

GUIDE FOR PRACTITIONERS

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RURAL BUILDINGS
OF THE LOTHIANS
CONSERVATION
AND CONVERSION

TECHNICAL
CONSERVATION,
RESEARCH AND
EDUCATION
DIVISION



RURAL BUILDINGS OF THE LOTHIANS: CONSERVATION AND CONVERSION

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FOREWORD

The range of buildings that can be found in the Scottish rural setting is immense. Their form, function and detail reflect changes in agrarian practices, such as developments in mechanisation, as well as more general trends in architectural fashion or constructional techniques.

Often originally built to a carefully thought out formula, the physical module of one farm cottage, one cart shed bay and a pair of stable stalls can readily be equated to 70 arable acres of good farmland. Associated structures, such as doocots, mill buildings, kilns and windmills, add diversity.

Across the country this variation is enhanced by the wide range of materials that have been used in the construction process, resulting in a great diversity of colours and textures. Until the coming of the railways, materials were usually locally sourced. Estates, towns and villages often had their own nearby quarries from which stone for walling or roofing was won and used, their own local supply of clay or turf for building in earth and their own source of materials for thatching. The inevitable geological and biological diversity shows through in the architectural diversity of the finished structure and its detailing.

In conversion and conservation work the subtlety of all of this is frequently underestimated. It requires a keen eye and an awareness of materials in use to gain a fuller understanding so that a sensitively completed scheme emerges. To gain this awareness usually requires a detailed period of on-site investigation, survey and analysis. Here, in this Guide for Practitioners, the project working group have essentially undertaken this process, distilled the results and presented a clear

working method that will allow any future building projects to be more fully informed by the finer points of the existing building's form and detail. Thus a better and more sensitive decision-making process is made available to the practitioner engaged in the repair and adaptation of rural buildings.

This document is intended to offer building professionals, building owners, developers, planners and conservation officers sufficient information and advice, both directly or by reference to other material (in particular the *Memorandum of Guidance on Listed Buildings and Conservation Areas* and related Technical Advice Notes) to support sound repairs and sensitive conversions. The information presented here has resulted from the personal experience of a number of individuals and has been drawn together from a variety of sources.

It has been produced by an unusual, but most effective, partnership of interests between central government and the four local planning authorities of the Lothians. Commissioned by TCRE Division, and overseen by the Historic Scotland-chaired Rural Buildings Conservation Initiative, the document is offered as an exemplar of guidance to inform future work on rural buildings in the Lothians, and as a prototype for consideration elsewhere in the country.

Ingval Maxwell
Director, TCRE Division
Historic Scotland
Edinburgh
February 2000



2 *Steadings in their landscape; Papple and Overfield farms, East Lothian.*

SUMMARY

This guide for practitioners gives technical information and advice on the conservation and conversion of traditional rural buildings in the Lothians.

Background The obsolescence of many rural buildings, particularly farm steadings, has produced widespread concern among conservation bodies. It is felt that this part of the built heritage is being eroded, either through lack of use and maintenance, or through being altered by conversion.

This erosion was initiated by changes in agricultural and industrial methods which have made the eighteenth and nineteenth century buildings redundant, but has been compounded by an undervaluing of these buildings as an essential aspect of Scotland's economic history, and as an important and integral part of Scotland's landscape. In addition, in many cases the design of conversion schemes pays too little attention to the character and history of the original buildings.

A number of organisations supported the idea of publishing useful information on the materials, construction, original layouts and functioning of rural buildings, including guidance on their maintenance and, where necessary, conversion. These included Historic Scotland and the Historic Buildings Council, the countryside bodies represented on the Rural Buildings Conservation Initiative forum (the Association for the Protection of Rural Scotland, the Institute of Historic Building Conservation, the Scottish Civic Trust, and the Scottish Agricultural Colleges) and the local planning authorities within Lothian.

Historic Scotland offered to fund the publication as one of a series of Guides for Practitioners.

Regional coverage It was felt that guidance should be concentrated on only one area of Scotland, because of the wide regional differences in the vernacular building tradition, and the difficulty of giving adequate information in a reasonably concise form. The Lothians were chosen, for several reasons. The character of the agricultural and rural industrial buildings is relatively homogeneous. There is strong pressure for residential conversion, and the rate of change to rural buildings is high. Conservation officers from West Lothian and Edinburgh were already involved in the forum, as was the Historic Buildings Inspector for the Lothians. In addition, planning

departments from all the Lothian Councils were willing to be involved in the working group producing the document.

Each of the three rural councils of the Lothians has carried out surveys of farm buildings in the past, and East Lothian has also studied its watermills, which gave a good factual basis for the study.

Although this guidance note only describes the traditional architecture of the Lothians, it contains principles applicable to all rural buildings, as well as information on the relevant legislation covering the whole of Scotland.

Rural buildings This document specifically targets the more remote traditional buildings such as farm groups, watermills, etc. It does not look at buildings within villages, nor does it cover the grander country houses, although in general estate buildings accommodating rural functions are included.

Content The Scottish legislative framework for repair and alteration work is described briefly, and then the historical context for the Lothian area. The original functions and characteristics of the various building types and the perceived potential for current use are listed. This is followed by chapters on the different elements of construction or layout, giving information and advice on their repair and alteration. Each chapter closes with a number of guidelines, emphasizing the most important principles involved. Finally a number of case studies show Lothian buildings which have been repaired, altered or converted, to illustrate the points made within the earlier chapters and to highlight the successes and missed opportunities.

Aims The aims of this guide for practitioners are to provide relevant information on the design, construction and repair of traditional rural buildings, as well as guidance on good practice in alterations and conversions. It is hoped that this will raise the level of appreciation of these buildings by owners and building professionals, and result in better levels of maintenance and a more appropriate design quality in alterations and conversions.



3 *Dereliction typical of farm buildings; an example at Brunt steading, East Lothian.*



4 *Derelict cottages at Loanhead, East Lothian.*

1 INTRODUCTION

1.1 The value of traditional rural buildings

Traditional rural buildings are an integral part of Scotland's heritage. They are both visually important to the landscape and of value in themselves as documents of social and architectural history (illus 2). The character of rural buildings results from and reflects their original functions. For example each steading has a variety of different functional components, bound together by common materials, building style and the spatial planning requirements of the working steading as a whole. With knowledge and experience it is possible to read a farm group, identifying each element and appreciating its original purpose, as well as understanding the historical development of each building.

1.2 Outlook for the future

Unfortunately, many older farm or mill buildings are now unsuitable for current operational needs. Some, as a result, are empty and unmaintained (illus 3, 4). Some have been extensively altered to allow continued use for agriculture or industry. Yet others have been incorporated into much enlarged farming complexes and have become almost unrecognisable (illus 5). Meanwhile, in certain areas, circumstances have combined (for instance tight planning controls on new development in the countryside, and greater commuting distances possible with faster roads) to create a demand for the reuse of existing rural buildings, particularly farm buildings, as dwellings. Many have been upgraded or converted, but in the process they have invariably lost part of their original character.



5 The scale of change and modernisation resulting from modern farming methods is evident in this aerial view of a working farm at Westfield, East Lothian. New sheds have been added since this photograph was taken.

1.3 Policy Background

Many of the most complete and best examples of Scotland's traditional buildings are listed as being of special architectural or historic interest. The 'Memorandum of Guidance on Listed Buildings and Conservation Areas' sets out government policy on matters relating to listed buildings and conservation areas, with a specific section on listed farm buildings. The planning authorities of the Lothians also have policies of strict control on the alteration or conversion of rural buildings, including unlisted buildings, which are incorporated in the Local Plans.

This Guide for Practitioners supports the Memorandum and the planning policies by promoting an understanding of the origins, planning, functions and construction of the rural buildings of the Lothians; and by guiding repairs and conversions along lines of sound practice, protecting the buildings and conserving their settings. It aims to illustrate satisfactory methods of compliance with the principles given in the Memorandum.

It should be stressed that the guidance given here also applies to unlisted buildings and looks at repair and maintenance as well as alteration.

1.4 An approach to conservation

The imposition of standard solutions and sets of rules cannot provide the best answers, although guidelines can help. It is essential to work from basic principles and to give due consideration to the alternative options, to design within the potential and the restrictions offered by the existing building, in order to satisfy any new functional requirements.

By far the most important part of successfully repairing or adapting an existing building or group of buildings, is to understand and appreciate what is already there. The setting, the site, the reasons for the layout, the functions, characteristics and condition, the materials and construction should all be assessed, before the need for refurbishment or change and how this can best be accommodated, is considered.

Repairs should be part of an ongoing programme of maintenance. It is therefore suggested that they should be carried out in materials and by methods closely related to the original, both because the essential form of the original should be respected and maintained, and because the insertion of a different material or construction might cause disruption to the way the existing materials function.

On the other hand, it is important for the comprehensibility of the building or group that new additions and major alterations should be distinguishable from the original. There are well

established traditions which can be followed, for instance later porches and rear extensions to dwellings being in different but compatible natural materials. If the basic use of the building is unchanged, and the scale and character of any new elements are in keeping with the original, this can successfully extend a living vernacular tradition.

However, alterations and extensions of a very different scale or form, for an altered function, and in modern mass-produced or synthetic materials, can overwhelm the original building and adversely affect its character without making any positive contribution.

Another approach is to recognise that matching new build to old, in order to produce a sympathetic and unobtrusive change, is unlikely to lead to confusion about which is the original. This is because the traditional local materials and craftsmanship in the Lothians are not easily accurately reproduced, and because the ageing and weathering of older materials distinguishes them from new. Where a clearer indication of new work is wanted, a date can be inscribed on stonework or harl.

Technical Advice Note 8 gives an introduction to International Conservation Charters and an overview of current international conservation philosophy. The concepts discussed there have informed the approach to the conservation of rural buildings promoted here. They are:-

- Authenticity (non-distortion of evidence);
- Conjecture (the need to establish sound evidence of the original form and detail before carrying out any restoration or reconstruction);
- Integrity (material wholeness, soundness and uncorrupted character);
- Patina (respecting the qualities given to materials by the processes of weathering and ageing);
- Rights of the indigenous community (cultural significance);
- Respect for the contributions of all periods;
- Inseparable bond with setting (the building's context being essential to understanding and appreciating it) (illus 6).

The recommended criteria on which action should be based, include:-

- Minimal intervention (or conservative repair);
- Minimal loss of fabric (respecting existing material and losing as little of this as possible);
- Reversibility (making alterations and additions reversible);

- Legibility (ensuring that new work is distinguishable from old);
- Sustainability (adopting a long-term perspective).

In addition, *The Stirling Charter: Conserving Scotland's Built Heritage*, has just been published, specifically to inform conservation work in Scotland.

1.5 An approach to change

Before a change of use is considered, serious thought should always be given to any means by which the existing traditional farm buildings can be kept in agricultural use although not necessarily for their original purpose. Grants may be available to assist with repairs to buildings remaining in agricultural use.

As the best use for a building is nearly always that for which it was intended, planning and listed building authorities will usually be sympathetic to the needs of farmers, millers, manufacturers etc. Large additional buildings, for example general-purpose sheds and silos, may be allowed on a listed farm, recognising that these are essentially reversible additions which will prolong the working life of the entire complex. Cases where loss of existing fabric will be involved will

require careful consideration, but slappings to allow tractor access for instance, may be considered appropriate in some circumstances.

This Guide for Practitioners accepts that change and adaptation are to some extent inevitable, indeed often necessary, if rural buildings are to survive; but promotes the approach that change should not be at the expense of losing the physical expression of the original function of a building and the elements of a complex. Whilst functional change is bound to be mirrored in a measure of physical change, more of the character and value of a building can be saved if change is minimal and cautious.

When initiating change, it is recommended that careful consideration should be given to the following aspects:-

- Supporting uses which can be accommodated within the original buildings with minimal change required;
- Restricting the extent of change (eg limiting the numbers of new openings, especially on dominant elevations);
- Limiting the intensity of use and occupation;
- Finding accurate information on traditional construction, and seeking helpful advice on good



6 *The immediate environment of a farm is of significance. This view of Fountainside, Midlothian, shows the tree plantation and the stone walls to the approach road.*

technical standards of repair and sources of appropriate materials;

- Incorporating new elements only where essential.

Since the vast majority of conversions in the Lothians are from farming to residential use, the advice here has looked in more detail at this particular aspect of alteration. This results from a recognition of reality, not from any desire to encourage such conversions.

Because of the nature of the housing market, those seeking to convert steadings or mills for sale as dwellings usually try to create as many houses as possible. However, experience shows that a conversion with fewer units necessitates less new build, and existing buildings can be utilised with less radical alteration. This approach is therefore the one recommended.

1.6 Professional and specialist skills

Conservation work requires a good understanding of traditional materials and skilled craftsmanship. A high quality of design and construction can only be achieved if both the building professionals designing, specifying and supervising the repairs or alterations, and the contractors carrying out the works have suitable training and experience.

Advice on building professionals can be given by the appropriate professional institutes (see chapter 13, 'Useful Addresses'). Those for chartered architects and surveyors have recently started accreditation schemes to register conservation experience and training.

Information on experienced building professionals, contractors and specialist subcontractors is available from the Scottish Conservation Bureau within Historic Scotland.

1.7 Regional coverage

The principles of repair and adaptation given here are widely applicable, and the legislative and administrative framework described in chapter 2 applies throughout Scotland. However, the forms that traditional buildings take vary tremendously within Scotland, depending on a wide number of factors such as terrain, agriculture, tenure, locally available building materials, etc. They range from the crofts of the Highlands and Islands to the formal estate steadings of the rich arable farmlands of the East coast, the whitewashed dairy farms found in the South-west and the smaller, rubble-built central belt mixed farms.

Each area has its own local building tradition, and to cover the regional variations found throughout Scotland is beyond the scope of one volume. The information given here therefore concentrates upon the

relatively homogeneous tradition found in the rural buildings of the Lothians. The case studies are drawn from within this area, and are intended to illustrate some of the conflicts and some of the options, to highlight successes and to suggest where there were missed opportunities.

1.8 Building type and date

This publication looks at the humbler buildings of the countryside, mainly in agricultural and allied uses. These comprise residential and industrial buildings as well as farms. It includes neither the larger country houses nor villages.

The vast majority of Scotland's farms date from the eighteenth, nineteenth and twentieth centuries, with very little left from the periods before Agricultural Improvement and the Highland Clearances.

The guidance presented here therefore focuses on post-improvement buildings, continuing into the earlier part of the twentieth century, when the character of rural industry and farming was irrevocably changed by the increasing scale of mechanisation and mass production. Because within the Lothians there are only isolated examples of pre-improvement buildings, these are not specifically included in this document. However, advice is available in Historic Scotland Technical Advice Notes on building materials such as lime, thatch and earth.

2 LEGISLATION

2.1 Introduction

Statutory controls are the most important areas of legislation applying to existing rural buildings. The change of use of a building and its alteration or extension almost always require statutory approval, and may require a combination of different authorisations from the relevant bodies. As it is not possible to offer more than a broad introduction to the general principles of such statutory requirements in this guide, it is important that an early approach is made to the planning and building control departments of the appropriate authority to discuss any proposals.

This chapter does not attempt to explain the operation of each system of statutory control in full. Instead it highlights those aspects particularly relevant to existing rural buildings. The main acts, statutory instruments and supporting information which relate to alterations to buildings are listed in the bibliography.

In addition, the areas of legislation covering value added tax and public funding in the form of grants are discussed.

2.2 Planning Permission

2.2.1 Need for Permission

Planning law requires permission to be obtained for most activities involving building or engineering work where these go beyond repair. However, there are exceptions, and the local planning authority can advise on these. The current and proposed use of a building, whether or not it is in a conservation area, and the form, location and scale of any change are all matters which can have a bearing on whether or not permission will be required for specific work.

The need for planning permission should be determined by the planning authority prior to any alterations being carried out. If granted, planning permission is normally subject to conditions which may relate to the detailing, finishing or other aspects of the alteration. Failure to obtain planning permission or to comply with any conditions is likely to result in enforcement action by the planning authority.

There is a right of appeal to the Scottish Ministers against refusal to give planning permission or listed

building consent, or against the conditions imposed in a planning permission or listed building consent.

2.2.2 Houses: Permitted Development

Certain relatively minor works to a house (but not a flat or maisonette) may be carried out under the scope of 'permitted development' without any need to make a formal application to the planning authority.

The complex rules governing permitted development rights are liable to change from time to time, and their provisions vary when the house forms part of a terrace, is listed or within a conservation area. The extent to which alteration has previously been carried out will also be a consideration.

The degree of change allowed within permitted development rights can be quite extensive. The planning authority may therefore wish to restrict rights in certain cases, in order to preserve the character of a building (or group of buildings) and its setting. Permitted development rights may be restricted or withdrawn either as a condition attached to a planning permission, or through the introduction of an Article 4 Direction.

The advice of the planning authority can be sought on the extent of any permitted development rights which may apply in a particular case.

2.2.3 Change of Use

There are currently eleven classes of use for planning purposes. To change from one class to another would normally require planning permission although some changes are exempt. A change from agricultural or industrial to residential use will always require permission. Some ancillary changes of use do not actually require planning permission. For instance, many people occupying houses in the countryside wish to conduct a modest business operation from their premises and often this is possible without the need for planning permission. Determining criteria include the type of business and its scale.

Most authorities, before determining an application for conversion of existing buildings in the countryside, will require the submission of an engineer's report to prove that the buildings in question are capable of conversion without substantial demolition (illus 7).



7 *A building may appear sound initially, but there may be differing views on the need for replacing old timbers and worn stones or reconstructing walls, for example, and it is important for agreement to be reached on the approach before work starts. As much as possible should be retained and repaired. An engineer's report can be useful in establishing the extent of dunting required, and in ensuring that no more than necessary is carried out. (Barberfield, East Lothian)*

Change of use under planning law should not be confused with change of use under building law, which uses different criteria and legislation.

2.2.4 Local Policies

Individual planning authorities have specific policies relating to the change of use and alteration of buildings in the countryside, and it is important that their advice is sought at the earliest stage in planning any change. Most authorities recognise that the repair, alteration and conversion of redundant buildings can help maintain the economy, environment and vitality of an area, but will have policies to ensure that this is done in the most sensitive manner and without conflict with other rural activities. In general, strict criteria will apply to the specification of materials and the extent of any alterations. Individual Councils publish their policies within their Local Plans and often issue guidance notes and advice on the conversion of buildings in the countryside.

2.3 Conservation Areas

Where there are areas of special architectural or historic interest, whose character it is desirable to preserve or enhance, the local planning authority may designate them as conservation areas. The authority can advise on the whereabouts and boundaries of these areas.

The fact that a building is located within a conservation area increases the level of control which affects it, particularly if an Article 4 direction has been imposed. For instance, normally permitted development by way of new hard surfaces for parking areas or patios may need planning permission, as might the painting or rendering of the building or the installation of a new satellite dish fronting onto a public road.

Conservation area consent is always required for the demolition of any building in the conservation area.

2.4 Listed Buildings

2.4.1 Background to listing

The Scottish Ministers are required to compile lists of buildings of special architectural or historic interest. The first lists were drawn up in the 1950s and 60s at a time when the preservation of rural agricultural and industrial buildings was given a relatively low priority. However, this heritage is now more greatly appreciated, and at present a comprehensive resurvey of the existing lists is underway. Scottish farm buildings and other rural buildings of interest are well represented on the revised lists. To date approximately 1,800 farms, mills or steading components have been listed in Scotland, comprising just over four percent of the total stock of listed buildings.

2.4.2 Criteria for listing

Assessment of suitability for listing includes factors such as date, architect, design, planning, technological interest and regional and local significance. The listing aims to protect well-preserved, architecturally and historically significant farm buildings, but other good examples showing gradual changes in response to the development of farming are not excluded. The group value of buildings is recognised, and the survival of intact fixtures and fittings is important and might also make a building a suitable candidate for listing.

2.4.3 Listed Building Consent procedure

Where a building is listed, any works which (in the opinion of the planning authority) would affect its character, require to be the subject of an application for 'listed building consent'. These applications are usually considered by the planning authority, which also consults with national amenity bodies. For the majority of cases, before granting consent, the authority must notify the Historic Buildings Inspectorate of Historic Scotland (acting on behalf of the Scottish Ministers), who may request that a case be referred to them for their own decision.

Listing does not seek to prevent change; the aim is rather to preserve the character of the building, and to manage change in order that the essential elements are still recognisable and understood. Many farms have been run for generations as a family business and therefore farmers are aware of the tradition and continuity of rural life; the steadings and related buildings are part of this continuity and so deserve maintenance, care and respect.

Applications for listed building consent should include detailed survey drawings of the existing buildings and large-scale proposal drawings. A photographic survey is also a valuable aid when determining an application. The services of a professional agent experienced in historic building work is advisable in all cases other than the most modest alterations.

As with planning permission, listed building consent is normally granted subject to conditions. In the case of a refusal of listed building consent or the application of conditions deemed unreasonable, it is possible to appeal to the Scottish Ministers. Carrying out alteration work without obtaining listed building consent, or without complying with the conditions specified in the consent, is likely to result in enforcement action by the planning authority, or referral to the Procurator Fiscal with a view to prosecution. It is worth noting that with planning permission and listed building consent there is no notice required, or certificate issued, of completion of the approved works.

2.4.4 Urgent works to listed buildings

The planning authority has powers under the Planning Act to pursue the proper preservation of listed buildings and buildings in conservation areas. These allow the authority to issue a repairs notice to the building owner, specifying works required for the preservation of a building and the timescale in which they should be undertaken. Failure to comply can lead to the authority undertaking the work and charging the owner, or pursuing procedures to acquire the building compulsorily.

The owner has a right of appeal regarding the cost, reasonableness and extent of the repairs required to be undertaken.

2.4.5 References

Fuller information on listed building control can be found in Historic Scotland's leaflets *Scotland's Listed Buildings: A Guide for Owners and Occupiers* and *Farm Architecture: the Listing of Farm Buildings*, and in the *Memorandum of Guidance on Listed Buildings and Conservation Areas*.

2.5 Scheduled Monuments

Occasionally a building may be, or its site may contain, a monument of national importance scheduled by the Scottish Ministers under the *Ancient Monuments and Archaeological Areas Act 1979*. For example, Midhope Castle in West Lothian and Stoneypath Tower in East Lothian are scheduled buildings adjacent to farms (illus 322).

Most operations affecting scheduled monuments should only be carried out with the prior written consent of the Scottish Ministers. This is referred to as 'Scheduled Monument Consent' and administered by Historic Scotland. Relevant works broadly comprise repairing, altering, adding to, demolishing, destroying, damaging, removing, flooding and tipping onto a scheduled monument. They also include certain agricultural, horticultural or forestry works which might disturb the soil below the depth affected by normal ploughing. In addition there are controls on the use of metal detectors within scheduled sites and the removal of any finds.

There are a number of scheduled monuments which are also listed buildings. Anyone wishing to know the full protected status of a particular site, should check both the List of Ancient Monuments in Scotland and the Statutory List of Buildings of Special Architectural or Historic Interest. The local planning authority should be able to make such lists available for inspection on demand. Historic Scotland publishes a number of leaflets relating to scheduled monuments and their protection.

2.6 Building Control

2.6.1 Purpose of the building regulations

The essential purpose of the building regulations is to safeguard people in and around buildings. They are also intended to aid the conservation of fuel and power.

2.6.2 Requirement for a building warrant

Proposals to erect, demolish, alter, extend or change the use of a building nearly always require a warrant from the local authority. Building legislation is always undergoing revision, and recent changes have exempted certain minor building operations from the requirement to obtain a building warrant. There are also certain classes of buildings which are exempted from the regulations. It is therefore advisable to consult the local authority as to whether a building warrant is necessary.

2.6.3 *Application to farm buildings*

In general, farm buildings are exempt from the application of the building regulations if they are less than 2000 cubic metres in capacity, and at least ten metres (or their own height if that is less) from the boundary of a residential building. Buildings to which people do not normally have access are also exempt, and there may be agricultural buildings which fall within this category, for instance grain silos. However, when their use changes (for example by conversion) the regulations apply, and at this point the full standards for the new use are required. (See exempted classes of buildings, Regulation 3, Schedule 1).

Residential buildings on farms, such as farmhouses and farmworkers' cottages, are, however, subject to the regulations.

2.6.4 *Application to existing buildings*

There can be confusion about the application of building regulations when work is carried out to existing buildings whose use has not changed. Building regulations do not apply retrospectively, unless there are exceptional circumstances, as it would be a very costly exercise if existing buildings were compelled to meet current standards every time the regulations changed. Existing deficiencies in parts of the building which are not being altered can remain, but must not be made worse by any new building work. Nevertheless the local authority has powers, limited to certain regulations and very rarely used, to compel building owners to bring existing buildings up to current standards.

2.6.5 *Repair and Restoration Work*

In general, works of repair, restoration and replacement do not require a building warrant where the work is simply restoring or repairing what was there before, or replacing like with like. For example, when restoring a pantiled roof in traditional construction where the use of the building remains the same, retiling the roof will not attract current standards, but altering the structural timbers will take the work into a class requiring a warrant and to which the current standards apply.

Repair work to an existing building using different materials will also require a warrant, and the full current standards apply, but where it is not possible to achieve these standards without harming the character of the building, the local authority may grant a relaxation of the standards. For example, where an old corrugated iron roof is replaced by a traditionally-constructed pantiled roof, the new roof will have better insulating properties than the old, and it is an improvement on the existing deficiency, which might be sufficient to be granted a relaxation.

The installation of new windows in existing, unaltered openings will not normally require a warrant. However, owners have a legal responsibility either to fit a window matching that which was removed, or to fit a window which meets the current applicable standards such as those for ventilation, areas of glazing, type of glass, access for cleaning and emergency access or escape from fire. (See Fixtures not requiring a warrant, Regulation 4, Schedule 2).

Further advice on these matters should be sought from the local authority.

2.6.6 *Exemptions*

It has already been mentioned (in 2.6.2 and 2.6.3) that certain classes of buildings are exempted from the building regulations, in particular many farm buildings. In addition to these, there are other exemptions from the regulations. The most relevant are likely to be those for small single-storey structures ancillary to houses (but not flats and maisonettes), such as porches and conservatories, car ports, covered areas and detached garages and sheds. Garden walls are also exempted, provided they are less than 1.2 metres high and fences if they are less than two metres high. (See Regulation 3, Schedule 1).

2.6.7 *Relaxations*

The local authority has the power to dispense with or relax a provision of the building regulations in relation to a particular building or class of building. This is an important power when dealing with existing buildings involving change of use, where it may be unreasonable in the particular circumstances for specific requirements to be applied. It is therefore likely to have relevance in the conversion and adaptation of traditional rural property.

It would be unusual for a regulation to be dispensed with, but there is often scope for relaxing a prescriptive standard. This requires a formal relaxation procedure.

2.6.8 *Deemed-to-satisfy provisions*

Many of the normal constructions deemed to satisfy the technical standards for complying with the building standards regulations may not be applicable to older buildings. It is useful to remember that the technical standards can be satisfied by other means, particularly when the standard is in a functional form. For example, one standard requires 'adequate ventilation', which does not necessarily mean that the detailed ventilators described in the deemed-to-satisfy clause for the standard must be provided exactly as described. The alternative solutions must be agreed with the local authority.

2.6.9 Conversion or Change of Use

The change of use of a building will trigger the application of the building regulations. For example, where a byre or barn (which is usually exempt from the regulations) is to be converted to a house or other use, the building would become subject to the building regulations for the first time, and consequently all parts of the building would require to meet the current standards.

It is important to understand that the change of use of a building which is already subject to the building regulations does not necessarily require a complete upgrading of the building to meet the current standards in all respects. The key principle in such cases is that if a change of use attracts a more onerous standard, then that standard will apply in full. Any existing deficiency may remain if a more onerous standard is not attracted by the new use.

Change of use can apply to a part of a building as well as a whole building, or even to an element of a building such as a wall or floor. For example, if the layout of an existing building is changed, so that a wall forms part of a stair enclosure when it did not do so before, then a fire-resistance standard may apply, and this is a 'change of use' in building control terms.

Change of use in relation to building law should not be confused with change of use under planning law which uses different legislation and criteria.

2.6.10 Extensions

Any extension of an existing building is classified as new work, and the extension must comply fully with current standards. In some circumstances an extension may make a deficiency in the existing building worse, in which case a local authority would ask for that aspect of the existing building to comply fully with the relevant standard. This can occur, for instance, when an extension further compromises fire-escape provision.

A building may have insufficient escape routes by current standards; this deficiency is permitted to remain, even though work may be done to the building. Nevertheless, it must not be made worse by, for example, blocking off one of the escape routes or by extending the building so that its occupancy capacity is increased, thus requiring more escape routes.

It may be sensible to bring the escape routes of an existing building up to current standards in any case, but this is not necessarily a requirement of the building regulations.

2.6.11 Procedure

Brochures setting out the procedures, rights of appeal

and information required to accompany various types of application can be obtained from the local authority building control staff, and are also to be found in the building procedure regulations.

It is an offence under the Building Act to carry out construction work without a warrant where one is required. The local authority has the power to serve a notice to compel owners to remove unauthorised construction work or to make it comply with the building regulations.

The Building Act also prohibits the occupation or use of building work (not necessarily the whole building) carried out with a building warrant until a completion certificate has been obtained from the local authority. When work is carried out in existing occupied buildings, occupation will normally continue without the need for formal approval from the local authority, if the alterations are such that occupation is still viable. However, a local authority may impose conditions in the warrant restricting use, although this would be unusual.

Occupation of an existing building that is the subject of a change of use (from a farm building to a dwelling for example) or a new building, would require formal approval from the local authority. There is provision in the Act for the temporary occupation of a building before completion, at the discretion of a local authority, which may permit finishing work for example to be completed after occupation.

2.6.12 Dangerous Buildings

If a building becomes dangerous to the public through deterioration or neglect, the local authority can issue a notice under the Building Act requiring the owner to close the building and secure it from entry, and can require the owner to carry out remedial works to remove all immediate danger or to demolish the building. The local authority may carry out any necessary works itself and recover costs if an owner does not act.

2.7 The Construction (Design and Management) Regulations

These regulations were made under the Health and Safety at Work Act, and set out the way in which all building and construction projects covered by the regulations should be designed and managed, from the initial concept to final completion. They apply to all projects and construction work notifiable by virtue of the regulations. Certain of the regulations do not apply when work is carried out for a domestic householder, provided that the house is not used for business. In such cases, the duties of the designer still apply,

together with the requirement to notify the project if it is applicable. If the project involves any demolition work, then all provisions of the regulations apply. The regulations place duties on the client (which include the appointment of a planning supervisor), on other professionals and on the contractors appointed to complete the work. The Health and Safety Executive, or any professional involved in a project, should be able to advise whether these regulations are applicable to any planned work.

2.8 Drainage

Achieving satisfactory drainage is often the greatest impediment to gaining consent for a conversion, and a number of solutions may be available. The local building control authority controls drainage systems and septic tanks, to which building regulations apply, but questions relating to the provision of public sewers should be referred to the Area Engineer of the water authority. Outflows from septic tanks (where these are sited in sensitive areas) and discharges to controlled waters are the responsibility of the Scottish Environmental Protection Agency. The planning authority may also impose conditions in relation to drainage.

2.9 Other Services

The provision of other services, including water, power, gas, telephone and cable television (but not the erection of satellite dishes), is in general exempt from statutory control, although a planning authority may, for example, require services to be provided by underground routes, as a condition attached to a planning permission.

The provision of an oil or LPG (liquefied petroleum gas) storage tank, often wanted when rural buildings are sub-divided or converted, requires planning permission and a building warrant.

2.10 Road Construction Consent

The construction of a new public road or access route, or the upgrading or renewal of an existing one requires road construction consent from the roads authority.

2.11 Superior's Consent

Before implementing works authorised by planning permission or a building warrant, the consent of the feudal superior may be required. A solicitor should be able to advise on this matter.

2.12 Value Added Tax (VAT)

Works of repair to a building are subject to VAT. Alteration works to a residential or religious building are zero rated if it is listed and listed building consent has been given for the alterations. VAT on alteration works may also be recoverable where non-residential buildings change use to residential, or where a residential building which has not been lived in since 1973 or before, is rehabilitated and brought back into residential use. Otherwise alterations are subject to VAT. VAT is not payable on the construction of new residential buildings, so if there is substantial demolition (down to one wall) and reconstruction of an existing building, the project may be zero rated. HM Customs and Excise produce a number of leaflets giving guidance on VAT, particularly *Notice 708 (Building Construction)* and *Notice 719 (DIY builders' pack)*. These are periodically updated.

VAT status can be an important influence on the extent of reconstruction work carried out to buildings undergoing substantial alteration or conversion. The tax can discourage retention of reparable building fabric, as well as encouraging conversions to housing use. In response to this, planning authorities often ask for a structural engineer's report on the condition of the existing building, so that the need for any demolition on structural grounds can be ascertained before consideration of an application. This can be backed up with planning conditions requiring that existing building fabric is not taken down and substantially reconstructed.

2.13 Grants

Depending on the circumstances, various grants may be available to assist with the cost of repair or conversion of rural buildings.

There are grants for farm buildings from the Scottish Executive. Historic Scotland can give repair grants for buildings of special architectural or historic importance and also more modest buildings in outstanding conservation areas, as well as grant aid to help manage ancient monuments, and may also offer funding for archaeological surveys on farmland. Local housing authorities may offer either standard or discretionary grants for the repair or improvement of housing, but may require compliance with the building regulations as a condition of some grants.

Historic Scotland and the Scottish Civic Trust jointly produce a useful directory of '*Sources of financial help for Scotland's historic buildings*'.

3 HISTORICAL CONTEXT

3.1 Farm buildings

3.1.1 Introduction

Both environmental and cultural factors favoured agriculture in the Lothians. Geology, topography and climate, communications and markets, ownership and tenure - all of these combined to foster an innovative, highly efficient style of arable farming which, during the eighteenth and nineteenth century, became the envy of the world.

Its physical environment was, by Scottish standards, kindly. From a northern coastal plain along the Firth of Forth the land rises gently, intersected by the principal river systems of East, Mid- and West Lothian, the Tyne, Esk and Almond. Towards the southern edge of East and Midlothian, beyond the Southern Upland Fault, the Lammermuir and Moorfoot Hills pose more difficult conditions, yet only here and in the igneous Garleton, Pentland and Bathgate Hills do elevation, drainage, slope or soil characteristics noticeably impede exploitation (illus 8). Elsewhere, carboniferous sandstones and limestones, overlaid by glacially deposited boulder clay and outwash or, most fertile of all, post-glacial raised beach deposits, give rise to

better drained, less acidic, more readily worked soils. Further enrichment came from seaware, from locally-burnt lime and from the human waste of Edinburgh and lesser settlements.

3.1.2 Materials

These sandstones - termed freestone - limestones and clays had a further bearing on agriculture as the materials for farm building construction. Glacially smoothed and deposited fieldstone offered a readily sourced material for walls and paving. Quarried sandstones were easily won and wrought as rubble or, where status demanded, as ashlar. Even where resort was had to the more intractable igneous whinstone, sandstone was still employed for dressed margins. As far back as the early 1600s, limestone, burnt with locally extracted coal, not only enriched the more acidic soils but also bonded stone walls or protected them through its use in harl (a lime and aggregate coating). Evidence of mass clay walling has all but disappeared, but the use of clay as a mortar can still be seen in the oldest or most humble buildings of the uplands and west. Fired clays, from glacial or mined deposits, were shaped into the tiles which helped drain the land - principally from the 1840s. From at least the



8 View of Swanston farm, Edinburgh, in 1949, looking towards the Pentland Hills.



9 *Blackford Farm, Edinburgh, in 1856, showing pantiles, slate and thatch as roofing materials.*

early-eighteenth century there were works producing pantiles, brick and floor tiles at sites in the Lothians. Deep-mined clays, extracted from coal measures, were the basis of the brick and tile works which flourished in the nineteenth century and which still survive today in a much reduced form. Yet not until the twentieth century was brick - mostly the inferior common brick - used for external walls. Pantiles, though characteristic, were never universal on Lothian steadings. Straw, or local rush, thatch was in general use in the eighteenth century and persisted until at least the mid-nineteenth in the upland west of West Lothian. Buildings of higher status, such as minor lairds' houses, once used sandstone flags for roofing, as at Sydsarf (East Lothian). From the mid-nineteenth century slates from Argyll and Highland edge quarries came into general use (illus 9).

