lion rampant (Scotland), the unicorn, crowns, etc. The crowned lion and winged dragon figures were used in several ceilings in and around Edinburgh (eg Stenhouse and Moray House see illustration 59), and John Touche suggests that they were originally supporters for the Coat of Arms of Queen Elizabeth of England. Since the arms of Queen Elizabeth would not have been used in Scotland instead of those of King James VI, they may just have been employed as useful fill-in casts (the plasterers already having the moulds or casts). Royal regalia included the Royal Coat of Arms, lion rampant in double treasure, the crown, sword and sceptre.

Other very frequently used motifs were winged cherubs' heads, stars, flowers and fruit, terminal figures, etc (see illustrations 60 and 61).

In the 1630s, decorative plasterwork was installed at the House of the Binns, the French Ambassador's House in Linlithgow, Balcarres, Moubray House, Whittingehame, Lennoxlove, the palace of Holyroodhouse, Brodie and Winton (to celebrate the visit of Charles I in 1633 en route to his coronation in Edinburgh); and in Elcho Castle and Balgonie c1640.

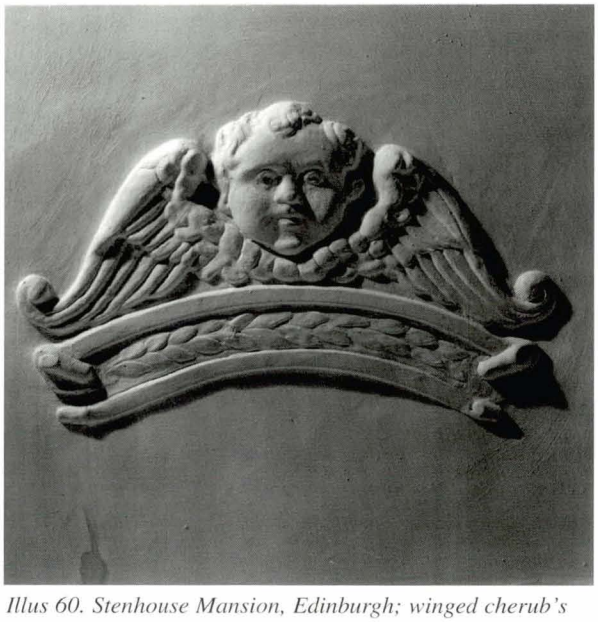
Illus 56. Muchalls Castle, Aberdeenshire; medallion head of King David, one of the nine 'Worthies', framed by strapwork and cherubs (1624). © Crown copyright RCAHMS. Reproduced courtesy of Country Life Picture Library.

Illus 57. Craigievar Castle, Aberdeenshire; medallion head, thought to represent Queen Margaret, in a strapwork frame (1625). © Crown copyright RCAHMS

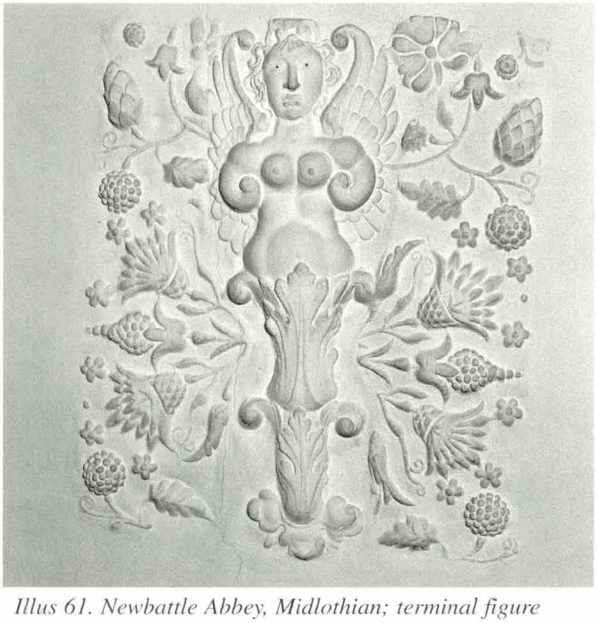


Illus 58. Carnock House, Stirlingshire; ceiling roundel with national emblems. The thistle and rose combination was a display of pride in the Union of the Crowns, with the fleur-de-lys illustrating England's continued claim to a part of France. © Crown copyright RCAHMS

Illus 59. Croft-an-Righ, Edinburgh; the cast for this winged dragon could perhaps have been originally made as a supporter for the English royal arms; similarly the crowned lion shown on the front cover photograph, also at Croft-an-Righ. © Crown copyright Historic Scotland

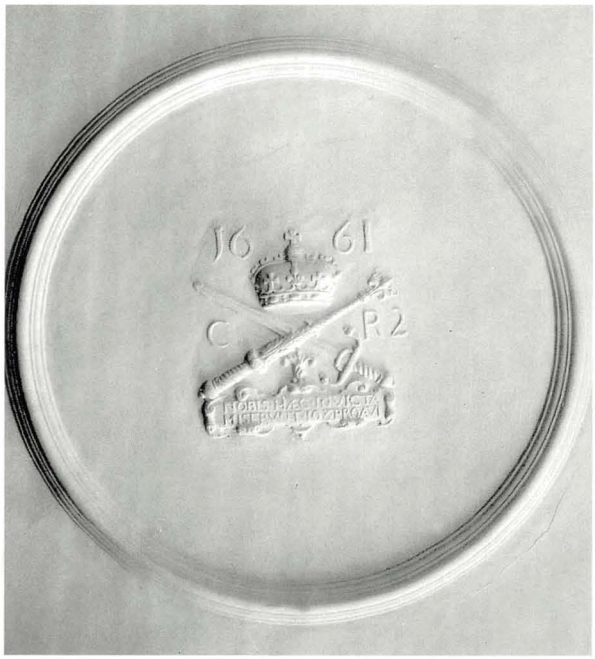


Illus 60. Stenhouse Mansion, Edinburgh; winged cherub's head motif. © Crown copyright Historic Scotland



Illus 61. Newbattle Abbey, Midlothian; terminal figure motif. © Crown copyright RCAHMS

Although many 17th century plaster ceilings are of unknown date, there was clearly less plasterwork of this style being executed by the middle of the century. The coronation of Charles II at Scone in 1651, was too rushed, with Cromwell too nearby, to allow any new plasterwork to celebrate the occasion. Mid-century plasterwork includes Tailor's Hall, Edinburgh, possibly c1643, and that in the Roman Eagle Hall in Lawnmarket, Edinburgh, dated 1645 and 1646; Crawfurdland Castle's plaster is dated 1648, and that at Carnock House is thought to date from 1646-64. Of the two ceilings in Baillie John McMorran's house in Lawnmarket, Edinburgh, one is thought to be possibly mid-17th century, and the other dated either 1648 or, more probably, 1684. Bonhard House is thought to be mid-late 17th century. A significant development here seems to be that slightly less important town houses had started to include decorative plaster ceilings. Also, some of the ceilings – although their styles were very varied – had slightly more self-consciously designed layouts, so that the panels related to the shape of the room, instead of just repeating the panel pattern as space allowed.



Illus 62. Gorgie House, Edinburgh (1661); royal regalia, adapted from an earlier cast designed for Charles I, to incorporate a 2 for Charles II. © Crown copyright RCAHMS

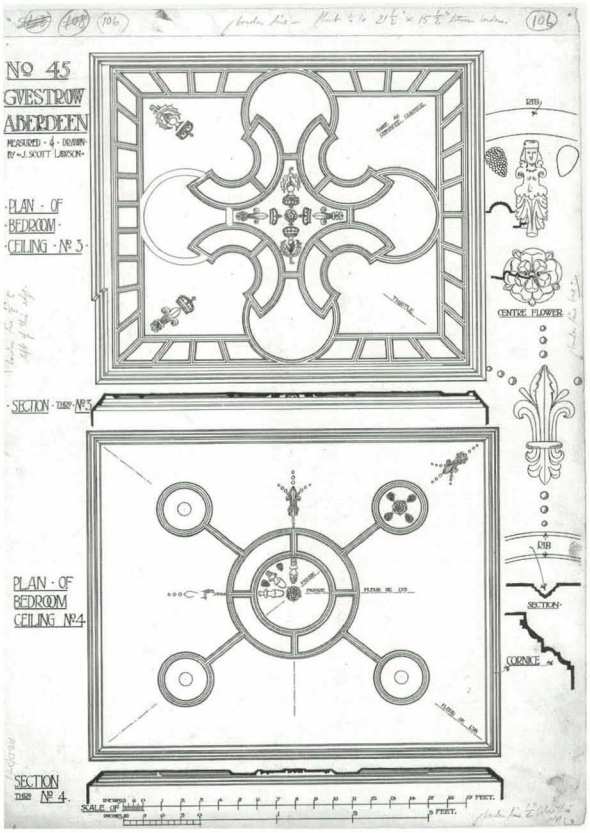
Illus 63. 341 High Street, Kirkcaldy, Fife (c1672); the oval panel was a new fashion, as was the use of a single central panel. © Crown copyright RCAHMS

The next great burst of activity was in response to the end of the Cromwellian occupation of Scotland, and the return of Charles II to his throne. Between 1661 and 1662 there were ceilings and overmantels with decorations which included the royal regalia, installed at Dalry House, Gorgie House, Merchiston Castle, Niddrie House (or Niddrie Marischal), Stenhouse Mansion and probably Woodhall House, all in Edinburgh. There was also plasterwork with royal regalia at Riddle's Court/Close, Lawnmarket, Edinburgh (perhaps 1684). The style of these ceilings is very much in the same tradition as earlier plasterwork; many of the same casts and moulds were used, indeed some were altered crudely to adapt to Charles II instead of Charles I (see illustration 62).