During the seventeenth and eighteenth centuries the region was poorly endowed with construction timber, but had ready access by sea to Norwegian and Baltic sources. As estate-grown timber matured, from the early-nineteenth century, this provided a local source.

3.1.3 *Agricultural development*

The region was also well-placed to market its produce. Edinburgh, with its brewers and baxters, was close at hand. A long coastline gave access to the city and to more distant markets. The addition of turnpike roads (from the 1750s), the Union Canal (from the 1820s) and railways (principally from the 1840s) improved

landward communications and contributed, for example, to East Lothian's later-nineteenth century success in selling potatoes to the London market and West Lothian's in selling dairy produce to industrial central Scotland.

Yet environment and markets offered only the potential for success. Its achievement, and its expression in built form, resulted from decisions made by owners and occupants.

The Lothians were not a region of large estates; even Hopetoun, spread across the three Lothians, had been assembled from smaller components. By the end of the seventeenth century, the feuing of church and crown lands had added a class of small-scale near-owners to the established ranks of landowners, most noticeably in the villages. The assimilation of these lands into larger estates was never completed and, for a prolonged period there was a widened pool of decision-makers with the security of occupancy to invest in Agricultural Improvement. These owners and feuars were neither isolated nor conservative in their outlook: in the eighteenth century many had access, through their Edinburgh associations, to the most advanced thinking on agriculture; figures such as Cockburn of Ormiston or Lord Belhaven at Biel were amongst the earliest Scottish Improvers.

Eighteenth-century improvers remodelled the land and its use but had less impact on buildings. Cultivation ridges were straightened and fields enclosed; a process which continued into the early-nineteenth century.

New crops and crop rotations were brought in, whereby sown grasses and root crops were inserted between grain crops. Farm units were enlarged through amalgamation and reclamation. Whatever built legacy was created in the eighteenth century, much of it was obscured or replaced by later-nineteenth century redevelopment. The main exception was the home farm, run in-hand by a landowner through a factor and as much the product of fashion as of practicality. These showpiece steadings, in their Classical, Gothic, Scots baronial or other attire, were still being built in the mid-nineteenth century and remain to this day the most architecturally formal of farm buildings.

The tenantry also contributed to Improvement. Outwith village or town lands, by the late-seventeenth century most farms were already occupied by only one or two tenants, with written leases. Very long improving leases, based on multiples of nineteen or twenty-one years, were a feature of the later-eighteenth century, subsequently settling to one nineteen or twenty-one year term at a time. Whilst building work was first and foremost the responsibility of the estate, tenants could carry out approved works on their own behalf, recouping the value of any unexhausted improvements at the end of their leases. Most of the surviving stock of tenanted farm buildings belongs to two periods of heightened agricultural prosperity, and high grain prices, namely the Napoleonic Wars (1800 to 1815) and the High Farming period around the mid-nineteenth century. In contrast to home farms, these buildings used a fundamentally practical architecture, developed to perfection by specialist architects. Embedded within these there may be earlier structures, still discernible on close inspection.

Steadings were not the only rural buildings to emerge and survive from the age of Agricultural Improvement. New lime kilns were built; grain mills were rebuilt to prepare meal, flour or pot barley for urban markets; textile mills were established to process locally grown wool or flax; sawmills and joiners' shops proliferated as plantations matured; smiddies were constructed or reconstructed to forge the ironwork needed by the new farming: parts for carts and ploughs, other implements and horseshoes. These small rural industrial buildings shared with farm buildings a common scale, idiom and use of materials.

The onset of agricultural depression in the 1880s hit the Lothians, with their reliance on grain crops, especially hard. This marked a watershed, beyond which buildings were constructed in less durable, non-traditional materials. The age of excellence, which had imprinted itself on the Lothian landscape, was already a matter of history 100 years ago.

3.1.4 *The function and form of buildings*

As elsewhere in Scotland, then as now, the individual buildings of the Lothian steading represented four inter-related functional systems: labour, expressed in dwellings and their related outbuildings; land, comprising housing for land-working equipment and its animal or mechanical power sources; grain, in the form of storage and processing facilities for cereal crops and, finally, livestock, principally housing for cattle, their feed, bedding and waste products.

Provision for each of these reflected the size of the farm, the labour-intensity of the type of farming pursued and the relative importance of cereals or livestock. Collectively, they helped determine the plan form at any given steading. In Lothian terms, this meant comparatively large, labour-intensive farms with a marked dependence on cereal crops.

Generally speaking, there was a decline in typical acreages from east to west, with 200 acres of arable or more on the farms of northern and eastern East Lothian, but a mere fifty acres or so on those of western West Lothian. As an approximate rule of thumb, each seventy acres of land necessitated housing for one ploughman, or hind, stabling for his pair of horses and a cart bay.

3.1.5 *Buildings for labour (illus 10 to 13)*

On the larger, more easterly farms, the farmhouse became separated from the steading, in keeping with its occupant's status. The day-to-day operations of the farm were delegated to a grieve or steward, whose lesser house occupied a controlling position beside or within the steading. Evidence of earlier, eighteenth century arrangements, with a re-used former house within the steading, can still be found on some sites. On the smaller farms, further to the west, this earlier arrangement persisted; the farmhouse here may be of lesser proportions, perhaps only of one and a half or



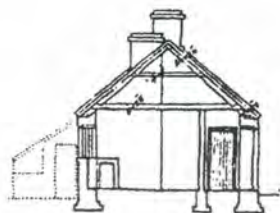
10 *Pre-improvement linear house and steading at Clashme Down, West Lothian (now demolished), with a bing immediately behind. Like many Lothian buildings of its time it was thatched.*

PLAN
of the
FARM COTTAGES
Erected upon
THE EARL OF ROSEBERY'S
ESTATES.

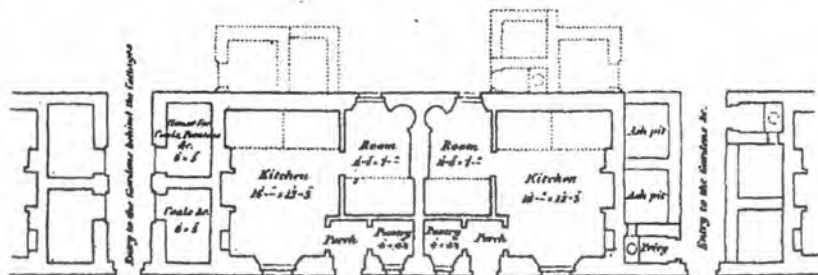
Note. At places where only two Cottages are built, the Coal House, Ash pit and Privy are sometimes placed behind the Cottages as shown by dotted lines in the Plan.



Elevation.



Vertical Section.



Ground Plan.

Scale of 0 10 20 30 40 Feet

11 Plan of cottages erected upon the Earl of Rosebery's estates, Mid and West Lothian (pre-1839).



12 Nineteenth century farm cottages and their occupants at Hedderwick Hill, East Lothian.

even a single storey. This difference in scale and status also applied to ancillary domestic buildings. Most had small domestic dairies but the larger, more prestigious farmhouses had, in addition, gig houses with their own stables, harness room and perhaps even accommodation for a groom. Domestic poultry had their own apartment within the steading, perhaps close to a boiler house for warmth, but also close to the farmhouse. Doocots, dating from the sixteenth to eighteenth centuries, and once symbols of independent status, often survived; in later-eighteenth or nineteenth century steadings they often retained a vestigial presence in small doocots over yard entrances or in gable walls. Finally within the domain of the farmhouse there were gardens, occasionally with stone beehives (illus 109) inserted into south-facing walls.



13 Cottages and vegetable garden at Redmains, East Lothian, 1887. The cottage walls are limewashed, whereas the agricultural buildings behind are not. There is no guttering on these pantiled buildings, but a board at the eaves diverts drips from above the nearest door. The vegetable garden is separated from the yard by a timber paling gate and fence.



14 A courting couple outside a stable door in a West Lothian farm (1880s). The ground beside the building is paved with crude flagstones.

Because of a regional preference for married farm workers, whose wives or daughters could also work at peak periods, most farms had their cottar houses, as many as twelve on the largest units. The earliest of these to survive, generally single storeyed, date from the 1830s, but the better, later ones tend to be of one and a half storeys, their setting slightly detached from the steading. Each had its ancillary buildings: pig sty, earth closet, sometimes a wash house. Where the keep of a cow formed part of a worker's payment, there might be a separate servants' byre within the steading. Bothy accommodation for single workers, whilst less evident than in Fife, Angus and east Perthshire was still needed to house migrant workers during peak periods such as harvest. On the smaller farms in the west the few non-family workers might take meals in the farmhouse and sleep over byres (women) or stables (men), a system more typical of small farms further west and north.

3.1.6 Buildings for land-working (illus 14, 15)

As previously noted, stabling and cart bays were of a scale proportional to the arable acreage. Horses were stalled singly along the inner wall of the stable, separated by high trevises. The stable usually had windows, glazed above with adjustable vents below. Outward ventilation via the roof was achieved either



15 The cartshed and granary at Crauchie, East Lothian before conversion. There is a cattle court visible behind.



16 Early hand-threshing barn at Eaglescairmie Mains, East Lothian, modernised in the late-eighteenth century Improvement period, when the roof was slated and the walls heightened.

through projecting ridge-mounted cowls and cupolas or through slightly raising sections of roof in the manner of swept dormers. In order to optimise ventilation, hay storage on the best farms was sited adjacent to rather than above the stable. The equipment which the horses hauled was gradually provided with its own accommodation during the nineteenth century. Cartsheds start to appear in numbers from the 1820s and 30s, generally with a granary above. The openings, usually arched in the Lothians, are margined with dressed sandstone and are occasionally dated. On the smallest farms there may be no more than one or two bays, on the largest as many as ten or twelve. As the range of large field implements increased, after 1850,



17 Cartshed and granary at Duncanlaw, East Lothian in 1974, with the steam engine house, chimney stack and threshing barn beyond.



18 Working horse in cart harness, the horse engine house (or horsemill) behind it, at Addiewell, West Lothian (pre-1914).



19 Milkmaid and cow at Auchenhard, West Lothian, in front of byre (pre-1914).

an additional implement shed might be built, typically of rubble and slate construction, open-fronted and with a wooden lintel carried on cast-iron columns. The positioning of cart and implement sheds, peripheral to the steading, reflects both their comparatively late introduction and, as with stables, the need for ready access to the fields.

3.1.7 Buildings for grain (illus 15 to 18)

Grain was the mainstay of most eighteenth and nineteenth century Lothian farms. Enclosed rickyards were a feature of both pre- and post-improvement steadings. Outdoor storage of unthreshed crops was the norm throughout Scotland, and the threshing barn, with

house and byre, was one of the three basic components of the earliest documented steadings. Prior to the mechanisation of threshing, from 1786 onwards, barns were single-storey, with steeply-pitched roofs and slit vents, angled to catch the wind. Opposing doors helped create a through current of air to aid winnowing. Very few of these survive intact, though careful examination might reveal their adapted remains within later barns. With both threshing and winnowing mechanised, barn design underwent major changes. A more complex structure of two storeys in East and Midlothian, often one and a half in West Lothian, the machine-threshing barn had space at upper level for the sheaves from one rick, a middle zone for the machine itself and a third area, without vertical sub-division, for threshed straw.



20 Milkmaid and other farmworkers at Gormyre, West Lothian (pre-1914).

The bagged grain was carried to a granary, sited above cartsheds for protection against vermin, damp and theft or, sometimes, less appropriately, over stables or cattle court shelters. Vented openings in the granary's front wall maintained air movement.

Initially threshing machines were powered by horses, water wheels or, on some of the largest farms, by windmills, the last of which had ceased to operate by the mid-nineteenth century. Horse engine houses were typically polygonal (though often circular within), with wide, full-height openings between stone piers. Pantiles were more commonly used than slates. Water wheels were generally roofed over. Steam power was first employed in the early 1800s and from the 1820s improvements in design led to its rapid adoption, especially on larger farms with high cereal acreages. By the 1860s and 70s their tall, brick chimneys, with adjoining engine and boiler houses, had become a characteristic feature of the rural Lothians. Where slope and drainage permitted, water power continued to be used, as did horse engines on smaller farms.

3.1.8 Buildings for livestock (illus 19 to 21)

Every farm carried livestock at some time of the year, though its role in the Lothians was subordinate to cereal growing. Sheep farming in the uplands has left few remains, other than open, circular stells in high valleys and early nineteenth century courts along the

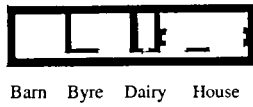


21 Shelter shed and cattle court at East Fortune, East Lothian.

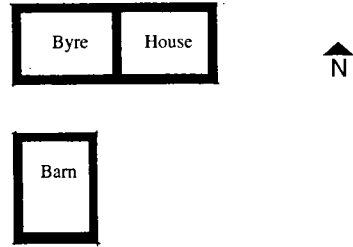
Lammermuir, Moorfoot and Pentland edge. Cattle, however, had more of an impact on buildings. Byres, with houses and barns, had been one of the three principal elements in pre-improvement steadings, but other than as dairy byres for domestic use, they had little part in Improved, intensive arable farms. On poorer land to the south and west they continued to feature - low, single-storey ranges with minimal fenestration and a single row of beasts, tethered, later stalled, along the back wall rather than across the building as in earlier times.

On the majority of mainly arable farms, cattle were bought in for fattening over winter and were an essential adjunct to the arable, consuming turnips and converting straw bedding and feed into manure, by which the land's fertility was maintained. The courts or reeds in which they were housed became increasingly

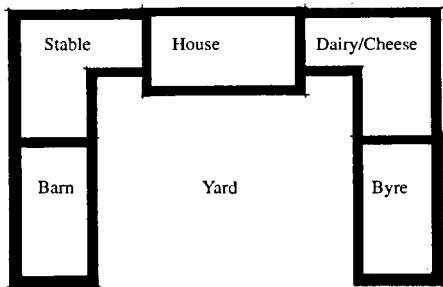
1) Early/small 17th century to later
(eg Jawhills, West Lothian)



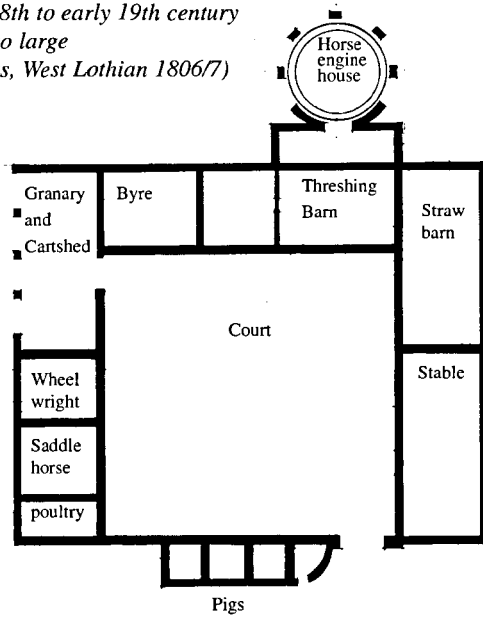
2) Small circa 1800



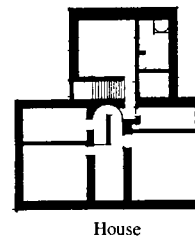
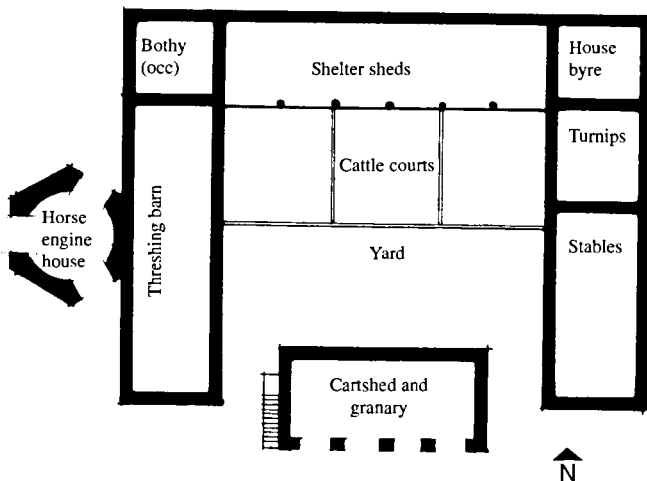
3) Large – by 1700 or more
general by late 18th century
(eg Garvald Grange, East Lothian)



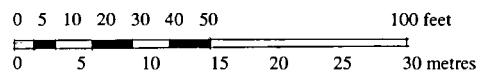
4) Late 18th to early 19th century
medium to large
(eg Stacks, West Lothian 1806/7)

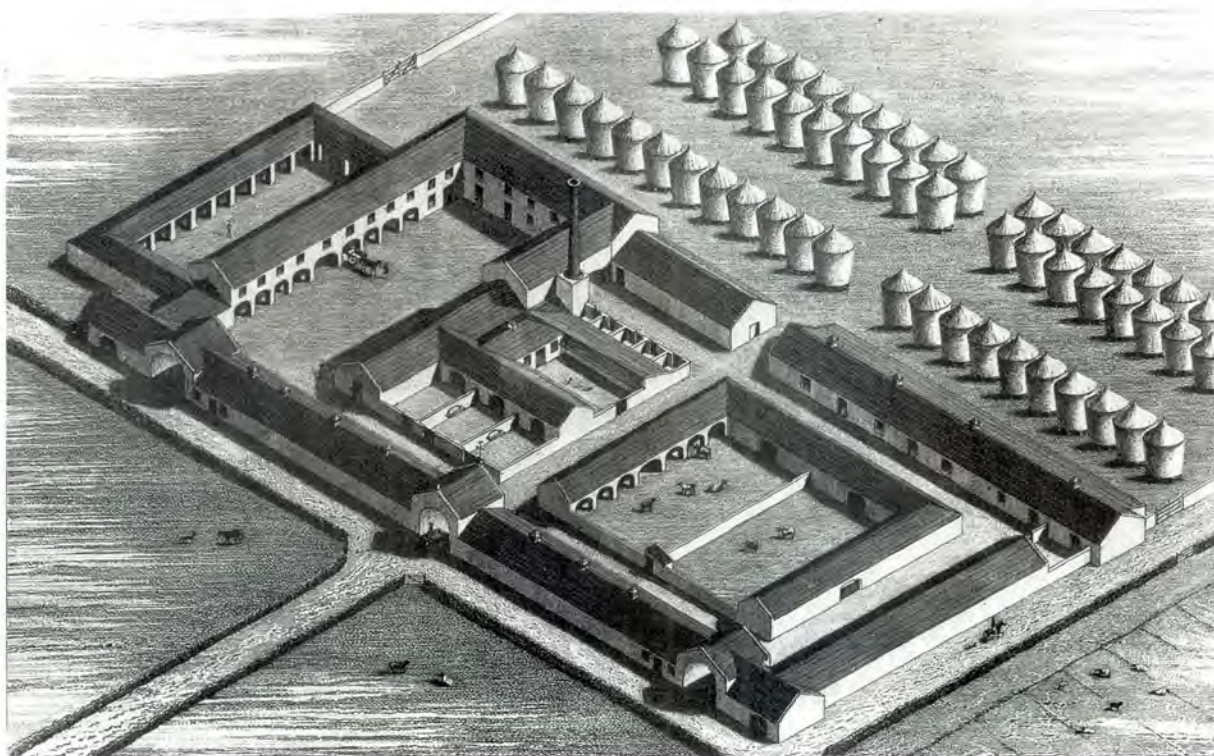


5) Circa 1820



House located separately



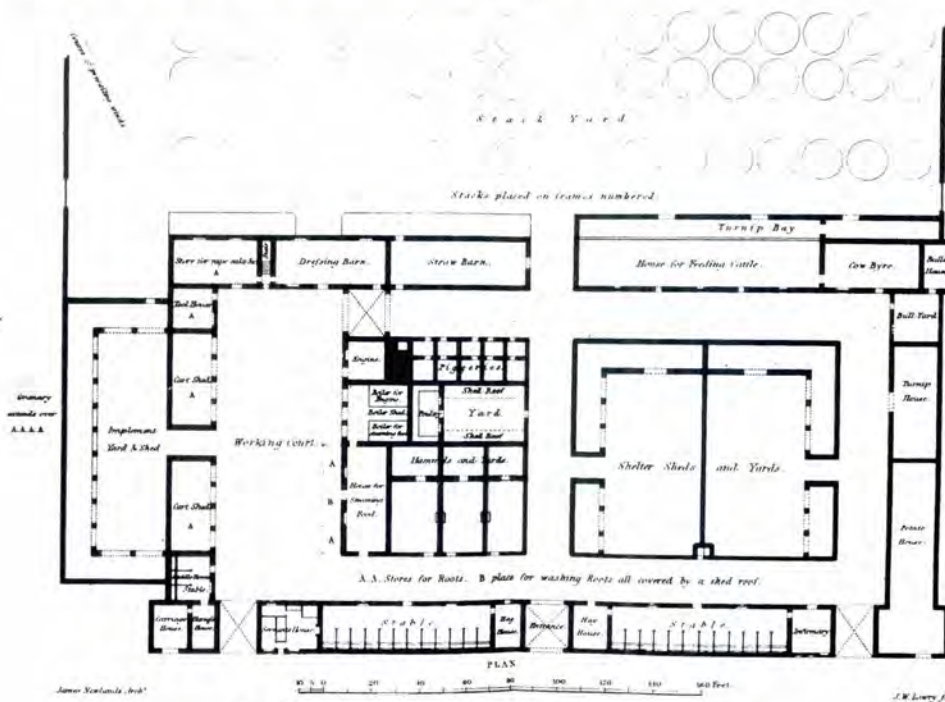


FARM BUILDINGS.

Plate XXI

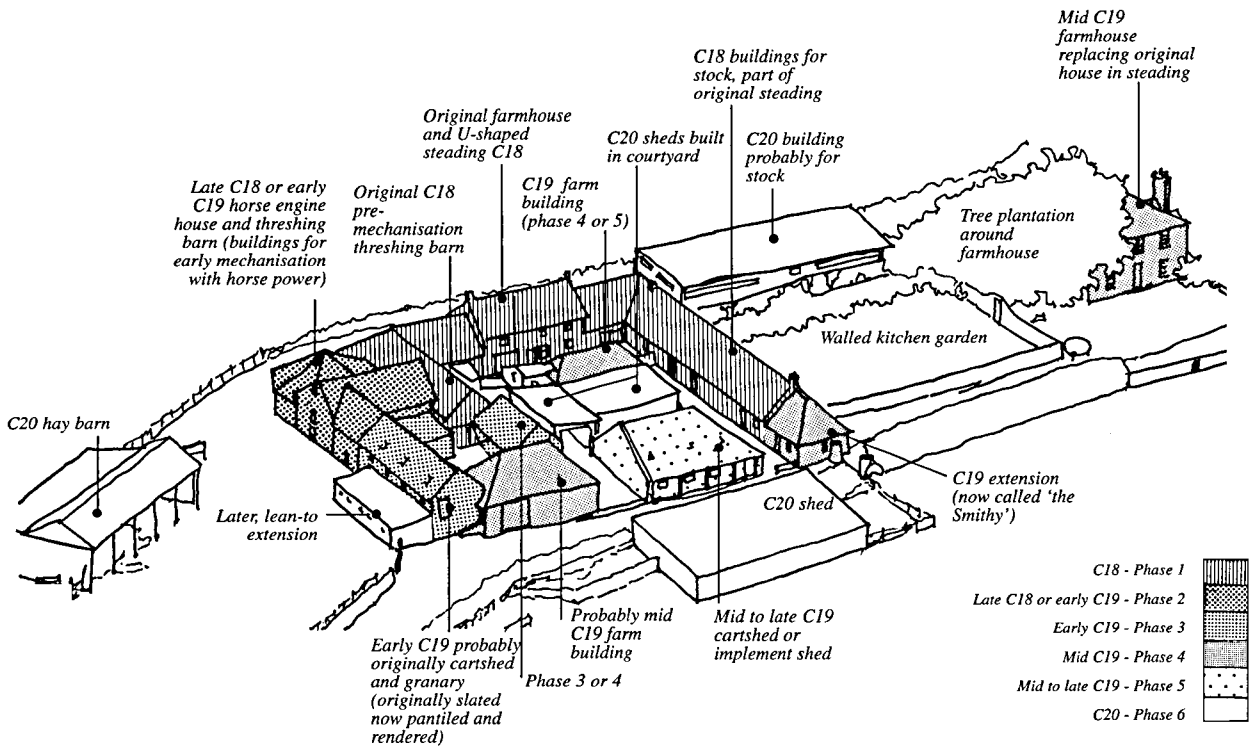


ELEVATION

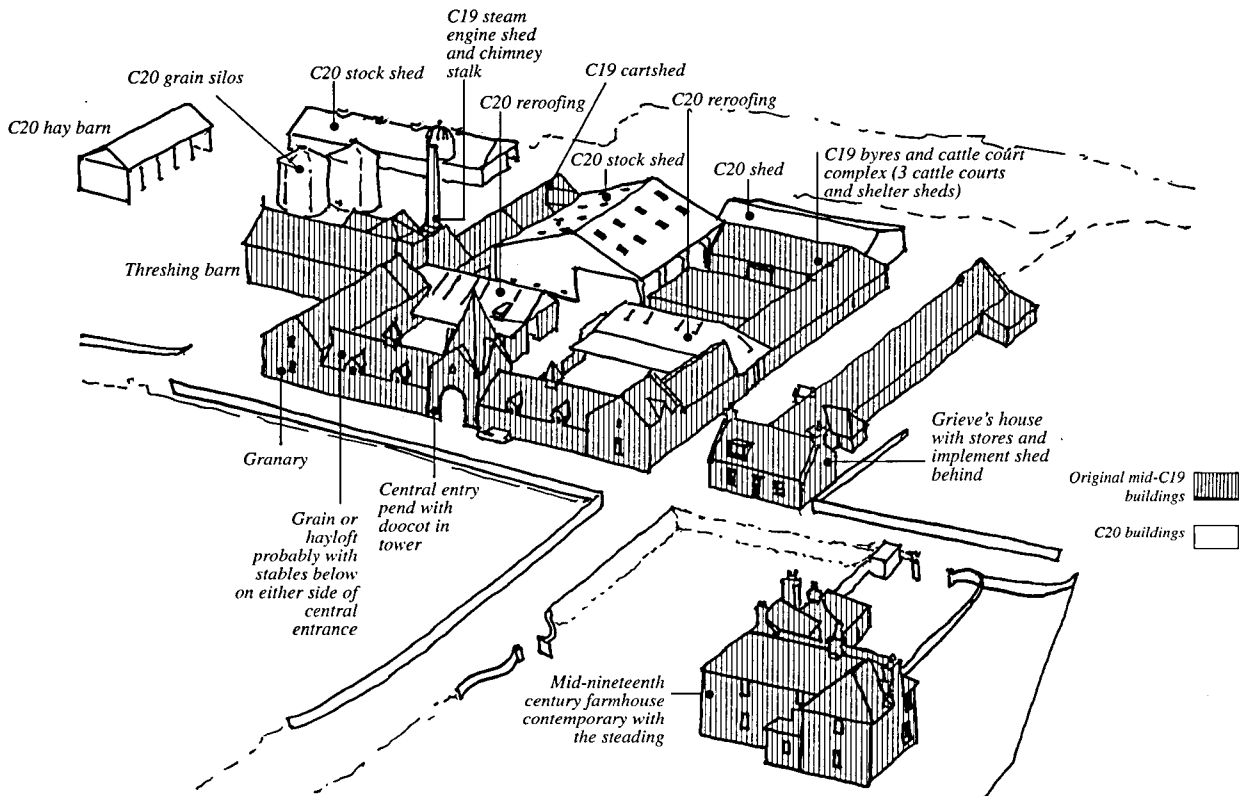


PLAN No 7 FOR A MIXED FARM OF 500 ACRES ERECTED AT SWANSTON NEAR EDINBURGH.

23 Plan and isometric of Swanston, Edinburgh (typical of large farms built circa 1850).



24 Aerial view (1989) of Garvald Grange in East Lothian. Interpretation of possible sequence of development. The steading has now been converted to residential use; all twentieth century buildings have been demolished, as well as some in the courtyard.



25 Aerial view (1989) of a large, mid-nineteenth century farm at Papple in East Lothian. Planned and constructed as a complete unit, the only major interventions are mid-to-late-twentieth century.

sophisticated as the nineteenth century progressed. Initially formed by closing off the fourth side of the barn-byre-house square, they developed into individual courts, each with a yard and shelter shed. Eventually, by the mid-century, there could be a complex network of open yards, shelter sheds, feeding shades, feeding passages and feed stores. In a final phase, begun in the 1850s, courts were roofed over, a plan not universally adopted in the Lothians where open courts continued to find favour.

3.1.9 Plan form (illus 22 to 25)

The scale and articulation of these elements determined plan-form. The earliest surviving arrangements, dating from the eighteenth and early-nineteenth centuries, involved, on smaller farms, a linear plan with barn-house-byre in line or with a barn set at right angles. On larger farms, they comprised a three- or four-sided court, with house flanked by barn and byre. In each case the byre related to the kitchen end and the barn to the best room end of the house. Where possible the barn occupied a site to the west or south-west, to make use of the prevailing wind to ventilate the ricks. The Victorian ideal was for a double court, one for livestock, the other, a 'clean' yard, for grain. This is well-illustrated in the showpiece mid-century steadings at Swanston, Edinburgh and Thurston, East Lothian (illus 23, 323). However, a tendency to adapt existing buildings rather than start afresh meant that this ideal was not always fully realised.

3.1.10 Conclusion

Over the last 100 years, changes in farming practice have rendered most of these buildings obsolete. Houses are still needed, though with mechanisation far fewer workers are employed. The associated pigsties, earth closets and house byres are long disused. The farmhouse's gig house and house stable may still find a use in garaging or for riding horses, but henhouses within the steading are nearly all used for storage only. The later-nineteenth century saw a reduction in dependence on cereals and diversification into livestock, bringing a greater involvement during this century in commercial pig and poultry farming and, especially where urban and industrial populations were close at hand, in dairying. The scale of enterprise involved and a tightening of hygiene regulations both made new-build a better option than adaptation. Cattle courts, once mucked out by graip and horse-cart, now prove too cramped for convenient mechanical handling. Portable threshing machines began to replace fixed ones from the 1870s and 80s; in the 1920s the first combine harvester came to the Lothians; now all grain is threshed in the field, the straw baled and the grain bulk-stored in ventilated silos. During the first half of the twentieth century horses were replaced by tractors. These, and the powered field machinery now used, have become too big and too diverse to be housed in cart bays or even implement sheds. Added to this has been a continuing process of farm amalgamation, making the steadings of led farms redundant. In their time, the eighteenth and nineteenth century steadings



26 Preston meal mill, East Lothian. This seventeenth/eighteenth century watermill is now in the care of the National Trust for Scotland.



27 *Tynninghame Sawmill, East Lothian, an early-nineteenth century estate sawmill, with diamond-lead panes and wheelhouse. It has since been converted to residential use.*

of the Lothians may have been of national, or international standing. They still make an important contribution to the landscape, and they may yet be recognised as the important documents of social and economic history which they are.

But for now they face an uncertain future. Many have become totally redundant, leading to pressures for non-agricultural use. The least altered steadings are not only the least suitable for agriculture; they are also the most favoured for conversion to domestic, commercial or public use. Over the last twenty years or so, for better or worse, a substantial proportion of the best preserved steadings have undergone this change.

3.2 Rural Industrial Buildings (illus 26 to 29)

3.2.1 Introduction

In addition to farm buildings, the Lothians countryside also contained many small-scale buildings for processing raw materials or manufacturing goods. These included grain mills, sawmills and textile mills, smithies, joiners' shops, lime kilns and hand-loom weavers' premises.

The basic trades of smith, wright, miller and weaver were already well-established in both burgh and countryside by the early-eighteenth century. Where raw materials were bulky or heavy, there were clear

benefits in processing near source. Thus, given access to peat or coal for fuel, lime-burning remained close to the quarries from which it was sourced. The need for water to power millstones, fulling stocks, flax scutchers or saws gave more of a rural emphasis to certain trades than might otherwise have been the case - at least until the nineteenth century when small-scale fuel-efficient steam engines came into general use.

3.2.2 Fabric and setting

There was considerable variety in the physical setting and architectural character of these minor industrial workplaces. Some activities involved no buildings: basket-making and tin-smithing by travellers; cloth bleaching at the burn-side; sawing in saw-pits or lime or charcoal burning in clamps. The simplest of structures were open-fronted shelters, or luges, of a kind once used by masons.

Some trades, involving simple technologies and small-scale materials, could be accommodated within the home or in minor buildings appended to it. These included textile trades, such as heckling, carding, spinning and weaving; shoe-making, tailoring, hand-knitting and other costume making; and nail-making. The positioning of premises in relation to the house might be alongside, in the same range - as with loom-shops - or in cellars or ground floors.



28 *Glenkinchie Distillery, East Lothian.*

In terms of scale, materials and construction, workshops tended to adopt the same vernacular idiom as domestic and agricultural buildings: clay-mortared, later lime-mortared rubble walls, thatched, later pantiled or slated roofs, generally one, sometimes two and occasionally three storeys in height. Local variations - clay walls, turf, stone and turf - applied to small-scale industrial buildings as much as to other vernacular types. Only exceptionally, with estate workshops built in villages or parks, did polite architecture feature in such functional structures: the Earl of Haddington's sawmill, at Tynninghame, East Lothian, with its crow-stepped gables and diamond-paned windows, is a good example (illus 27).

During the later-nineteenth and twentieth centuries, the availability of materials usually considered too inferior for domestic use, helped create a more distinct architecture. As estate plantations matured, timber became available as a walling material, supplemented by imports and recycled railway sleepers. A particularly common style used wide deals, set vertically, with narrow timbers covering their joints. Corrugated sheet metal, already available by the 1840s, and corrugated asbestos, from the early twentieth century, served as cladding and as cheap replacement roofing - even on the roofs of previously thatched houses. Iron, later steel, could replace timber in frame and roof construction. Common and sand-lime brick were adequate for additions or alterations to

workshops, but were not thought appropriate for the external walls of houses - unless concealed beneath a layer of render.

3.2.3 *Special features*

Other, functional, characteristics set these rural buildings apart. The processes which they housed may have required any of the following: the storage, moving, heating, cooling or drying of materials; manual or powered equipment for working materials and light to work by; perhaps also a little human comfort in terms of ventilation.

3.2.4 *Storage*

Indoor storage might be provided for raw materials, for partially-worked materials, or for finished products. Parts of other buildings might be set aside; lofts were one such option, out of the way of workplaces and especially suited to materials such as those textiles which required a dry environment. Conversely, the cool, damp environment of a cellar was well suited to storing beer. Grain mills and salt works had their granaries and salt ginals. Wood-working premises had open-sided or slatted stores which sheltered timber from the rain but allowed free air circulation to discourage decay and assist seasoning. These were sometimes sited at ground level, with the workshop above, or vice versa.



29 *Smiddy at Oldhamstocks, East Lothian in 1900.*

3.2.5 Movement

The movement of materials - onto and off site, into and between processes - also had an impact on the appearance of buildings. For many trades, doorways of domestic scale were adequate but in others the scale of the objects being worked on required higher or wider openings. Larger openings might also be needed to admit carts or other vehicles. In buildings of more than one storey, external doorways in upper floors, perhaps with hoists above, admitted materials without their having to pass through working areas. Grain mills, for example, might have external or internal hoists, the latter passing through trap doors which were opened by the ascending load. Their internal layout well exemplified the ways in which gravity could be exploited to assist the movement of materials from process to process. In ropeworks, the movement of the manufacturing process, drawing out and twisting lengths of rope, gave rise to exceptionally long, narrow buildings. Sawmills incorporate another feature related to the movement of materials, their open sides or ends allowing heavy logs to be manoeuvred onto the saw bench.

Collection of materials or distribution of products might require stabling (often with a hay loft over) plus cart or wagon bays or, latterly, garaging.

3.2.6 Heating

Most types of small-scale manufacturing premises used heat as part of their processing. Kilns, and the less sophisticated clamps, were built exclusively for that purpose. As an adjunct to corn mills rather than farms, kilns first occurred in south-east and east-central Scotland, and were already widespread by the sixteenth and seventeenth centuries. The kiln's role here was to dry grain in preparation for grinding, its essential components being a furnace below with a bed for the grain above. These earlier kilns were round (a good detached example survives at Preston Mill, East Lothian) (illus 26); improved, rectangular kilns date from the later eighteenth or nineteenth century and form part of the mill building. A subsidiary role for corn kilns was in drying malted grain prior to grinding; latterly maltings, breweries and distilleries had their own kilns.

Kiln-drying of timber was a more rapid alternative to air seasoning. Other kiln types were used for brick and tile making.

Direct heating of materials, within the workshop itself, was a feature of metal-working premises. In a blacksmith's shop the wide, projecting raised hearth is a dominant and characteristic architectural feature. Occasionally there is an outshot to the rear of the building to give sufficient width to house the handle of the bellows - as at Cousland, Midlothian (illus 220).

Heating materials in liquids, or heating liquid materials, were processes common to many small-scale manufactories, such as bleachfields, paper mills, breweries and distilleries. These found architectural expression in fixed furnaces, boiling vats and chimneys - though these last might be indistinguishable from conventional hearths.

Finally, other trades needed heat sources for minor purposes. These could be accommodated on conventional hearths or, latterly, on the specialised workshop stoves manufactured by Scottish foundries.

3.2.7 Cooling and Ventilation

Cooling, airing and drying featured in far fewer types of workshop than did heating. In architectural terms, this often involved replacing part or all of the walls on one storey or more with louvred vents. Usually upper floors were used, on account of their greater exposure, as in breweries (to ventilate the cooling vats), in tanneries (to dry the tanned hides) (illus 222), in warping lofts (to dry the prepared linen warp threads before weaving) and in mills making paper by hand. Long, single-storey drying sheds, with louvred sides, were a feature of tile works where they housed moulded clay in preparation for firing.

The ventilation of work-places was less of a concern, though some provision might be made where heat or dust levels were exceptionally high. Such windows as existed were generally fixed. Smithies might have doors with lower and upper halves, of which the upper could be opened for ventilation, while grain mills and maltings might have horizontally sliding louvred vents underneath shutters. Loose-fitting, low insulating pantiles were particularly well suited to smithy roofs; the better insulated slate roofs were often fitted with ridge or side vents.

3.2.8 Working equipment

Of particular importance were space in which to use working equipment (fixed or movable) and light to work by. These requirements influenced layout and built form. A source of daylight was needed, and window openings were often closely linked to work stances. The characteristic opposing (back and front)

windows of hand-loom shops are found in twos, fours, occasionally sixes, each window corresponding to a loom stance. Repetitive lines of windows show the same relationship between light source and individual work space.

The premises of many trades, but more especially those using hand-tools, contain fixed work-benches below and beside windows, most commonly at the front of the building. The windows may be small in scale and number - perhaps only one or two - or, at the other extreme, as in some wood-working shops, may extend continuously across one or more elevation.

The presence of one or other power source - animal, water, wind, steam or combustion - has its own effects on form with horse gin, wheel or wheelhouse, windmill or engine and boiler house plus stalk as part of the built assemblage. The Lothians had a scattering of wind-powered grain mills. A characteristically Scottish form of windmill, dating from the seventeenth century, consisted of a stone-built tower over an adjoining vaulted chamber, as at Balgone Barns, East Lothian (illus 78). Both horse engines and wind engines were used in water pumping and, occasionally, for other purposes, as well as on farms.

Water power was the prime mover in small-scale manufacturing until at least the 1830s, but had little impact on built form, other than in wheelhouses - which were by no means universal - and the need for well dressed stonework on walls exposed to water. Steam engines were first used to pump water, but found few other uses until about 1800. During the course of the nineteenth century the availability of increasingly compact, efficient and powerful steam engines contributed to the success of town and city workshops, and a decline in rural industry.

3.2.9 Conclusion

Now that these buildings, like those of farms, are redundant, there is a need for a change of use if they are to survive. Mills have been favoured subjects for conversion to domestic and other uses, but as with other small industrial buildings, careful consideration needs to be given to their adaptation if the original character is to be retained.



30 Single-storey farmhouse at Skivo, West Lothian, forming one side of steading quadrangle, and facing into farmyard. The farmhouse was harled or limewashed, with a slated roof, twelve-pane sash and case window and two-leaf boarded door. The adjacent farm buildings were of exposed rubble stonework with pantiled roofs.



31 A two and a half storey farmhouse with semi-circular rear stairtower at Hilly, West Lothian. The farm buildings are close to the house.

4 BUILDING CHARACTERISTICS AND POTENTIAL REUSE

4.1 Introduction

The age, function (residential, agricultural, industrial or a combination of these) and location of rural buildings determine many of their characteristics. The development of farming methods and the arrangement of farm buildings has already been described in the previous chapter. Within these farm groupings, each part of the building complex needs to be considered on its own merits. They are listed and described below, with brief comments on conversion potential. The main categories of rural industrial buildings are also discussed in terms of their possible reuse. The broad philosophy promoted here is to match any new use to the character of the existing building.

The later chapters address particular elements of construction and propose appropriate methods of repair and conversion.

4.2 Buildings for labour (domestic buildings)

4.2.1 Farmhouses (*illus 30 to 33, 295 to 298, 300 to 303, 326, 327*)

In the eighteenth century, the farmhouse was often attached to the farmsteading. Even where separate, it formed the fourth side of the steading square. In the

nineteenth century it was usually set apart on all but small farms, with a walled garden area and trees. The house was commonly two storeys, but sometimes one and a half (ie with bedrooms in an attic floor), or occasionally single-storey. In West Lothian many farmhouses were originally built as single-storey, but were later raised to two storeys (almost seamlessly) as fortunes developed. Others remained as single-storey, while some were completely rebuilt.

The size of the farmhouse depended on the size of the farm, the location (smaller in the west and uplands) and the date (see 3.1.9, 'Plan form'). Generally it had a slated roof and the walls were of ashlar or rubble masonry, sometimes harled with stone surrounds to openings. Windows were timber sash and case, and doors panelled or boarded. Internally there would have been plastered walls. Floors were generally timber, but stone in kitchen and entrance areas.

A farmhouse can almost always remain in its established residential use (although one is known to be in use as a dentist's surgery and several are pubs or hotels). There should be no major problems unless there is a desire to provide greatly expanded accommodation or ancillary facilities (for example a swimming pool, conservatory or garaging). The use of other redundant farm buildings to accommodate these should always be encouraged.



32 Farmhouse at Temple, Midlothian, completely separate from the steading, with a walled garden.



33 Originally a coaching inn, this building at Westcraigs, West Lothian later became a farmhouse and has now been converted to housing. The steading at the rear has been converted to a community centre, library and museum.



34 Grieve's house positioned on a prominent corner by the entrance to the steading at Papple, East Lothian.

4.2.2 Grieves' houses (illus 34)

On larger farms, where a grieve or steward was employed, his house was close (often attached) to the steading, on a prominent corner adjacent to the entrance. It was normally rubble-built (but sometimes harled) and usually slated. Windows would have been sash and case and doors boarded. Internally, walls were plastered and floors were timber, except in kitchen and entrance areas where they were stone-flagged.

The most suitable use for a grieve's house is residential, as for farmhouses and cottages. However, as a grieve's house can be in the middle of a working farm, use as a farm office or for a similar purpose is sometimes preferred.

4.2.3 Farm cottages (illus 11 to 13, 35, 139, 152, 299, 329 to 332, 342)

The farmworkers' cottages were set apart from the steading, usually built in a semi-detached form or as a terraced row. They were small, with two to four rooms. They had gardens or vegetable plots at the rear. There were often wash houses, closets/privies and pig sties behind the cottages. Roofs were usually slated, but sometimes pantiled. Walls were normally stonebuilt, though very occasionally brickbuilt, and sometimes harled. Windows were timber sash and case, doors boarded or panelled. The cottages were usually single-storey or one and a half storeys.



35 Terraced farm cottages at Yorkston, Midlothian.

A dairy maid's or cattleman's house was likely to be located within or near to the steading. It would be small and single-storey (or occasionally one and a half), with sash and case windows and boarded doors. Internally, walls were plastered and floors mainly of timber.

Residential use is best for these cottages, but extension or amalgamation of units may be desired. Any extensions should be small and unobtrusive. Amalgamation may be preferable to extension if it requires less overall alteration. Cottages located within the steading group, or attached to it, may be best used as farm offices or ancillary agricultural accommodation if the farm is still in operation.



36 Bothy at Ewingston, East Lothian.



37 Dairy pavilion at Hedderwick Hill, East Lothian.

4.2.4 Bothies (illus 36, 175)

There are few bothies in the Lothians, but one was occasionally provided for unmarried male or seasonal workers. It was usually located among the farm buildings and probably of the same construction. There might be two rooms, a dormitory above or alongside a living room, with sash and case windows and boarded doors.

Because of its small size and location in the steading, it is unusual to find a bothy still in residential use. If a farm is still in agricultural use, it might be suitable for use as office or ancillary agricultural accommodation.

Accommodation for single servants or workers was also sometimes provided above stables (for men) and above byres (for women). These lofts will have more daylighting than is otherwise usual, and may be suitable for residential use if the stables or byres are not still used to house animals.

4.2.5 Ancillary domestic buildings

Dairies (illus 37, 318). Most farms had a small dairy situated close to the farmhouse. On home farms or estates, dairies could be elaborate circular or polygonal buildings, with cresting or finials. On other farms, they were simpler, usually slate roofed, often whitewashed internally or tiled and plastered, with various degrees of decoration. They sometimes had tiled or flagged floors, fly grilles on the windows, stone, marble or slate shelves and benches, and cast-iron ventilator grilles in walls or ceiling.

Milk houses, where these existed, were used for the hygienic storage of milk and dairy products, and were more utilitarian in character.

Game larders, ice houses etc (illus 38) These food storage buildings were more commonly associated with large country houses, but were occasionally



38 Farm ice house at Thornton, Midlothian.



39 Gig house (and groom's quarters) at Gateside, West Lothian.

attached to farms. Game larders were often at an upper level, facing north and with good ventilation by means of louvred or slatted openings. Ice houses were almost underground, often in a north-facing slope, with only a small tightly shuttered entrance.

Gig houses (illus 39, 40, 328). Only found on the larger farms, a gig house accommodated a small horse-drawn vehicle, with adjoining stables, harness room, and in some cases, groom's quarters. Usually located close to farmhouse and steading, it was typically of stone and slate construction (probably matching the house), with timber-framed windows.



40 Stables at Borthwick Manse, Midlothian, now converted into living accommodation. There was often a glebe steading attached to a manse, which was a small version of a farm steading, perhaps just one or two building ranges, similar to this one.



41 Kennels at Stobshiel, East Lothian. Note the brick construction and Welsh slate roof.



42 Poultry house with hen steps and hen entry at Bridgend, West Lothian.

Kennels (illus 41). These comprised small cubicles opening to the outside, each with a railed outside yard. They may often have been associated with hunts, and are most often found at mains (or home) farms.

Poultry houses (illus 42, 307). These were situated within the farm buildings, but close to the farmhouse. An outside door was provided for humans as well as a small, higher-level door for hens. There could be external stone steps up to the hen entry. The poultry house was a smallish room, sometimes plastered, with stone nesting boxes recessed into the walls, similar to those in doocots, but usually larger and with only two rows, one at ground level and one above.

Garden buildings (illus 43). These include greenhouses, potting sheds and privies. Construction varied from fairly basic to ramshackle. Greenhouses were of timber framing and cheap, uneven 'greenhouse' glass with brick or stone bases to walls. The greenhouse was usually formed as a lean-to against the south side of a north wall to the garden or kitchen garden. The other outhouses would have been roofed in slate or pantiles, with rubble, brick or rendered walls, boarded doors and small timber-framed windows.

Doocots (illus 44 to 48, 310, 347, 439 to 447). Freestanding doocots were usually either lectern or beehive-shaped until the late-eighteenth century, when cylindrical, polygonal or square towers with pyramidal roof were developed as alternatives. A door (often rather low) was provided at ground level, and there were projecting stone rat courses around the walls and high level flight holes at the eaves or roof level for the



43 Outhouses (possibly privies) at Barberfield, East Lothian, now converted to garden sheds.



44 *Beehive doocot, probably sixteenth century, at Drylawhill, East Lothian.*

doves. The interior was lined with nesting boxes, and there was usually a wooden pole and revolving ladder (potence) giving access to the boxes. There were rarely any windows, which restricts potential conversion. One successful conversion in Lothian has been to a visitor centre (see the case study of Athelstanford Dooocot at 11.7), and there are residential conversions (at Newliston in Edinburgh and Humbie in East Lothian).

In the nineteenth century, doocots were also often incorporated in the towers above entry pends on formally-designed estate steadings. These were sometimes provided with windows or false windows, in which case conversion to habitable space is easier, although nesting boxes should be retained. Rooms have been formed in such doocots (where there is adjoining living accommodation), and they are even occasionally proposed for such purposes as wine cellars or libraries, to make use of the nesting boxes.

Most ancillary domestic buildings are close to the house and can be used as some form of domestic accommodation, stabling or if large enough, as separate dwellings.



45 *A late-eighteenth century round doocot at Bolton, East Lothian.*



46 *This early-eighteenth century double-lectern doocot at Newliston, Edinburgh (said to be the second largest in Scotland) has been converted to a house.*



47 *A doocot over the entry pend at Bridgend, West Lothian.*



48 Habitable accommodation in the tower above the entrance to Calder House Steading, West Lothian, originally a doocot at the upper level (see illus 276 for a photograph of this building before conversion).



50 Cottage at Spilmersford Mill, East Lothian in 1887.



51 Woodcockdale Cottages and Stables, Union Canal, West Lothian. These housed the barge horses and workers.

4.2.6 Housing for industrial workers (illus 29, 49 to 51)

In some cases housing was provided for workers on the same site as the industry (or nearby). For instance on a large scale, Glenkinchie Distillery has rows and rows of terraced brick-built houses and cottages, set along streets in a form of designed village layout. And the shale-oil industry in West Lothian built estates of brick single-storey row housing, much of which has now

been demolished, so that a couple of isolated terraces remaining will seem rural. But this is much more extensive than most of the other workers' housing found with the smaller rural industries.

At a watermill there is more likely to be an individual house, perhaps for the mill owner or manager, plus a



49 Housing for the workers at Glenkinchie Distillery, East Lothian. The cottages are constructed of polychromatic brickwork with slated roofs and clay ridge brattishing. Many of the doors and windows have been altered.

small row of cottages for the workers (see the case study of Redhall mill at 11.2). The house may be slightly apart from the mill, whereas the cottages usually form part of the group of mill buildings. The house and cottages are usually stonebuilt with slated roofs, although cottages may be pantiled.

A workshop (smiddy, joiner's shop, or hand-loom weaver's workshop) almost invariably has a cottage alongside for the craftsman, of the same construction, with stone walls and pantiled, or later slated, roofs. An estate group of workshops, on the other hand, will be separated from the housing, although it may be close by (see the case study of Thornybank steading at 11.6). On an estate, the design of both cottages and workshops is likely to be similar, and often carefully designed as a group.

4.3 Buildings for land-working

4.3.1 Stables (*illus 52, 305, 306, 312, 313, 349*)

Stables were designed to provide good conditions for horses, as these were more highly valued than other farm animals. They were spacious, well ventilated and well lit. The building was usually single-storey, though occasionally with a granary or hayloft above (or even bothy or groom's accommodation). Stables usually have windows incorporating fixed glass and louvred vents below, or opening glazed sections. There are often roof vents as well, either projecting ridge-mounted cowls or slightly raised sections of roof. Internally they were sometimes plastered or tiled, and there were stall divisions (trevises), feeding racks and paved and drained floors.

Because stables have windows, they can be suitable for conversion to habitable accommodation. A fenestration form close to the original should be used in any conversion. Paving and trevises should be retained if possible.



52 Stables at Lilyburn Farm, Midlothian, 1974.



53 Single-storey cartshed at Fountainside, Midlothian.



54 Cartshed with granary above at East Fortune, East Lothian, one of the largest cartsheds. A stable is usually situated at one end.



55 *Implement shed at Spittal Farm, East Lothian.*



56 *Implement shed at Maudslie, Midlothian.*



57 *Timber building at Binny House steading, West Lothian.*



58 *Old railway carriages at Barberfield, East Lothian.*

4.3.2 *Hay storage (illus 189)*

Haylofts were often located above stables or other agricultural accommodation, but in larger or better farms, hay was stored alongside stables rather than above them. Good watertight roofing was needed and good ventilation, which resulted in the frequent use of slated roofs and louvred windows or roof vents. Lofts also had an upper-storey loading door.

The lack of good daylighting and headroom may make these areas unsuitable for residential conversion.

4.3.3 *Cartsheds (illus 15, 53, 54, 263 to 267, 309)*

Most farms had cartsheds, almost always with granaries on the upper level. They had up to twelve wide, arched openings, usually without doors. The location was peripheral to the steading, allowing easy access to fields. The cart arches faced in one direction only, either into the courtyard or outward. The roof was almost invariably slated, and the walls built of rubble stonework, usually with dressed stone piers and surrounds to openings.

A cartshed is best utilised as open storage (for instance garaging). Careful detailing will be required if it is proposed to infill the arches to form living accommodation (see chapter 8 'Openings').

4.3.4 *Implement sheds (illus 55, 56, 208, 277)*

Provided from the 1850s onwards in many farms, an implement shed was nearly always single-storey and open-fronted, often with cast-iron columns. The walls on the other three sides generally had no openings. The roof was either slated or pantiled.

Suitable uses include parking bays, open storage areas, covered drying or wet weather children's play areas. Enclosure to form internal accommodation alters the character excessively and is not advised.

4.3.5 *Timber buildings (illus 57, 58)*

On some farms, timber buildings can be found, often with slated roofs. These are probably mainly early-twentieth century, and used for a variety of purposes. In addition, occasional old railway carriages or caravans have been utilised for farming functions (henhouses etc). Some of these are now valuable traditional artefacts in their own right.

4.4 **Buildings for Grain**

4.4.1 *Threshing barns (illus 16, 59, 60, 230)*

Up to the late eighteenth century, barns were single-



59 Threshing barn and horse engine house at Black Dykes, East Lothian.



60 Horse mill and threshing barn at West Broadlaw, West Lothian.

storey buildings with steeply-pitched roofs and slit vents in the walls, angled to catch the wind. Doors were wide and arranged opposite each other. Roofs were pantiled and the stonework rubble. Few such barns remain unaltered.

Later barns were two storeys in East and Midlothian, but often one and a half in West Lothian. Although there was usually a loading door giving access to the upper level, and various doors at ground level, there were few windows.

Conversion to residential use may require the insertion of additional window and door openings. This is generally undesirable, and any new openings must be carefully designed and located (for instance only in the less visible frontage) to ensure that they are unobtrusive. A use which requires no extra openings to be made is preferable.

4.4.2 Granaries (illus 15, 17, 54, 263 to 267, 271, 308)

Grain was nearly always stored above the cartshed, but occasionally over the stables or cattle shelters. The granary had regularly-spaced window openings in the front wall to allow free ventilation. These were arranged with one over each cart arch and were often partially or wholly louvred. There were sometimes additional window openings provided in the back wall, or roof vents. Roofs were nearly always slated for watertightness.

Because there are regular openings, a granary can be relatively suitable for conversion to habitable accommodation. However, internally the ceiling is often low or coomed and window openings may be at a low level. This can present difficulties in terms of building regulations, and might require relaxations (see chapter 8 'Openings'). Otherwise, rooflights may need to be provided in a conversion to give high-level ventilation and sufficient daylighting (see chapter 7 'Roofs').

4.4.3 Horse engine houses (or horsemills or horse gangs) (illus 18, 59, 60, 143, 144, 184, 185, 384, 387)

Horsemills usually date from the eighteenth or early-nineteenth century. The most common type in the Lothians was polygonal externally (although they could also be round) and attached on one side to the threshing barn. There were wide floor-to-ceiling openings on two to four sides. A faceted conical roof, generally pantiled, had a radial timber roof structure exposed inside, with an overhead drive shaft. Where roofs were slated, they usually took a smooth conical form above a circular stonebuilt horsemill, but this was not a usual Lothian design. The central timber post and machinery occasionally remain.

Many horse engine houses have been converted to living spaces. Because of the large openings, daylighting can be generous. But if machinery survives, this may restrict the use of the space. Horse gear, even if incomplete, is now a very rare survival and should be retained in situ wherever possible. In listed buildings, consent for its removal is normally given only where there is proof that retention is not feasible and on condition that it is recorded, carefully dismantled and stored for possible museum display elsewhere.

Buildings harnessing the other contemporary power sources of wind and water are described under 4.6 'Rural Industrial Buildings', although farms also had their own windmills or watermills in some cases.

4.4.4 Steam engine and boiler houses, and chimneys (illus 1, 13, 17, 61, 107, 362, 376)

Steam was used as a means of power for threshing from the early-nineteenth century. The chimney was always built of brick (round or square, sometimes decorated with polychromatic brickwork) and constructed on a very solid stone base. The engine and boiler houses were in a stone building or buildings adjoining the



61 Steam engine house and chimney stalk at Waterstone, West Lothian. This typical chimney is round and built of brick on a stone base. The threshing barn is behind the chimney. The area in the foreground may have been the stackyard originally.

chimney, with several door openings but few windows.

The steam engine house with its boiler house and chimney was usually in a peripheral location on the outer side of the threshing barn (in a similar position to the horse mill).

There are few chimney stalks left, so their preservation is important. The installation of lightning conductors and the carrying out of regular inspections to monitor the pointing and structural condition are important for their survival.

The boiler and engine houses might be useful for workshops, garaging or storage, but the chimney is unlikely to be usable in a conversion, except perhaps for some industrial process requiring a flue. However, there are currently farm conversions where the chimney is being retained or even rebuilt, as a feature and for use as a barbecue or pizza oven flue.

4.5 Buildings for Livestock

4.5.1 Cattle Byres (illus 62, 188, 207, 314)

The byre was usually of a single storey, though occasionally with a granary or hayloft above. It often had roof vents and/or slit vents in the walls. There was minimal fenestration, apart from rooflights. Because of the need for good ventilation, earlier roofs were generally pantiled and later roofs (after 1850) sometimes open-slatted. Internally the floor was paved and drained, and there were sometimes stall divisions, arranged across the building in earlier farms and later along the back wall, although the cattle were previously tethered to poles instead.



62 Byre at Bridge End, Edinburgh. Note the clay ridge vents and traditional, regularly-spaced, small cast-iron rooflights. From the width of the building, it is probable that this is a double byre, with stalls along both back and front walls.



63 Livingston Mill Farm, Almond Valley Heritage Centre, is an example of a change to museum use which retains most of the original buildings of the steading. Public use does, however, require safe access and improved amenities, so some change has to be accommodated.

Because they have few windows, byres are not easily converted to habitable accommodation without substantial alteration to their external appearance (an example of this is the fabric workshop at Hiltly, West Lothian). Suitable uses might include light industrial functions, workshops or storage. One farm has been converted to a farm museum at Livingston, West Lothian (illus 63). This has allowed most of the buildings and fittings to be saved, but modifications and additions have had to be made to give safe public access and amenities.

4.5.2 Cattle courts and shelter sheds (illus 21, 64 to 69, 317, 351, 352)

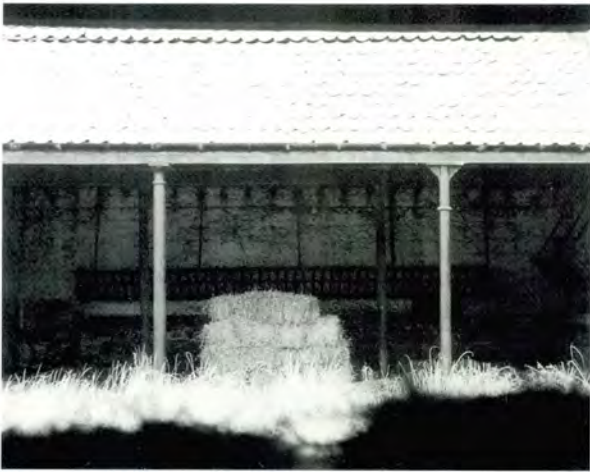
Earlier courts were simple and uncovered, with open-fronted shelter sheds against the south side of the northern wall of the steading. Older shelter shed roofs are pantiled, but later roofs were sometimes open-slatted to allow good ventilation. Columns were often cast-iron.



64 The outer facade of the cattle court complex at Almondhill, Edinburgh. The double doors probably gave access to a turnip storage area.



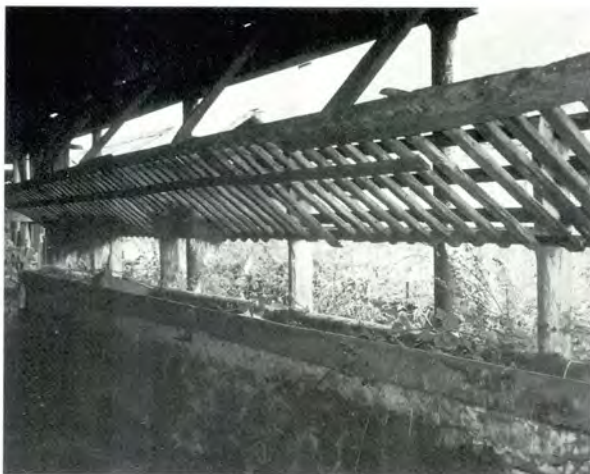
67 Cattle court and shelter shed at Spittal, East Lothian.



65 The inner face of the shelter shed at Almondhill, Edinburgh, opening onto the cattle court.



68 Roofed cattle court at Eastfield, East Lothian.



66 Feeding passage, trough and hay heck in the shelter shed at Almondhill, Edinburgh.



69 Cattle court with a later roof at East Fortune, East Lothian.

On the larger farms, by the mid-nineteenth century, complex arrangements for the housing of the cattle were being constructed. These included open yards, shelter sheds, feeding shades, feeding passages and feed stores. After the mid-nineteenth century many cattle courts were roofed, often in a lightweight material such as corrugated iron. In home or model farms the arrangements for feeding and mucking out were often particularly well designed.

Where a cattle court roof was added to an open court, there may be justification for removing it and reverting to the original form. Where the roof was an integral part of the original structure, or where it is of particular structural interest, it should remain if possible. Walled cattle courts can be utilised in a conversion to provide private gardens or courtyard spaces. Where arrangements were especially well designed, every effort should be made to retain as much as possible.

4.5.3 Sheep houses and shelters (stells) (illus 70 to 72)

Sheep farming is not a major part of agriculture in the Lothians, but in the upland areas sheep farms or mixed farms can be found. Only a few buildings are specific to these animals, mainly remote shelters as illustrated.



70 Exterior view of sheep house at Glede Knowe, Midlothian.



71 Courtyard view of sheep house at Glede Knowe, Midlothian, partially re-constructed using the same materials.



72 Sheep stoll at Hiredean Hill, Midlothian.

4.6 Rural Industrial Buildings

The majority of the industries operating in the Lothian countryside were found along the major rivers (in particular the Almond, the Avon, the Esk, the Tyne and the Water of Leith). Most of the smaller rural mills were powered by water, and many (such as tanneries, paper mills, scutch and lint mills) used water for their cleaning or cooling processes. There was even a gunpowder factory (the only one in the Lothians) located on the Esk in Roslin Glen (illus 73, 221).



73 Gunpowder factory in Roslin Glen, Midlothian.

Distilleries and breweries both required a good pure source of water, provided by either a spring or a well. Smiddies and workshops were positioned by a road, and often in villages. Some of the larger industries were normally located in towns (in particular breweries and tanneries), and are therefore generally outwith the scope of this advice, but some were sited in more remote areas, or attached to farm or estate groups. The method of powering an industrial process and the material processed determined both the size and design of the building.

More detailed information about industries and their buildings can be found in John R Hume's *Industrial Archaeology of Scotland* which also itemises industrial remains in the Lothians (volume 1).

4.6.1 Watermills (illus 26, 27, 74 to 77, 388 to 400)

Watermills had to be located where the best waterpower was available or could be contrived, in good riverside positions or below millponds. Sufficient water was channelled to the wheel by a lade, and then either returned to the river, or continued along the lade to serve other mills. If the location was suitable, a mill might be within a farm or village group, but often it was situated on its own.

The position of the waterwheel varied. In some mills the lade ran under the building, with the wheel located internally. In others the lade ran outside, either down one long elevation or along the gable. The wheel would then be external and a covered wheelhouse was often provided. Stonework on walls exposed to water was well dressed and of good quality.

Roofs were pantiled or slated. Walls were of rubble stonework. Doors were vertically boarded and windows were usually fixed lights or shuttered, or a combination of the two. There were usually wallhead-level hoists for moving and lifting materials.

Watermills with machinery in complete or near complete preservation are now relatively rare and working mills are very rare indeed. These mills are likely to be listed. The practical needs of the few remaining millers should be sympathetically considered in order that they can continue in business, but wholesale destruction of the original workings should not be allowed in a listed building. Any machinery which is to be removed should be recorded beforehand and carefully stored, and any changes made to the structure should be easily reversible. Working museum projects should obviously receive particularly sympathetic consideration.

Where the proposal is for change of use, the minimum desirable requirement should be that the waterwheel, gearing and any millstones, kiln vents or other features



74 Thornton Mill, East Lothian, in 1965. There are few water wheels remaining.



75 Barley mill at West Saltoun, East Lothian, in the 1960s before conversion. The kiln with an angled cowl is in the corner between the two other buildings.



76 The West Saltoun mill after conversion. The buildings are now harled and the kiln has a slated roof; the timber forestair runs the other way.



77 *Breast Mill, Edinburgh, which was converted to a dwelling some years ago.*

are retained in situ and the watercourses repaired, even if left dry. If present, the furnace and funnel of the kiln may inhibit the usefulness of the lower floor, but their presence is important to allow an understanding of the original working of the building. It should therefore be a condition of listed building consent that they are retained, unless it can be proved that this is not feasible. The exterior of the building should always be altered as little as possible.

Conversion potential depends upon the type of mill, but most can be reused in a variety of ways. Continued industrial use can be the most suitable, if the process suits the building and causes no nuisance to neighbours. Office, commercial or residential uses might all be acceptable, but will depend upon individual circumstances. Care must be taken to retain the particular qualities of each mill, the existing levels and features of the site, the variation in openings and the fenestration pattern.

Windows are a major problem in mill conversions, as there is often a wish to enlarge them and increase their numbers in order to achieve the standards required for the new use. The opening mechanisms sought by developers also tend to conflict with conservation needs. As always with residential conversions, the problem is greatest where there are most housing units, and if the number of dwellings can be kept low, a more satisfactory conversion can usually be achieved.

Mills for which water would have been the most common original power source include the following:-

Grain mills. These were the most common mill type. There were external or internal hoists for lifting materials, with internal trap doors for feeding the grain down into the hoppers on the floor below. The wheel was normally sited on a gable, either inside or outside. The machinery was concentrated at the wheel end of the building, with paired stones (often three sets) on the first floor. There were two or three floor levels, the wheel and drive shaft on the lowest, the main operation on the floor above, and the raw material storage and feed on the top floor. Use was often made of a sloping riverside site to provide ground-level access to all floors. A track gave cart access to bring raw materials in and take the finished product out.

The grain-drying kiln was usually detached until the mid-eighteenth century, but thereafter located at the opposite end of the mill from the wheel, with an internal dividing party wall. Roof ventilators were usually more discreet in the Lothians than further north, but sometimes had revolving cowls (as at Redhall). The kilns could be circular (as at Preston Mill, East Lothian, illus 26) or square. They were vaulted at the lower level, around the central firebox. Above the firebox there was a drying floor for the grain made from perforated cast iron or (later) wire mesh. Perforated ceramic tiles were occasionally used, but these were commoner in England than in Scotland.

Carding and spinning mills. These would have had regular fenestration and a rectangular plan.

Scutch or lint mills. These were smaller buildings, with associated retting ponds.

Paper mills (illus 320, 377). The heating and cooling processes resulted in extensive external louvres and ridge ventilators. The mill was dependent on water for power, and for processes such as cutting and pulping rags. There were large machine houses of increasing lengths, which if in continuous use would be repeatedly rebuilt, as machinery was modified. The early buildings would have been stone, but late-nineteenth and twentieth century brick buildings on a larger scale have usually been added.

Sawmills (illus 27, 319). These mills had open sides or ends, allowing timbers to be manoeuvred to the saw bench. The wheel was usually sited on one of the long sides of the building.

4.6.2 Windmills (illus 78, 79)

Sited in exposed, windy positions, occasionally attached to steadings, but usually on their own, characteristic Scottish windmills have a stone built tower over (or adjoining) a vaulted chamber. The tower is round and tapering towards the top, with a few shuttered openings and a door at the base. There would have been sails originally, and sometimes revolving caps. A conical slated roof has sometimes been added after use as a mill has ceased, to protect the structure from the weather. Windmills were used for a variety of processing purposes (see Scottish Industrial Archaeology Survey publications).

Windmill towers are now very rare in Scotland and those which survive, together with such machinery as may remain (none is complete), should be safeguarded. Alteration of what remains should not be allowed.

Windmills are not easily converted to habitable accommodation without complete loss of any internal machinery and major external alterations to allow new window openings. There is little conversion potential in an unaltered windmill, as it is too small and dark to be used for more than a store. However, a preserved windmill could perhaps be a visitor attraction, despite the lack of sails.

4.6.3 Breweries and distilleries (illus 80, 81)

Brewing was originally a domestic activity rather than an industry, but since the late-eighteenth century each town has had a brewery, and it seems to have been an urban industry for the main part. The Belhaven brewery, on the edge of Dunbar and West Barns, is the only semi-rural one in operation in the Lothians.



78 Windmill at Balgone Barns, East Lothian, in 1974.



79 Windmill at Bielside House in 1976, long after conversion to residential use. It was also used as a doocot.

Distilling only became legal (if licenced) in the 1820s, and although there were others, Glenkinchie is the only distillery still based in the Lothian countryside. It was constructed in the late-nineteenth century, and is on a larger scale than most other rural industries.

The steam produced by the heating and fermenting processes needed to be drawn off through roof vents and chimneys, and these resulted in characteristic roof forms. The coolers, located on upper floors of breweries, required ventilation, which was provided by horizontally-louvred timber walls. Tower breweries



80 *Belhaven Brewery, East Lothian, in West Barns on the periphery of Dunbar.*



82 *Mains Maltings, Linlithgow, West Lothian. Now converted to flats.*



81 *Glenkinchie Distillery, East Lothian, the only rural distillery in the Lothians.*

used gravity to assist the processes, and developed their own architectural styles. Cooperages might be housed in temporary timber sheds.

There are few, if any, obsolete rural brewery or distillery buildings available for conversion. Nevertheless, they would share the potential of watermills, with wide possibilities restricted by the individual building and site. Louvred walls should preferably be retained.

4.6.4 *Maltings (illus 82)*

In maltings, the barley was heated to promote a start to shooting, ready for the fermenting process. The buildings were sometimes independently located in the grain-growing areas or sometimes adjacent to breweries and distilleries.

They had a rectangular plan on two or more storeys, with stone or iron steeps at one end. Internally there were either timber posts or cast iron columns supporting the beams. The attic may have had a conveyor fed by an elevator. There was a kiln or kilns at one end, usually with a pyramidal roof and louvred terminal. Inside each kiln there would be a ground-

level fire box, with a floor of perforated tiles, cast iron plate or wire mesh above. Fenestration was regular, with semi-shuttered windows.