After the early 1660s, subtle changes crept into the plasterwork designs. A 'transitional' style can be seen; no longer with any specific reference to Charles II, and still in the recognisable style of 17th century plaster, but with more emphasis on a single, centrally-focussed ceiling layout (rather than a repetitive pattern as before). The cast motifs were often the old ones, but also included more exotic creatures and mermaids, sunbursts, etc. This period includes work at Arbuthnott House, (1660s), Stobhall, (1671), 341 High St, Kirkcaldy (c1672), Wemyss Castle (1672-3), some of the work at Balcaskie (1674), Provost Skene's House, Aberdeen (1676) and Kellie Castle, (1676).

Evidence of these changes in style can be recognised in many ceilings, despite the individual differences. For instance, the plasterwork at Kirkcaldy (see illustration 63) has an oval central panel – a new shape for Scottish ceilings – and a decorated frame or rib, probably based on a shallow, wide, run moulding, built up with a large quantity of repetitive pre-cast foliate enrichment. The motifs used are traditional, although these versions are sometimes more refined than earlier ones. A similar rib to that at Kirkcaldy, but without any visible run moulding, was employed at Arbuthnott probably in the 1660s, which was also a throwback to similar ribs at Roslin (1622).

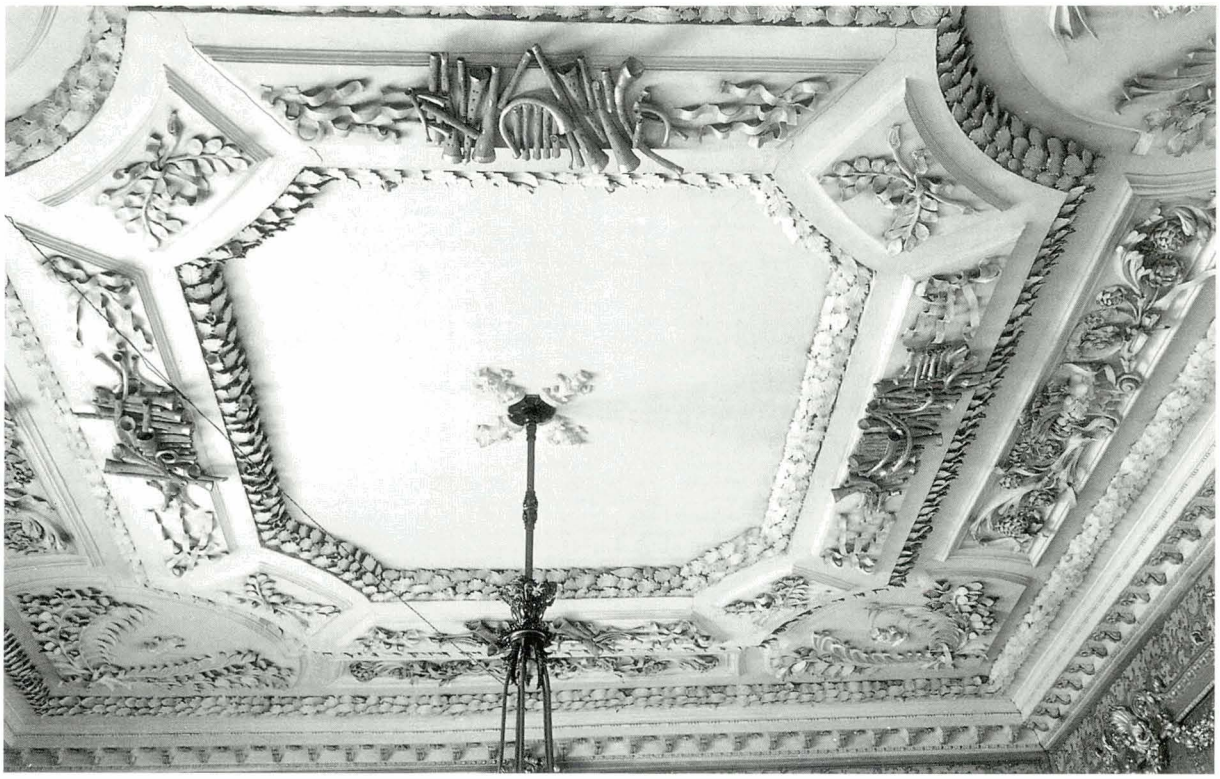
Illus 64. Kellie Castle, Fife (1676); the vine room illustrates changing ideas in plasterwork with its painted central panel and the free-flowing vine motif. © Crown copyright RCAHMS



Illus 65. Provost Skene's house, Aberdeen (1676); these designs showed considerable experimentation in the ceiling layouts, particularly the swirling shapes employed in bedroom 3. © Crown copyright RCAHMS

Ceilings at Kellie Castle in 1676 demonstrated the growing fashion for a greater amount of ornamental framing with just one central panel (in the Vine room there was only one central panel, as at Kirkcaldy, but this time circular and containing a painting, see illustration 64). All the ribs were highly ornamented, as were the spaces between them. The ornamentation was becoming more 3-dimensional, sculptured and free-flowing, as with the extensive vine plants, instead of small stiff casts placed symmetrically about the spaces. At Provost Skene's house in Aberdeen, on the other hand, although the ceilings were all still rigidly symmetrical, three of the four were designed around large central panels and there was considerable experimentation in varying their layouts and compartmentation, especially in the swirling forms in bedroom no 3 (illustration 65). These examples mixed new with old; some in each case introduced new ideas, while others reproduced variations on the tried and tested styles. Not all these developments were incorporated into the late-17th century fashions when these settled into a baroque form, but some trends were clear.

By the 1670s, a fully mature style, with work of a much more elaborate, heavily sculptured and highly ornamented nature, was being demonstrated at Thirlestane (1671-5, illustration 66), Balkaskie (1673-4) and the palace of Holyroodhouse (1676-8). Sir William Bruce was deeply involved in this (particularly at his own houses at Balkaskie and later Kinross, c1690), and some of the same Scottish, English and Danish plasterers (Lindores, Dunsterfield, Houlbert and Alborn) worked at Thirlestane, Holyrood and Kinross. Ceilings were designed to fit well into their spaces, with a strong emphasis on a large central panel, often oval or round. There were more heavily sculpted features than casts, made up of hand modelled pieces of plaster, assembled at floor level or in the workshop and then fixed to an assigned ceiling location, with the aid of dowels or whatever mechanical fixings were needed to take the often not inconsiderable weights. Other examples of this baroque style were at Kinneil House (late 17th century), Bannockburn House (1680, illustration 67), Hatton House (late 17th century), Caroline Park (1685-93), Raith House (1696-98), Prestonfield House (late 17th century) and Touch House (very late 17th century or 18th century).



Illus 66. Thirlestane Castle, Scottish Borders (1671-5); in the vanguard of fashion, by the early 1670s a much more elaborate style was evident. © Crown copyright RCAHMS. Reproduced by courtesy of The Hon. Gerald Maitland-Carew, D.L.

Illus 67. Bannockburn House, Stirlingshire (1680); a baroque style had established itself by this date, replacing the simpler plasterwork of the earlier C17. © Crown copyright RCAHMS

APPENDIX B
GLOSSARY OF TERMS

Aggregate - Material which, when combined with a binder, forms a mortar. This can include sand, crushed rock, brick dust, or any other appropriate filler.

Air limes - Limes that set through carbonation, rather than through chemical reaction with water. So called because they set in air.

Aluminates - Compounds of aluminium and oxygen.

Amorino - Idealised naked infant with wings (putto).

Armature - A rigid framework of wood or metal, around which is built up a plaster, clay or wax model (usually foliage or figures).

Borescope - An instrument for viewing detail within a small space (eg behind lath and plasterwork).

Calcium carbonate - Chemical state of the raw limestone material, and of fully set lime mortars.

Carbonation - The process by which fresh lime mortar re-absorbs carbon dioxide in moist conditions and reverts to calcium carbonate. As a result of this process the lime mortar becomes relatively harder, more stable and less soluble.

Cartouche - An ornamental panel in the form of a scroll or tablet, with curling edges, usually bearing an inscription or coat of arms, sometimes ornately framed and often the centrepiece of an overmantel.

Casting - Shaping a material (plaster, molten metal, glass, etc) into an object by pouring or pressing it into a mould.

Chimneypiece - The frame surrounding a fireplace, the mantelpiece, sometimes including an overmantel or mirror above.

Coarse stuff - A mixture of lime and coarse sand or other aggregate used as lime mortar.

Core work - The mix of mortar and stone pieces forming the core of a masonry wall.

Cornice - Decorative moulding in the angle between wall and ceiling.

Couchant - Lying down (as in lion couchant).

Cove - A large hollow moulding. A coved ceiling has a deep hollow curve in the plastering between the walls and the flat part of the ceiling.

De-humidifier - An air-conditioning unit which cools and dries the air.

Devil float - A plasterer's float pierced by nails and used to scratch a key into the surface of undercoats which are to receive a further coat of plaster.

Dry hydrate - Hydrated lime in which quicklime has been slaked with just enough water to form calcium hydroxide in the form of a dry powder.

Dubbing out - Filling out an uneven wall to a roughly even surface with plaster or mortar.

Enrichment - Ornamentation used in plastering or stone cutting.

Entablature - The structure surmounting a row of columns in the classical order. Divided into architrave, frieze and cornice.

Exemplar - A model to be copied; an ideal pattern.

Fat lime - Non-hydraulic limes, consisting almost entirely of calcium hydroxide, plus water. Also known as 'air limes'.

Fibrous plaster - Plaster of Paris shapes made in the workshop by casting in gelatin or plaster moulds. They are reinforced with coarse, open canvas and wood laths, and sometimes with wire netting.

Finish coat - The final coat of paint or plaster.

Fleur-de-lys - Representation of a lily with three distinct petals; national emblem of France.

Frieze - Horizontal band between architrave and cornice, especially ornamentation just below ceiling and cornice.

Gig stick - A radius rod.

Grouting - Filling joints, crevices or voids in walls, which are too small or inaccessible to be filled using a mortar of normal consistency, using a very fluid binding material.