These buildings can be suitable for residential, office or workshop conversion, but floor-to-ceiling heights are fairly low, and windows are often small. These aspects can cause major problems. As in mill conversions, there may be a desire to enlarge the windows. Also, their non-domestic type of window (inward-opening casements, often solid shutters with fixed lights above) may need replacement with something suitable to habitable accommodation. The dramatic kiln roofs should be respected.

4.6.5 *Tanneries (illus 83, 222)*

Tanneries needed water for the tanning processes and were therefore located in riverside sites. The buildings were often two-storeyed, with louvred walls for ventilation usually to the upper floor. The tanning pits found in the yard behind formed a stone-lined grid. Bark mills were often associated with tanneries.

Tanneries were mainly based on the periphery of towns (because of the noxious smells) so were semi-rural, although many are now engulfed by the town. Linlithgow had two tanneries, now in use as a bakery and a joiner's workshop. Haddington has one converted to a restaurant and craft gallery, while Dalkeith has one residential conversion.



83 This tannery in Dalkeith is urban, but illustrates the louvred window screens. It has since been converted to residential accommodation.

The conversion potential is for offices, workshops or other light industrial use, or residential accommodation. The louvred appearance should be maintained, although windows can be incorporated and the frames painted the same colour as the louvres.

4.6.6 Workshops (illus 29, 84 to 86, 220, 321, 378, 430 to 438)

There are two main classes of workshop, those (usually on estates) where there was a yard with workshops grouped together, and those where an individual craftsman (a blacksmith, joiner or weaver etc) was operating independently.

The former type of workshop group was often carefully designed to match in with the estate buildings, of good quality masonry and with slated roofs. The windows varied according to the use of each space, but large windows with fixed glazing in metal frames (as described below for smiddies) was common.

Some are still in use by the estate, others may be still in use as workshops by others (as at Thornybank, Dalkeith, see case study 11.6) and others may be available for reuse or conversion. These buildings can be suitable for a range of functions, from light industrial to residential. With sensitive design and not too many units fitted in, there should be no need for major alterations to accommodate any new uses.



84 Joiner's workshop and cottage at Pitcox, East Lothian, set at right angles to the road and facing the smiddy across a yard.



85 Pitcox Smiddy and Blacksmith's cottage, East Lothian.

The latter type of workshop usually faced directly onto a road, with an area of hard ground in front of the building which could be used for outside workspace. It was often located in a village, although it could also be on its own.

Smiddy. The smiddy was a single-storey building, often with the blacksmith's cottage attached, as at Ecclesmachan in West Lothian. Roofs were pantiled, or if slated, often had ridge or side vents. The entrance door sometimes opened in two halves, and was high enough to allow access for horses. A smiddy often had a large fixed front window to give light, with greenhouse glass pinned between vertical (and sometimes horizontal) astragals, usually of cast-iron or zinc. This feature is very characteristic of the building type, and should be preserved. Occasionally there was a front or rear outshot to accommodate the full length of the bellows. Inside, there was a wide, projecting, raised hearth.

Joiner's shop. Fixed work benches were located below the windows, usually at the front of the building. Windows either extended right across the frontage, or were small and few.



86 Smiddy and cottage at Ecclesmachan, West Lothian, now converted to one house. The smiddy was on the right.

Handloom weavers' premises. Shops had several stances, with small, paired windows in back and front elevations. The entrance door was set off-centre. Linen or cotton weaving was carried out on the ground or basement floor to prevent breakage of warps. Separate warping lofts had louvered walls. These premises were sometimes accommodated within or alongside the home, either in a loft (for weaving wool) or basement (for weaving linen or cotton). They were more often sited within a village than in a truly rural location.

All these workshops are of domestic scale with windows and doors. It should be possible to convert them to residential use without major problems (particularly as they are usually attached to a dwelling for the craftsman) provided that any alterations leave clear evidence of the original form.

4.6.7 Kilns (illus 87, 88)

Detached kilns included lime kilns, kilns for brick and tile making and drying kilns (for corn, timber etc). Most lime and brick or tile kilns are structures rather than buildings, with very little scope for conversion. Drying kilns for timber or corn (where these were separate buildings) were small and almost windowless with conical roofs, most suitable for ancillary storage or a similar function.



87 Wardlaw Limekiln. West Lothian.



88 Corn drying kiln at Luffness Mill, East Lothian.

4.6.8 Water towers (illus 89)

There are a few water towers dating from before the days of a public supply in the countryside.



89 Early to mid-nineteenth century water tower, Luffness Estate, East Lothian. The arcaded parapet was removed in 1968.

5 MASONRY AND POINTING

5.1 The Lothian Tradition

Most traditional buildings in the Lothians are constructed of stone. However, there is great variety in the way this material is used, dependent on factors such as local geology and building traditions, the preferences of the designer or estate and the date and purpose of the building in question. The character of masonry walls is influenced by the type of mortar used and the detail and finishing of the stone and joints. Examples of stone details from rural buildings in the Lothians are given in illustrations 90 to 105.

Dressed stonework. Cut and dressed sandstone is used throughout the grandest, most formal farm complexes, as it is in many cottages and mills. In many older and smaller steadings, fine-grained dressed sandstone is reserved for the edge and corner details where precision is most needed (quoins, window and door surrounds, copes and skews), with the greater part of the masonry being constructed in rubble. Polished ashlar of the quality found in urban buildings is rarely

encountered in rural agricultural or industrial buildings, but high quality droving and other tooling of the surface is often found at door and window openings, cart arches and other features.

Squared and snecked sandstone. In some walls the stones are square-dressed on the beds and joints but the face is left relatively rough. In such walls the stones are bedded with a degree of horizontal coursing, small stones being used to make up the levels where necessary.

Rubble stonework. Rubble wall construction is often in coursed, roughly dressed sandstone but in some areas, such as parts of West Lothian, random field stones of sandstone, whinstone or a mixture of the two are used, usually brought to courses at intervals. This work often contains large boulders, each split and laid with its centre of gravity downwards and its flat face to the external face of the wall. The irregular gaps between stones are filled with smaller boulders and 'pinnings'. Although often termed 'random rubble',



90 *Dressed stonework at Binny House steading, West Lothian. Polished ashlar sandstone with very fine joints.*



91 Dressed sandstone masonry at Thurston Home Farm, East Lothian. Broached ashlar finish to opening surrounds and stugged ashlar finish to courses.



92 Stonework detail at Bridgend, West Lothian. Snecked and dressed sandstone masonry with droved margins.

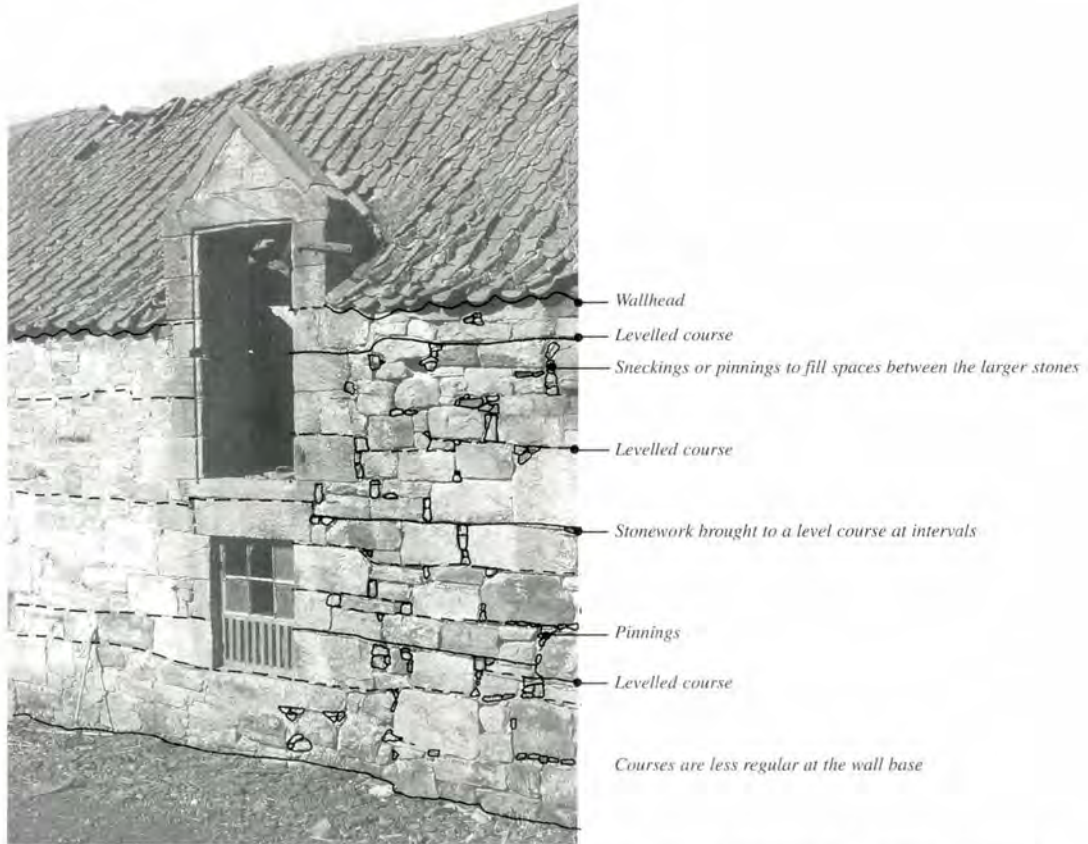
walls of this type are not haphazard and display a degree of rhythm and pattern which can be determined after a little study. In rubble walls stones are always laid with their centre of gravity to the bottom - in other words, each stone has a right way up which should be respected. This produces a robust structure and also gives the wall an appearance of stability. Larger stones were generally reserved for the foundations and lower levels. Although made from found materials, such walls are generally very skilfully constructed and give the buildings a distinctive texture and character which is difficult to reproduce.

Colour. In the Lothians, sandstones vary in colour from the deep reds of the east to the honey colours of the west, but they always have an affinity with the surrounding soil colour, which helps the buildings blend into the landscape. Whin stones also vary in colour (from browns to purple-black and rusty-black), and often contrast effectively with the sandstone dressings (illus 93, 98). An unusual use of colour banding is shown in illustration 108. For a discussion of the variety of building stones of the Lothians see McWilliam *The Buildings of Scotland: Lothian* pages 19-20, and McMillan *Building Stones of Edinburgh*.

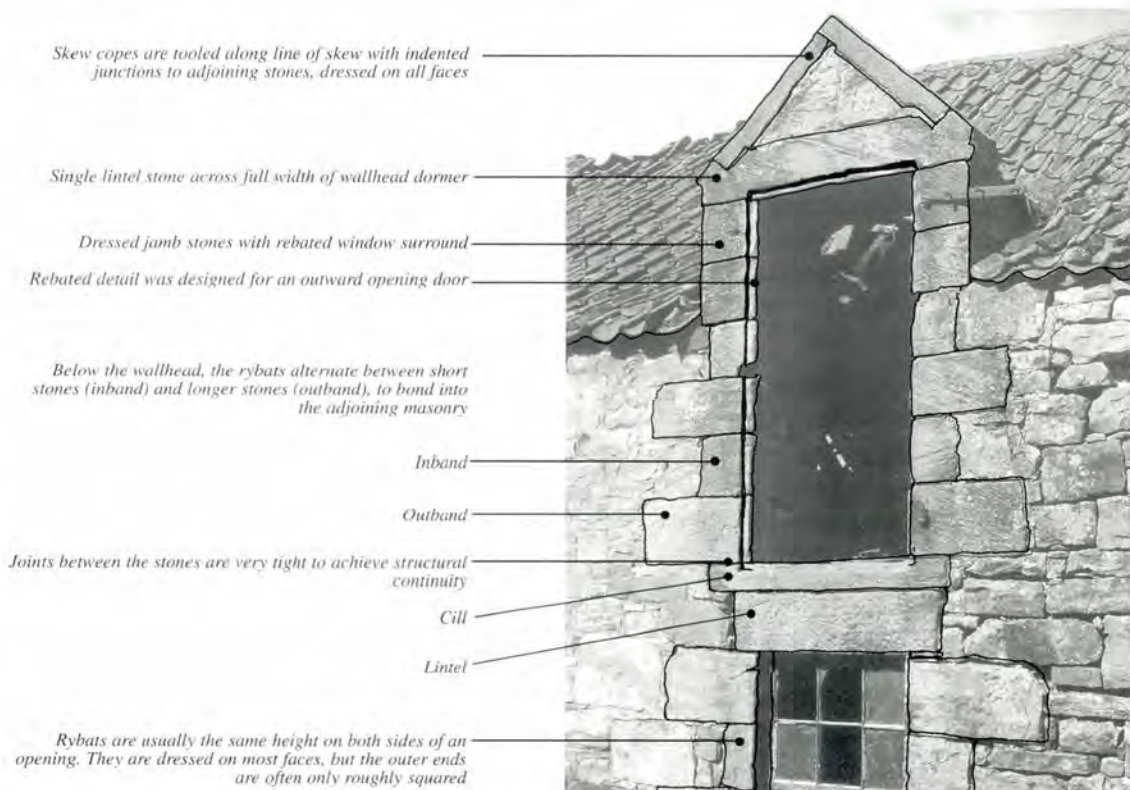
Few rural buildings have been affected by industrial pollution, with the result that their stonework has generally weathered naturally.



93 Coursed and squared whin at Ochiltree Mill, West Lothian, with droved ashlar sandstone quoins and window surrounds.



94 Squared sandstone rubble masonry at South Mains, West Lothian, coursed and brought to a level at intervals.



95 Stone detailing at window and door surrounds in squared sandstone rubble masonry at South Mains, West Lothian.

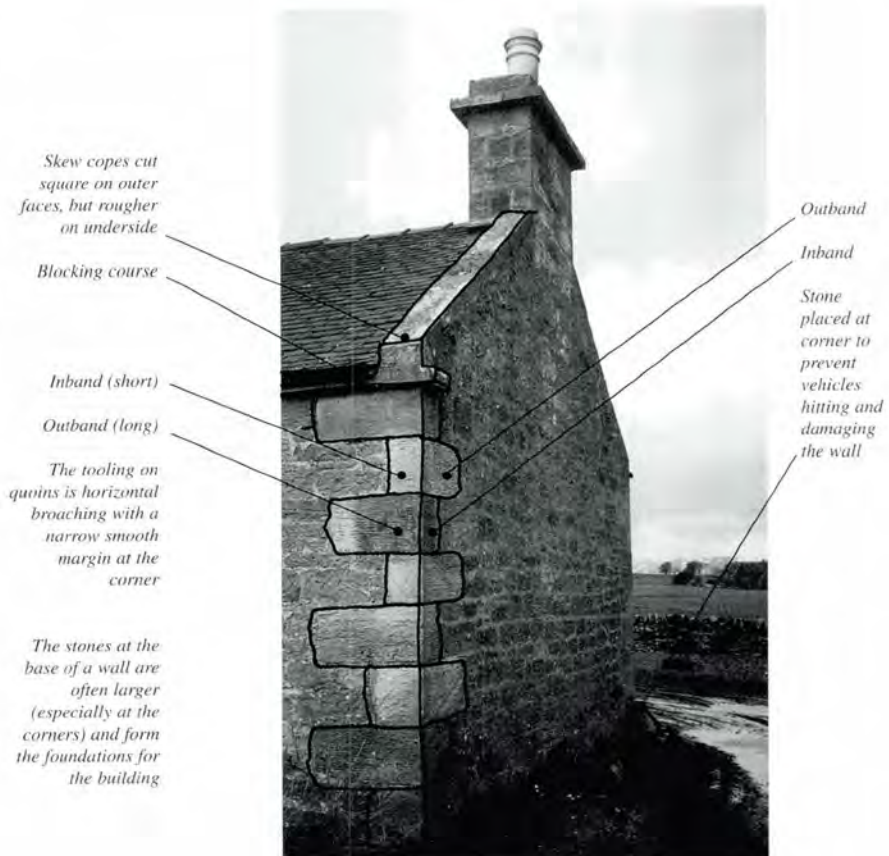


96 Rubble masonry (mainly whin) with dressed (broached ashlar) sandstone at corners and around openings. Dressed ashlar finish to sandstone copes. Good early pointing to masonry on left.



98 Coursed whin rubble with dressed sandstone quoins (most appear to be stugged ashlar) at East Fortune Steading, East Lothian.

97 Corner detail to stonework at Gladhouse Mains, Midlothian. Roughly squared and coursed stones form the wall, with broached ashlar dressings. Note the alternating inband and outband quoins at the corner bonding into the adjacent courses. The stones used at the chimney, the skews and the quoins are better cut and dressed than those in the general masonry.



Finishes. Only rarely is external stonework painted, colour washed or harled, and such finishes are generally restricted to individual cottages and the smaller farms of the west and upland areas (see chapter 6).

Pointing. The appearance and character of stonework is also dependent on the manner in which it is pointed and the precise materials used. Careful observation of original work will often indicate that the wall surfaces were finished to a level plane to provide an architectural unity to the building. From the nineteenth century onwards, informal lining out of the joints was also often present.

Brickwork. Scotland has relatively few brick buildings, probably due to there being an abundance of good stone sources compared with only average quality clay being available for the manufacture of bricks. There were a large number of brickworks in the Lothians, however, mainly producing common bricks and tiles. In the later nineteenth and twentieth centuries, additional ranges and outhouses to rural buildings were sometimes constructed of brick (illus 106). In residential buildings brickwork was used extensively for internal partitions; less commonly externally, where it was usually rendered. Agricultural and industrial buildings more often exposed their external brickwork. The walls of industrial buildings were in some cases built entirely of brick.

The tall chimneys characteristic of Lothian farms were nearly always built of brick and constructed on stone bases (illus 107).

Evidence of change. Many rural buildings, particularly those associated with farms, have been adapted over a considerable period through enlargement, heightening or radical alteration and, as shown in illustrations 99, 109, 110, and 113, it is not unusual to find walls and gables which display a number of different phases of construction of different date, materials and building methods. Such walls are not only visually interesting, but are valuable records of the history of the buildings.

5.2 Stonework

5.2.1 Repair and maintenance

Repair philosophy. Where stonework is in need of repair, it is important that the work is undertaken in a manner which is similar to the existing masonry surrounding it, in terms of the stone size, type, colour, physical and chemical properties, laying pattern and pointing. A good repair of this type will maintain the character of the building and match the performance of the original structure, so that it can continue to weather, settle or expand as before.

While there are other approaches to the repair of ancient buildings, which advocate a more obvious contrast between the old structure and the new work (through the deliberate recessing or projecting of new work or the use of alternative materials such as brick in a stone wall), it is considered that these are not necessarily relevant to the repair tradition in these relatively recent rural buildings. While examples of unselfconscious vernacular repair in alternative materials and styles are to be found, these result from a very different repair philosophy. It is recommended here that in most instances of day to day repair and maintenance, deliberate contrast and the introduction of additional materials and forms should be avoided.

Supply of stone. Finding a supply of stone of the appropriate shape, colour and size is not always easy, but a little time spent searching for the right material will repay the effort. Demolition contractors and salvage yards often have supplies of second-hand stone, and local sources are often known to the local Planning Department. There is no wish to encourage quarrying of stone from unused buildings, and every effort should be made to keep all existing structures, especially in listed groups. Nevertheless, many farms have ruinous stone walls, for instance, which can offer stone for reuse, and there are often piles of old stones around farm yards. Where a wall is not structurally sound and has to be demolished and reconstructed, it is important that the original is recorded in drawings and photographs and the stones marked prior to doughtaking.

Whin is particularly difficult to source, but there have been several successful schemes where second-hand material has been found and reused (illus 111 and case study 11.3).

Patching. No attempt should be made to patch old stone walls by making up defective areas with cement or mortar in an attempt to imitate the adjacent stone, as this is never convincing and can lead to the accelerated weathering of the softer original material.

Laying pattern. No matter what the style of masonry, successful repair requires a careful analysis of the laying pattern of the original stonework. Photographs can prove very useful in recording and understanding the existing work.

Where polished, pattern-tooled or square-cut stone is to be renewed, it is crucial that it is matched as closely as possible. New sandstone should always be laid with the 'bedding planes' at right angles to the face of the wall to ensure maximum resistance to weathering (generally horizontally as in illus 112, but vertically or edge-bedded for copes, sills, lintols, blocking courses etc). Repair of squared and snecked walling requires particular care.

The upper section of masonry has some very large field stones (laid with greatest width at base). It is very random rubble, with coursing not evident. There are wide joints between large stones in places, and pinnings have been put in to fill the gaps

Stonework brought to roughly level course

In the central section of masonry most stones are split field stones laid with the wider part at the base. The coursing is necessarily irregular (shown by dotted lines) and pinnings are used to fill between larger stones. Note that all the stones are touching to give structural continuity. The mortar only provides a cushion to hold the stones in place rather than having any structural strength

Stonework brought to a level course with long rectangular stones

The stones in the base section are generally more rectangular than those above



99 Details of coursing in random rubble stonework of mixed sandstone and whin (Cauldhame, West Lothian). The masonry incorporates split field stones. It is occasionally brought to a level course, and changes slightly in nature at two points, the stones being different in size and shape.

Where the original pattern is not closely matched, the repair will always look artificial and contrived and at worst can have the appearance of 'crazy paving', especially if the pointing is poor.

Grouting and underpinning. In a few cases walls may be encountered which are in such a poor condition that retention necessitates either grouting or underpinning. Both of these are specialist structural areas, for which professional advice should be sought. It needs to be remembered that vernacular buildings may have minimal foundations, apart from field boulders at the wall base, and any excavation adjacent to existing walls can undermine them.

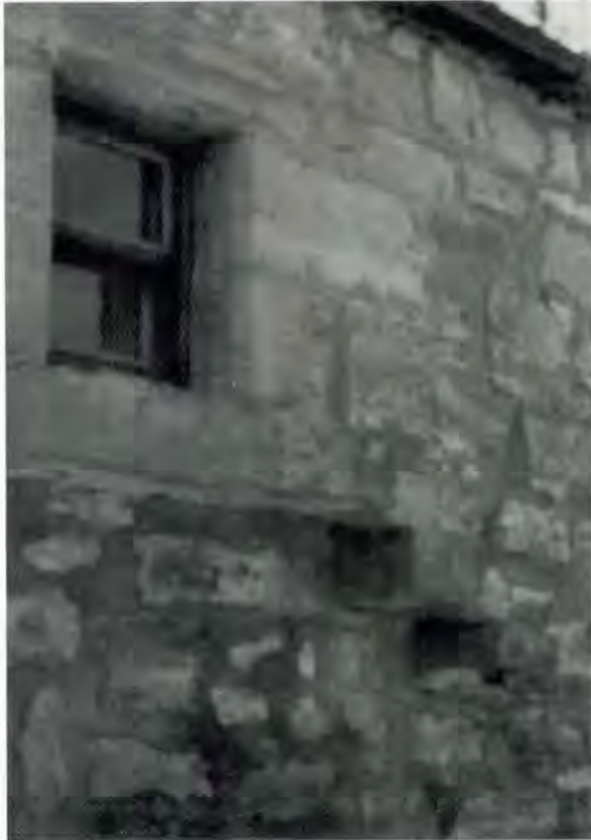
Where a building intended for reuse is in a poor condition, an engineer's report can be invaluable in establishing at the outset how much demolition and reconstruction is likely to be necessary.

5.2.2 Cleaning Stonework

Cleaning the stonework of rural buildings by chemical or abrasive means is neither necessary nor desirable, although a washing down with water and bristle brushes can often remove superficial layers of agricultural grime and dust. The soft nature of many



100 Rubble masonry with roughly tooled and dressed window surrounds at Addiewell, West Lothian. The pointing is old, but mainly sound.



101 Rubble masonry, recently cement-pointed at Hillhouse, West Lothian. Note the hen steps and a new window in the hen entry.



102 Simple classical detailing to the granary at West Bearford in East Lothian, with an owl-hole at roof level within the triangulated pediment. The masonry is sandstone rubble with broached ashlar dressings, and a wide plain margin on the dressed surrounds at door and window.

sandstones used in rural buildings, particularly where combined with harder whinstone, means that aggressive cleaning can result in significant deterioration of both stone and pointing, and the loss of the unique colour and texture which has developed over decades.

See *Stonecleaning - A Guide for Practitioners* (Historic Scotland 1994) for information on stonecleaning. For advice on the removal of biological growths from sandstone, see *Historic Scotland Technical Advice Note 10*.

5.2.3 Alterations and Extensions

Philosophy. New masonry should be informed by the craftsmanship of the past and time needs to be spent to understand the way the original mason used the stone, including its selection, cutting and dressing, laying and bedding. In the case of the surrounds to new openings, building up later openings and small areas of new walling, original stonework should generally be matched as closely as possible. Where it is desired to

distinguish the new from the old, a subtle difference, for instance the use of a different stone or a slightly different detail may give a better result, both aesthetically and functionally, than the introduction of modern materials of poorer quality or with strongly different characteristics (illus 113 to 115).

Detailing. It is important that new door and window reveals are given the same masonry treatment and depth as the original openings in the building. Similarly, cills and lintels should always be of the same profile and depth as the originals. Illustrations 90 to 105 show examples of traditional detailing. Illustrations 116 to 121 show altered or new openings.

In new rubble walling, stones should be laid as closely together as possible, avoiding wide joints, with the aim of achieving a solid, sturdy finish without too much uniformity. Careful attention should be paid to local details and to the rhythm of coursing, use of pinnings, proportions of sills and lintels, depth of window and door reveals, patterns of quoins, etc. Copings should always be of a local traditional form with the stones laid tightly.



103 A restrained gothic style at Melville Castle's coach house and stable in Midlothian, employing projecting quoins, hoodmoulds running into string courses and tooled ashlar masonry. The windows are regularly spaced, but some are blind.



106 Later brick buildings at Slatebarns Steading, Midlothian (the pantiled sheds were probably late-nineteenth or early-twentieth century, but the larger building behind is more recent).



104 An idiosyncratic treatment at Gowanbank, West Lothian. The colours and shapes of a variety of dressed or found stones are imaginatively exploited to produce a geometrical patterning and form.



105 Red sandstone gate piers (in broached ashlar) at Thurston Home Farm, East Lothian.



107 Brick chimney stalk at Samuelston, East Lothian. The top has been recently rebuilt.



108 Unusual colour banding to the cart arches at Lennoxlove, East Lothian, using cream and red sandstone archstones alternately. The round piers are also rare.



109 Evidence of three stages of masonry in this rubble gable at Hiltly, West Lothian. It has been recently repointed in lime mortar. Note the beeboles in the wall to the left.

110 Closer view of the side wall at Hiltly, showing details of phasing and coursing, with whin field stones in the rubble below, and roughly squared and coursed sandstone above.

Building Phase 3
Roughly rectangular sandstone rubble masonry, tightly laid and well coursed. Brought to a level course at intervals.

Building Phase 2
(More evident at gable)

Building Phase 1
Split field stones of whin. The pointing covers all but the larger stones (harl pointing)

At the lower level the whin field stones are more densely packed, with less mortar visible



Early opening with splayed ingoes in Phase 1 stonework (parts of this farm are very old)



111 Reinstated infill to a garage door at Gowanbank farmhouse, West Lothian, reconstructing the original wall. The coursed, squared whin stones were recovered from the surrounding ground, where they had been lying half buried for many years. The joints have not yet been pointed up, hence the different appearance of the new masonry.



112 The horizontal bedding plane is clearly evident in some of these very weathered stones in mixed rubble masonry at Whitekirk Barn, East Lothian.



113 This building at Fountainside, Midlothian, has been heightened at some time in the past. In a traditional manner, stone has been used, but detailed in a way that was probably currently common, rather than trying to match the original.



114 Another heightened building at Fountainside, Midlothian. In this case brick has been used both for the heightening and for an opening at the left. Brick functions differently from stone because of unit size, porosity and expansion, and its different appearance makes such an alteration very obvious.



115 This alteration to the openings at Millbank Cottage, Midlothian, has employed a cheaper material than stone, and masked its use by rendering the affected area of wall, and lining it out to match the scale of the masonry. The render is an inferior and less distinctive material than the original stone.

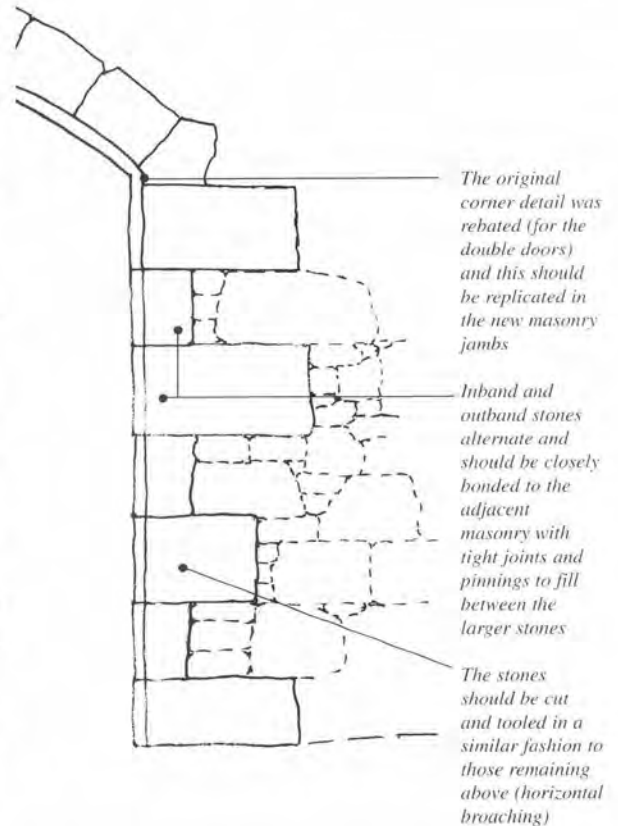


The original masonry has very tight joints; the stones were carefully selected to fit. The pointing was kept back from the face of the stones

Line of rebuilding

There is no rebate in the new corner detail

The stones used in rebuilding the jamb are mainly old stones (some possibly the original jamb stones) recut and redressed partially or wholly. The original tooling has not been reproduced, the jointing is not as tight and the mortar is taken over the face of the stones at edges. The lime mortar is finished too smoothly and appears to have less aggregate than the original



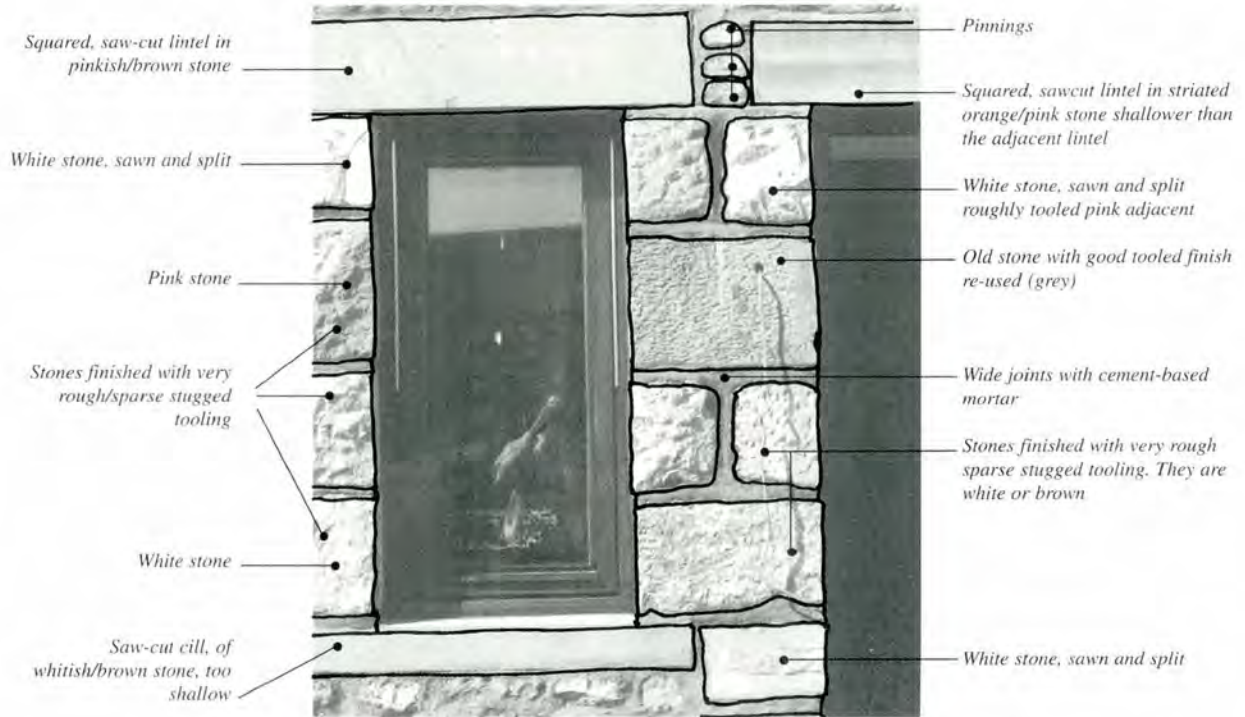
The original corner detail was rebated (for the double doors) and this should be replicated in the new masonry jambs

Inband and outband stones alternate and should be closely bonded to the adjacent masonry with tight joints and pinnings to fill between the larger stones

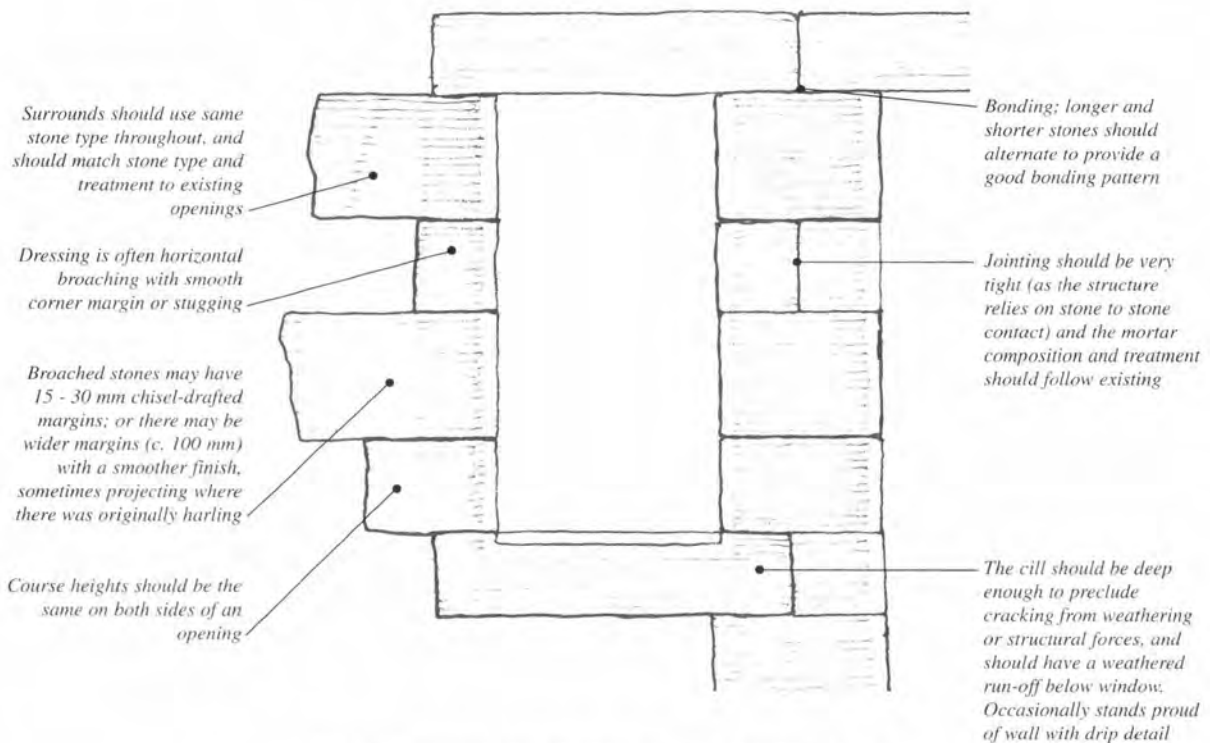
The stones should be cut and tooled in a similar fashion to those remaining above (horizontal broaching)

116 Masonry repair to the jamb of a pend opening. Although natural stone and lime mortar have been used, the way they have been employed does not match the original detail.