Gypsum - Gypsum plasters are made by heating gypsum or alabaster (calcium sulfate in mineral form) to drive off part of its water of crystallisation . The powder obtained gives a rapid-setting, hard plaster when recombined with water. The first gypsum plaster to be used in Scotland since Roman times was Plaster of Paris, probably in the eighteenth century.

Herringbone dwangs - Cross bracing by means of small timbers inserted diagonally between joists or studs to increase the stiffness of the structure.

Horse - A short board housed to receive the stock (or wood backing) to the shaped metal template which forms a plaster moulding to the required profile. The stock is fixed to the horse by wooden stays.

Hydrated lime - See dry hydrate. In modern building practice the term is commonly used to describe non-hydraulic lime powder, ie 'builders' lime', used in modern cement/lime/sand mortars.

Hydraulic limes - Limes prepared from limestone containing reactive silica or silica/alumina, often, but not necessarily, in the form of clay minerals. These give the mortar a chemical set that is quicker and harder than the carbonation of pure limes, and a degree of ability to set in wet conditions. Hydraulic limes come in a range of strengths - NHL2 (feebly hydraulic), NHL3.5 (moderately hydraulic) and NHL5 (eminently hydraulic) are the most commonly used descriptions. Hydraulic limes cannot normally be stored as putty for any length of time because the chemical set will cause them to harden, and they are therefore stored as dry hydrate. Also known as 'water limes'.

Ironfoundry waste - Byproduct of ironworking processes, which can contribute to the setting action in a lime mortar.

Keel - The fillet or projection forming part of a roll or scroll moulding, shaped like the keel of a boat.

Key - The grip of plaster upon laths or any rough surface; for instance plaster undercoats are scratched in order to provide a good key for finishing coats.

Knocking up - The re-working of a mortar mix to regain plasticity before use.

Lime putty - Hydrated lime which has been slaked from quicklime using sufficient water to form a thick liquid and subsequently settled out to a putty during storage.

Limewash - A form of paint, a suspension of slated lime in water.

Mitre - A corner joint formed between two pieces of material (usually timber), by cutting bevels of reciprocal angles at the end of each piece.

Mortar - Material which can be worked or placed in a plastic state, becomes hard when in place, and which can be used for bedding, jointing or finishing the materials forming the component parts of a wall.

Motif - A single added piece of decoration.

Moulding - A continuous projection or groove used as decoration to throw shadow, sometimes also to throw water away from a wall. It may be in stone, plaster, timber etc.

Muffle - A layer of material (may be padding or gauged stuff (plaster)) covering a horsed mould to the thickness of the finishing coat, used when running the earlier coat. Before the finishing coat is run, the muffle is removed from the mould.

Non-hydraulic limes - Pure limes, consisting almost entirely of calcium hydroxide without reactive silica or silica/alumina. Non-hydraulic lime mortars harden only by slow drying and carbonation, and cannot set in wet conditions. Also known as fat limes or 'air limes'.

Overmantel - Panels, framing etc, on the wall above a mantelpiece.

Pendant (or pendent) - A carved or moulded feature suspended from a ceiling, roof or vault, often ending in a boss.

Pinning stones - Small stones (or shells etc) placed in joints to stabilise masonry and reduce the volume of mortar required. Used in conjunction with mortar in repointing, etc.

Plaster of Paris - Gypsum plaster, the name deriving from the large gypsum deposits under Montmartre in Paris. Plaster of Paris was probably the first gypsum plaster to be used in Scotland after Roman times (18th century).

Plate - A general term for a horizontal timber, supporting ends of beams, joists, etc, for instance wall plate (on wallhead).

Pozzolans - Materials containing fine particles of silica and alumina, and sometimes iron oxides, which will react with calcium hydroxide and water to produce a chemical set in mortar, similar to the set achieved by hydraulic limes.

Portland cement - The common form of cement made by grinding clinker formed by firing clay and limestone at high temperatures.

Putty - See lime putty.

Quatrefoil - A leaf or flower with four divisions; a carved or moulded ornament which has four petals or foils radiating from a common stem.

Quicklime - Calcium oxide. A highly caustic material produced by burning limestone. Quicklime is slaked with water to produce lime for building works.

Rampant - Used in heraldry (of a beast). Standing on the hind legs, the right foreleg raised above the left.

Relief - The projection of forms (ribs, decoration and pendants or bosses in plaster ceilings) from a flat background.

Ribs - Projecting mouldings or bands on the underside of a vaulted or plastered ceiling.

Riven lath - Lath which is split, not sawn, to shape.

Roughing out - Doing the first rough work; laying the core of plaster in a moulding, for which the horsed mould is covered with a muffle.

Running - Forming a moulding such as a cornice, in situ or on the bench with a horsed mould.

Sawn lath - Lath which is sawn, ,not split, to shape.

Scoured - Compacted - as in plaster - by being worked with a cross-grained float in a circular motion. Sometimes water is sprinkled on with a brush at the same time.

Scratch coat - The first coat of plaster on lathing; the surface is roughened or 'scratched' to give good adhesion for subsequent coats.

Sejant - Used in heraldry, of a beast. Shown seated.

Silica sand - Sand containing only grains of silica.

Slaking - The controlled process of combining quicklime with water to form slaked lime in the form of lime putty or dry hydrate.

Soffit - The underside of any architectural or structural feature, eg arch, lintel or ceiling.

Squeeze - A first impression or mould of an existing cornice or moulding which is taken so that an accurate profile can be formed to match it.

Straightening coat - Second or floating coat in plastering.

Strapwork - Decoration (possibly derived from work in the Netherlands c1540) consisting of interlaced bands and forms similar to fretwork or cut leather; generally used in ceilings, screens and funerary monuments in 16th century and 17th century, and also in 19th century Jacobean revival.

Studding - Intermediate vertical members in a timber-framed wall or partition.

Stugged - Masonry roughly picked or hacked as a key for rendering; also used as a type of surface finish in 19th century.

Substrate - Ground, background; any surface which is to be painted, tiled or plastered.

Suction - The characteristic by which a wet bond is created between lime, and other, mortars and porous masonry surfaces.

Template - A full size pattern of wood or metal used as a guide in repeating or copying a shape in timber, plaster or stone.

Tempera - A mural painting method practised in the Middle Ages, using a medium of gum, egg and water on gesso. A painting medium for powdered pigments, consisting usually of egg yolk and water. Any emulsion used as a painting medium with casein, glue, wax, etc.

Undercut - The underside of a stone or timber projection which has been formed so that it slopes slightly downwards to the projection and prevents liquid (eg rainwater) from running along the underside into the building.

APPENDIX C
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APPENDIX D
GAZETTEER OF SURVIVING DECORATIVE PLASTERWORK AND RECORDS OF PLASTERWORK IN SCOTLAND, 1600-c1675

The following list has been compiled from a range of documentary sources and an archive is held by the Scottish Lime Centre. However it is recognised that information gathered to date is by no means exhaustive and Historic Scotland TCRE would welcome updated or additional information. Locations are listed by their current local authority area but where significant changes of address have occurred, due to boundary changes, former county names are also indicated. Some of the locations may contain only small fragments of original work, or they may now be almost entirely modern restorations of early 17th century decorative plasterwork. Where only records remain in the form of photographs or drawings of plasterwork which has been demolished, the location has been included in the list and noted as such. Some examples may still remain hidden above later ceilings, added when fashions changed.

Note that inclusion of a property in this list does not necessarily imply access.

ABERDEEN, CITY OF

Provost Skene's House, Broad Street, (formerly 45 Guestrow), Aberdeen

Built 1545, twice extended, acquired 1669 by George Skene and altered. Plasterwork dated to 1676, restored 1951-3. Contains 4 ceilings. 1st has rectangular panels divided by double ribs (not enriched) and square central panel; outer corners have thistle motifs, 4 crowns around central square, rose and foliage within. 2nd has series of squares (centre of room and at either end), 4 circles, 2 semi-circles and 4 squares set diagonally with connecting ribs; ribs are run without enrichment; coat of arms and initials (GS for George Skene) in central square, roses and stars in the circles and semi-circles, different rose in the angled squares. 3rd (bedroom) has a sinuous pattern of 4 semi-circles leading into 4 circles; opposed thistles and fleur-de-lys with crowns above at outer corners; central rose in central panel surrounded by crowned, opposed thistles and fleur-de-lys; rectangular panels around outer edge, possibly coved. 4th ceiling (again a bedroom) has a design with a double-ribbed central circle with connecting ribs to 4 satellite (or peripheral) circles; 4 fleur-de-lys at outer corners and 4 around central circle; rose in the centre of each circle, surrounded by 4 bunches of grapes in the outer circles, and 8 terminal figures alternating with bunches of grapes in the central circle. Late use of earlier style. Now a museum, owned by Aberdeen Council.

ABERDEENSHIRE

Arbuthnott House, Aberdeenshire
(formerly Kincardineshire)

Owned by the Arbuthnotts, who were made Viscounts in 1641, there are gabled wings containing 17th century plaster ceilings. Plasterwork in a second-floor bedroom may date from the 1660s, with late 17th century style ribs covered by leafy decoration (no run mouldings, only cast oak leaf enrichment) but with an earlier cast of King David (framed by strapwork) reused as a panel motif. The ceiling layout has large central circle with linking ribs to smaller peripheral circles (as at Provost Skene's House, Aberdeen). Another room has a central circle with a similar rib, but the leaves identical to some at Balcaskie; also foliate cast reliefs in the centre and outer corners. Plasterwork in the drawing rooms and elsewhere is probably c1695, extremely ornate and heavily enriched, but with late 17th century exuberant caryatids, etc similar to work at Whittingehame and Brodie. Privately owned; open to the public on specified occasions.

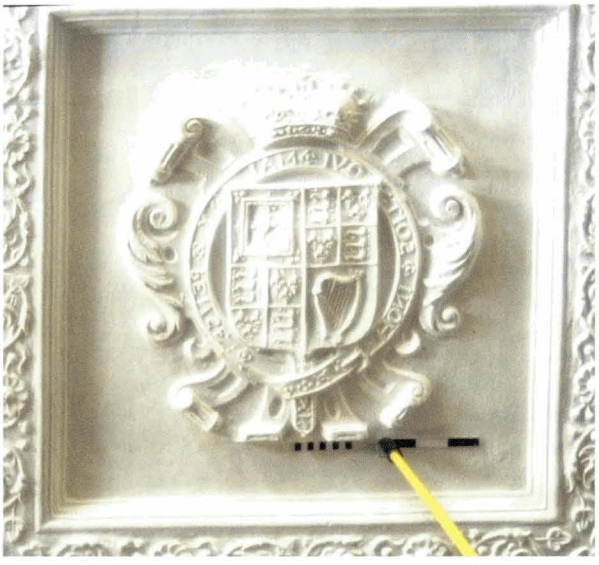
Barra Castle, Aberdeenshire

Fortified laird's house, built first half 17th century (1614 and 1618), altered and extended in 18th century. Sold by the Kings of Barra to the Setons of Meldrum, who occupied it until 1658. Some ceilings may be original early 17th century but with nearly all embellishments removed. Still in use as a private residence.

Craigievar Castle, Aberdeenshire

L-plan tower-house, started by the Mortimers, and sold in 1610 to William Forbes, a zealous covenanter and Sheriff of Aberdeen, who completed it in 1626. The first floor hall is vaulted and plastered, with very large, decorative pendants and wide, shallow, florally-

enriched ribs. The rib pattern has squares and semi-circles, with diagonals at the vaults, and is similar to those at Ballencrieff and Glamis. Cast motifs in the panels include medallion heads (David, Alexander, Lucresia and others, some with reversed letters which makes identifying the moulds easy), coats of arms and initials (MW, WMF) and floral symbols at corners.



Illus 68 Coat of arms set between ribs, Craigievar Castle, Aberdeenshire, with measuring rod. © Scottish Lime Centre

There is a vast overmantel displaying the Royal Arms (the full achievement) with a terminal figure on either side, male and female. There are early 17th century plaster ceilings throughout. Each room is different in character, but can be divided into 3 main variations. The drawing room, white room, blue room and Queen's room have wide, shallow ribs, enriched with a continuous pattern. In the blue and white room these are floral, but the drawing room has an interlaced, celtic form, also found at Glamis and Muchalls. The rib layouts are similar to the hall, but with variations, having squares, circles, quatrefoils, and lozenge shapes. The blue room is dated 1626. Cast motifs include cherub heads, medallion heads, lion heads, coats of arms, rectangular celtic patterns. The white room has a small overmantel with a coat of arms and floral frieze frame, similar to one in the landing to the Queen's room. This landing also has deeper ribs with an unusual alternating motif enrichment. The bedrooms have variations either on narrow, undecorated ribs with an angular layout of panels, and decorative casts in the spaces, or on wider undecorated ribs with designs radiating from the centre of the rooms and no decorative features at all. Some of the same moulds for the cast motifs at Craigievar (for instance medallion heads) were used at Balcarres, Muchalls and Glamis, and it may be that the same plasterers carried out work at all of them. Open to the public (NTS).

Huntly Castle, Aberdeenshire

Remnants of moulded plaster frieze with swirling foliate patterns on 17th century partition inserted into first floor hall in tower. Said to date from 1602-10, when the castle was restored by the 1st Marquis of Huntly (after damage caused by James VI's attack in 1594). In state care, open to the public.

Midmar Castle, Aberdeenshire

Z-plan, central towers built c1570-75; wings 17th century and 18th century. List describes 'original ceiling 1st floor' and 'original plasterwork 2nd and 3rd floors' in central tower. Panelled room on second floor may retain remnants of early 17th century plaster ceiling, but all decoration removed except a ribbed roundel

Muchalls Castle, Aberdeenshire
(formerly Kincardineshire)

The Burnet family remodelled the castle from 1619 to 1627, incorporating older work. Three principal interiors, the laird's study, great hall and dining room, have Renaissance plasterwork of 1624, as lavish as any at this period. The great hall has a rich strapwork frieze and 11 pendants, the central one almost 1m long and hugely elaborate, made of 4 scrolls with protruding human and animal heads. The ceiling is compartmented by wide ribs enriched by fruit and floral decoration. Coats of arms of the Burnets, their relatives and political associates are positioned within ceiling panels and above the windows. Other panels contain medallion heads of Hector, Alexander, David

Illus 69 Strapwork with pendants, and fruit and floral decoration, Muchalls Castle, Aberdeenshire © Crown copyright Historic Scotland

and Joshua. These same moulds were used at Glamis and Craigievar, and previously at Bromley-by-Bow (London 1606), and it could be that the same plasterer worked at all four properties; alternatively, various plasterers could have shared or passed on the same moulds. The dining room is low, with a narrower rib dividing the ceiling into stars and diamonds, framing more coats of arms and medallion heads (heroes, Tarquin and Lucresia, Alexander and Justinian), initials and floral reliefs. The laird's study ceiling is also low, compartmented by wide flat ribs with an interlaced (slightly celtic) enrichment, the panels containing small medallion heads as in the dining room, monograms, lion heads and a rose in a strapwork frame. All 3 rooms have overmantel panels containing royal arms. The castle is now a hotel.

ANGUS

Auchterhouse, Angus

Tower ruined; keep converted to mansion and remodelled for the Earl and Countess of Buchan in the 1620s. South range early 17th century. Plasterwork c1620 in drawing and ante rooms, first floor library and two bedrooms. Richly decorated ceilings with monograms, floreate and foliate decoration. Probably the same plasterer as at the Binns, as many of the patterns are the same. Many elaborate pendants, as also found at the Binns, Winton, Glamis etc, the design usually developed from medieval ceiling bosses. Also displays florally enriched ribs, without any run moulding beneath, as at Pinkie. Privately owned.

Glamis Castle, Angus

Owned by the Lyon family, Lords Glamis (now Earls of Strathmore, and still occupying the castle). Two ceilings have moulded plasterwork dated 1621. Same moulds used as at Muchalls and Craigievar. The ceiling in the drawing room (formerly great hall) is barrel-vaulted, with a symmetrical geometric design formed by narrow, unenriched, moulded ribs. There is a row of large, elaborate pendants along the centre; smaller bosses occur at some rib intersections. Cast motifs in the panels include monograms of John (2nd Earl of Kinghorne) and Margaret Erskine, medallion heads, coats of arms and floral designs. King Malcolm's room has a flat ceiling, slightly coved at the edge, with a more traditional layout of ribs and panels, squares, quatrefoils and lozenges, defined by wider, enriched ribs; the enrichment is an interlaced pattern, slightly celtic in character, similar to the enrichment at Muchalls (laird's study). Cast motifs include monograms, medallion heads, animal heads, rampant lions and formalised foliage. The overmantel is framed by the same floral design as the frieze, and displays a coat of arms, bearers and crest. Privately owned, but open to the public.

EAST AYRSHIRE

Crawfurdland (or Craufurdland) Castle, East Ayrshire

Built by the Crawfords. The west wing incorporates late 15th century or early 16th century tower. The east wing, built 17th century, has a fine ornamental ceiling on the first floor (King's room), dated 1648 and incorporating the Royal arms. Ribs are wide, flat and enriched with a stylised foliage design. Anecdotal evidence from Bill McVey suggests that plasterwork may have been carried out by the Pitts, an itinerant family of 17th century plasterers, who also worked in north east England, Edinburgh and Aberdeenshire. Privately owned.

EAST LOTHIAN

Auldhame, East Lothian

Ruined 16th century mansion, probably built by Sir Adam Otterburn of Reidhall, King's Advocate and Provost of Edinburgh before the Reformation. On the first floor there is a fragment of 17th century plaster frieze, hunting scene with dogs. Privately owned.

Ballencrieff, East Lothian

Rectangular tower-house, SW part built late 16th century and early 17th century, by 1st Lord Elibank. North front and east end added c1730. It was the home of Sir Gideon Murray of Elibank, Depute-Treasurer of James VI during the period of refurbishment of Edinburgh Castle for James' 'homecoming' in 1617. Two early plaster ceilings dating from c1617, perhaps by the same plasterers as at Edinburgh Castle and Kellie (Viscount Fentoun was a neighbour of Murray's in old Haddingtonshire). These ceilings and the roof above them collapsed in 1868, when the mansion was burnt out. Restored late 20th century. Enough remained of one ceiling in 1992 to record it, and it was reconstructed to a similar design with modern materials. Run ribs, unadorned, of middle width; square central panel containing the initials SGM (for Sir Gideon Murray) with 4 lozenge-shaped panels around it and 4 circular panels at the corners. Other initials (DPM for his wife) and motifs found, including horn from Murray coat of arms. Privately owned.

30 High Street, Haddington, East Lothian

List describes building as 18th century, but RCAHMS photos taken 20th century show 17th century ceiling in ground floor room. Central roundel; simple, narrow, run ribs and cornice. Motifs include central rose or mask, fleur-de-lys, terminal figures, stars, etc, scattered outside roundel, winged cherub head, lion rampant, honours of Scotland, etc inside. Condition was very

poor when photos were taken. Ceiling - no longer visible; concealed or perhaps demolished.

Lennoxlove (previously Lethington), East Lothian

Tower house, enlarged 1676 by Sir William Bruce and altered by Robert Lorimer, 1912. The second-floor lady's bower has a geometric ceiling of square and star patterns with little pendants. It may date from 1632 as does the panelled overmantel (although the central overmantel panel with shield and arms – possibly removed from elsewhere – is dated 1618). Motifs include crowned monograms (an earl's coronet and the initials IMS for John Maitland, 2nd Lord Thirlestane, 1st Earl of Lauderdale, and Isabel Seton, his wife), their armorial bearings, and winged cherub heads. The cornice is heavy and simple. On the next floor up, the Duchess of Lennox's room has a coved ceiling with diagonally opposed thistles and roses. The earliest plasterwork is probably a ceiling in the ground floor sitting room in the east wing, where a date of 1618 remains in the panel over the fireplace. Privately owned but sometimes open to the public.