117 Recommendations for the repair of the masonry jamb at 116.



118 A mixture of stone types with a variety of tooled and smooth finishes inserted at new openings in a conversion at Newbyth, East Lothian. The original openings would have had a simpler and more uniform treatment.



119 Recommendations for the stonework detailing to the new openings at Newbyth.

It is often advisable to construct trial areas of rubble walling at an early stage in a project to ensure the use of appropriate techniques. Examples of new masonry are shown in illustrations 122 to 126 and 386.

A technique sometimes employed for new 'rubble' walls is to build the wall in blockwork and then bond a thin skin of stone to the outside face. This does not result in convincing masonry, the stones usually being laid like crazy paving on the wall face instead of being horizontally bedded with a staggered bonding pattern, and brought to a level every few courses (illus 400).

Case study 11.3 (chapter 11) shows a small listed cottage which was extended in the manner of the original through the use of second-hand whin and tooled sandstone dressings (illus 403).

Alternatively, it may be desired to distinguish new work from old in which case any new materials introduced should be of appropriate quality and the detail design carefully thought through to ensure that the new work is aesthetically and functionally compatible with the old.

5.3 Brickwork

Advice on the repair of brickwork is in principle the same as for stone masonry, and a separate section on the repair of brickwork has not been thought necessary. The repair of chimney stalks is a structural specialisation, needing specialist professional advice.

In the past, brick was used in a vernacular fashion for ad hoc repairs and alterations to stone buildings. In general these have mellowed over the years and now blend in fairly unobtrusively in a low-key working building. New repairs using brick in a stone building would stand out more starkly, and are not recommended.

5.4 Pointing

5.4.1 Repair and Repointing

Where the original pointing survives in good order there is no need to replace it. However, in many cases it will already have been replaced by an inappropriate cement-based mortar. In older buildings lime mortars may be reaching the end of their natural life and may require to be renewed. If repointing is undertaken badly or in an inappropriate manner, the character and long-term stability of the building will be compromised.

All replacement pointing should match the original as closely as possible in terms of mix and appearance. It would be sensible to carry out samples of repointing before agreeing on the final method and finish, and in some cases it may be advisable to commission an



120 New openings at Gowanbank, West Lothian, closely based on original openings on another elevation.



121 A DIY alteration, where an opening has been widened, using brick sides (bonded, but probably not tied into the stonework) and a too-slender lintel. The structure should have been more robust, and the detailing less mean in scale.

analysis of the original mortar in order that as close a match as possible can be used.

5.4.2 The argument for lime-based mortars

From the largest mansions to the humblest of farm buildings, lime was universally used in the mortar of Lothian's traditional rural buildings. It was quarried locally and 'lime burning' was an important rural industry, as the product was also an essential element in the management of improved agricultural land and a component of many industrial processes.

Since the introduction of Portland cement earlier this century, the widespread use of new materials and new methods of building has meant that the old ways of working with lime have been largely forgotten. Today



122 A partially reconstructed gable at East Whitburn Mains, West Lothian. The new build above the eaves line is evident. Although many of the stones have been reused, the build is different, with fewer small field stones and the masonry never brought to a level course. Compare this with the partially re-built gable at illus 386.

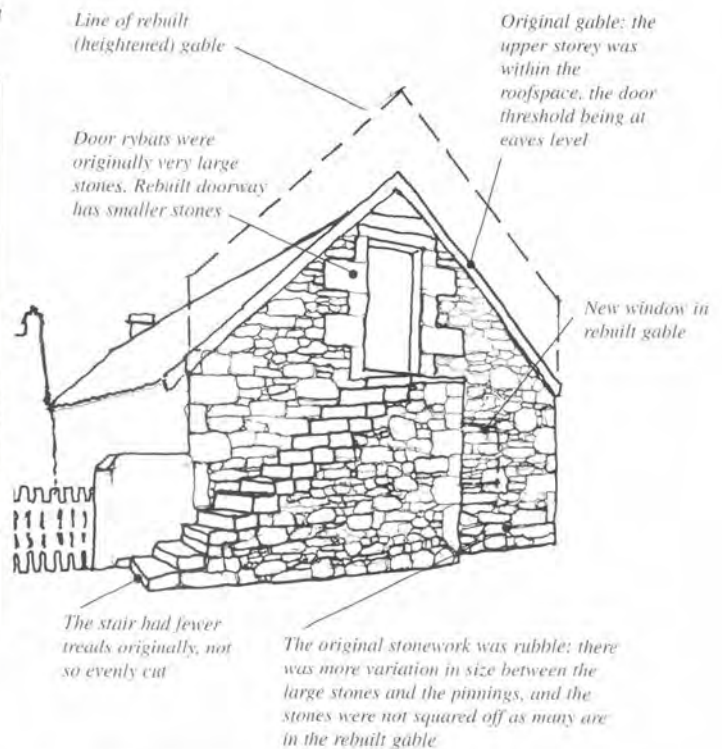


123 A reconstructed gable at Skivo, West Lothian (compare with the original gable shown in illus 30). It shows similar characteristics to the previous illustration; few small stones are used, the coursing is often slightly curved and is rarely brought to a horizontal level. The rebuilt wing is also higher than the original. There are previous alterations to the farmhouse just visible; the slated roof has been pantiled and the harling on the walls stripped.

it is common to see traditional buildings repaired with modern materials. Cement has proved a popular substitute for lime as it sets quickly to a hard mass and is apparently suitable for use during the winter months. It is now known, however, that cement has many drawbacks due to its impermeability, and as a result many buildings suffer from unnecessary problems of moisture retention, cracking and decay (illus 127).

Cement-based repairs can lead to other potentially serious problems. Most built structures do not remain totally static. Changes in temperature between winter and summer, or even between night and day, can result in a small amount of movement. Minor settlements in the ground or movement due to severe frost can also cause slight adjustments in the structure. Lime mortar, being more flexible than cement, allows the structure to adjust to these small movements without cracking. By comparison, cement mortar is harder and more brittle, and is therefore more likely to form fine cracks along the joints, and to introduce areas of rigidity which can result, eventually, in the formation of wider 'movement joints'.

Also, being softer than the surrounding stone, lime mortar will always succumb to the effects of weathering by wind and rain before the stone will - and



124 Comparison of original gable stonework with the new at Skivo, West Lothian.



125 A reconstructed farm building at Boghall, West Lothian, with raised wallhead. As in the previous examples, the rubble masonry is not levelled off every few courses as authentic traditional rubble usually was and the courses tend to curve gently. However, the use of smaller stones as pinnings, and the variation in the size and shape of stones is slightly better in this case.

it is always easier to replace the mortar than the stone! Because they are permeable, lime mortars allow moisture to evaporate from the structure, thus reducing the risks of stone decay and also, importantly, reducing the risk of a build up of moisture levels in the building fabric. In many rural buildings the original pointing has been replaced by a harder cement mortar, in the mistaken belief that the harder mortar would be more durable and would reduce water penetration. In fact, the opposite is true and the level of moisture retained in the structure is likely to be increased, as a result of wind-driven water penetration through hairline cracks, and the inhibition of evaporation through the cement. In solid-wall masonry construction, any material which inhibits evaporation of moisture to the outside air will encourage a build-up of moisture within the building fabric, with potentially serious consequences in terms of dampness and decay.

The widespread use of modern materials threatens to destroy the variety and individuality of our traditional rural architecture. Fortunately, many specialist builders, material suppliers and property owners are returning to the use of lime-based mortars for the repair of structures originally built in this way.



126 New stone boundary wall, well built and pointed, at Hillhouse, West Lothian.



127 *Hard cement pointing and render is contributing to accelerated decay in the softer adjoining stones (tooled ashlar sandstone masonry) at Thurston Home Farm, East Lothian.*

Lime mortars allow a building to be adapted and altered over time. The building materials can be reclaimed for reuse, since the mortar can be easily removed if necessary. On the other hand, once stones or bricks have been set in cement, their reuse is normally impossible.

5.4.3 The Mortar Mix

It is important that an appropriate mortar mix is used in pointing work in order that it performs properly in terms of good building practice, historical accuracy and visual appearance. Traditional mortars comprise a mixture of lime and some form of aggregate such as sand, gravel, shell or stone dust. The lime may be pure, with a slow soft set, or it may contain impurities, such as clay minerals, which promote a slightly faster, harder set (these are known, respectively, as non-hydraulic, or 'air', limes and hydraulic, or 'water' limes). To minimise stone decay the set mortar should

be slightly less hard than the stone itself; the use of over-hard mortars, especially cement-based mortars, is one of the principal causes of deterioration of sandstone in buildings.

Lime. One of the advantages in the use of non-hydraulic lime mortars is that, properly stored, they can be kept for months or years (and indeed, they will improve on keeping), and are available for use as needed. For the majority of situations the purchase of ready-made mature lime mortars will be the best option. These materials are made up by specialist suppliers and a range of mortars, including mortars with local sands, are normally available off the shelf. Special mixes can also be made to order. Alternatively lime mortars can be made up on site using traditional slaked lime putty and a suitable sand. To achieve the best results, time must be allowed (normally up to twelve weeks) for site-made mortars to mature in advance. The mature mortar must be 'knocked up' to achieve workability. For repointing, a stiff plastic consistency is required and additional water is not normally necessary. For building or harling work a little extra water is normally added. Where hydraulic lime is to be incorporated in the mortar this is done on site shortly before use, by running the hydraulic lime powder to a slurry with a little water and thoroughly beating into the basic mortar mix. Because of this addition of extra lime on site, mortars for gauging with hydraulic lime are normally supplied with a higher proportion of sand.

Selection of the appropriate type of lime for the type of stone, as well as the degree of exposure, is important. Generally speaking a non-hydraulic lime mortar, or one with only a slight hydraulic set, will be appropriate for most sandstone buildings in the Lothians. Whinstone buildings can usually be repointed with a moderately hydraulic mortar, but the use of a strongly hydraulic or a cementitious mortar will be liable to encourage water penetration and retention in the building fabric.

Cement. The practice of adding a small proportion of cement to lime mortar is not recommended. This has been found to reduce the performance and durability of the mortar rather than improve it, and if additional strength or setting are required, a hydraulic lime should be used in the mortar.

Brickdust. The use of a small gauging of brickdust will also promote a more positive set, without significantly increasing the hardness or reducing the permeability of the mortar. Brickdust is quite often found in nineteenth century lime mortars.

Sand. The other important ingredient in lime mortars is sand. Rural buildings almost invariably used the nearest available source of suitable material. To retain local distinctiveness and to achieve a good matching

mortar in repairs, both in terms of its colour and performance, selection of a matching local sand is advisable. Historic Scotland maintains a database of all currently available Scottish sands, which is described in the Technical Advice Note 19 *Scottish Aggregates for Building Conservation* and is also accessible through the Scottish Lime Centre Trust. To achieve a sound mortar, a relatively coarse sharp sand should be selected with a good varied profile of particle sizes and shapes; the commonly available soft 'building' sands, available from many builders' merchants, are not suitable for making lime mortars.

Mixes. For a modest fee a specialist laboratory can analyse samples of existing mortar, to allow an accurate match to be made in new work, and can advise, where necessary, on appropriate mortar mixes and working techniques. Most specialist suppliers can also offer advice on appropriate mixes for individual jobs.

Mortar mixes normally contain 1 part lime to 2.5 or 3 parts aggregate. Mixes based on non-hydraulic lime in putty form, and a good local sand, are suitable for the repointing of sheltered sandstone in most traditional rural buildings in the Lothians, but in some situations, such as very exposed locations and where whin or other hard stones are used, mixes containing hydraulic lime may be appropriate.

For new stone walls, it is advisable to discuss the proposed mix with the building control authority, as they may have strong views on the type of lime or cement in mortar.

5.4.4 *The Pointing Process*

Once the mortar has been used in construction or repair work it gradually dries out and, in doing so, absorbs carbon dioxide from the air. This process completes the 'lime cycle' and the material returns to its original chemical form of calcium carbonate, known at this stage as 'carbonated lime'. Because the carbon dioxide must penetrate the entire depth of the mortar in order for a complete set to be achieved, lime mortars must be used in layers, several of which may be built up, allowing time for each to cure, if a substantial thickness of mortar is required. Lime mortars must be protected from frost, wind and rain until properly cured. The method of working with lime mortar is therefore somewhat different from that adopted in cement work.

Preparation. The first stage in the pointing process is to prepare the joints. Joints in rubble stonework should be raked out carefully to remove dirt and loose mortar to a depth of fifty millimetres or the equivalent of two and a half times the width of the joint. Any 'pinnings' which require to be removed should be set aside for

replacement. With finer, square-cut masonry, the joint should be cleared out with a flat, fine-bladed tool. Where the building wall has been repointed in the past with an inappropriate hard cement mortar, the removal of this mortar should be undertaken with great care to avoid damage to the stone to which it adheres. On no account should power tools be used. Once cleared, the joints should be thoroughly washed out and left wet.

Deep holes in the wall are 'tamped' with small amounts of mortar, pressed well home to within forty to fifty millimetres of the wall face and left rough as a key for pointing. Pinning stones should be inserted soundly to reduce the volume of mortar and to match the original texture of the masonry. In building up voids and deep holes, use can be made of porous clay tile and brick fragments as pinnings.

Pointing. Working from the top of the wall down, the joints are thoroughly filled with mortar which is normally left recessed a few millimetres in from the face of the stonework (unless a different finish, such as harl pointing, is intended). Deep 'hungry' joints or ledges which can collect water and lead to the decay of the adjacent stones should be avoided.

At all stages care should be taken to avoid splashes and mortar stains.

Where it matches the local method, a particular visual effect can result if the mortar is finished with a texture which allows the aggregate to show and encourages evaporation. This can be achieved through stippling (not brushing) the partially set mortar with a bristle brush or pot scourer or by drawing the edge of a blade over it. On no account should the mortar be given a smooth finish, nor should it be made to protrude from the joints.

Protection. All new pointing should be guarded from frost, rain, wind and strong heat until set, by hanging damp sacks or other protection over the wall to keep it sheltered and moist. In hot weather the setting mortar should be kept damp by a fine mist water spray.

Fine joints. Finely-jointed dressed stone should only be repointed where absolutely necessary. The removal of cement pointing will invariably result in damage to the stone and should be considered carefully. Joints can be cleaned out by hand with a hacksaw blade or similar tool. The wetted joint is then filled with a fine mortar mix (e.g. 1 part lime putty and 1 part fine sand), using the edge of a blade inserted into the joint to press the mortar well into place. The addition of a small quantity of hair to the mortar will greatly ease this process. To minimise the risk of surface staining, the wall face should be well damped down before repointing. The fine lime mortar may be mixed with animal hair or sisal fibre to make a plug for the back of excessively deep joints. Mortar should be brought to the face of the

stones, and the surface cut back with the edge of a blade to leave an open-textured finish. Again, the mortar needs to be kept damp and protected.

Working with lime. Techniques of working with lime mortar are not in themselves at all difficult, but they are different from those for cement mortars. Contractors

not experienced in using lime mortars are strongly advised to attend at least a one-day workshop such as those provided by the Scottish Lime Centre Trust.

For more information on lime mortars and pointing see Historic Scotland *Technical Advice Note 1*, which provides a comprehensive introduction to this subject.

5.5 Guidelines

The following general guidelines are offered for masonry and pointing work -

Repair. A good repair will match the qualities and performance of the existing/original masonry so that there is no disruption to the way it functions (weathering and movement) and no disturbance or accelerated decay is caused to surrounding masonry.

Reconstruction. Where a wall is to be taken down and rebuilt, photographs should be taken and the stones marked prior to demolition.

Patching the surface. No attempt should be made to make good the surface of old stone walls by building up in mortar to a thickness of greater than 8mm without inserting stones.

Repointing. Where original pointing survives in good condition, it need not be replaced. Where joints are over approx 8mm wide, stone pinnings should be used in the joints, keeping the quantity of mortar to the minimum.

Mortar. All repointing should be carried out in a mortar as close to the original as possible in mix and appearance. An analysis of the original mortar and preliminary samples of the proposed pointing materials and methods can help.

New walls. Selection of mortar should be suitable for the type of stone (a little softer and more permeable than the stone itself) and the exposure of the masonry.

Working methods. Techniques of working with lime mortar are very different from cement mortar, and if contractors do not have experience of them, they are advised to undertake training.

Protection. New pointing with lime mortar takes longer to cure than cement mortar, and needs to be protected from frost, rain, wind or strong heat during this process.

6 RENDER, HARL AND LIMEWASH

6.1 The Lothian Tradition

6.1.1 Renders and harls in Scotland

Through much of rural Scotland it is common to find a decorative and weathering coat on the exterior of buildings. Most frequently this was a 'wet dash' mixture of lime mortar thrown or cast onto the wall, its resulting texture being dependent on the nature of the aggregates used and the skill of the individual craftworker. This form of wet dash render is commonly known as 'harl'. Less frequently (indeed, normally found largely on more prestigious buildings), the surface of the render was pressed back with a float to a smooth finish, which might occasionally be lined out to resemble pointed ashlar work with a trowel or other tool. In some situations the walls, whether rendered or not, were given frequent (often annual) coatings of limewash which over time built up to form a thick but relatively smooth surface.



128 A thin traditional lime harl, in a very worn condition at the eighteenth century Rockville Doocot, East Lothian (possibly originally a windmill).

In each of these examples of traditional practice, the purpose of the coating is to protect the underlying masonry and the interior of the building from water penetration and decay, while acting as a sacrificial weathering layer which can be renewed as necessary. In traditional harls, the open texture and wide surface area of the covering allow moisture to evaporate easily from the wall, and also slow down water run-off, protecting the vulnerable base of the wall.

6.1.2 Lothian features

Early harl and limewash. In the Lothians, as in the rest of Scotland, it is thought that prior to the mid-eighteenth century most rubble-built rural buildings would have had some form of render or wash (illus 128 to 131). Many have now lost their coatings, either through neglect or as a deliberate way of exposing the stonework, in the belief that this was more historic or visually attractive (illus 132). Most buildings of such a date, if little altered, will be listed, and any proposals to remove or add surface coatings will be subject to statutory control.

Nineteenth century finishes. Few buildings associated with the nineteenth-century agricultural improvements in the Lothians have applied external finishes. For aesthetic, functional or economic reasons, their designers and builders preferred to leave the stonework uncovered. A number of residential buildings such as lodges were, however, rendered (illus 133, 134). Moreover in some upland farms to the west of the Lothians and in dairy farms (where limewash



129 This lime harl to seventeenth-century Sydserf in East Lothian, was sparse at the time of the photograph and has since almost completely disappeared.



130 Lime harl to walls at Luffness Mill House, East Lothian.



131 Harled walls and dressed stonework at window margins, eaves, quoins, chimneys and door surround, Morham Manse, East Lothian (early-nineteenth century).



132 The exposed stonework at Bonnington House, East Lothian, could (judging by the detailing of rubble and dressed stonework) originally have been harled.

was used to improve hygiene), buildings can be found with traditional surface coatings over the stone. In most other cases, the rendering or colour washing of rubble stonework is a consequence of a recent change of use from agricultural to residential, the incoming owners seeking to 'restore' the building through a well-intentioned but erroneous interpretation of local traditional practice.

Harl pointing or slaistering. Rendered surfaces require careful study prior to their repair. It is not uncommon to find pointing mortar applied in such a generous manner that there is more mortar than stonework visible. This was done traditionally, in parts of West Lothian and Midlothian for example, in situations where rubble walls were constructed in a wide variety of stone sizes and types (illus 135, 136). It is also found in recent repointing work, but often in hard cement mortar, which is particularly damaging when used in this way (illus 137). In some cases a highly mortared face may simply be an accumulation of repairs carried out over a long period, rather than a deliberate render.

Later renders. Renders are commonly found on 'set piece' houses, lodges and ornate cottages of the late nineteenth and early twentieth centuries where their architects deliberately sought to emulate the effect of polished ashlar, the most expensive form of building construction. In addition, many Lothian farmhouses were extended or radically altered in the early twentieth century, and in an attempt to blend the brickwork used for the new construction with the



133 The late-eighteenth century lodge to Belsyde House, West Lothian. It is harled, with painted dressed-stone margins to window and doors.



134 Smooth lined-out render on a late-eighteenth or early-nineteenth century farmhouse at Wester Middleton, Midlothian. There are no window margins, and the render is painted.

existing masonry, many were rendered for the first time, often with cement mortar (illus 138). In most cases this survives intact, but in many situations such render is in need of attention. The post-war years saw a revival in the use of roughcast finishes on old buildings, though too often these were hard, grey, cement coatings containing jagged granite chips, the results being far removed from the subtle finishes of traditional practice.

Limewash. This was commonly applied to maintain the effectiveness and appearance of harls and renders, but in some cases was applied directly to the stonework. As each coat of the wash is relatively thin, the undulations and irregularities of the underlying rubble stonework can be read through.

Remaining evidence suggests that in many modest farm buildings where walls were limewashed, stone dressings around doors and windows also received a coat of wash at the same time as the walls (illus 129). In some cases (especially from the end of the nineteenth century, in larger houses and their outbuildings and lodges) the dressings were deliberately left unwashed as contrasting bands (illus 131).

Recent years have seen the use of modern masonry paints rather than traditional limewash.

6.2 Harl

6.2.1 Traditional materials.

Traditional harling uses the basic mortar mix of lime putty and sharp well-graded sand, thinned down to a workable consistency. Mortar for harling is generally richer in lime than other masonry mortars. It is rare to find large aggregates or pebbles in a traditional harl, although shell sand is often present, and small pieces of shell, small pebbles and grit may be present (illus 141).



135 A harl-pointed facade at Cauldhame, West Lothian.



136 Detail of traditional harl pointing in lime mortar at Cauldhame, West Lothian.



137 Harl pointing probably in hydraulic lime mortar, Brunstane, Edinburgh, causing damage to the face of the stone in places.



138 Cement render added in the twentieth century to an earlier building at Bridgend, West Lothian.

6.2.2 Patching and reharling

Where original lime harl requires attention, it is often more desirable and cost effective to patch it carefully and apply several coats of limewash, rather than to strip and re-render the whole elevation.

The most appropriate methods of repairing traditional buildings invariably involve the use of materials and techniques employed in their original construction. Where the original harl has been lost or deliberately removed, it is often possible to locate surviving fragments of the original, which may be analysed with a view to specifying the same mix for the replacement.

Preparation. Where harl is to be patched, the failed material should be carefully removed and cut back to sound material. The walls should be made sound through lime mortar repairs.

For reharling too, the deepest joints and voids should be filled out at this stage to eliminate water traps, through the introduction of 'pinning' or 'galleting' using fragments of matching sandstone, or sometimes soft brick or broken terracotta tile, to straighten the surface of the wall to the desired profile. Although major irregularities in the wall can be remedied in preparation for reharling, it is inappropriate to attempt to straighten out the elevations completely, as the underlying masonry is intended to show through. Harl which follows the contours of the stonework also dries more evenly after rain.

Application. Harl should always be applied in thin layers, generally either in one or two coats, over a well prepared background. Given its purpose as a protective coat, the mix of the base coat should be slightly weaker than the background masonry and that of the outer coat weaker than that which it covered.

As with pointing, ready-mixed materials are available from suppliers of specialist materials. The harl is usually cast onto a repaired and dampened background in one or two even coats of around six to eight millimetres. If a flatter finish is required, the individual coats can be lightly pressed back with a wood float. A key is left on the first coat for the application of the top coat, which may occasionally contain extra aggregate.

The modern technique of trowel-applied undercoats with a wet dash finish is derived from the use of cement-based renders and is not appropriate to lime harling. Lime-based harls adhere and cure more effectively if cast onto the wall surface with some force.

Protection. All new work should be covered for a week to ten days to protect it from wind, sunlight and frost during the critical initial curing period, when the material must be allowed to dry slowly from the depth of the coating before surface hardening has taken place.



139 *Limewash on a cottage, now the Bennie Museum, Bathgate, West Lothian (before repairs were carried out).*

In hot weather the harl should be kept damp by regular light spraying to prevent the surface from drying too rapidly.

Limewash. The subsequent application of limewash is an integral part of any harling job, as the wash helps to fill and seal fine cracks, cover stains and blend the old with any new patching. For example, where fine crazing occurs, it is possible to remedy this through the application of limewash.



140 *The miller's cottage at Little Mill, West Lothian used to be limewashed.*



141 *Detail of a traditional lime harl at Alderstone Coach House, East Lothian.*



142 Recent lime harling at Athelstaneford Doocot (see case study 11.7) allows the form of the stonework behind to show through.

6.2.3 The advantages of lime over cement

As with pointing, the use of cement-based mortar for harling has a number of apparent, rather than real, benefits. The main perceived advantages of cement-based harling or rendering, are familiarity on the part of the builder, speed of application and initial economy. However, cement-rich harls or renders on traditional buildings are generally unsatisfactory in terms of the overall performance of the building. Due to their hardness, they are unable to accommodate the inevitable minor seasonal and structural movements, leading to hairline cracking and trapped moisture behind the surface. Because of its relative impermeability, cement-based harl will not allow moisture in the building fabric to dry out through the harl, but will retain it in the wall. The presence of this water can lead to a build-up of dampness in the building, and can trigger a process of decay in the stone, occurring out of sight behind the harling layer. Freeze/thaw action will eventually loosen the bond between cementitious harl and the underlying masonry.



143 The horse mill at Williamcraigs, West Lothian, newly limewashed in the 1960s.

When this bonding fails, the harl will fall away in sheets, a process which is sometimes dangerous and always unsightly. Cement-rich renders and harls on traditional buildings are also generally unsatisfactory in visual terms.

Lime harl is a softer, sacrificial material, designed to protect the underlying stone. It accommodates a certain amount of movement without cracking, and it allows dampness in the stone to dry out through the harl.

As it weathers it may crumble and gradually degrade, or it may develop pattern staining or colour change reflecting the movement of moisture in the building fabric. The resultant appearance, although natural, is unpredictable, and can therefore be disappointing. Many building owners feel that traditional lime harls are too random and do not have a sufficiently pristine finish. Others prefer the softer appearance of lime; one of the beauties of traditional harl is the way in which it allows the sculptural quality of the underlying masonry to show through (illus 142).

The process of harling is perceived as messy and time consuming, requiring specialist skills and demanding work in the appropriate season and weather conditions. In practice, the application of lime harl is more easily mastered by the enthusiastic amateur than the application of cement-based 'harl' and, because the basic materials can be stored indefinitely in a form ready for use, harling repairs and routine maintenance can be undertaken at any convenient time, provided the weather conditions are appropriate. Large-scale reharling jobs are best left to specialist contractors or craft workers. While many local builders will offer their services when harling is proposed, there are only a few contractors in Scotland capable of successfully undertaking lime harling without specialist advice and supervision.



144 *Limewash on the horse mill at Williamcraigs, West Lothian, not renewed since the 1960s and wearing off when this photograph was taken in the 1990s.*

Lists of contractors who are lime specialists are available from the Scottish Conservation Bureau in Historic Scotland. As with lime pointing, contractors inexperienced in the application of traditional lime harls are advised to attend at least a one-day training workshop.

6.3 Limewash

6.3.1 *The traditional material*

Traditional limewash is a vapour-permeable finish. It has a subtle, natural look not achievable with modern paints, often being coloured through the use of earth pigments or copperas (sulphate of iron). The regular application of limewash was largely abandoned in the mid-twentieth century with the result that the walls which were once so treated now have a patchy appearance (illus 143, 144).

6.3.2 *Maintenance and reinstatement*

Treatment. The temptation, when faced with a wall where much of the limewash has weathered away, is either to remove the fragments of limewash which remain, exposing the stonework, or to recover the walls in a modern masonry paint. Modern factory-made masonry paint finishes have been widely used as an alternative to traditional limewash on account of their convenience, consistent colour and supposed durability. However, modern film-forming paints do not actually last any longer than limewash and they are

not 'maintenance free'; they simply cannot be effectively maintained and have to be completely stripped and renewed periodically. Weathered limewash can be recoated easily, but peeling masonry paint requires far more drastic action.

Any type of paint finish on solid masonry walls must be vapour permeable or it will trap moisture and peel off. Limewash is significantly more vapour permeable than any other type of paint finish, even modern microporous paints.

Limewash should be reinstated wherever it is evident that it was used historically. Where a reapplication of limewash is not an option, it is generally best to leave remnants of limewash to weather off naturally in time. In any case their presence is rarely offensive and they contribute to the visible history of the building. Attempts to remove coats of limewash are often undertaken using jet washing or other more abrasive blasting techniques but such methods can damage the stonework.

Preparation. Again, as with other types of paint finish, appropriate preparation of the background is critical. A new paint coating of any type applied over an unsound background will fail. Removal of loose, peeling or friable material, and of lichen and moss growth, is essential. Specialist advice should be sought where it is desired to apply limewash over impervious backgrounds such as whinstone or cement render.

Application. Limewash is readily available from suppliers of traditional materials, although in some

situations it can be made up more economically on site. Limewash is made from traditional slaked lime putty (not from hydrated lime powder) diluted to a milky consistency and is applied to a sound and dampened surface by brush. After painting it is desirable to burnish each coat with a soft brush as it starts to dry. Where colours have been added it is important to mix a batch for each elevation or day's work to minimise colour variation.

If the wash is too thick, cracking can occur, and limewash should always be applied in several thin coats, rather than one thick one, and should be allowed to dry slowly. Do not apply it in the hot sun unless some protection can be provided. A damp, misty day provides the ideal conditions for limewashing. As with other types of paint finish, rain or frost may damage newly applied limewash.

6.3.3 Colour

In using colour, it is important that local traditions are

respected. Buildings throughout a whole estate, for example, were often given a limewash coating of the same colour. The original colours included subtle off-whites, pale (and occasionally darker) ochres, raw and burnt umbers and siennas, pastels and greys, but were often lively and glowing, mainly reds, yellows and oranges in pastel shades. Modern pure whites are inappropriate, and the adoption of rather dead colours, such as a dull dark brown, as a means of blending the building into the countryside is rarely successful.

A few paint manufacturers supply limewash in a variety of shades, although it is cheaper to make up your own colours using natural pigments, obtainable from the Scottish Lime Centre and other lime suppliers. Care should be exercised when reading manufacturers' shade cards, as colours generally appear considerably lighter once applied.

Where repainting an existing masonry or microporous paint finish, paints in 'period' and 'traditional' colours are available from several manufacturers.

6.4 Guidelines

The following general guidelines are offered for lime coatings –

Selection of materials. Select materials on the basis of any existing lime coatings (which should be preserved wherever possible) and the character of the underlying masonry, local climate and conditions. If possible use pre-made matured harling mixes from a specialist supplier. Otherwise use well-matured lime putty or fresh hydraulic lime hydrates (powder) as appropriate, and clean, well-graded sharp sand.

Preparation of materials. A typical mix might be two parts lime to four-and-a-half or five parts concrete sand. Thoroughly beat the mix before use. The harling mix should be sufficiently liquid to be cast on in a thin coat. Mortar for making good the masonry surface should be plastic and sticky.

Types of lime. Non-hydraulic lime mortar is not suitable for use in permanently wet situations. Feebly or moderately hydraulic lime mortars might be suitable for harling and rendering in more exposed situations. Do not use 'builders' lime', ie non-hydraulic hydrated lime from the builders merchant, or agricultural lime. Use only appropriate traditional materials.

Strength. The coating should be weaker and more permeable than the host masonry. Cements and strongly hydraulic limes are not suitable.

Detailing. Harling should be of a consistent thickness, up to 8mm per coat, avoiding variations in

thickness caused by uneven masonry backgrounds. Avoid forming ledges or horizontal surfaces which will catch the rain. Finish edges of harling into rebated checks or feather out to avoid thick exposed edges.

Preparation of surfaces. Allow saturated walls to dry out before coating them. Remove all dirt, dust and debris, and dampen masonry where necessary to control suction. Provide a mechanical key where suction is inadequate. Build out excessive hollows using lime mortar with small fragments of stone, etc. to eliminate deep recesses, and allow to cure before applying the harling.

Application. Apply harls and renders in thin coats, usually up to 8mm max, leaving an open texture to the surface and avoid excessive working of the material. Allow each coat to cure before re-coating. Good, and appropriate, site practice is essential for successful application.

Limewash. The use of a limewash finish (six or more very thin coats) will prolong the life of the harling. Apply by brush, working limewash well into the surface. Allow each coat to cure.

Protection. Ensure that roof coverings and rainwater goods are functioning. Carry out work in suitable weather and provide adequate protection, to guard against over-rapid drying, excessively dry or saturated conditions, and frost action. Do not apply non-hydraulic mortars after the end of September, to allow sufficient curing time before the winter.

7 ROOFS

7.1 The Lothian Tradition

In the Lothians, straw or rush thatch were generally used to cover roofs until at least the mid-nineteenth century, but have almost completely disappeared now. Sandstone flags were used on buildings of higher status, but only remain on a few castles or churches (illus 145, 146).

Locally made red clay pantiles were common in the eighteenth and nineteenth centuries throughout the Lothians, and are the most distinctive traditional roof materials remaining on rural buildings (illus 60, 147).

Natural Scottish slates are also commonly seen, and occasionally Welsh or Westmorland. Slate was used on the more formal steading buildings from the eighteenth century, and became more widespread in the nineteenth. It covered only the more important buildings in a farm group (the farmhouse for example and often the granary) while clay pantiles roofed the subsidiary buildings. Where plentiful ventilation was a requirement, pantiles or half slating were used, but where the need for weathertightness was paramount, slates were employed (illus 148).



145 Whitekirk Barn, East Lothian (originally a tower house, later a teind barn, usually referred to as Whitekirk tithe barn) being reslated with the original stone slates, supplemented by new, matching slates.



147 Pantiled roofs at the Glebe Barn, Stenton, East Lothian. The barn itself, to the left, now converted into a house, has its original pantiles. Secondhand pantiles have been used on the roof of the new garage to the right.



146 The completed roof at Whitekirk. A fine original detail was lost when diminishing courses were not incorporated into the roof detailing.



148 West Highland slates on roofs at Calder House Steading, West Lothian.

Corrugated iron is another roofing material used on farm buildings since early in the nineteenth century, becoming more common in the late nineteenth and earlier part of the twentieth century. Its use in the Lothians has on the whole been restricted to the lower prestige sheds and barns, often as a replacement for pantiles or thatch (illus 149). Frequently a mixture of roofing materials is found on farm buildings, due to extensions and alterations which have been carried out over the years (illus 150).



149 A corrugated-iron roof at Buteland Farm, Edinburgh.

The most usual traditional roof form in Scotland (and in the Lothians) is for the roof to run between upstand gable walls or skewes. Hipped roofs are also common in rural areas. In addition, from the mid-nineteenth century on, there were many Lothian examples of the picturesque style of building, with overhanging eaves, timber fretwork and barge-boarding at gables; these were mainly estate buildings and often architect-designed, for instance Gowanbank in West Lothian designed by James Gowans. Examples are shown in illustrations 151 and 152.



151 James Gowans' idiosyncratic design at Gowanbank, West Lothian with features such as overhanging eaves, catslide dormers and porches.



150 A common sight on farms is a mixture of roofing materials as here at Threemiletown, West Lothian.

152 The picturesque style used for farm cottages at Little Spott, East Lothian. Note the scalloped tiles, ridge brattishing and finials, overhanging eaves with fretted timber bargeboarding and porches.



7.2 Pantiles

7.2.1 Original Materials and Construction

The material. Pantiled roofs were a local, cheap and long-lasting roof covering, particularly prevalent in east-central Scotland, which have performed well on many farm buildings. The burnt-clay tiles were hand-made, and therefore of slightly variable dimensions, although the profile used was always a double roll hooked over open battens in traditional construction (illus 153 to 156).

Appearance. The variations in the type, quality and purity of clays used, as well as the inconsistencies in the firing process, produced differences of colour, density and texture which give the roofs a less uniform appearance than modern mass-produced tiles. Irregularities may also be due to movement and deflection in old roof structures and to colonisation by mosses and lichens. Old pantiles have weathered over time and are therefore less visually strident than new pantiles. The original colours are likely to reflect the colours of the local landscape, as they were produced from local clays. Pantiles are most commonly orange-red in colour, although blue-grey or black are occasionally found (illus 157). Some glazed pantiles are also found (illus 158, 159).

Ridges and eaves. The ridges (and sometimes sloping valleys) were protected by clay ridge tiles, set in lime mortar. There were rarely any rainwater goods, but the roof slope at the eaves was sometimes slightly bellcast, or occasionally the wallhead was more closely covered by 'easing' courses; about three to five courses of slates at the base of the pantiled slope (illus 159). Courses of slate were also employed at times to give a shallower pitch over dormers or raised openings at the wallhead.



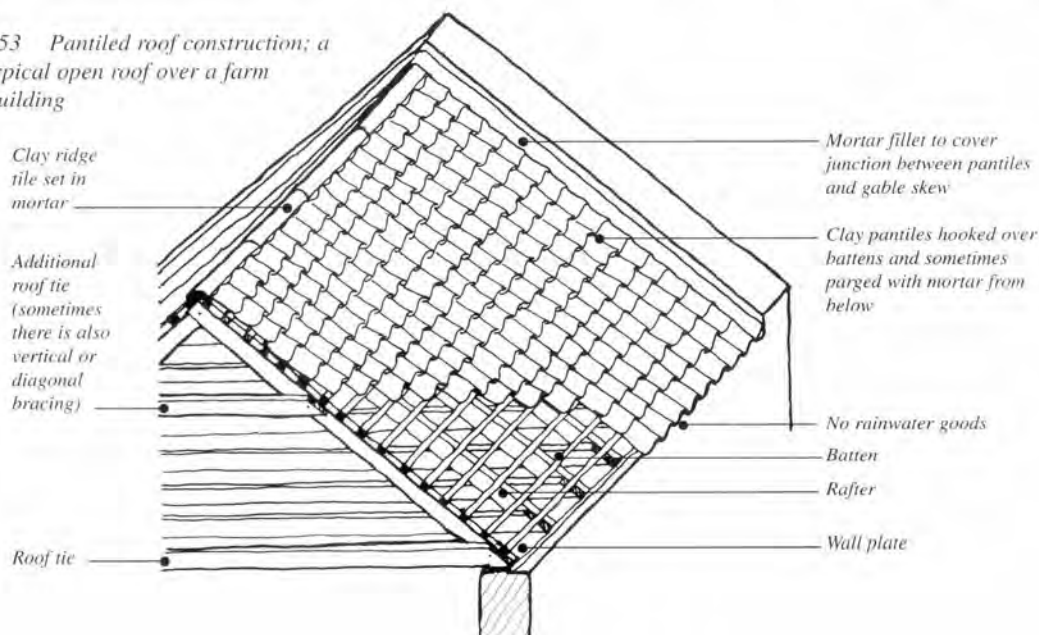
154 Salvaged pantiles and new ridge tiles (Cauldhame, West Lothian).



155 Internal construction of a pantiled roof, showing unsawn roof ties, open battening and mortar parging.

Mortar and flashings. The lowest courses were often bedded on lime mortar, unless there were easing courses. Pantiles were sometimes parged (the underside of the tiles being filled or daubed with mortar between the battens) (illus 155). The use of

153 Pantiled roof construction; a typical open roof over a farm building



mortar parging may have been locally variable, depending on climatic factors such as exposure, or the need for ventilation in the building, but does not seem to have been widespread in the Lothians.

An external mortar fillet was usually used at the gable skew to prevent water ingress. Valley gutters were unusual, but where pantiled buildings ran alongside each other, there were probably zinc or lead-lined valleys.

Features. Particular features which are sometimes seen on pantiled roofs include the use of a small number of glass pantiles, which were a convenient way of introducing light into steadings. Ridge tiles occasionally had vents incorporated, and there were often separate ridge vents in louvred timber or metal.

7.2.2 Repair and maintenance

Condition and reuse. Where existing pantiles can be retained, they are by far the most appropriate and visually satisfying material. Although traditional pantiles can last for many years, they were a locally-made product and consequently their quality varied. Roofs may be in a generally sound condition, needing

only minor repair, but tiles have a tendency to become more porous with age and should be checked.

Before abandoning all old pantiles on a roof and replacing them with new, it is always worth examining the potential of the original pantiles for reuse. Advice can be obtained from the Building Research Establishment on testing for porosity. Usually many can be reused; although inevitably there is wastage when stripping an original roof. In particular, if any tiles have been rebedded on cement mortar, it is unlikely that they will be able to be lifted undamaged, stripped of mortar and reused. Some breakages are inevitable, especially where cutting pantiles for corners. Where old tiles are being lifted and relaid, they will need to be sorted into lots with matching or similar profiles, so that they fit together reasonably snugly.

Patching and retiling. If old pantiles are defective and have to be replaced, over a part or the whole of a roof, either second-hand or new clay pantiles (preferably hand-made) should replace them. In situations where only patching is required, the pantiles used must be matched as closely as possible to the existing in size, thickness, colour and profile, so second-hand tiles are obviously preferable.



156 Interior view of another pantiled roof (Skivo, West Lothian) showing hand-sawn and axe-cut timbers and unusually close battening under pantiles. The timber has been limewashed. No parging is evident.



157 Mixed black and red pantiles on a roof at Broadwoodside, East Lothian.

Old pantiles. Salvaged second-hand tiles can be obtained from various sources, for instance East Lothian Council's salvage store. Second-hand tiles should be carefully sorted before use, as they need to be close fitting on the roof, but the shapes tend to vary a little. If some old and some new are to be used, it would be best to put the old on the most visible slopes, if this is possible, and use the new where they are less noticeable. Salvaged pantiles reused on a new roof are shown in illustration 147. Contrast these with the smooth and highly reflective new pantiles shown in illustration 415.

Secondhand pantiles which are not suitable for use on habitable buildings might nevertheless be acceptable on garage roofs.

New pantiles. Clay pantiles are still manufactured, and new tiles are readily available, but most products are machine-made, not hand-made. These machine-made pantiles are very regular in shape and colour, giving a much more uniform appearance to a roof. Even modern hand-made tiles are more standard in shape and colour than the old ones found on these buildings, but are a closer match than mechanically-made ones. New tiles are also much brighter, and the colour will stand out for many years; but eventually they, too, will weather to some extent, develop a patina and grow lichen, and will blend in with the local landscape. The artificial colouring or weathering of new pantiles to make them look older is not recommended.

The recommended fixing details for modern pantiles include the nailing of all perimeter tiles, and additional mechanical fixing in exposed locations.

Profile. It is essential to use pantiles of the correct double-roll profile (illus 154, 159). There are some modern pantile types which appear similar, but are different enough to look wrong on the roof.

Interlocking tiles. Modern pantiles can be either traditional in shape or interlocking for extra weathertightness and security in fixing. Although not historically accurate for use in patching and retiling, it may be that the use of interlocking pantiles can be beneficial on new roofs in certain exposed situations, where strong winds might dislodge traditional pantiles.

Ridges and skews. Clay ridge tiles are available as one third or one half round, or triangular. The original ridge should be matched, and is most often one-third round. Half-round ridges can appear too large and clumsy. Ridge tiles should be bedded in lime mortar with a hydraulic set. Waterproofing was achieved at skews generally by means of a mortar fillet, and should preferably be renewed in mortar, rather than using the more durable but uncharacteristic lead or zinc cover flashing (illus 160, 161). A hidden lead or zinc undercloak flashing can be introduced if desired, and should improve the weathertightness of the detail.



158 Salvaged glass pantiles (Cauldhame, West Lothian).



159 Slate easing courses and glass pantiles on a roof at Almondhill Steading, Edinburgh.



160 Traditional skew detail to pantiled roof, using a mortar fillet to cover the junction between the wall and the tiling (West Lothian).



161 New skew detail at gable, using a lead cover flashing, of good quality but non-traditional. The traditional detail is a mortar fillet, and sometimes an undercut cope stone to shelter the junction.



162 Eaves detail at Pottishaw, West Lothian; the provision of a rhone is not traditional, and it may have been added later. Sarking straps are used, but as there is no sarking, the fixings appear to be to the masonry or wallplate. Note the profile of the tile with a shorter upper roll than modern pantiles have.



Wooden boarded box ridge vent at Hédderwick Hill, East Lothian. No flashings are visible



Clay pipe ventilators under the ridge at Millrig Farm, West Lothian



Clay pipe ventilators to the ridge of the byre at Bridge End, Edinburgh

163 Traditional vents to pantiled roofs giving ventilation to the internal space.



164 Vents in a pantiled roof at Millrig Farm, West Lothian.

Features. Ridge vents, glass pantiles, slate easing courses etc. should be retained.

7.2.3 Alteration and conversion

Where agricultural or industrial buildings are put to another use, a higher specification may be required for the roof in order to comply with the building regulations, particularly so as to incorporate insulation. The normal specification for new construction incorporates sarking, felt (underslating felt or waterproof building paper), insulation and roof ventilation. To achieve this in an existing roof will in many cases mean stripping and retiling the roof. It may prove possible to insert boarding and insulation on the underside of the rafters in other cases, leaving the pantiles undisturbed. Another possibility may be to

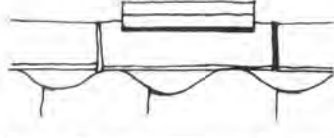
introduce an insulated ceiling, leaving the roof unchanged, although ventilation to the roof space above may need to be improved to meet the requirements of the building regulations. Care must be taken when retiling (especially where the build-up beneath the tiles is being increased) not to raise the roof, so changing the eaves detail and relationship between roof and wall.

In addition, where there are no rainwater goods, these will usually need to be introduced (see 7.5.6 and illu 162).

Ventilation, insulation and condensation. Even where the use of the building is not changing, a reduction in the generous ventilation provided by the open battens of a pantiled roof may be desired. An insulated suspended ceiling can be introduced, or the

Ridge ventilation - Most of these proprietary ridge ventilation methods are designed for use with the larger ridge tiles. These may not be as close to the originals as the smaller, triangular or one-third round ridges available. Individual details can be incorporated at ridges instead.

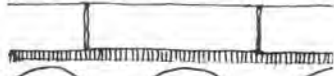
a) for clay or concrete ridges, rounded or triangular, suitable for roofspace ventilation, soil vent pipe terminal or air extract (for hot flue gases, a larger box on the ridge is used)



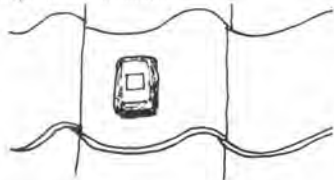
b) for clay ridges suitable for roofspace ventilation.



c) for clay or concrete pantiles, suitable for roofspace ventilation.



Ventilation incorporated into the general tiling - Visible on the roof, protruding above the tiling. Various forms are available



Eaves ventilation - Individual designs can also be incorporated into the wallhead detail, often less obtrusively than many of the proprietary designs available.



165 Roof ventilation in a pantiled roof. A wide range of proprietary roof space ventilators is available, and some of the more discreet designs are illustrated here. Individual designs can also be incorporated into roof detailing and can be unobtrusive.

rafters backed by sarking and felt. However, if the roof is modified in some way, there is a danger of introducing condensation and there may also be a need to comply with additional building regulations (see 7.6).

Where the building is being converted or the roof altered so that it has to comply with the current building regulations, the space between sarking and insulation must be ventilated, generally by the installation of proprietary vents into the space below the roof. An alternative method is to use a breather felt on open-boarded sarking, but this detail may prove ineffective in the long term, and acceptance of its use must be obtained from the local authority. If unmortared, the existing roofs are naturally well ventilated, and if the traditional open batten detail is retained, this may be accepted as giving sufficient air flow.



166 Concrete 'pantiles' used in a conversion at Hallhill, East Lothian.

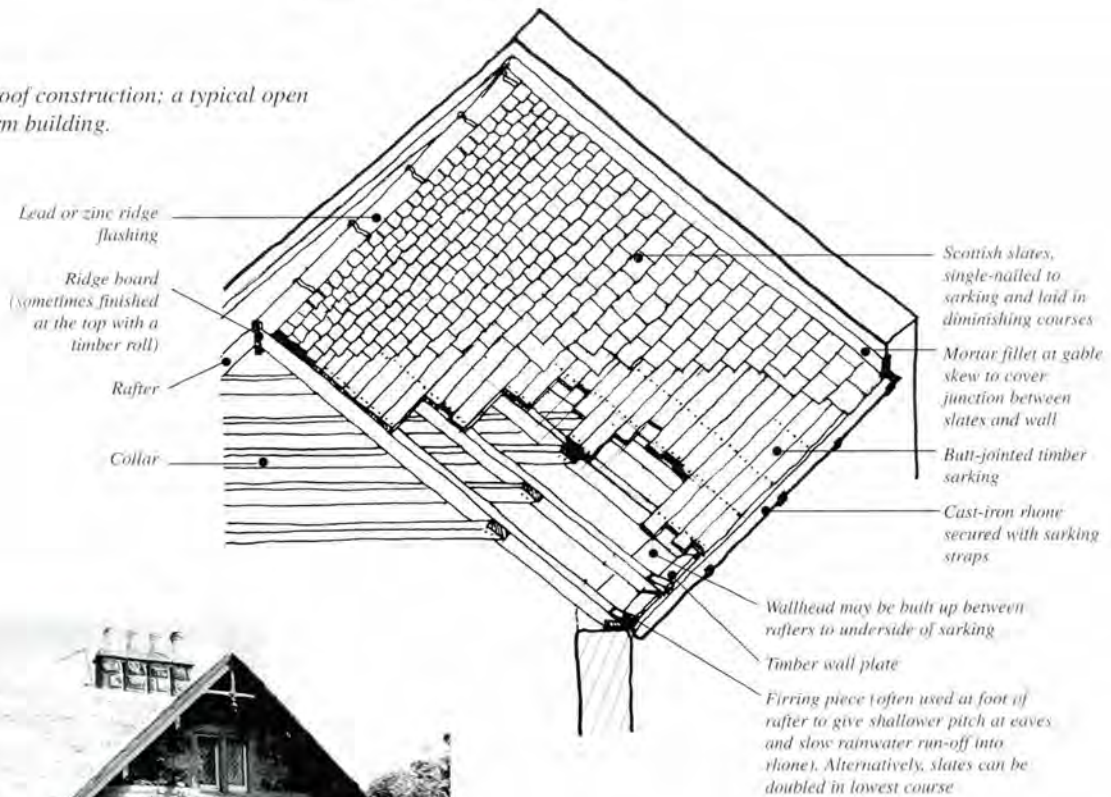
There is a variety of ways of providing roof ventilation, using either proprietary or individually-designed details. In each case, the best solution for the building should be individually assessed. It may be possible to utilise existing roof vents (originally provided to ventilate the internal space) (illus 163, 164). Eaves ventilation can be introduced unobtrusively behind the rhone, with a mesh insert between wallhead and sarking. Ridge ventilation can be inserted under the ridge tile, or above the low point of the top pantile, although care must be taken to ensure that the felt underlay both protects the sarking from rain and allows air to flow behind it. Purpose-made roof ventilators are also available, though some are less obtrusive or more robust than others (illus 165 and paragraph 7.5.4).

Safety and fixings. In buildings with public access, safety has to be paramount, and there must be no doubts about the security of the pantile fixings and the possibility of falling tiles. If tiles are loose, the roof must be stripped and the tiles resecured, as at Livingston Mill Farm, West Lothian (now a museum), where the new pantiles will also be drilled and screwed to the sarking, to ensure they are securely fixed and present no danger to the public.

Alterations to detailing. There is no reason to introduce an easing course on a roof if there is no evidence of it having existed previously. Where mortar seals the lowest course of pantiles, the use of coloured mortar to match the pantiles (instead of the usual uncoloured) is anachronistic and is not recommended.

Concrete tiles. Concrete 'pantiles' are also available, but are usually heavier and thicker than clay ones, with a correspondingly heavy and regular appearance (illus 166). The roof structure may have to be strengthened to support the extra weight. Although concrete tiles are less expensive than clay, they are less durable, becoming porous more quickly. They do not weather and age as gracefully as clay tiles, and the colour can sometimes leach out gradually. For these reasons they are not likely to be acceptable for use on listed buildings. Clay pantiles should not be replaced with concrete; there is no long-term justification for it.

167 Slated roof construction; a typical open roof over a farm building.



168 Polychromatic slating at Kingscavel Cottages, West Lothian, incorporating a mixture of slate types.



169 Slated roofs at Brunt, East Lothian. The slates on the left are Scottish slates, probably West Highland, while those on the right are probably Welsh. They are smoother, thinner, purpley-blue and more uniformly sized. Both roofs appear to be nailsick, the right being in a worse state.

7.3 Slates

7.3.1 Original materials and construction

The slates (or stone slates) covering earlier buildings would usually have been from quarries in the vicinity, perhaps those near Peebles, or from smaller local outcrops. From the late-eighteenth century, West Highland and other Scottish slates were more widely used in the Lothians, brought mainly by sea and canal (the Forth-Clyde canal opened in 1790, the Crinan canal in 1801 and the Union canal by 1822). With the coming of the railways in the 1840s, Welsh slates were sometimes used as well, or occasionally Westmorland slates.

Scottish slates. The Scottish slate quarries produced a vast range of different colours and types of slate, of varying quality, most being rather heavy, thick and rough. The West Highland range of slates are very dark blue/grey to black with iron pyrites, and so are easily identified. Scottish slates were always supplied and used in random sizes.

Welsh and Westmorland slates. Welsh slates are thinner and smoother, usually larger, and except for some early roofs are in regular sizes. They are most often purple, but there is a range of greys, from light to dark (illus 169). Westmorland slates are often green, but also come in dark grey ('blue grey'). They were in random sizes and laid in diminishing courses (like Scottish slates) in most nineteenth century roofs, but were later mainly produced in regular sizes.



170 Traditional skew detail to slated roof at Addiewell Farm, West Lothian, using mortar fillet over junction between slates and skew cope (crowstepped and painted in this case). See also illus 443 (Athelstaneford doocot).



171 Half slating over a cattle byre and shelter shed at Hallhill, East Lothian.

Traditional construction. In traditional Scottish construction, the slates were single-nailed directly onto timber sarking laid over the rafters or purlins (illus 167 and 306), although in the oldest roofs wooden pegs were used instead of nails. In general the slates were laid in diminishing courses, starting at the bottom with the larger slates and reducing gradually to the smallest at the top (where less rainwater was running over the roof, and the need for waterproofing was therefore less critical). The slates were sorted into different sizes, and then the slating commenced with a number of courses of the largest slates. Probably within these courses, the thickest slates would have been put together for the same course, usually the lowest.

The use of diminishing courses is a particular feature of Scottish slate practice, where slates have never been machine cut into standard sizes; but as mentioned, roofs of Welsh and Westmorland slates can also be seen laid in this way. Ridges to slate roofs were normally of



Wooden louvered box ridge vent at the Brunt, East Lothian. The cap is metal, the flashings to the slates are lead or zinc.



Metal cowl terminating vent pipe at Thurston Mains, East Lothian



Slated catslide vent at Almondhill, Edinburgh. The framing is timber, protected by lead flashings



Gooseneck vent pipe at Hartwood, West Lothian

172 Traditional vents to slated roofs giving ventilation to the internal space.

lead or later zinc, though stone or clay ridge tiles were sometimes used (illus 173 to 175).

Slates were often used on buildings where air tightness and warmth were important requirements, since they gave a much more snugly fitting roof than the open and well-ventilated pantiles. Nevertheless, butt-jointed sarking boards still allowed good ventilation to the undersides of the slates and within the roof space (if any). The use of roofing felt between the sarking and slates is a relatively recent phenomenon, and probably started with hair felts (perhaps to reduce rattling) leading later to bituminous felts. The use of underslating felt considerably reduces the air flow.

Half slating. There are also a few surviving examples of half slating, which may have been quite common, where the slates were laid with gaps instead of butted at the vertical joints. It was designed to give plentiful air flow, for example over cattle courts, smiddies and dyeworks (illus 171).



173 Decorative treatment to roof vents at Crichton Mains, Midlothian.



174 Vent pipes on roof at Thurston Home Farm, East Lothian, ventilating the internal byre or stable accommodation.



175 Long ridge vent at Eastfield Steading, East Lothian. Note decorative chimney design and gable crowsteps, also the gate designed to deny access to cows and sheep. There was a bothy in the building on the left.

7.3.2 Repair and maintenance

Natural slate is a tough and long-lasting material. Repair of a roof is usually necessitated as a result of 'nailsickness' (corrosion of the ferrous nails) or delamination or breakage (most commonly at the nail hole) of the slates.

Patching. If only a few of the slates need to be replaced, this can be done by patching with sound slates, pulling the adjacent slates aside to allow fixing of each new slate in position. Because Scottish slates are generally single nailed, except at edges, the slates can be manoeuvred in this way. Welsh slates may be double-nailed, and if so are likely to be more difficult to patch.

Reslating. Where large numbers of slates are loose, displaced or missing (a common situation in abandoned rural buildings), the whole roof should be reslated. The existing slates have to be taken off very carefully to allow sound slates to be saved for reuse (usually a high proportion can be reused). Some will need redressing and all have to be graded by size. It is important that only the minimum of redressing is carried out; broken bottom edges should be acceptable as long as they do not compromise weatherproofing. Such an approach conserves the existing stock of Scottish slates and results in a roof that will generally not look out of character with the rest of the existing building.

Secondhand slates which are no longer good enough for use on occupied buildings, might nevertheless be put to good use on garage or store roofs.

Sarking nowadays is usually covered in underslating felt to give extra protection against rainwater or snow blown in under the slates. The slate numbers will need to be made up with matching slates, which are then nailed to the sarking in diminishing courses starting at the bottom. Welsh slates may be of a standard size and laid regularly. The use of stainless steel or non-ferrous nails is recommended to reduce maintenance and extend the length of time before reslating is next required.

The use of underslating felt can have drawbacks, in reducing airflow in the roofspace and thereby increasing condensation. This can result in dampness and decay in the roof timbers, and even ultimately lead to softening and deterioration of the slates. When underslating felt is used, it should be vapour-permeable to minimise the risk of these problems developing.

Sourcing of slates. Scottish slates are only available second-hand, as no Scottish slate quarry is currently open, so all the extra slates needed will ultimately be coming off another Scottish slate roof. This is clearly a diminishing resource and should be treated with respect.

Where Welsh slates in regular sizes have been used, it should be possible to buy new slates to match. If the roof was laid with randomly-sized Welsh slates, it may be possible with persistence to purchase similar slates (perhaps seconds), although they are not yet readily available. Otherwise, it should be possible to cut slates down to the required size for patching, if not reslating. The recent (but now obsolete) categories were 'bests' (which were thinnest), 'strongs' (thicker) and 'extra heavies' (which were even thicker, sometimes flawed or twisted and treated as seconds). Extra heavies were the most suitable for the Scottish market and were often cheaper. Westmorland slates, too, can be readily purchased in random sizes, although this is not how they are generally marketed.

If a mix of salvaged and other slates are used, it is generally best to mix these throughout the roof, unless the different types can be restricted to different roof slopes.

Detailing. It is essential to a good repair to match the existing materials and methods of construction, only altering the specification where there is good reason and the change is not to the detriment of the character of the roof. Matching natural slates should be used for patching and reslating. The original rainwater goods (usually cast iron) should be repaired or reinstated, and rhones regularly cleared of leaves. Ridges, valleys and flashings should be repaired using the original material and detail. If skewers have only a mortar fillet, consideration could be given to the introduction of a lead or zinc undercloak with mortar fillet above, to improve the weathertightness of this junction.

7.3.3 Alteration and conversion

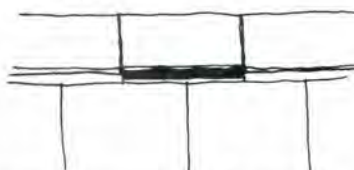
Sourcing of slates. Welsh and Westmorland slates are readily available to match those on existing roofs, but until a Scottish slate quarry is re-opened, there is an acute shortage of Scottish slates. On existing Scottish slate roofs any patching or reslating should, nevertheless, be carried with with natural Scottish slates laid in the traditional manner. However, where large areas of new roof require to be slated, the most reasonable option is often to use a good quality non-Scottish slate, chosen for its similarity to the appearance and performance of the particular Scottish slate used elsewhere on the building. On listed buildings, a change of roofing material or slate type will require listed building consent.

It is important to match the colour, size and thickness of slates as closely as possible. Recently, Westmorland slates (blue-grey, of the 'strong' or heavy variety) have been used at Stirling Castle as the closest available match in new slates for the original Scottish slates. One of their main advantages lies in being available in

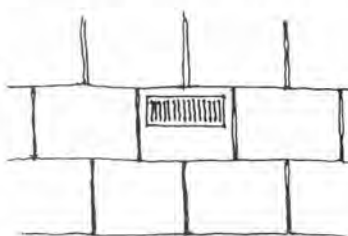


176 Slated roof at Bangour, West Lothian, with zinc ridge flashings and valleys, cast-iron rainwater goods, small pipe ridge vents to the left and a larger box vent.

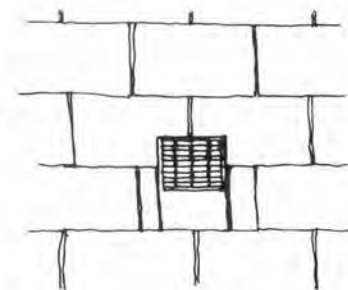
Ridge ventilation - ridge vent in natural slate, bonded to UPVC venti body for roof pitches 22.5 to 60°, connected to extension piece or pipe adaptor to reach roof space



Ventilation incorporated into the general slating -

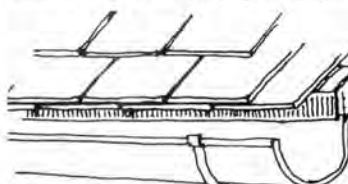


a) adjoining slates cut back to insert polypropylene tray with ventilation grille and underlay deflector. This type of vent can also be used as a soil vent pipe terminal, or for mechanical extract ventilation of roof space



b) adjoining slates cut back to allow insertion of vent. Several proprietary types are available

Eaves ventilation - Several proprietary types are available



177 Roof ventilation in a slated roof. There is a wide range of proprietary roof space ventilators available, and some of the more discreet designs are illustrated here. Individual designs can also be incorporated into roof detailing and can be unobtrusive.

random sizes, so that they can be laid in diminishing courses.

Imported slate, particularly from Spain, is also readily available and being increasingly used, but caution is advised. These slates have only been tried out on Scottish roofs for a few years, so their durability has not yet been adequately tested. Nor are the comparative merits of the various types yet well known. There have already been reported problems where imported slates with single-nailed fixings were too lightweight to withstand Scottish winds. The heavier slates are usually the most suitable, but tend to be rather large and available only in a few standard sizes. Spanish slates can provide a reasonable visual match to West Highland slates, however (apart from their regular sizes), if black slates with pyrites are selected.

Roof ventilation (illus 177). The comments on roof ventilation given for pantiles also apply to slates. As with pantiled roofs (see 7.2.3), there are many ways of providing roof ventilation between sarking and insulation, using both proprietary and one-off methods,



178 Internal construction of a traditional corrugated-iron roof. The sheets were laid direct onto the roof timbers without sarking or insulation.



179 Corrugated asbestos roof, West Lothian. This material is particularly susceptible to the growth of lichens and mosses.

and by reusing existing ventilators (originally intended to ventilate the internal spaces). Some traditional roof vents are shown in illustrations 172 to 176. For new roof constructions there are alternatives to the use of sarking, which may allow better ventilation and minimise condensation (see Part G of the Technical Standards; Provisions deemed to satisfy the standards (G3.1) pitched roofs).

7.4 Corrugated Iron

7.4.1 Original materials and construction

This light-weight iron sheet material was generally nailed directly onto the timber substructure, without insulation or lining below (illus 178). Often it was fixed over an existing thatched roof as an easy alternative to repair of the thatch, or it was used to clad a timber-framed building. It was nearly always painted, sometimes red or black, or dark green for churches and halls, but in a few instances came ready-coated with a



180 Barrel-vaulted corrugated-iron over a nineteenth-century shelter shed, at Stoneypath, East Lothian. Painted in traditional fashion, the paint is now wearing off.



181 Twentieth-century farm sheds clad in corrugated iron at Barberfield, East Lothian (now demolished).

more durable finish. Later galvanised sheet was sometimes left unpainted. More recently, corrugated asbestos or fibre cement sheeting has been used in similar situations, sometimes to replace earlier iron. Corrugated plastic/ perspex sheeting has also been a recent innovation to provide areas of rooflighting.

7.4.2 *Repair and maintenance*

Regular repainting is essential to prevent corrosion of metal sheeting, preferably in the colours traditionally used. Fixings must be sufficient in number and secure, as this light sheet material can be lifted by strong winds. The probable lifespan of metal roofs is considerably less than a slated or pantiled roof.

Corrugated iron can be regarded as a traditional material (since it has been in use since the early nineteenth century), but the same cannot be said for corrugated asbestos (a twentieth century material), despite its superficially similar appearance (illus 179). Although asbestos cement is a low-risk material when undisturbed, removal may require to be done by a licenced contractor. Check with the local authority to determine what the local arrangements are.

7.4.3 *Alteration and Conversion*

When corrugated iron or asbestos requires replacement, reinstatement of pantiles or slates can be more appropriate than renewal in sheet metal, if the sheet material appears to have been a later alteration. It may be prudent if reverting to pantiles or slates to have the roof structure checked by a structural engineer, to ensure that it can still take the additional loading.

Corrugated iron is, however, a traditional material in its own right, introduced as part of a continuing vernacular tradition, and should not automatically be rejected as being inappropriate. Even if a later addition, it can still be an authentic part of the building. Each situation should be looked at on its own merits.

Regular maintenance is needed for painted iron sheeting, and in situations where the roof is not easily accessible, and the building is not an important or highly visible one, its replacement with pre-coated profiled metal or fibre cement roof sheets could be considered, as these do not need repainting, at least for an initial period of up to twenty years. However, they can lack the colour and textural variation of patinated corrugated iron. See illustrations 180 to 182 for a comparison of new and old sheet metal roofs.

If adding insulation, ventilation and thermal breaks to comply with the building regulations, care must be taken with the roof detailing. The depth of the roof construction will be much greater than previously, and particularly at eaves and abutments, this may cause



182 *New sheet-metal roof at Rosebery Home Farm, Midlothian.*

awkward junctions and alter the proportions. The aesthetics of the building will also be changed if a simple detail becomes more complex.

7.5 **General Considerations**

The roof is fundamental to the appearance of a rural group, particularly when viewed from a distance. It is therefore important to avoid unnecessary or excessive alterations to rooflines or pitches, and to ensure that the materials used on the roof remain the same as before. Many steadings have large roof slopes unpunctuated by openings, and in these situations new interruptions to the roofscape can have a damaging visual effect.

When considering the conversion of an old steading to a new use, remember that steadings were constructed to meet the needs of the farms at the time, and were often incrementally added to as needs changed. A change to domestic use is a radical one, and the buildings cannot be assumed to adjust readily to such a different set of requirements; in particular they cannot be expected to comply with current building regulations, and it may be necessary to apply for relaxations of these on some points.

7.5.1 *Roof Form and Proportion*

It is always important to maintain the original proportions of the building. This means retaining the roof pitch and the wallhead height to ensure that the physical proportion and balance of the building is maintained. Illustrations 109, 113, 114, 123 and 125 shows heightened wallheads. Many older buildings were constructed on a slope, with their roof line parallel to the falling ground level (illus 183, 271 and 324). This is a traditional feature and should not be 'corrected' in any conversion work.

If an existing wallhead is not at a sufficient height to fit in the desired number of floors, an alternative and more imaginative solution to the interior space should be considered. Many farm steadings seek to use the



183 The eaves and ridge of this roof slope with the fall of the ground on these cottages at Dalhousie Mains, Midlothian.



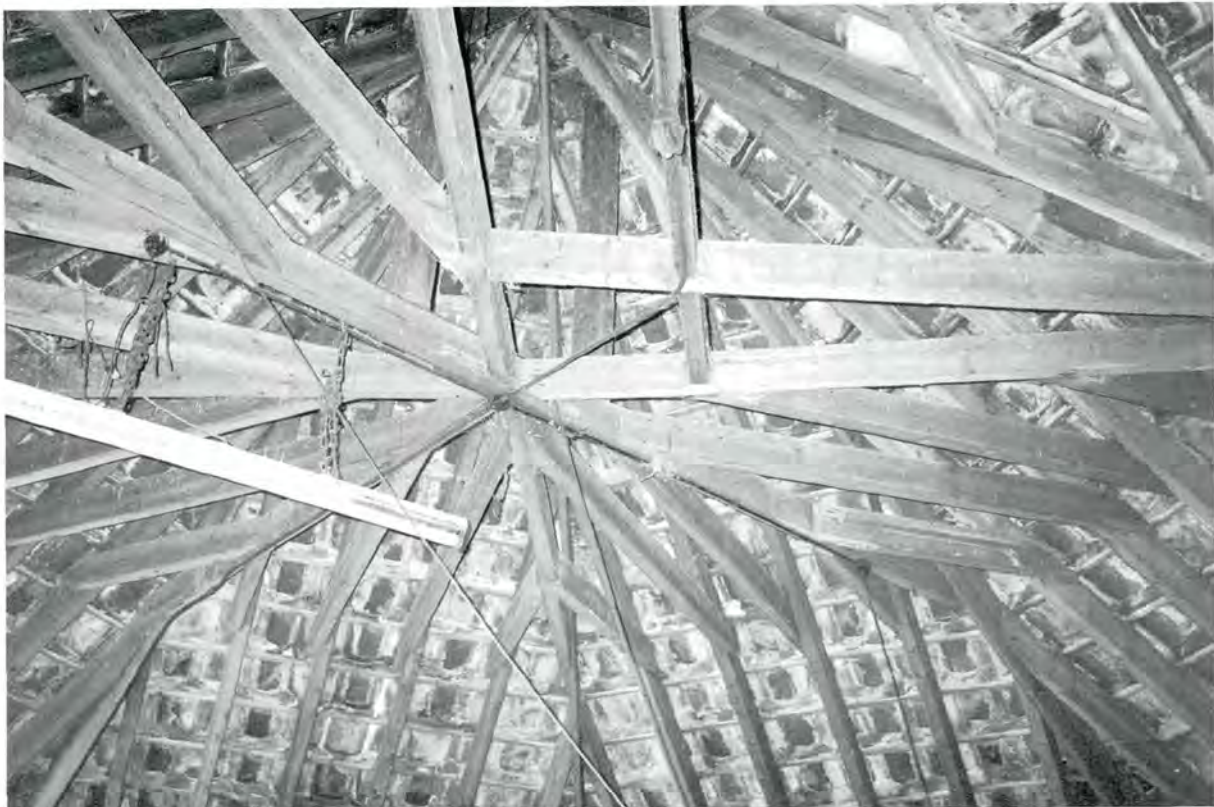
184 The horsemill at West Broadlaw, West Lothian, where deterioration of the roof has exposed the timber structure. (See illus 60 for a photograph of the building with the roof intact. Note also the loss of pantiles on the cottage, and their replacement with a sheet material).

roofspace as living accommodation. While this can often be successfully achieved, it is always worth considering leaving as much as possible of the existing roof structure visible inside a building. This can be particularly effective in a building constructed in an unusual way because of its original function, for example a horsemill (or horse engine house). These are common in Lothian steadings and usually have a polygonal or conical roof. Exposing a roof structure can give a more interesting internal character and avoid the need to raise external walls in order to gain height internally (illus 184 to 186).