Pilmuir House, East Lothian

Laird's house built 1624 with early 18th century alterations, which originally belonged to the Cairns. 17th century ribbed plaster ceiling in drawing room could be original. Central roundel linked by 4 plain ribs to corner arcs; very few decorative features; opposed roses and thistles in square frames at centre of each side of the room, plus a flower motif at centre and corners.

Pinkie House, Musselburgh, East Lothian

Later 16th century L-plan house, extension started c1613, but not finished until later. The initials AS.ED and AS.MH appear frequently in the decoration (Alexander Seton, chancellor to James VI, who became 1st Earl of Dunfermline in 1605, and his wife Margaret Hay, married 1607). One room on the 1st floor and 3 rooms on 2nd floor have early 17th century plaster ceilings. Earliest plasterwork (copied at Winton) in the green room or hall is said to be 1613, has rounded cast floral enrichment forming ribs (without any run mouldings), forming a pattern of 4 squares and 5 circles linked by ribs, with delicate floral motifs (fleur-de-lys and roses) in outer circles and squares. A portrait medallion in strapwork frame occupies the central circle; the spaces between have terminal figures and branches with thistles, roses, acorns, etc., also crowned monograms and cinquefoil in crescent. The 3 rooms on the 2nd floor have 'probably the finest 17th century plaster ceilings in Scotland' (RCAHMS Inventory). In the King's room (N), ribs are wide and shallow, enriched with a floral

Illus 70 Rounded, cast floral enrichment, Pinkie House, Musselburgh, East Lothian © Scottish Lime Centre

pattern incorporating roses, fleur-de-lys, etc. (similar to Bromley-by-Bow?). There are massive and elaborately wrought pendants; many of the motifs are the same as in the green room, suggesting that the date might be the same, or at least the moulds; however they also include more elaborate scenes such as a lion (or deer, or unicorn?) among foliage. The layout of ribs and panels is more elaborate, and there is a cove and (later?) cornice around the edge. The Seton room (south) has ribs as in the green room, but a more elaborate and sinuous overall design, plus a Seton coat of arms above the fireplace. Both here and in the turret stair and passage, crowned monograms and cinquefoils in crescents recur. Elsewhere in the house there are also plaster ceilings in a later style from c1700 to 1740, with the initials SIHM for Sir John Hay and his wife, to whom it passed in the 1690s. Charles I stayed here, as did Bonnie Prince Charlie. Now part of Loretto School (private).

Whittingehame Tower (formerly Castle), East Lothian

Late 15th century to early 16th century L-plan tower house, with more recent extensions. First floor drawing room (or hall) has outstanding 17th century plasterwork, similar to Lennoxlove and House of the Binns, suggesting that the same workmen were employed and perhaps a date of c1630. But it has also been compared to late 17th century work at Brodie and Arbuthnott, c1680-95. Wide ribs with naturalistic enrichment, including flowers, fleur-de-lys, birds, serpents, squirrels, etc, very similar to those at Moray House and Winton. Heraldic, mystical and fertility symbols in the panels are also similar, and motifs

include the winged naked lady among foliage (terminal figure), clothed female figure, lions, sprays of flowers, fruit, vines, etc, some stylised and with mythical creatures. Less usual are the grotesque human masks. Recently restored. Privately owned.

Winton House, East Lothian

Built 1620-27 for the Setons, Earls of Winton, by William Wallace, the King's mason, with plasterwork by John Quhytte (or White). The plasterwork is said to be identical to earlier work at Pinkie, and was evidently executed from the same moulds. Library (King Charles' room, 1st floor) has fine early 17th century plaster ceiling, frieze and chimneypiece, c1635. The frieze is deep and employs a repeated motif of a vase of flowers within an architectural frame of arches and pediments. The triangular pedimented overmantel contains a circular wreath device set on surging waves, all strapworked. The ceiling has large and elaborate pendants, and wide, shallow, decorated ribs. The layout is a central square panel linked by ribs to lozenges and these linked again to outer squares; the pendants are at the corner junctions between the lozenges. There are royal, ornamental and heraldic devices, including a central royal coat of arms, the honours of Scotland, crowned rose, thistle, fleur-de-lys, harp and portcullis, and winged cherub heads. Initials CR on the ceiling for Charles 1, who apparently stayed at Winton in 1633 on his way to and from Edinburgh. The adjacent drawing room (formerly the Great Hall) has a magnificent frieze with heavily moulded enrichment, including repeated winged cherub heads, birds, fruit, etc. Above the fireplace is a band of arabesque plasterwork very beautifully executed (beneath the frieze) and a heraldic panel with bearings, supporters, crown and banner, showing the union royal arms and the motto UNIONI UNIO (by union a unity). The ceiling is very elaborately worked, divided into panels by similar enriched moulded ribs, but with diagonally set squares, and petal shapes with inset squares. The RCAHMS inventory states that the Seton arms are in the central panel. Cast motifs on the ceiling include winged cherub heads, flower vases, fleur-de-lys, and beneath a coronet, initials, 3 crescents intertwined or a star. There are also good plaster ceilings to bedrooms, the main bedroom illustration showing narrow, unadorned ribs, in a pattern with squares or circles inset in 4-petalled forms, linked by arced ribs; few relief motifs, except in the squares or circles, these being fruit or flower vases, and 4-leafed decoration around small pendants. A mermaid set within pseudo strapwork framing in a ribbed panel is very similar to one at Newbattle Abbey. Private house (may be open to public on limited basis).

EDINBURGH, CITY OF

Abbey Strand, Edinburgh

Within the 2-storey 17th century building (east of the earlier 4-storey structure) at 1st floor level, front, there is a simple 17th century compartmented ceiling, extended 1935. It has 6 sections, with circular panels at all corners. In state care, not open to the public.

Baberton House, Edinburgh

Built in 1622-3 by James Murray of Kilbaberton, master of the King's Works. On the principal floor, the office (formally withdrawing room) adjacent to the dining room, has a ribbed and enriched ceiling; narrow ribs with a cast relief in each compartment; stars in the outer panels, the inner have items from the national arms of Great Britain (except the Scottish lion); Prince of Wales (ostrich) feathers, and fleur-de-lys (the Tudor emblems, similarly employed at Winton), thistle, lion, portcullis, harp, rose as at Muchalls and Craigievar (some slipped below a crown). East wing drawing room has plaster cornice enriched with bayleaf garland, possibly late 17th century or early 18th century. Now commercial offices, privately owned.

Illus 71 Ribbed and enriched ceiling, Baberton House, Edinburgh. © Crown copyright RCAHMS

Croft-an-Righ, Holyroodhouse, Edinburgh

16th century house, reconstructed later 17th century; probably built by James Stewart, Earl of Moray and Regent of Scotland. The first floor of the main block has a moulded plaster ceiling of earlier 17th century, divided by a later partition. Narrow moulded ribs compartment the space into circles and squares, containing reliefs of crowned lions, griffins, a man clad only in breeches and hose, terminal figures, sprays of fruit and foliage, roses, fleur-de-lys, lion and human masks, sea creatures and other devices. Small bosses on the ribs sit among leaves. Similar emblems were used at Newbattle, Merchiston, etc. Now Historic Scotland local offices.

Dalry House, Edinburgh

17th century Z-plan house, perhaps 1660s, and later 18th century and 19th century additions. Compartmented plasterwork dated 1661, in 1st floor hall (the King Charles room in the original front 3 bays); some features survive, heavily restored. Junctions of panels are circled and enriched with pendants; in each panel is a moulded plaster ornament or 'stamp'. The same emblems are also found in other plasterwork of this date, where the same moulds may have been used - at Stenhouse, Merchiston and Gorgie House, for instance - including Scottish crest/honours of Scotland, with Charles 2 initials, a crowned Saltire, lion rampant and mullet, thistle stepped, fleur-de-lys, terminal figures, cherubs' heads, vine slip and rose on a cartouche. Now an old people's day centre owned by City of Edinburgh Council.

Edinburgh Castle, Edinburgh

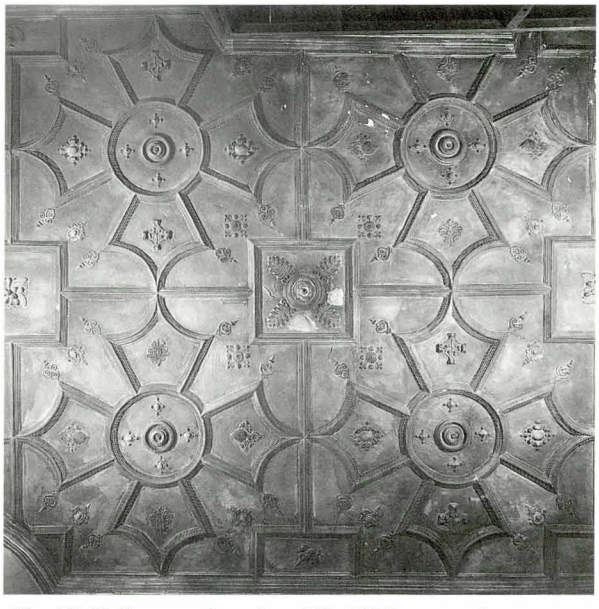
The palace had original plasterwork of 1617 (for James VI's visit to Scotland that year) in the Laich Hall and Presence Chamber (previously called the King's Dining Room and Ante-Chamber) which had been removed. Moulds were brought from Kellie Castle to be reused at Edinburgh in June 1617. Some of the plasterwork was thought to have been carried out by John Johnstoun from York. The two ceilings and over-mantels were totally reconstructed in the 1990s, based on one small section of original frieze, which was also found at Muchalls Castle; the designs and motifs were also based on those at Glamis, Muchalls and Craigievar Castles. The plaster mixes were based on samples from Thirlestane Castle. The castle is in state care and the rooms are open to the public.