7.5.2 Roofing Materials

When considering coverings to new roofs, building materials which respect the local tradition should always be used. As previously described, in the Lothians these would be clay pantiles, natural Scottish or Welsh slates, perhaps corrugated iron or even thatch. It is important to retain the links with the past by using the original materials in any restoration.

However, it may be appropriate to differentiate a new extension from an original building by varying the roof finish. For instance the new extension at Bield Cottage, Linlithgow, West Lothian has a slated roof, while the original cottage is pantiled. This is following a once fairly common habit of using a different local material for an extension, possibly one that was in more common use at the time the extension was built.



185 Internal roof structure to horsemill at Blackdykes, East Lothian.

7.5.3 Dormer Windows

New dormers. The insertion of new dormer windows will alter the appearance of a steading or mill, particularly from a distance. Dormers are rare on steadings, except on formal facades, which are usually carefully and symmetrically composed and whose balance would be upset by any additions (illus 187, 188, 190). Granary or hayloft loading doors at wallhead level are, however, common original steading features, also found in the upper floors of mills. They were functional elements, and their location, number and size were determined by the use of the building. There was rarely more than one loading door in any building frontage, and the addition of others would confuse the original arrangement (illus 94, 189, 384).

Size and location. No new dormers should be added unless there were dormers previously. In any case these should be kept to a minimum and may be less obtrusive if they face into a courtyard rather than facing outward, where they can be seen from a distance. If there are dormers as original features of the building, then the form and proportions of these should generally be used as a guide. If dormers are too large, they can be overdominant (as in illus 191). To avoid this, the glazed areas of dormers (except in converted loading doors) should not be as large as ground floor windows.

Positioning. It is worth noting that most steadings were not formally designed, but developed in an incremental way, and that in these buildings the introduction of formal and symmetrical design in the



186 Internal roof structure to pend at Wamphray, East Lothian.



187 Formal frontage with carefully arranged dormers and central doocot, at Sunnyside Steading, East Lothian.



188 Byre with regularly-spaced wallhead dormers (each one below a box ridge ventilator) at East Fortune, East Lothian.



189 A first floor entrance door (with forestair) and loading door are both in wallhead-dormer form in this former mill building at Ewingstone, East Lothian.



190 New windows in existing dormer openings at Waughton, East Lothian. Single-pane pivot windows have been used, to provide a simple, unfussy replacement for the boarded shutters.

positioning of new dormers will look wrong. Conversely in formally designed steadings, any new additions such as dormers should be regularly spaced, respecting the existing style and proportions, and their position should relate in an appropriate way to other door and window openings.

7.5.4 Vents and flues

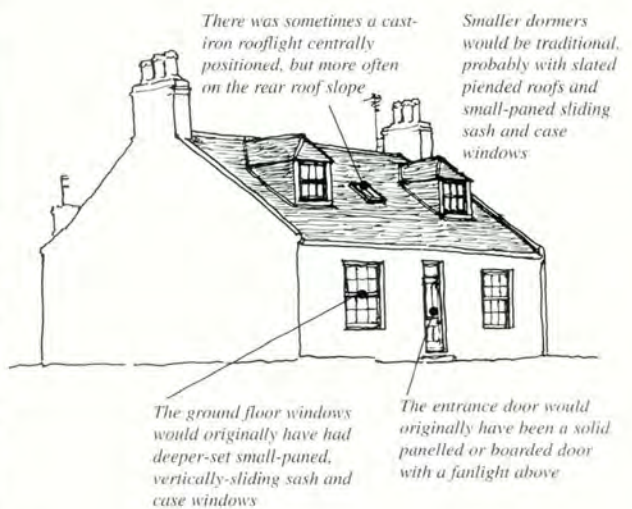
Pipes. Smaller piercings through a roof can collectively appear fussy and obtrusive. Building regulations require that roofs be ventilated, but there



191 The later dormers to Millbank Cottage, Midlothian, although neatly located above the ground floor window openings, are much larger than them, and overdominant.



192 Box dormers are not traditional, and drastically alter the profile of a pitched roof (West Binny, West Lothian).



193 Alternative dormers for the roof at West Binny.



194 This new dormer is a non-traditional flat-roofed form, and the inward-opening top-hung window is unexpected, given its sash and case appearance (Newton, West Lothian).



197 Glass paniles spaced regularly along a roof at Millrig, West Lothian.



195 Traditional cast-iron rooflight, with central astragal at Waterstone, West Lothian.



196 Traditional detailing for fixed-glass skylights at Maudslie, Midlothian.

are many different ways in which this can be achieved, as previously discussed in 7.2.3 and 7.3.3 (illus 165, 177). Roof ventilation should be considered at an early stage in the design of the project and not added as an afterthought. Soil vent pipes, ventilation ducts, overflows etc. are better clad in lead above roof level, or made of cast iron (in which case they can be painted to match the roof covering). Plastic pipes, although cheaper, are not sufficiently robust to be recommended and cannot be painted to minimise their impact.

Chimneys. The provision of new chimneys, even if constructed of stone, can be out of character in an agricultural group, and consideration should always be given to less conspicuous alternatives. A metal flue through the roof, of the minimum height required, is less domestic in character than a masonry chimney and may be more appropriate (see examples in case studies 11.2, 11.4 and 11.5).

Ventilation stacks etc. Any special features of a roof, such as those shown in illustrations 163, 164 and 172 to 175, should always be repaired and retained as an important contributor to the original character of a building. Removal and replacement by replicas is rarely convincing, so it is essential to preserve the original if possible. Even if their original function is no longer required, they can often be re-used to conceal ventilation duct or soil stack terminals, or possibly as locations for communal television aerials. In mills, breweries or distilleries, there are much larger and very distinctive roof forms acting as vents and flues for the various industrial processes, which are critical to the particular character of each building or complex. (Chimney stalks in steadings are discussed in chapter 4).

7.5.5 Skylights

Traditional types. Skylights are a very common traditional feature on certain rural buildings. Roofs of farmhouses and cottages usually had a few small cast-iron rooflights over corridors, boxrooms or stairs. In agricultural buildings, skylights were often numerous on certain ranges, either laid as a continuous bank of



198 A long skylight in a farm roof at Braidwood, Midlothian. This is a traditional method of arranging skylights, especially in industrial buildings.



199 Run of skylights in a new roof at Newmains, East Lothian. Because they are of a low profile they are less obtrusive than many rooflights.

skylights or more commonly set out in a regular pattern of small areas of glazing, small cast-iron rooflights or small areas of glass pantiles across the roof (illus 195 to 198, 203). On industrial buildings too there were long runs of roof glazing in places (which was detailed to lie at the same level as the slates), or small, cast iron skylights, usually spaced at regular intervals (illus 377).

Where additional light is needed in an attic or upper floor, the use of rooflights or skylights can often be a much better design solution than new dormers. However it is important to consider the size and spacing of these in a roof slope, and their position between the ridge and the wallhead (illus 200 and 201).

Detailed design. Generally, new rooflights should be kept to a minimum, to avoid dominating a roof slope. They are better positioned well up the slope, rather than too close to the wallhead. Where there are windows below, rooflights should be aligned with them. They were usually spaced far apart, but regularly along the roof, and this spacing should be followed for any new rooflights. Various examples of modern rooflights are shown in illustrations 199 to 205.

Rooflights are always less conspicuous if they are fitted flush with the roof covering as traditional skylights were. Special flashings and specifications are available for new 'low profile' rooflights on slate roofs.

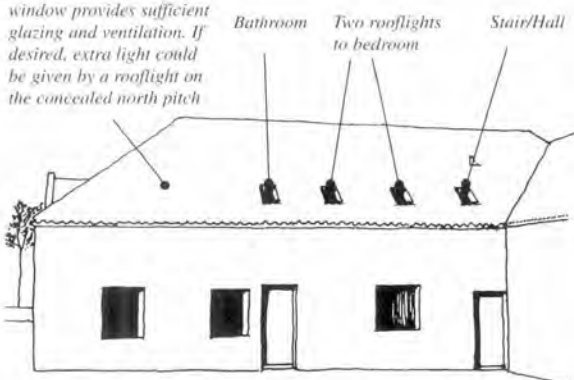
In order to reduce the impact of new rooflights, they should be no larger than traditional lights, and vertically proportioned. Small cast iron rooflights (so-called 'conservation rooflights') are now readily available new, and suit the roof better than large non-traditional designs. It is, however, important to check that all rooflights can be cleaned from inside if compliance with the building regulations requires this.

Regulations on escape and ventilation. Another requirement to bear in mind when deciding on the size and location of rooflights, is the possible need for fire escape. See 7.6 'Building Regulations' below. The building regulations also specify a minimum area of



200 New rooflights at Hallhill, East Lothian. These are larger than traditional ones (perhaps in some cases for escape purposes) and do not relate to the window layout below. Unfortunately rooflight manufacturers do not produce colours to match pantiles, so the frames are highly visible.

The large (living room) rooflight could have been omitted, as the end window provides sufficient glazing and ventilation. If desired, extra light could be given by a rooflight on the concealed north pitch



201 Alternative roof treatment for Hallhill. The rooflights shown in illus 200 are new, but they are not needed for emergency access or escape. Four small, evenly-spaced rooflights should suffice for the daylighting and ventilation requirements of this building.



202 A new rooflight arranged above a new window, both in line with an existing opening below at East Whitburn Mains, West Lothian. The size of the rooflight has been kept small, but it would have been neater if a low-profile rooflight had been used, ideally of traditional style.

trickle ventilation for most rooms in a dwelling (by means of a ventilator which must be capable of being adjusted to be open or closed). Where the windows and/or rooflights do not house trickle ventilators (all modern rooflight designs do), and it is not acceptable for traditional windows to be adapted, they must be located somewhere else.

Glass pantiles. In pantiled roofs, a cheap way of introducing light into steadings was by the use of glass pantiles. Whilst these may be impractical for use in house conversions, except perhaps to light a roofspace, it can be possible to retain them for use in non-domestic buildings - stores or garages for example.



203 Rooflights in a granary at Newmains, East Lothian, before conversion to residential use.



204 The replacement rooflights after conversion at Newmains, East Lothian. They have been carefully arranged to line up with existing openings, but would have looked more like the original ones if smaller and slightly higher up the roof. The ground floor openings are all new and alter the appearance of the building considerably, but the granary windows have been renewed to match the originals.



205 This low-profile, modestly-sized new rooflight in a slated roof at Gowanbank, West Lothian is inoffensive because it is close to the traditional pattern, though clearly distinguishable. A mix of slates is used, but not West Highland.



206 Cast-iron rainwater goods at Millbank Cottage, Midlothian. Ogee gutter, rectangular downpipe and classical detailing to the hopper.

7.5.6 Rainwater Goods

Although rainwater goods were not always provided on old buildings in the countryside, particularly for pantiled roofs, these will usually be required in a conversion or extension today. Where there are existing rainwater goods, these should be retained, repaired or renewed to match as necessary (whether plain or ornate) (illus 206).

If there are none, the general rule is that simple, robust new ones should be provided. Cast-iron rainwater goods are readily available, last longer and look better than plastic ones, and should always be used in preference. The rhones (gutters) should not be fixed with brackets to timber fascias as is common new-build practice. The traditional method of fixing was with sarking straps (allowing a natural shadow line), and this method should be followed in general. An alternative method sometimes employed was to support the rhones on cast-iron spikes built into the wall.

Rainwater goods look least obtrusive if painted to match the colour of the stone, but slightly darker, or if painted a dark grey, brown or black. On some farms and estates all ironwork (and perhaps woodwork too) is painted a common colour, and in these places this policy should be followed.

7.6 Building Regulations applicable to Roofs

In considering alterations or conversions, a major factor in approaching the project is the need to carry out the works to an acceptable standard and to comply with the building regulations where appropriate, as described in chapter 2.

Most farm buildings are not required to comply with the building regulations (see chapter 2), so repairs and alterations to the roofs while still in agricultural use are

unlikely to need warrants, although good standards of construction and workmanship will provide a more satisfactory and safer result than more makeshift solutions. The 'Technical Standards' can also be used as a source of advice on good roof constructions; deemed-to-satisfy specifications show, for instance, how to provide good insulation but avoid condensation.

In repairing roofs in other buildings, already subject to the regulations, care must be taken not to worsen any existing non-compliance with the regulations (for instance by stripping out the roof lining and thereby reducing its insulation value), and not to alter anything so as to invoke a new regulation requirement without getting a warrant (for instance by replacing a rooflight with a new dormer window).

Where the use of buildings is changing in a conversion, particularly where the use was previously agricultural, it is likely that the roof will have to comply in some or all respects with the current regulations. The following advice is for general guidance only, and the building regulations applicable will need to be ascertained and checked. The aspects which will most commonly need attention are:-

Regulation 12. Technical Standards Part D: Structural fire precautions. Each element of structure in a building has to meet a specified fire resistance, and certain parts of a building are required to be non-combustible. A large building or a building subdivided into units in different ownership will have to be divided into fire compartments, separated by fire-resistant walls. Fire-stopping of the roof, the introduction of cavity barriers and the enclosure of roof spaces to restrict the spread of smoke and flame will also be required. A roof must be constructed so as to resist flame spread and fire penetration from outside.

Slates and pantiles are both regarded as non-combustible, but any potentially combustible roofing

materials (for instance felt, plastic or rubber) and any glazed areas might require to be a certain distance from the boundary with adjoining properties.

Regulation 13. Technical Standards Part E: Means of escape from fire etc. These include requirements for emergency escape windows and emergency access windows. For roofs these are mainly relevant in relation to rooflights in attic storeys. The Scottish Office has issued Building Regulation Note 3/97 giving local authorities further advice on emergency escape windows which may permit many existing window forms to be retained. The local building control authority will advise on what is acceptable to them.

Regulation 14. Technical Standards Part F: Combustion Appliance Installations and Storage of Liquid and Gaseous Fuels. This gives requirements for chimneys and flues, the non-combustibility of materials and the height they must terminate above the roof.

Regulations 17 and 18. Technical Standards Part G: Preparation of sites, resistance to moisture and resistance to condensation. The provisions deemed to satisfy the standards give examples of pitched roof constructions (incorporating insulation and ventilation) which satisfy regulation 17. The condition and water tightness of the existing materials, such as slate, will need to comply with British Standard BS 5534: Part 1: 1978 (1985) for slates and tiles. In order to satisfy Part G. Existing materials may require to be tested (BRE can advise on testing). This is particularly important for residential conversions.

However, the 'deemed to satisfy' specifications provided are not the only ways to meet the regulation. It may be possible to retain, for example, an open-battened construction under pantiles if the insulation is provided at suspended ceiling level. Alternatively, if it is desired to show the timber roof trusses within the interior, it may be acceptable to take off the pantiles and battens, put on the ceiling, vapour barrier if required, insulation, and sarking (or battens, counter-battens and felt) above the rafters, and then relay the pantiles above. This latter method however could raise the eaves detail and roof profile unacceptably. The roof will require to be ventilated; see comments under 7.5.4.

Regulation 22. Technical Standards Part J: Conservation of fuel and power. This sets out the thermal insulation levels required in roofs. Target U-value standards for dwellings and insulation thicknesses for roofs are given in appendices.

Regulation 27. Technical Standards Part P: Danger from Accident - P2. Windows and rooflights must be constructed so that they can be cleaned safely. Alternative ways of achieving this are described. Buildings other than dwellings must also have safe and suitable access to higher roofs.

If it seems likely that there will be difficulty in reconciling the terms of the planning consent (and listed building consent if applicable) with the requirements of the building regulations, it is worth discussing this early on with the building and planning authority officials. There may be a need to modify the project, for instance changing the number of units planned, or it may be feasible to apply for the relaxation of a building regulation in certain circumstances.

7.7 Guidelines

The main guidelines for a good roof repair, alteration or conversion are:-

Survey. Develop an understanding of the roof materials, construction, condition and potential. Seek specialist advice where necessary.

Materials. Retain the existing materials and detailing, repairing them where necessary. Search out sources of matching material, second-hand or new.

Design. Preserve all characteristic features such as finials, louvred ventilation shafts, etc. Ensure that interventions (such as new dormers, rooflights, chimneys or flues etc.) are kept to an absolute minimum, but where essential are located sensitively and designed in an appropriate way (for example - formal, symmetrical, imposing - or vernacular, small-scale, irregular) to fit in with the existing building.

Setting. Look at the building from a distance, in its setting, considering the visibility of the roof from all directions. Make sure that any changes are as unobtrusive as possible and do not disrupt important views (of the building or of the countryside). Try to retain its rural and agricultural character.

Building regulations. If anything more than repair is proposed, check which regulations will apply to the works proposed, and discuss with the building authority at an early stage in the project to establish requirements and resolve any problems.

Planning and Listed Building controls. Check the listed or scheduled status of the building, and any local plan policies which may affect it. Discuss any proposals for the building (if they go beyond pure repair) with the planning authority at an early stage.

8 OPENINGS

8.1 The Lothian Tradition

Many rural buildings derive a large part of their character from the number and arrangement of their windows, doors and other openings. In non-residential vernacular buildings such as farm steadings, workshops or mills, the proportions, scale and position of openings were nearly always a product of the building's function; the need for controlled ventilation, or the movement of goods and vehicles commonly being as important as the desire for daylight. For instance, in many courtyard-layout farm steadings, buildings with long expanses of outer wall containing very few openings are common, as windows away from the yard were not required (illus 207). Furthermore, the need for shelter and a tradition of economy in building, meant that the steading often turned its back on the elements, and that the number and size of openings was no greater than absolutely

necessary. But, as discussed in Chapter 4, these steading buildings might also include implement sheds and cattle shelters completely open to the yard or cattle court, and cartshed/granaries with ranges of open arches and louvred openings above (illus 208).

In contrast to the vernacular tradition described above, there are also in the Lothians a number of carefully designed steadings, usually built as home farms (or mains) by estates, or as tenanted farms. In some of these cases, only the entrance facade or entrance range is designed in a formal manner, and the steading buildings behind follow the usual vernacular forms (illus 209). The elevations are drawn up for aesthetic effect, the openings being arranged regularly and symmetrically, with classical detailing. A central entrance pend surmounted by a tower (often housing a doocot), leads through to the central courtyard (illus 210). Windows are most often twelve pane sash and



207 A typical external facade devoid of openings at Buteland Farm, Edinburgh.



209 A formal steading frontage with vernacular buildings around the courtyard behind, at Herdmanston, East Lothian. Note the use of blind windows to formalise and articulate the facade.



208 Implement shed open to the outer courtyard at Standingstone, East Lothian.



210 A formal steading design and layout, with a central entrance pend and symmetrically arranged windows to the entrance facade at Phantassie, East Lothian.



211 Gables and cart arches arranged symmetrically to either side of a central pend on this elevation at Ballencrieff, East Lothian.

case, and there may be dummy windows or blocked arches to complete the composition where real windows are not needed. There are often dormers (illus 187). Even the cart arches may be symmetrically organized to either side of an entry or a stair up to the granary and given a central date stone (illus 211).

Openings can be divided into three categories: windows (including unglazed and shuttered, ventilation slits and very small openings), doors, and wider openings (including cart arches and other vehicular accesses, pends and implement sheds).

8.2 Windows

8.2.1 Original forms

The rural buildings of the Lothians display a very wide variety of window types, and while it is wrong to look for standard designs, a number of common elements can be identified. Most window openings are vertically proportioned, and nearly all window frames are made of timber. Any building or complex might have some or all of the following:-

Sash and case windows (illus 212 to 216). Vertical sliding sash and case windows are commonly found in cottages and houses, but only in farm and mill buildings of the highest architectural pretensions, or those parts of the building complex once given over to residential or administrative use. In less formal situations, such as bothies or housing above stables, they are often found without weights and sash boxes.

Although there are many vernacular variations, most openings are vertically proportioned (most commonly between 1 to 1.2 and 1 to 2.5 width to height). The commonest glazing patterns in steadings and cottages from the eighteenth and early-nineteenth century, are six panes in each sash, three panes in the upper and six

panes in the lower sash, four panes in each sash, or two panes in the upper sash and four panes in the lower sash. Many windows have since had their glazing bars (astragals) removed and have been reglazed with large panes. Sash and case windows from the later-nineteenth century are generally glazed with one or two panes in either sash. However, in modest buildings and rear elevations, smaller panes continued to be used as an economy measure for some decades after the larger panes became available.

Although the principle found in urban buildings which dictates that the slenderness of the glazing bars is a guide to their age (early-eighteenth century astragals were heavy, but became more slender as the century progressed, whereas in the nineteenth century, the astragals were sometimes stouter as pane sizes increased), this does not always hold true in the robust tradition of agricultural building. In existing sash and case windows, where there is no evidence of earlier glazing bars it is best not to introduce them.

Casement windows (illus 217, 218). Side-hung, inward-opening glazed windows can sometimes be found, although they are unusual. They can be single or in a pair, and when paired, may meet either with or without a central timber mullion. The openings can be vertically proportioned, square or even horizontal rectangles. Casement windows usually have astragals and sometimes zinc or lead comes, as their use in Scotland is restricted mainly to late-nineteenth and early-twentieth century designs influenced by the Arts and Crafts movement. The inward-opening operation should be retained in any repair or replacement scheme. Weatherproofing requires some care, but can be achieved satisfactorily.

Fixed lights (illus 219 to 221, 435). It is not uncommon to find fixed windows whose original purpose was to provide light without ventilation. Proportions vary greatly. Especially large fixed-light windows, often fabricated in cast iron or zinc, were found at smiddies, workshops and mills. An opening section (with cast-iron or timber surround) was sometimes incorporated.

Unglazed louvres (illus 222). Where greater ventilation was required, openings contained horizontal or vertical timber louvres, or hit and miss slats. They can be found covering complete external walls in mills, barns or tanneries, but also in smaller openings, as in granaries.

Fixed-glazed lower lights with inward-opening glazed hoppers above (illus 223). These windows are usually divided by astragals, but may be in a variety of glazing patterns, with two to four panes in each half. The proportions range from almost square to about 1 to 2, width to height. They are often found in stables.



212 Twelve-pane, vertically-sliding, timber sash and case window. A classic design, usually dating from the Georgian period. This example at Buteland, Edinburgh, is unusual in having 'horns' to either side at the bottom of the upper sash, which was more often a feature of later windows, although often incorporated in error in new 'like-for-like' copies of Georgian sash and case windows.



214 Victorian three-pane, vertically-sliding, timber sash and case windows, arranged in a pair (Temple farmhouse, Midlothian).



213 Four-pane, vertically-sliding, timber sash and case window (Bridgend, West Lothian). Probably late-Georgian or Victorian.



215 Two and four-pane, vertically-sliding, timber sash and case windows, in this Victorian bay window at Braidwood farmhouse, Midlothian.



216 Rare horizontally-sliding sash and case windows at the Gardener's Cottage, Luffness, East Lothian, perhaps eighteenth century. The astragals may be zinc.

Fixed-glazed upper lights with shutters below (illus 224, 226). These were often used to provide daylighting with controllable ventilation or opening arrangements. Usually the upper light is arranged in one line of three or four fixed panes. The lower shutters are side-hung and inward-opening, meeting in the centre with or without a central mullion. They tend to be vertically proportioned, usually between 1 to 1.5 and 1 to 2, width to height.

Fixed-glazed upper lights with vertical timber slats or horizontal louvres below (illus 225 to 227). These provided permanent ventilation in granaries or haylofts, together with a measure of daylighting. There were usually three panes, but occasionally two, four or six in the fixed light. Proportions vary from square to about 1 to 1.5, width to height.

Unglazed boarded openings (illus 228). An opening with one or two inward-opening timber shutters is usually found at the loading door or hatch to a hayloft or granary. Proportions are usually from square to 1 to 2, width to height.

Ventilation slits (illus 16, 230, 429). These slits are generally narrow and vertical, without glazing, but they can sometimes take other shapes. They are found in barns, cattlesheds and byres where additional ventilation may be provided by roof vents.



217 Victorian timber casement window, side-hung and probably inward-opening, with diamond-pattern leaded lights (Kingscavil Cottages, West Lothian).



218 Original (circa 1860) double side-hung casement window at Gowanbank, West Lothian.



219 Fixed lights (or possibly side-hung casements) at Almondhill, Edinburgh; although late-nineteenth or early-twentieth century, the curved distortions in the glass can be seen very clearly.



220 Fixed-light window (Cousland Smiddy, Midlothian). The vertical panes are held in place by metal window bars, probably zinc. Such metal-framed fixed windows are a distinctive feature of eighteenth and nineteenth century smiddies and workshops.



221 Small-paned factory window at the Roslin Glen powder mill, probably a fixed light set in a wall of timber construction. There are also boarded doors adjacent.



222 Louvred screens to tannery (Croft St, Dalkeith).



223 Fixed glazed lower light with (bottom-hung) glazed hopper light above (Almondhill, Edinburgh).



224 Fixed glazed upper light with double, inward-opening shutters below (Broadwoodside, East Lothian). This form of window was widely used in farm buildings and mills in the eighteenth and nineteenth century. The proportion of glazing to shutter varied.



226 View of the same window (South Mains, West Lothian) from inside, showing the shutters. This is typical of stable windows.



225 Fixed glazed upper light (in six panes) with vertical slats below. In this window (at South Mains, West Lothian) there are shutters behind the slats to control the ventilation.

Other openings (illus 42, 47, 109, 198, 209, 231, 232). Some of the more idiosyncratic openings which may occur in farm steadings include owl holes, dove entries, arrow slot windows, hen doors, beeboles, low-level feeding hatches and blind windows.

8.2.2 Constructional details, repair and maintenance

The stone surround. The window frame is set against and inside a stone rebate, which protects it from the weather. Rebate, frame and window are usually recessed some 100 to 150 millimetres from the outer face of the wall. In later buildings the stone cill is

occasionally designed to project beyond the general wallface, with a chased-out drip on the underside to shed water clear of the wall, but the vast majority of cills stop at the face of the wall.

The joint between the stone and the timber frame is pointed with lime mortar, but the face, ten to fifteen millimetres deep, is pointed up with mastic, originally made from burnt sand and boiled linseed oil. This remains soft, like putty, and should allow slight movement in the joint without cracking.

Timber. External joinery was traditionally of red Baltic pine, or in better quality doors and windows occasionally hardwood. Both timbers are denser, with fewer knots, than the modern softwoods of which most doors and windows are currently fabricated. Therefore, original doors and windows should be kept if at all possible, as they are made of a more durable and better-seasoned timber.

Often the most decayed part of a neglected window will be the cill. Replacement of this (to match) or the piecing in of a half cill (the outer part is always more weathered or rotted) plus a thorough overhaul of the mastic, the putty and the paint may be all that is needed to give the window a new lease of life. In other cases,

the lower sash, casement or shutter may need partial or total replacement (the bottom rail frequently suffers, being more exposed than the rest). Various methods of in-situ sash repair are illustrated in the SPAB leaflet *The Repair of Wood Windows*, including the use of brass angle brackets to reinforce weak corner joints. Replacement timbers, preferably of Baltic redwood, should be pretreated against rot and primed before being painted.

In sash windows the sash cords may have to be renewed. *The Care and Conservation of Georgian Houses* describes how to do this.

Metal. Although nearly all doors and windows in rural buildings were made of timber, windows in smiddies were sometimes fixed windows in metal frames, perhaps with an opening section. The metal was usually cast iron or zinc. If zinc, cast iron was used both to frame any opening section and for saddle bars to provide intermediate supports.

Cast iron may only need rubbing down or wire brushing, and repainting; though if maintenance has been neglected and there is bad corrosion, the glass may need to be removed, or the whole window taken out and grit blasted before repainting. If the damage is too great for repair, a matching iron window can be cast, although allowance must be made for shrinkage in the size of the mould. Recasting is only likely to be economic if a large number of windows have to be made.

The repair of zinc windows can present more of a problem. The metal tends to go brittle after years of expansion and contraction, particularly where used on the south side of a building, and it can split and sag. Replacing zinc can be both difficult and expensive, as only a few manufacturers still produce a suitable zinc plate or strip. It has to be folded into a T-shape to take the glass.

If the zinc is not reparable, and replacement in the same material proves impossible, cast iron is a potential alternative if the section dimension can be matched. Because of the external glazing with putty into a T-shaped astragal (or came), the appearance is not dissimilar, although cast iron remains rigid where zinc tends to sag with time.

Glass (illus 219, 221). In the eighteenth and early-nineteenth century, much of the glass used would have been blown crown glass, which had curved ripples and was restricted to small pane sizes. This was what determined the small multi-paned form of Georgian and early-Victorian windows.

Blown and rolled cylinder glass would also have been widely available, and might have been used where the translucence and high quality of the surface finish was



227 Fixed glazing (in three panes) with horizontal louvres below (East Fortune, East Lothian). This may be a later modification rather than being original.



228 Boarded shutters to door and window openings in the barn (Blackdykes, East Lothian). Note also the raised eaves over one opening to allow better head room.



229 Several window types used in a single elevation (as well as rooflights above), reflecting the varied functions, despite the formal nature of this entrance frontage at Bridgend, West Lothian.



230 Ventilation slits in a barn at Drem, East Lothian.

not so important. It is likely that in farm or industrial buildings, where a lower standard was acceptable, for instance in stables, workshops and greenhouses, that this sort of glass may well have been used. The size of panes was not so restricted and the effect may have been almost of an obscured glass.

During the nineteenth century, techniques for manufacturing plate or sheet glass were developing all the time, and larger pane sizes became feasible, particularly after 1838. The form of glazed doors and windows changed, with fewer, larger panes of glass (although still slightly curved on the surface). This trend continued, but was partially reversed by the deliberately nostalgic Arts and Crafts movement of the late-nineteenth and early-twentieth century, which employed small panes in multiple groups as an aesthetic device. Many rural buildings, mainly properties and cottages on estates, were deliberately picturesque. However, farms and rural industries were not in the forefront of architectural fashion, and in most situations economy was much more important than looks, certainly in the less formally designed of complexes. And so small, multi-paned windows continued to be incorporated for their low cost, long after urban dwellings and country houses were proudly displaying large uninterrupted sheets of glass in their windows.

Even in the late-twentieth century, the clear walls of plate glass associated with modern architectural design are not a feature of farm architecture. There are few windows, as such, in the huge sheds housing current farming activities; sliding doors and adjustable ventilating louvres or screens are the only interruptions to the wall cladding, and plastic rooflights give daylighting.

The distortions and flaws in eighteenth and nineteenth century glass are irreplaceable. They cannot be reproduced by modern techniques, and are reminders of the age of the building and the craftsmanship which went into its construction, as well as giving each pane

an individual visual interest. Modern glass by contrast is flat and technically perfect. If the original glass is not broken, it should be kept. Replacement windows, even if the form of the timber frame has been faithfully reproduced to match the original, lose the authenticity and much of visual character of the original.

Finishes. Regular maintenance of the painted finish is the best way to protect timber and iron against decay and to prolong the life of the windows.

Most joinery was painted with a flat, matt (or semi-matt) lead-based oil paint finish. The same paint colour was often used for all external paintwork, and carried over both joinery and rainwater goods. Strong dark colours were often used; deep reds were not unusual, nor blue-greys, greys, deep greens, and browns. Particular attention should be paid to local or idiosyncratic use of colour such as black or green windows with a white putty line.

In seeking the original colour, there will always be pieces of relatively unweathered timber to be found. The upper parts of windows on north-facing elevations (where the sun has not bleached the pigment) are often good places to look. Otherwise the original colour and type of paint can be established by scraping or dissolving the paint off layer by layer (or having paint scrapes carried out by a specialist).

There should be no difficulty in matching the appearance of any original paint uncovered, although lead-based oil paint cannot be used. It is now illegal to use it except on A-listed buildings where a justifiable conservation case can be made and a permit is issued.

Microporous paints can be used on new wood, and these are preferable to non-porous finishes. Although not traditional, modern stains (which are microporous when used on new wood, last longer than paint, and need less preparation before renewal) can give a suitably solid colour and matt appearance, if carefully specified with this requirement in mind. Translucent paints and stains should not be used. External timber



231 Owl or dove entry at high level in gable (Craigmalling, West Lothian).



232 Small square opening, less than one metre above ground level (Wester Causewayend, West Lothian), perhaps originally a hen entry or hatch.

was very rarely left with a natural or varnished finish, so that modern natural wood stains (particularly in shades of red-brown, yellow and henna) look completely alien and should not be used.

Where there is a desire to use white, it is inappropriate to use modern brilliant white paints, as the original oil paints yellowed with age and exposure to sun. Several paint suppliers now supply historic colours including neutral 'old' whites.

Ironmongery. The original ironmongery often combined locally-made components of infinitely and imaginatively varied design, with foundry-produced items. It was usually of brass or iron. If it is possible to identify and match the original fixtures, this should be done. If no original ironmongery remains, similar windows elsewhere might give clues. A good range of traditional catches, fasteners etc. is available. But caution is needed to avoid choosing anything anachronistic: exaggeratedly 'historic' or with medieval overtones! Eighteenth and nineteenth century rural buildings had robust and functional ironmongery, nothing more fancy.

Draught proofing. Repairing ill-fitting windows is the most effective first step in reducing draughts. In addition, draught proofing can make a difference to the energy efficiency and comfort conditions of existing

windows, often more so than inserting double glazing, which does not necessarily stop draughts.

It is worth remembering, too, that permanent ventilation may be needed (for an open fire, gas fire or gas boiler, for example) and that making windows airtight may necessitate putting in permanent ventilators which will reintroduce the 'healthy' draught just eliminated. Draughty windows (or good ventilation) will also reduce the likelihood of condensation on the inner face of the glass and general dampness in the room.

Most casements and shutters can be easily and cheaply draught proofed with draughtstrip of one type or another. But sash and case windows are much more difficult, probably the best methods being patented systems installed by specialists. See Historic Scotland's forthcoming Guide for Practitioners *The Conservation and Upgrading of Timber Sash and Case Windows* for advice on draught proofing, double glazing and secondary glazing to sash and case windows.

8.2.3 Alteration and conversion

The scheme and details for each project will need to be given individual consideration and discussed with the planning and building control authorities. There are no standard solutions applicable to all rural buildings.

Attention to the detail of the original window style and fenestration pattern is crucial to a successful conversion. Existing window openings should be retained and old ones reopened in preference to forming any new ones.

Retention of existing windows. As far as possible, the existing window frames and glazing should be repaired and retained.

Where timber shutters or louvres are part of the original window, they should also be kept. Glazing can be inserted behind if it is necessary to provide additional thermal insulation and draught proofing.

Hayloft doors and upper-level entrance doors pose particular problems, as they are large openings but always with a solid door or pair of doors. If a door is to be used as an access, the forestair has to have a secure handrail or balustrade provided, and it is often decided to save the forestair from change by using such a door only as a window. Ideally the shutters or boarded door should remain (or a matching replacement), but often the opening is wanted for daylighting (illus 234, 235, 387).

Reinstatement of original windows. On working farms it is common to find that windows have been adapted, abandoned or boarded up as circumstances have changed. Where these are to be reopened or brought back into use, it is important to ascertain their original function and design. This may lead to a variety of window types being used on the same building or group of buildings, but, although seemingly haphazard and random, this was quite typical.

Replacement of original windows. Where the condition of existing windows does not allow their retention, then it is important that the design of replacements is based as closely as possible on the detailing, appearance and opening mechanisms of the originals (illus 204, 233). Non-traditional details such as trickle vents in the window frame should be avoided. The style of glazing should respect the proportions and glazing pattern of the original windows, recreating the original diversity of methods of opening.

The doors and windows within a group of buildings will vary, depending on their original functions. Their forms give clues to the buildings' history, which should not be lost. The temptation to standardize windows, or to introduce a more sophisticated method of opening should be resisted.

Sash and case windows were a domestic residential form. Their introduction into agricultural property is only appropriate in buildings, or parts of buildings, where there is definite evidence that this was the original form, or where there was previously a residential or office use and where the openings can accommodate such units.