Gorgie House, Edinburgh. Demolished

Original house was L-plan 17th century, screened by later additions, and has all now been demolished. The south chamber (dining room) on the ground floor of the main block had a plaster ceiling dated 1661. Narrow ribs divided it into compartments bearing in relief such devices as terminal figures, cupids, fleur-de-lys, thistle slips, lion masks and stars. The circular central roundel contained a vine pattern and small pendant. Another panel had a crown, St Andrew's cross and the initials CR2, dated 1661; in another, CR2 above the Scottish Crest, with the royal regalia and 1661 date, above an inscription (as at Merchiston).

302-310 Lawnmarket, Brodie's Court/Close (Roman Eagle Hall), Edinburgh

Behind the Lawnmarket tenement, to the west of Brodie's Close, lies a three-storey 16th century mansion with a 17th century extension. The 1st floor hall, made by combining three rooms, has moulded plaster ceilings in the middle and south sections dated 1645 and 1646. Ornately compartmented by plain ribs, the first into St John's crosses enclosed by Greek crosses, and the second into petal shapes and squares (the pattern is similar to the Balcony room in Moray House, although the ribs here are narrow and unadorned). The motifs include winged dragons, geometrical shapes and stylised flowers, leaves, etc, with some strapwork framing. Owned by City of Edinburgh Council, and used as masonic hall; access difficult.



Illus 72 Hall, central section, 302-310 Lawnmarket, Brodies Close, Edinburgh.© Crown copyright RCAHMS

322-328 Lawnmarket, Riddle's Court or Close, Baillie John McMorran's House, Edinburgh

Behind the 18th century building facing onto Lawnmarket, there are two L-plan houses, built c1590 by Baillie John McMorran, restored by J Wilson Paterson 1964. In the south west building, said to be McMorran's own dwelling, there is an early/mid-17th

century plaster ceiling, in the south east room, 1st floor. It is symmetrically compartmented with squares, circles and curves, the ribs framing thistles, roses, acorns, fleur-de-lys and lions, etc, and a strapwork sub-frame to the central motif. In the north building, 2nd floor west room, is a plaster ceiling said to be dated 1648 (but could be read as 1684), with narrow ribs defining a large central circle surrounded by 4 smaller circles and 4 semi-circles, these containing crown, thistle, rose, lion and winged cherub head motifs. The royal regalia has the initials CR2 (the mould adapted from earlier use as CR), which suggest the later date of 1684 (since Charles II did not come to the throne in Scotland until 1649, and most CR2 ceilings date from after the restoration in 1660).

Merchiston Castle, Edinburgh

15th century keep owned by the Napiers, now enclosed by modern university buildings. Hall (east room) on second floor has plasterwork c1662, with a central pendant, four rectangular compartments, central circle and arcs. Relief motifs include royal crest and honours, the sword and sceptre exhibited in Saltire, flanked by CR2 (apparently reusing an earlier CR casting with the addition of the 2) beneath a crown and with an inscription (meaning '108 forebears handed these down to us unconquered'; also used at Gorgie House, Dalry House, Woodhall House and other 'restoration' period ceilings). There are heads of King David and Alexander the Great in round frames, fleur-de-lys as well as lions and winged cherub heads. Within the unadorned double ribs at the centre, individual, smaller reliefs of stars, crowns, lion heads and naked female torsos have been used. At the centres of the four subsidiary circles are vine motifs, with small pendants. Although the plasterwork date is later 17th century, it utilises early 17th century style and motifs, as do similar 'restoration' ceilings. Former hall now Principal's room, part of Napier University.

Moray House, Canongate, Edinburgh

Town house built c1625. Notable plasterwork by John White c1628; domed ceilings are particularly unusual. Over the turnpike stair, a central column supports a bowl-shaped ceiling with moulded ribs and enrichments. In the first floor south (Cromwell) room, is a domical ceiling with four main corner rib divisions, rising to a saucer at the top. Each compartment is divided into a number of small panels by narrow subsidiary ribs in a repetitive, geometric pattern. Panel motifs include low reliefs of lions, winged dragons or griffins, sprays or vases of flowers, thistles, heads, figures and fleur-de-lys. In the balcony room to the north, another domical ceiling, with 4 main ribs meeting at a central pendant, plus a smaller pendant on each rib. Within each quarter, wide, enriched ribs in a pattern of petals and squares. In the panels, many of the same motifs as in the south room, but with winged cherub heads, and some unusual figures, such as the naked woman standing in a thicket. The enrichment on the ribs in the balcony room - birds, foliage and serpents - appears to be identical to that at Winton, also by John White, and motifs such as the vase of flowers are also the same. (Mapledurham, Oxfordshire 1613, apparently also has a griffin frieze similar to the ceiling here). The cornices are later. Now occupied by University of Edinburgh.

Moubray House, 51-53 High Street, Edinburgh

2nd floor front room, a fine modelled plaster ceiling c1630-40, with narrow moulded ribs in a delicate pattern of squares, circles and lozenges. Panel reliefs include terminal figures, winged cherubs' heads and floral motifs, also heraldic devices (cinquefoil, crescent and crown). These motifs echo those at Moray House for example, but are in a much simpler form. Painted plaster fragment above fireplace dated 1630. Owned by Cockburn Conservation Trust and let on a long lease.

Niddrie House or Niddrie Marischal, Edinburgh
Demolished

C16 L-plan tower house, with 17th century wing and later extensions, demolished in 1959. It was owned by the Wauchope family in 17th century. 1st floor dining room, remodelled in 18th century, retained a portion of a modelled plaster ceiling dated 1661, commemorating Charles II's restoration. Each of the 4 main rectangular compartments had a central pendant, within 2 opposed roses (a star above each) and 2 opposed thistles (a crown above each), and had corner panels containing individual motifs including the royal regalia, lions, winged cherub heads, and floral devices (possibly with sea creatures). A date of 1661 had been added, and a 2 put in alongside CR, in a reuse of earlier casts or moulds. The ribs were narrow, but doubled along the central divisions, with a very ornate frieze between them. This had a strapwork top border incorporating birds, with fruit and foliage below, framing winged cherubs' heads (similar to reliefs at Newbattle). The style of the 4 quadrants was early-17th century, but the frieze had a richer, later feel. There also appears to have been a very grand plaster ceiling with 3 pendants over the stair hall, but this may well have been later.

Pilrig House, Edinburgh

L-plan tower house, built 1638 by Gilbert Kirkwood, a goldsmith. The interior was totally destroyed by fire 1960s; restored 1984-5, but no original plasterwork survives. According to RCAHMS inventory, 3 rooms on the ground floor and a suite of 3 rooms on the 1st

floor had heavily moulded plaster cornices. Photos show shallow ribs compartmenting a ceiling, with reliefs in the inner panels, but dating for this is not clear.

Saughton Hall, Edinburgh. Demolished

17th century L-plan tower house built by the Ellis family, with later extensions, now demolished. At first floor, 2 rooms had early plaster. In the south room; the EAA drawing shows wide moulded ribs enriched with a design incorporating thistle, rose, shamrock, fleur-de-lys, etc, which divided the ceiling into four quadrants, plus a central circle, and four semi-circles at the junctions of ribs with walls. Motifs used in the panels included winged cherub heads (in semi-circles), lion heads (on either side of main ribs), four thistles or four roses around a square (in the centre of each quadrant), four (acanthus?) leaves in the centre and vines at each corner. The other ceiling was richer and more elaborately ribbed. A photograph shows a similar style of rib, but lozenge-shaped panels and an unusual relief, framed with a simple moulded rib and showing a hunter in 17th century garb on horseback, accompanied by a hound. Motifs included lion rampant, Seton dragon, star, cherubs' heads, and a 'curious renaissance ornament comprising a nude human trunk and head, the former terminating in a rude variety of acanthus leafage, the latter 'horned' with rudimentary volutes' (RCAHMS). On the 2nd floor, west end of main block, a 3rd enriched ceiling bore rose, vine and fleur-de-lys motifs and scrolled cartouches (very sharply defined so possibly a reproduction).

Stenhouse Mansion (or Stenhouse Mill (House)), Edinburgh

16th century F-plan tower house, extended 1623 for Patrick Ellis, a prosperous merchant of Edinburgh. Second floor has 17th century moulded plaster ceilings (c1661), north one very simple, south one grander (with simple rounded ribs and small pendant; reliefs include royal emblems, female terminal figures, lions, lion masks, thistles, roses, fleur-de-lys, vines, foliage and cherub heads). Isolated 'restoration' period motifs on wall: honours of Scotland, lion holding sword and sceptre, Saltire and crown, CR2 (probably earlier Charles I moulds adapted and reused). Possibly the same moulds were used at Dalry House; certainly the motifs and the design are very similar to Merchiston. Restored 1964 by Albert Cram. In state care, not open to the public (Historic Scotland Conservation centre).

Woodhall House, Edinburgh

Built in 1630, there is a 17th century ceiling in left room on the main floor, with roundels of David and Alexander, and the inscription 'Nobis haec invicta miserunt 108 proavi' (as at Merchiston Castle), suggesting a 'restoration' period for the plasterwork, probably 1661-2. Privately owned.

FALKIRK

Bonhard House, Falkirk. Demolished
(formerly West Lothian)

16th century and later 17th century L-plan laird's house, demolished in 1972. Owned by the Cornwalls of Bonhard. Three 1st floor chambers had ceilings panelled in plaster in geometric patterns, with fruit and flower motifs; possibly mid to late 17th century. The drawings show plans and details for 2 rooms; deep narrow ribs without enrichment, 9 panels in both cases, but one more traditional than the other (central square linked by ribs to 4 lozenges and 4 roundels on the outer corners). The other has 5 more ornately shaped panels and 4 roundels. Motifs are only within the panels, and include fleur-de-lys, masks, stars, roses, thistles, terminal figures, nude figures, vases of flowers, and leaves, fruit or flowers radiating from a central point.

FIFE

Balcarres House, Fife

Mainly modern but incorporates late 16th century Z-plan house. A property of the Lindsay Lords Menmuir from 1587, the family became Lord Balcarres in 1633, then Earl of Balcarres in 1651, when Charles II visited. First floor hall ceiling dates from c1630; it contains casts of David, Joshua, Hector, Alexander, Royal Arms (in the central compartment), rib and other enrichments. An earlier painted ceiling lies above the plaster. The design and casts are very similar to Bromley-by-Bow, 1606, and Geoffrey Beard suggests (1975) that James Murray might have been the plasterer for both. (There is also a Bryce copy, 1863-7, of the 17th century Winton House library ceiling in the dining room, now the library). Privately owned.

Balgonie Castle, Fife

14th century keep and ranges around a courtyard dating from 14th century-18th century. Sold in 1635 by the Lundies to Alexander Leslie (who fought against Cromwell and was imprisoned in the Tower of London). Castle ruined, but more recently restored. Attic room in tower house has fireplace with fragmentary armorial plaster panel dating from C17 (c1640, carved with the arms of the 1st Earl of Leven. Badly damaged, but one support – a soldier – survives). There may also be a 17th century ceiling in the estate office. Privately owned; open to the public.

Earlshall, Fife

Tower-house built by Sir William Bruce in 1546 and restored by Lorimer 1892. It is known for its painted ceilings, but on the first floor hall in the main block, where Lorimer combined two rooms, the east part has a mid-17th century plaster pendant hanging from the ceiling. Privately owned.

341 High Street, Kirkcaldy, Fife

16th century and 17th century 2-storey and attic block. Deeply moulded cornices to 1st and 2nd floors. 1st floor west, plain 17th century coved ceiling in 2 compartments (inner large and outer small). Richer ceiling in east apartment, also divided into 2 compartments by 16th century structure; larger inner compartment with richly modelled oval, flanking cherubs and angle mouldings incorporating rose and thistle; inside the oval 2 terminal figures and 6 flowers (perhaps roses) radiating from the centre. The moulded ribs and foliate enrichment of the oval are reminiscent of Balcaskie (1674), although not as heavy or elaborate. According to the list description, a date of 1672 is suggested by a plain version of the oval at a nearby house of this date (225-229 High St, destroyed by fire). The smaller front compartment is marked off by a decorated beam. Ribs are doubled, with frieze-like ornamentation between (incorporating foliage, animals and fleur-de-lys); a central square and a lozenge on either side, each with a central rose; the square has 4 radiating lion heads with hanging fruit above. Owned by Scottish Historic Buildings Trust.

Kellie Castle, Fife

Built 14th century onwards; sold in 1613 by the 5th Lord Oliphant to Sir Thomas Erskine of Gogar, made Earl of Kellie in 1619, a favourite of James VI. Restored by Lorimer 1878. Early 17th century plasterwork in library (former bedchamber) in south-east tower, 1617; wide run ribs with scroll enrichment on the soffit; panel motifs in strapwork or round frames include 1617 date, initials TVF (for Thomas Viscount Fenton), stylised rose, human/medallion heads and lion masks. Moulds were taken from Kellie for reuse at Edinburgh by James Murray, who may have been the plasterer (see also Balcarres). Geoffrey Beard (1975) also suggests that work could have been carried out by John Johnstoun, a plasterer from York who did work at Edinburgh Castle. Later 17th century plasterwork in the drawing room (or hall or Earl's room), where the ceiling has a moulded cornice of plaster and is divided by shallow ribs (unenriched) into rectangular panels, with a line of 3 square central panels containing coats of arms. The middle one is dated 1676, and a garland in high relief surrounds the full achievement. The dining room, probably of the same date, has narrower moulded ribs, 4 quadrants and a central roundel containing a garland, crown and shield. The Vine room, in the east tower above the library, has a coved and richly ornamented ceiling, dating from the last quarter of 17th century. In the centre, a round painting by the Dutch artist De Witt, surrounded by heavily moulded and modelled framing plasterwork. On the coved surfaces is a delicate vine design. Two rooms at 2nd floor level in the main block have plaster ceilings; the central room is coved with enrichments, and a square central panel dated 1676 and enclosing a shield; the east room has a plain ceiling with lion masks and swags in the corners. Open to the public (NTS).

Wemyss Castle or Hall, Fife

15th century keep with other buildings round a courtyard and later additions. A property of the Wemyss family, who were made Earls of Wemyss in 1633. Charles II visited in 1650 and 1657. Ceilings within C17 south extension (probably built 1640-1650): south room on upper floor state apartments, King's Bedroom, has a fine 17th century plaster ceiling, ribs enriched with foliaged ornamentation, small pendants, relief casts (medallion heads) of Kings David and Alexander in the compartments. Although the motifs are early, the moulds may have been used at a later date for the plaster itself. Dressing room in the adjoining south east tower and bedroom to the west both contain enriched ceilings, the former having also a border of acanthus leaf pendants, and thistles, roses and fleur-de-lys to modelled plaster frieze; the latter has star, cherub holding roses and fleur-de-lys motifs. Earliest date uncertain, but some later work carried out in 1672-3 (a Danish plasterer, John Nicoll). Privately owned.

MIDLOTHIAN

Hawthornden, Midlothian

15th century tower, 16th century structure and 17th century mansion. Owned by the Drummonds during 17th century. Apparently at least one room on 1st or 2nd floor has 17th century plaster ceiling ('room on 2nd floor of mansion has its ceiling simply panelled in plaster' (RCAHMS); '1st floor east bedroom has crudely moulded ceiling, central panel and radiating plaques' (Buildings of Scotland)). Now a writers' retreat; not open to the public.

Newbattle Abbey, Dalkeith, Midlothian

Built on site of 12th century Cistercian monastery, remains incorporated into 16th century L-plan tower house, extended late 17th century and altered 18th century, 19th century and 20th century. The Kerrs acquired the abbey after the Reformation and were

made Lords Newbattle in 1591 and Earls of Lothian in 1606. 17th century plasterwork in first floor dining room and library ceilings, compartmented with narrow ribs. The dining room features a small central boss, 4 square panels containing strapwork frames to mermaid, stag's head and sun motifs, surrounding petal shaped panels holding stylised plants from which twinned sea creatures are flowing out, with winged cherub heads and with fruit patterns beyond. The library is in two slightly varying sections, one with bosses. The major motifs are larger, more detailed and elaborate than most: a winged nude female arising from among foliage and fruit; a winged cherubs head set amongst foliage, fruit and birds, with a strapwork top border; a symmetrical 4-branched vine as at Merchiston Castle. Winged dragons and crowned lions are diagonally opposed, alternated with fruit and foliage (including acorn, thistle and rose). The exotic sea creatures and mermaids in the dining room are also used in the library. Given to the nation by 11th Marquis of Lothian; now a residential college.

Roslin (or Rosslyn) Castle, Midlothian

Ruined 14th century keep, with late 15th century and 16th century tower and ranges, modified in 1622 and 1690. The main stronghold of the Sinclair Earls of Orkney and Caithness. In north room at courtyard level, 1622, for 6th Earl, a highly decorative coffered plaster ceiling. The 9 coffers are square, each divided into 4 subsidiary compartments; ribs are adorned on the soffit by running enrichment of birds and foliage. The coffers are adorned with floral garlands and fleur-de-lys, as well as fruit such as grapes and pomegranites, amid which animals, probably hounds, gambol. Outer coffers have a central roundel containing a merman cast, and in the centre is a square panel containing a shield bearing an engrailed cross, supported by a mermaid, with a comb in one hand and a trail of seaweed in the other, and by a griffin; helm and mantling above the shield with a label and a griffin, the initials SWS and the date 1622 (originally 1623?) Ownership private and Landmark Trust.

MORAY

Brodie Castle, Moray

16th century Z-plan tower-house, incorporated into later additions, particularly 19th century William Burn extension. Earlier plasterwork dates from 1635-40, in the vaulted blue sitting room (with embossed plaster motifs and wide, shallow, enriched ribs) and the best bedchamber (with ceiling frieze and corner motifs). The ribs are not rigidly straight (perhaps because of the difficulties of running them on a curved surface) and the motifs are set on a thickened base plinth; some are rather stiff in form, unlike those elsewhere, but giving them a slightly naïve charm. The ornate and elaborate plaster in the dining room is late 17th century, probably c1680 or later, and was described by Geoffrey Beard as exuberant, characterised by a flamboyant display of caryatid figures and strange creatures of the deep sea, (similar to Whittingehame and Arbuthnott). Still occupied by the Brodie family. Open to the public (NTS).

PERTH & KINROSS

Castle Menzies, Perth & Kinross

An extended Z-plan castle, the seat of the chiefs of the clan Menzies, built by Sir James Menzies in the 1570s. The main block is 3 storeys and an attic, with square towers of 5 storeys projecting on opposite corners. William Burns additions dated 1839 include the porched entrance. 'Some of the interesting old finishings are still preserved' (McGibbon and Ross). Ian Gow of NTS visited a few years ago and noted plaster motifs similar to other 17th century ones. Owned since 1957 by the Clan Menzies.

Elcho Castle, Perth & Kinross

16th century Z-plan tower-house. Held by the Wemyss family from 1468, made Lords Elcho and Earls of Wemyss 1633. Remnants of early 17th century (perhaps 1630s) moulded plaster cornice in private room first floor. Chevron pattern, interspersed with rose, thistle and fleur-de-lys, very similar to the rib enrichment at the French Ambassador's House in Linlithgow, c1630. In state care; open to the public.

SCOTTISH BORDERS

Thirlestane Castle, Scottish Borders
(formerly Berwickshire)

16th century castle built by Sir John Maitland, James VI's chancellor, created Viscount Lauderdale in 1624. Early 17th century (c1620) ceilings on upper floor, similar to ones of the same period at Kellie, Balcarres, Muchalls and Craigievar (partly restored with late 20th century techniques). The plasterers may also have worked at Edinburgh Castle, and moulds were made for use in the 1990s' reconstructed ceilings in Edinburgh Castle from casts taken at Thirlestane. Wide moulded ribs decorated with a running floral pattern, and compartments containing medallion heads of 4 of the 9 worthies (Alexander, Hector, David and Joshua) after engravings by Nicholas de Bruyn. One of the panels incorporates the initials SIM for Sir John Maitland; another panel shows his arms. The castle was remodelled in 1670 by Sir William Bruce for John Maitland, Duke of Lauderdale. Elaborate, highly sculpted, baroque ceilings were installed as part of this

refurbishment in 1671-5, by the same plasterers as were concurrently carrying out work at Holyroodhouse (Dunsterfield, Houlbert, Alborn and Lindores). Privately owned; open to the public (not the earlier 17th century ceilings at present).

WEST LOTHIAN

House of the Binns, West Lothian

17th century mansion, built 1621-30 for Thomas Dalyell, of a strongly Royalist family (subsequently altered; original house is north west part). Notable for c1630 plaster ceilings by Alexander White, with patterns similar to those at Auchterhouse. On 1st floor, King's Room has modelled frieze (fruit swags and cherubs' heads) and finely modelled ceiling with central pendant, Royal Arms above fireplace. Wide ribs enriched with mermaids and nude female figures, birds, animals, etc. Motifs include medallion heads of David, Alexander, Lucresia, etc, cherubs' heads, vases with foliage, rose, thistle, fleur-de-lys and harp. Central room (drawing room) has a less elaborate ceiling dated 1630, with narrow undecorated ribs in a geometric pattern and a central pendant; panels contain monograms (the initials TDIB for Thomas Dalyell and Janet Bruce, his wife), heads, lion masks, stars, crescents, fleur-de-lys, and impaled arms of Dalyell and Bruce (on the right side a crescent between 2 mullets in chief, a naked man; left a saltire and chief on a canton a lion rampant). Above the fireplace the arms are repeated on either side of panel bearing Royal Arms (Scotland). Sitting room to west has flat floreated ceiling, divided into quarters by wide shallow ribs with the same enrichment as the King's room; terminal figures to central corners. The sea room on 2nd floor has arched floreated ceiling, wide shallow ribs with the same enrichment, pendants along the centre of the vault and bosses in square panels to either side; leaves, foliage and human heads in reliefs. Open to the public (NTS).

Illus 73 Arched, floreated ceiling in Sea Room, House of the Binns, West Lothian. © Crown copyright RCAHMS

20 High Street, French Ambassador's House, Linlithgow, West Lothian. Demolished

Plasterwork c1630. Now demolished. Photographs show wide shallow ribs, dividing the ceiling into 4 quadrants plus a square central panel; enrichment on the ribs a geometric pattern (chevron, similar to Elcho) with fleur-de-lys, roses and thistles; at the outer corners of the central panel, a rose, thistle, harp and fleur-de-lys; inside 4 cherubs' heads and a central star; a short length of frieze with 2 hanging fruit swags and 2 flower vases in arched frames.

OTHER SCOTTISH DECORATIVE PLASTERWORK c.1600-1675: SURVIVING REMNANTS OR EXAMPLES LOST WITHOUT RECORD

ABERDEENSHIRE

Crathes Castle, Aberdeenshire
(formerly Kincardineshire)

Modified L-plan tower-house. There are inset panels dated 1553 and 1596 which appear to be of plaster. Open to the public (NTS).

EAST LOTHIAN

Preston Tower, Prestonpans, East Lothian

15th century L-plan tower house with top storeys 1626. First floor hall has moulded plaster cornice 16th century at springing of vault. Tower ruinous, but traces of plasterwork remained in 1924.

EDINBURGH, CITY OF

Brandfield, Edinburgh. Demolished

Said to have had 17th century plasterwork, but now demolished, and no record appears to remain.

George Heriot's School, Edinburgh

Building started 1628, finished 1693. There are coffered plaster ceilings in the refectory and in the council room, probably later, but part might just be original. It is not known if any of the earlier work survived later schemes.

Holyroodhouse, Edinburgh

Only late 17th century plaster ceilings survive (c 1676-78 by English plasterers John Houlbert and George Dunsterfield, as is Balcaskie and the later work at Thirlestane; the plasterer Thomas Alborn from Glasgow also worked here, and at Stirling Castle and probably at Kinross House). However, there is documentary evidence of earlier plasterwork being carried out in 1618 and 1633. Crown property, open to the public.

Tailors' Hall, 137 Cowgate, Edinburgh

Hall on south side of site completed 1621. Building to north along Cowgate c1643, demolished 1940, had a plaster ceiling in 1st floor room; 'a rather interesting ceiling of plaster, in the centre of which there appeared, something like the bust of a woman with a feathered head-dress' (perhaps a terminal figure of winged lady as at Whittingehame, Moray House, etc?).

FIFE

Balfour House or Castle, Fife

Late 16th century house, later extended, now a ruin/demolished, said to have contained early 17th century plasterwork.

Otterston Castle, Fife. Demolished

16th century L-plan house, extended 17th century, now demolished. 1st floor room had 17th century panelled ceiling in plaster.

PERTH & KINROSS

Stobhall Castle, Perth & Kinross

Dower House stair has plaster panelling of 1671. Generally slightly later 17th century style, but includes motifs which appear to be derived from earlier work.

SCOTTISH BORDERS

Fairnington House, Scottish Borders
(formerly Roxburghshire)

Last decade of 17th century, but wing incorporates 16th century structure. Enriched plaster ceiling in south-east room. North-east outbuilding is modern.

STIRLING

Cardross House, Stirling

Late 16th century tower-house within later building. One ceiling survives from 1598, with a later frieze.

Carnock House or Castle, Stirling

The house was built in 1548 and 1634, and is now ruinous or demolished. A fragment of a mid 17th century plaster ceiling (1646-64) is preserved at Kinneil House, West Lothian.

SOUTH AYRSHIRE

Auchans Castle, South Ayrshire

Built 1644 but with earlier nucleus. Ruinous. Not known if plasterwork fragments survive.

WEST LOTHIAN

Linlithgow Palace, West Lothian

17th century plaster fragments, including pieces of rib and cornice, and cast lions. These are no longer in situ, but are on display in the palace. The Long Gallery (north range) retains evidence of the timber supports for the heavy cornice. The plasterwork was carried out c1620 on the instructions of James VI after his visit to Scotland in 1617. In state care, open to the public.

SCOTTISH DECORATIVE PLASTERWORK c1670-1700 OF LATER STYLE

EDINBURGH , CITY OF

Caroline Park, Edinburgh
Front range dates from 1585 (converted 1685-93), though rest is late 17th century, baroque/rococo style. The majority of the plasterwork is later, but may contain remnants of earlier plasterwork, although none is thought to survive. Privately owned.

Hatton House, Edinburgh. Demolished
(formerly West Lothian)

Mainly 17th century mansion with 15th century L-plan tower in core. Demolished 1955 following fire. Had ornamented plaster ceilings in ground floor hall and enriched plaster ceilings in 1st floor rooms with initials - CM/EL for Charles Maitland, who married Elizabeth Lauder in 1652 and became 3rd Earl of Lauderdale in 1682; JEL/MC for John (son of Charles), 5th Earl, who married Margaret Cunningham c.1680.

Prestonfield House, Edinburgh

Earlier house burnt down 1681, rebuilt 1687. Now an hotel.

FALKIRK

Kinneil House, Bo'ness, Falkirk
(formerly in West Lothian)

Incorporates 16th century tower house, owned by the Hamiltons, extended 1616 and 1677, remodelled 17th centuryfor the Duke of Hamilton. Contains important 16th century wall and ceiling decorations and 17th century painted finishes, some on plaster. Plaster cornices from the late 17th century (the time of Duchess Anne) survive in north and south towers at 1st floor level 'with amorini developed into foliage in which appear the head of crocodiles' (Buildings of Scotland). Late 1970s or early 1980s excavation found further remains of late 17th century plaster. Also said to have fragment of mid-17th century plaster ceiling from Carnock House. In state care, open to the public.

FIFE

Raith House, Fife
Built 1692-95, extended 1785. Plasterwork 1696-98, heavily moulded ceiling in former entrance hall.

Balcaskie, Fife

Older house purchased and altered by Sir William Bruce 1668 to 74. Late 17th century ceiling in state apartment, drawing room (now library) ceiling 1674. By the English plasterers John Houlbert and George Dunsterfield, as were the ceilings of the same period at Holyroodhouse and Thirlestane. Privately owned.

PERTH & KINROSS

Kinross House, Perth & Kinross
c1690 by Sir William Bruce, plasterer probably Alborn. Privately owned; open to the public.

SCOTTISH BORDERS

Neidpath Castle, Scottish Borders
(formerly in Peebleshire)

Late 17th century and 18th century plasterwork, some now collapsed in hall. Privately owned; open to the public.

Thirlestane Castle, Scottish Borders
(formerly Berwickshire)

Ceilings on 1st floor are by Robert Mylne, 1675. The English plasterers John Houlbert and George Dunsterfield worked here as well as at Holyroodhouse and Balcaskie. See also earlier entry for early 17th century plasterwork. Privately owned; open to the public.

STIRLING

Bannockburn House, Stirling
Built last quarter 17th century. Two ceilings 1680. Magnificent plaster ceiling to 1st floor drawing room, similar to Holyrood. Also in room above library, more restrained but similar. Room in West wing has 17th century low relief plaster cornice, and may incorporate remnants of earlier plasterwork.

Touch House, Stirling

Plasterwork generally 18th century, although some might be very late 17th century; it is just possible (but unlikely) that some casts, such as the plaster heads in each corner of the library (part of 17th century extension to original tower-house) may be survivals from earlier work. Privately owned.

WEST LOTHIAN

Midhope Castle, West Lothian
16th century with 17th century extensions. 'Several of the rooms retain ...plaster cornices of late 17th century type' (RCAHMS). Privately owned.