233 New windows which in some of the openings maintain or to some extent reflect the previous window forms. But the windows at the left have changed completely from the originals, whatever these were. They would all be better painted a darker colour. The wallhead may have been heightened. (Newmains, East Lothian).



234 Upper-level door and forestair at Newbyth, East Lothian. The opening has been glazed, altering its character entirely. But the dark colour of the timber does at least make this less conspicuous. Because it is not an opening door, there was no need to put a handrail on the forestair.

Imitation sash and case windows, which are actually hinged or pivoted, but in which the units are made to have the stepped appearance of sliding sashes when closed, are only appropriate in exceptional circumstances. For instance, in a building with sash and case windows, if an emergency access or escape window is required, and there is no other way of providing it, this might be better than a modern window.



235 *The hayloft door at Borthwick Manse, Midlothian, has been cleverly converted to a window with folding boarded shutters retained outside the new, inward-opening casements.*

New windows in existing openings. The insertion of doors and windows in originally unfilled openings requires great care and attention.

No attempt should be made to create larger windows by heightening, lowering or widening existing openings.

Farm buildings can contain a wide variety of idiosyncratic openings such as owl holes, doocot flight holes, hen doors, feeding hatches, beeboles or ventilation slots. Preferably, these should be retained as they are, but in some locations they need to be infilled to protect against the weather. Simply glazed with deeply recessed glass (unframed or simply framed), such openings can offer opportunities for gaining valuable daylight, while adding to the interest of the new accommodation and retaining something of the original character. Framing should be kept to a minimum, deeply recessed into the opening, and painted a dark colour. At Gowanbank, West Lothian, the ventilation slots have been fitted with stained glass, which adds character to the domestic accommodation within. At Cauldhame, West Lothian and Damhead Farm, Midlothian they have been fitted with plain glazing in simple wooden frames or slotted into the stone, and at Hillhouse, West Lothian, there is a glazed hen door (illus 429, 101).



236 *A window converted to a door at Yorkston, Midlothian. The proportions, scale and framing are different, heavier and simpler, changing the appearance. But the shutters are the most jarring alteration, being quite out of character.*

New openings. The number of new windows should be minimised and extensive areas of unbroken masonry wall retained, to avoid a change in the character of the building.

The long blank walls presented to the windswept hills, for example, often present the best scenic views, which leads to a desire to introduce large, and wholly inappropriate, picture windows (illus 427). This should be resisted.

Wherever possible new openings should be restricted to internal or unobtrusive elevations. Care should be taken to ensure that the same sort of mixed fenestration pattern as is found in the original building is used (illus 229).

Any new window openings should have stone cills, lintels and margins to match the original window surrounds (as at Gowanbank, illus 238). In farm buildings in the Lothians, flush margins with a tooled finish are commonest, rather than smooth projecting margins. The depth of recess should be similar to the existing windows (illus 95).

Where additional light is required, rather than putting in additional windows, consideration should be given to the use of skylights, inserting partial glazing into high level hayloft doors, or infilling an original unwanted door opening with glazing, whilst perhaps retaining the door as a shutter.

Double glazing. There is often a desire to introduce double glazing in conversions. This should not be allowed to alter the appearance of existing windows or of new windows matched to the existing. The introduction of double glazing may be possible to conceal in new windows, but not usually where there are astragals, as it is very difficult to provide an



237 *The converted steading at Calder House, West Lothian (see also illus 48). Compare this with the unaltered front in illus 276. New twelve or sixteen pane sash and case windows have replaced the louvred or boarded originals in the tower. Some new openings have been made along the front, carefully arranged in a symmetrical fashion.*



238 *New side-hung casement windows in new openings (Gowanbank, West Lothian). The wood was still to be painted at the time of the photograph. Note also the diminishing courses in the slating and the low-profile roofline.*

adequately slender glazing bar section. Nevertheless rural buildings do in some cases have quite heavy glazing bars and these can accommodate double-glazing. The appearance of the glass itself will become more reflective when a double-glazed unit is fitted (illus 239).

Double-glazed units with visibly shiny metal seals should not be used. Dummy astragals, whether sandwiched between panes of double-glazing or applied to the face of the glass, should not be considered, as they are never convincing, and where applied externally are difficult to maintain. See Historic Scotland's forthcoming Guide for Practitioners *The Conservation and Upgrading of Timber Sash and Case Windows* for a discussion on double-glazing and secondary glazing to sash and case windows.

Other materials - uPVC and aluminium windows.

These are not appropriate in traditional rural buildings, and raise issues of sustainability in terms of the materials used and their long-term maintenance.



239 *New double-glazed sliding sash and case window in a new opening (Easter Carriber, West Lothian). Because there are no astragals, the double glazing can be accommodated reasonably unobtrusively.*

8.3 Doors

8.3.1 Original forms

The descriptions below give examples of common traditional forms found in the Lothians. They are all of painted timber.

Panelled doors (illus 240 to 243). These were usually one leaf, inward opening if external. Front doors are occasionally of two leaves, but two-leaf internal doors are too grand for ordinary rural buildings. Panelled doors were only provided in the better class of dwelling and in more formal estate steadings. Most Georgian doors had either four or six panels, and most Victorian had four.

Internal doors usually had flush mouldings and recessed panels. Panels on older doors were sometimes fielded (bevelled). External doors were flush-panelled in the Georgian period, but later had recessed panels with raised (bolection) mouldings on the outer face, to give added protection against the weather.

Boarded doors (illus 244 to 247). This is the most common door form in rural buildings, but the quality and stoutness of construction varied from a single skin of vertical boarding with two ledges (usually an internal door), to a framed, braced and boarded door (usually used externally). Front doors are occasionally of two leaves (illus 247). Boarded doors were used in all but the most prestigious locations. There are a few other variations -

- Framed and boarded doors with glazing (for example four square panes) in the upper half (illus 248).
- Boarded doors in two sections vertically, upper and lower halves opening independently of each other. These were used in stables or similar situations (illus 249, 250).
- Open boarded doors (ie with spaces between boards) used for locations needing good ventilation (illus 271). For conversions these can be retained or reproduced with glazing installed behind, or if necessary replaced with boarded doors.
- External sliding doors (illus 251, 252). These seem to have been used since the late-nineteenth century, and in some cases have replaced original doors on earlier buildings.

8.3.2 Constructional details, repair and maintenance

External doors nearly always open inwards, though stable and store doors may sometimes be an exception. The door frame is (as with the window frame) set



240 Georgian or early Victorian flush-panelled external door with four panels at Langside Farm, Midlothian. The flat-roofed porch is probably a later addition to the house.



241 Six-panelled door with bolelection mouldings, probably Victorian, at Millbank Cottage, Midlothian. The porch appears to be original.



242 Elaborate porch in rustic picturesque style, to front entrance (Toxside farmhouse, Midlothian).



243 Front entrance to farmhouse (Bridgend, West Lothian) showing inner lobby with typical glazed and panelled internal door, and fanlight above outer door.

against the rebate in the stone surround, and protected by it from the weather. The rebate, the frame and the door are set in about 200 to 250 millimetres from the outer face of the wall. The junction between frame and stonework is protected by the architrave or facing. This sits end on to the frame, against the stone ingo (reveal), giving a deceptively slim detail. It must not be turned through ninety degrees to lie flat against the frame if a new door and frame are inserted, nor brought forward to the outer face of the wall.

The parts of the door and frame most often needing repair are the bottom rail of the door and the lower sections of the architrave and sometimes the subframe. The advice on timber, paint and ironmongery, given in item 2.2 for windows, also applies in general to doors.

Replacement doors should match the originals exactly, with the same type of mouldings and the same framing and panel dimensions.

8.3.3 Alteration and conversion

Existing external doors. Wherever possible, existing doors should be retained as they are, and no new openings made. If doors are not needed, they can be closed up, made secure and left in position. If regulations require extra fireproofing or insulation, the

exterior can be left unaltered, while internal blocking satisfies the requirement.

New boarded doors. Although original boarded doors, particularly internal doors, may be unframed, a framed (ledged, battened and braced) and boarded door is less likely to warp, and it is recommended in this instance that the specification is upgraded if any doors require renewal.

Conversion of door openings to windows (illus 253 to 262). Where existing door openings are needed as windows, there are several options:-

- The existing door can be retained as a shutter, opening outwards, while the opening is simply glazed inside, preferably with one sheet of glass deeply recessed.
- The existing door (or a new door if necessary, of similar type) can be partially glazed and retained to act as a French window. The design of the glazing will depend on the type of door, but is usually better in the upper part of the door only.
- A window can be located in the door opening. The stone surround should be retained unaltered, to show that this was originally a door. The new window should neatly fill the upper part (so that



244 Boarded door of very crude construction, employing rather basic methods for securing and repair (West Lothian).



245 Simple boarded external door, reinforced top and bottom by external ledges, no doubt in addition to internal ones. The width of the boards indicates that this door is nineteenth century or earlier (Barberfield, East Lothian).

there are no odd bits of blocking around it), and a recessed blocking, preferably either rendered or of matching stone, the lower.

New external door openings. If it is essential to make additional door openings;

- These should be located in positions appropriate for the character of the steading (ie formally and symmetrically placed, or asymmetrical and vernacular) and
- The design and detailing should match the existing doors in that part of the complex.



246 A later boarded and framed door with narrower boards and fanlight above, set in a simple porch at Outerstone, Midlothian.



247 Two-leaf boarded external door, with shuttered hayloft door above (Almondhill, Edinburgh).



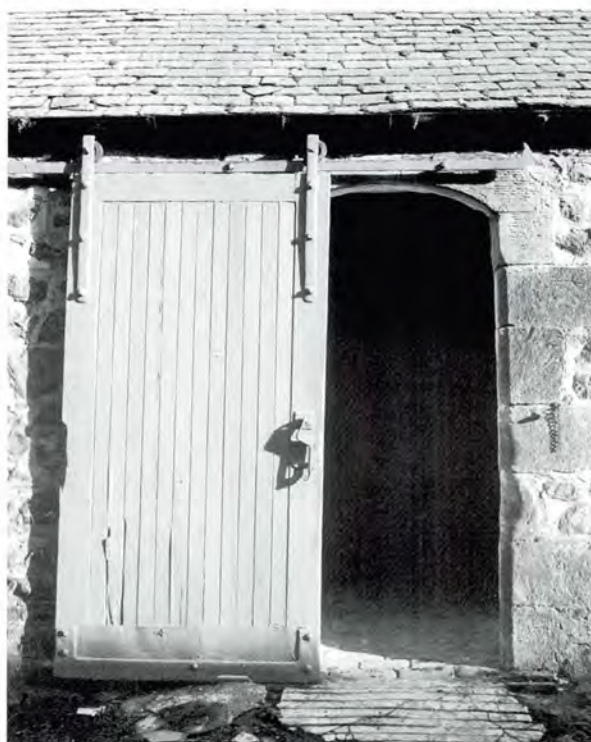
248 Two-leaf framed and boarded door with glazing (now gone) in the upper part (Lennoxlove, East Lothian).



250 Stable doors (Almondhill, Edinburgh) with fanlights above, and missing/ replaced top sections of door. These doors open outward.



249 Boarded stable door with upper and lower parts opening independently outward (Moorfoot, Midlothian).



251 Sliding door, boarded and framed. Note the narrow boards; this door is probably early-twentieth century (Almondhill, Edinburgh).



252 Sliding doors, glazed in upper part (Lennoxlove, East Lothian).



253 Stable door renewed to provide a window by double-glazing the upper half in a residential conversion (Easter Carriber, West Lothian). The ideal would have been to retain a boarded upper part, but this is a better compromise than many. Note the ventilation slits, unobtrusively glazed.



254 Doors renewed to match originals (Gowanbank, West Lothian). Note the pattern of rooflights, which conforms to the original, and uses reasonably small low-profile rooflights, even though of a modern type. This project has tried hard to follow acceptable conservation principles and is generally successful.

255 Original and new door openings fitted with fully glazed multi-paned doors. This is a reasonable way to treat the doors, but alternative options are shown in illus 256 for all the openings. The large upper opening, originally a hayloft door with outward-opening shutters, has also been glazed with small panes. The dark colour has reduced the impact of the fenestration, but it has become standardised and domestic in form (East Whitburn Mains, West Lothian).



256 Alternative treatment for the openings at East Whitburn Mains, West Lothian.

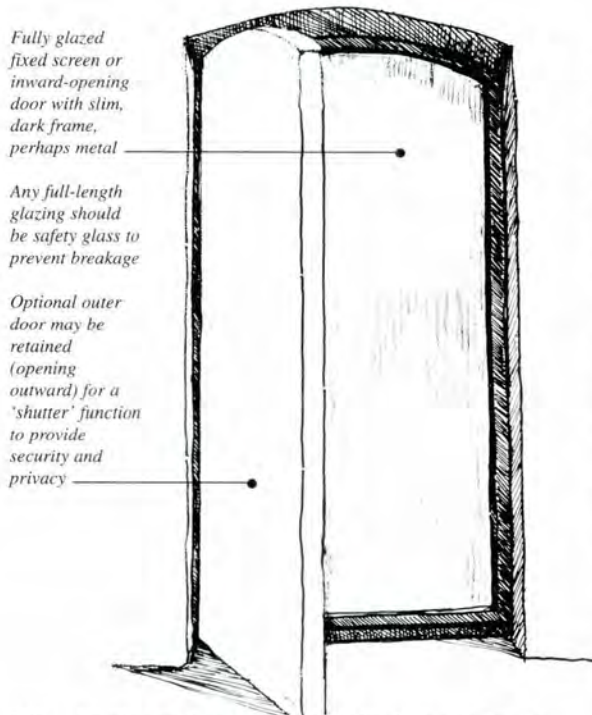




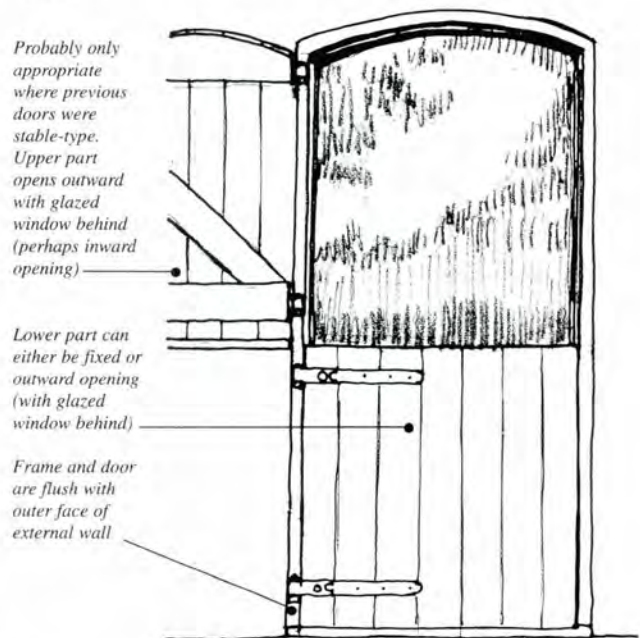
257 A modern example of doorway infill (Newmains, East Lothian). Both the window and the stone blocking are recessed, to leave the original shape showing, but the visual division into two distinct parts detracts from the form.



258 Another doorway infill, this time with a traditional window (unfortunately slightly heavily framed, probably because it is double-glazed) and a dark-painted panel below (Balerno Smiddy, Edinburgh). It is unlikely that the windows were originally of this form. The strong colour contrast between the white-framed window and the dark panel takes away from the overall shape. It would be more effective if the window and the panel below were the same colour (preferably darkish) and read as one unit, like a door.



259 An alternative treatment for the door opening at Balerno Smiddy.



260 Another alternative for the doorway at Balerno Smiddy.



261 A row of doors at Calder House Steading, West Lothian, before conversion.



262 The same view after conversion, showing doors altered to form windows. The number of panes in the window on the left has been increased in replacing the window. Sash and case windows have been used in the door openings, with a rather domestic result, but fitting neatly into the openings. Avoiding the strong contrast between the window and the panel below by using a single colour (preferably dark) is usually more successful, as at 253.

8.4 Wider Openings

8.4.1 Original forms

Cart Arches (illus 263 to 267). Most steadings have an arcaded cartshed, usually with a grain store above. The number of cart openings depended on the size and prosperity of the farm. In East Lothian some farms had up to twelve arches.

Their construction ranged from arcaded rows of arched openings divided by ashlar columns in the larger, wealthier and estate-owned farms, to a fewer number of arched or flat-lintelled openings with tooled rybats, rubble-built piers or occasionally cast-iron columns in the smaller farms.

Cart arches were usually open. Where they have doors, these may be later additions.



263 Cart arches with windows to granary above (Outerston, Midlothian). Solid rubble masonry, with dressed stones at openings.



264 Cart arches have often been altered and adapted to suit different functions, while still remaining in agricultural use (Barracks Farm, West Lothian).



265 Two in a row of cart arches heightened to accommodate increasingly large farm vehicles (Drem, East Lothian).



266 Cartsheds were also attached to industrial buildings (Brand's Mill, East Lothian). These have double doors.



267 Flat-lintelled cartshed openings (Chapel, East Lothian). The lintel is wooden.

Wide door openings (illus 268 to 270 and 272, 273). Externally-mounted sliding doors, top-hung on rollers and vertically-boarded and framed, are fairly common on other individual wide openings in farms (and perhaps as later adaptations to cart arches) and seem to have been used from the late-nineteenth century. Earlier doors, where these survive, were mainly outward-opening, vertically-boarded (and framed) double doors, and this form also continued to be

employed into the twentieth century, sometimes with incorporated glazing. These are often seen on coach houses in stable buildings, as well as on farms. The doors are fitted with long plain iron hinge straps.

Pends and entrance gateways (illus 274 to 276). In the more formally designed steadings or stable blocks, there was often an arched entrance pend (sometimes surmounted by a tower or doocot) either with or without gates. Pends and other arches should be retained as either pedestrian or vehicular routes and not blocked in. Gates can be reinstated, preferably to match the originals, probably of timber, or occasionally cast and wrought iron.

Implement sheds (illus 277). These sheds had three solid walls without any door openings, but one of the long sides was completely open, punctuated by cast iron columns or timber posts. Lintels were flat timber, cast iron or later concrete or steel. Implement sheds were usually single-storeyed, so that the lintel was not supporting masonry.

Shelter sheds (illus 278). Superficially similar to implement sheds, and also dating from the second half of the nineteenth century, these are common on larger farms. They are often of lean-to form built against the north wall of a cattle court and have cast-iron supporting columns.



268 A series of wide gable openings, originally all with double outward-opening side-hung boarded doors (Begbie, East Lothian). One opening now enlarged and provided with a modern steel roller shutter; this is typical of alterations made in agricultural use.



269 An arched opening with deep-set boarded doors (Almondhill, Edinburgh).



270 An arched opening with double doors. They are ledged, braced and boarded, side-hung and outward-opening (Bridgend, West Lothian). This gig house is eminently suitable for use as a garage.



271 Open-boarded doors to cart arches (Harelaw, East Lothian).



272 A sliding door (boarded and partially glazed) conceals the opening behind (Almondhill, Edinburgh).



274 Entrance pend with gates and doocot above (Bridgend, West Lothian).



273 An existing opening heightened and widened (note brick to one side) to accommodate larger farm vehicles (Buteland, Edinburgh).



275 Gate to pend (Harelaw, East Lothian).



276 Entrance pend with gates and tower above (Calder House Steading, West Lothian) (see also illus 48, 237).



277 Implement shed, with typical flat lintels and cast iron columns (Lennoxlove, East Lothian).



278 Shelter sheds for cattle (The Brunt, East Lothian). As in an implement shed, there are typically flat lintels and cast-iron columns, but often a longer frontage.



279 Deeply recessed doors to cart arches maintain their strength of form (The Brunt, East Lothian).



280 A good example of windows in cart arches at Crauchie in East Lothian, taken in 1987. These are deeply recessed, with minimal framing in a dark colour. The treatment of the upper door is also effective and functional.



281 Another successful glazed infill to cart arches at Myreside, East Lothian, where the cartshed has been converted to workshop and office use. The glass is deeply recessed so that the openings still read as arches, and framing (very slender) is only visible in the central arch. If this had been of a darker colour, rather than white, it would hardly have been visible.

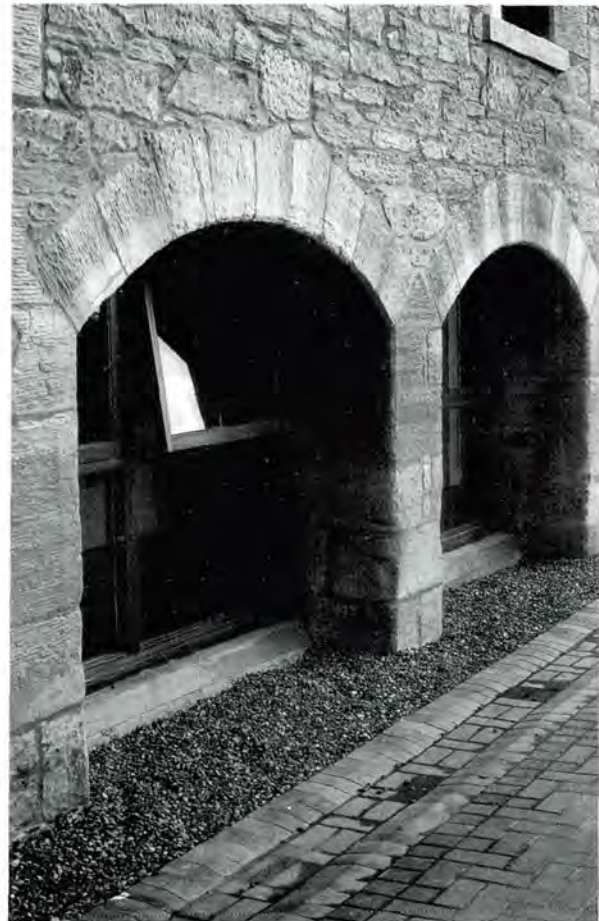
8.4.2 Repair and maintenance

Where these openings are without doors and frames, the only repair and maintenance is to the surrounding stonework (see chapter 5 'Masonry and pointing'). However, where there are doors or gates, the advice on repairs is as for doors in item 8.3.2 above.

8.4.3 Alteration and conversion (illustrations 279 to 294).

Ideally cart arches and other wide openings should be left open, and the space inside used for a purpose as close as possible to the original, for example open storage, preferably of vehicles. Pends, particularly, should be maintained as an open access, but could have gates reinstated. Implement sheds can make effective parking bays, open storage areas or wet weather children's play areas and should preferably not be closed in.

Often the space behind cart arches and other wide openings is seen as desirable habitable accommodation, and this results in the infilling of the arches, usually to form windows and/or doors. These large windows offer little privacy, and are better with living rooms behind them than more private accommodation, such as bedrooms.



282 Because they are deeply recessed, these infill windows to arched openings (Springfield, West Lothian) keep the character of the open-arched form, despite having rather robust framing. The buildings are in business use.



283 *An example of infill with darkened glass and slender metal framing, simple and sophisticated, but the glazing would have been better if recessed further (Mortonhall, Edinburgh).*

Framing and glazing. To restrict the impact of such a change, keep window frames and divisions to a minimum, as slender as possible and dark coloured (reducing their obtrusiveness). It is appropriate to glaze the windows with a single pane of glass or to use as few panes as possible. In certain circumstances, a dark-finished metal may provide the most discreet framing.

Use glazing (or solid infill) for the full height of the opening. It is better not to introduce a new threshold or cill level, as this can alter the scale and proportion of the opening.

Keep framing and glazing recessed, preferably to the back of the wall or columns. This retains the strength of the arched form and reduces the reflection and therefore the visibility of the glass. It can be darkened (or non-reflective) glass if desired, where appropriate to the character of the building, to reduce glare and solar gain. Darkened glass is less obvious and gives more privacy to the interior, but may introduce rather too sophisticated a style in some cases.

Infill materials. Be cautious about introducing new walling materials as blockings, especially timber boarding or other strongly characterised materials, unless used originally. Restrict the number of materials and use them consistently throughout.

Doors. Where there are existing doors, either side-hung or sliding, they should if possible be retained (or reproduced if not in good enough condition to repair), even where the opening is being blocked or made into a window. Outer doors can offer additional security for windows.



284 *The power of the arched form is lost as a result of this infill at Huntly Cot, Midlothian. The framing is too conspicuous because it is so shallow and too light a colour.*

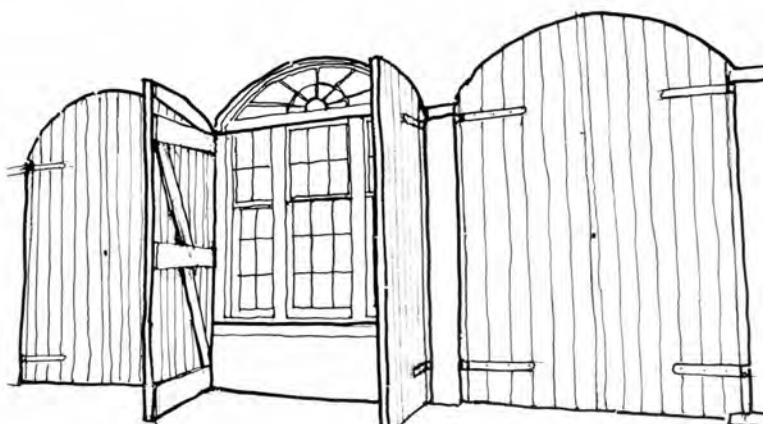


285 A past blocking of coach house arches at Saltoun Stables, East Lothian. These could have been treated in other ways, as suggested in the following illustrations.

If clear evidence for the original doors exists, reinstatement is an option

The drawing shows an adaptation of the existing situation, with doors added; fixed in front of the side blockings and opening in front of the central window

The doors are likely to have been double, shallow-mounted, outward-opening, vertically-boarded and painted

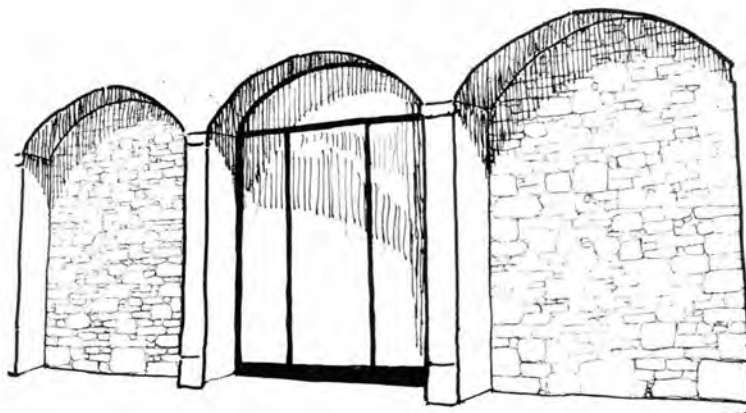


286 Suggestion for alteration of the existing blockings to the coach house openings at Saltoun Stables.

If there is no evidence that the openings had doors, the form and depth of the arches can be emphasised by recessing blockings and window

The window should then be as simple as possible, with the use of dark slender framing and few divisions

For such large areas, stone – perhaps rubble to differentiate it from the original masonry – may be a more interesting material than render for the blockings



287 An alternative treatment of the coach house openings at Saltoun Stables.



288 *Horsemill conversion at The Heugh, East Lothian with simply-designed windows, but the white frames are conspicuous and insufficiently recessed (see illus 387 with dark-framed windows). The stone infill below the windows slightly alters the proportions of the opening.*

If there are no existing doors, they can still be appropriate in some cases (for example where other similar openings have doors) as a method of closing an opening or to conceal glazed infill and provide extra security. A wall incorporating thermal insulation to the required standard can be built behind the doors if necessary.

Successful examples. Acceptable conversions using clear glazing, with slim dark timber or metal framing, can be found. There is no reason why infill need be in period style, provided it is elegantly detailed and discreet. Traditional sash and case windows in blocked arches will usually give a more domestic feel than is appropriate for what was originally an agricultural building. However, there are a few examples in older conversions where stone blocking has been used effectively, usually with windows of a traditional character. Another option is to provide two boarded doors in the space up to the springing of the arch, with a clear glazed fanlight above.

Unsuccessful examples. However, there are plenty of examples of conversion which have drastically changed the scale and character of the openings. Features which alter the character detrimentally include locating the window glazing too far forward, rather than deeply recessed to emphasize the open arches, using solid blocking up to sill level and in doing so changing the overall proportions of the opening, and inserting thick and obvious window divisions and frames, particularly with light-coloured and alien materials.

8.5 Building Regulations Applicable to External Door and Window Openings

The regulations noted below are particularly relevant to the alteration of external door and window openings, in existing rural buildings. They include requirements which may be more difficult to satisfy than in a property being built from new. Some local building authorities produce a guidance note on the building regulation requirements for windows which may help to clarify matters:-

Regulation 4. Technical Standards Part A: General etc. Schedule 2 lists those operations for the alteration of a building which do not require a warrant. Among these is 'replacement of a window by another which is not of the same general type as that which it is replacing'. The replacement window has, however, to comply with any relevant requirements of the regulations.

Regulation 13. Technical Standards Part E: Means of escape from fire, facilities for fire-fighting etc. - E8.3 and E9.21. Any residential accommodation will require emergency escape or access windows to rooms or storeys in upper floors, except where there is a second escape route. A door opening onto a balcony can be an acceptable alternative. If some of the existing windows are unsuitable, the room layouts may have to be adjusted to include suitable openings, or a second escape route considered. If windows are large enough, but the opening sections too small, special inward-opening devices can sometimes be provided, so that the normal method of opening can be overridden to allow a larger area to open in an emergency.

Regulation 14. Technical Standards Part F: Small Combustion Appliance Installations - F3 to F6. There is a requirement to provide a permanent supply of air for combustion to any heat-producing appliance (eg an open fire, or gas or oil-fired boiler). If not provided by means of a balanced flue, it is recommended that this should be through air grilles adjacent to the appliance (drawing air through an external wall or from under the floor), but great care should be taken in siting these to avoid draughts, particularly where the appliance is located in a habitable room. Where draughts are not a problem, permanent vents are often provided in the windows (but see comments on window ventilators at regulation 23).

Regulation 22. Technical Standards Part J: Conservation of fuel and power - J2 and J3. A minimum insulation requirement is laid down for each external wall, including the areas of window and door with their lower insulation values. The calculations can be very complex, but Table 2 to J2.2 gives U-values for glazing and appendix G gives target U-values for dwellings.

Small windows are a definite advantage in satisfying



289 *New sliding doors of traditional pattern at Livingston Mill Farm, West Lothian.*



290 *New infill at Gowanbank, West Lothian, as part of a residential conversion. The gable end had been previously altered to provide a large opening for vehicle access. The original form was unknown, and it was decided that a new glazed screen should be created, of a design appropriate for the building. This shows the screen and other timber in an unpainted state.*

this regulation, but often the converter's preference is to have larger double-glazed windows. These are rarely appropriate in a traditional rural building.

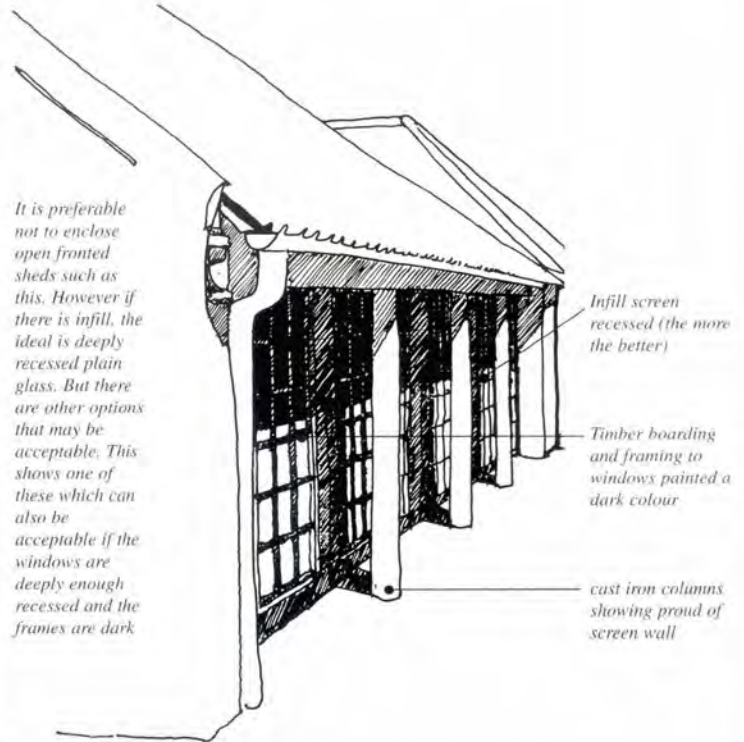
Regulation 23. Technical Standards Part K: Ventilation of buildings. In buildings there must be adequate provision for ventilation by natural means, mechanical means, or a combination of the two. The deemed-to-satisfy provisions give details for dwellings and garages of minimum areas of natural ventilation (including trickle vents), and minimum numbers of air changes per hour for mechanical ventilation.

Part of this ventilation is usually achieved by means of trickle vents in the windows or doors. These can be unsightly, but can blend in well where there is a generous reveal which casts a shadow on them, and where a traditional rich dark paint colour is applied. In sash and case windows, unobtrusive slots in the meeting rails can satisfy this ventilation requirement. Otherwise wall vents or roof vents can be used, where they can be inserted unobtrusively. If there is a problem in achieving the minimum openable area through existing windows, mechanical ventilation can be considered as an alternative.

It is stipulated that some part of a ventilator must be at least 1.75 metres above the floor. In top floor or attic rooms if the windows are too low, the provision of rooflights in addition can satisfy the regulation. In any other room where the existing windows are too low, mechanical ventilation might be the only answer. However, if the ceiling height is low, and the windows only a little too low to meet the requirement, it might be worth applying to the local authority for a relaxation of the regulation.



291 *Converted implement shed at Garvald Grange, East Lothian. The cast iron columns have been retained and expressed with a screen wall (incorporating windows and doors) built behind them. This at least indicates the original function, and preserves part of the earlier form. The wall is solidly built and well-detailed, but another option is shown in the next illustration.*



292 *Alternative design for infill to an implement shed.*

Regulation 27. Technical Standards Part P: Danger from accident - P2. This controls potentially hazardous projections (for instance outward-opening ground floor windows and doors). The regulations also require the glass of a large window (as in wider openings) to be constructed and installed, or protected, so as to minimise the danger of collision and injury to people. In practice, this will mean providing toughened or unbreakable glass, or a protective guard rail to a window where it poses a hazard.

In addition the regulation requires windows to be constructed so that the glazed areas can be safely cleaned. Alternative ways of achieving this are described. A device often used for sash windows, easy-clean hinges, can be fitted to existing windows and allows the lower sash to be swung inwards for cleaning. New windows can incorporate an opening method which allows the whole window (not just the usual opening part) to open inward for cleaning purposes.

Regulation 29. Technical Standards Part Q: Facilities for dwellings - Q3.5. Every room (other than a kitchen, bathroom, store etc.) must have a glazed area of at least one fifteenth of its floor area, in an external wall or roof, or into a conservatory.



293 *Enlarged gable opening (Gladhouse Villa, Midlothian). The widening has been to one side only with an asymmetrical result.*



294 New garages at Newbyth, East Lothian, imitating shelter sheds or an implement shed, but too extensive and uniform to do this successfully.

8.6 Guidelines

The following guidelines are offered for the alteration of openings:-

Existing doors and windows. Wherever possible, existing external doors and windows should be retained as they are, and repaired if necessary. The timber is of better quality than modern timber, and the glass is authentic and cannot be reproduced by modern methods. Proprietary methods of draughtproofing are preferable to double glazing if improvements in the thermal efficiency of the windows are desired.

Replacement joinery. If the poor condition of existing joinery makes it necessary to replace it, new joinery work should exactly match the original detailing, window form and fenestration pattern.

Modification. Where new uses demand that existing windows or doors are modified, they should be changed as little as possible (for example wooden shutters might be glazed or replaced by glazed side-hung casements if extra daylighting is essential), and all detailing and opening methods should be retained or matched.

Standardisation. When putting new doors and windows within existing openings in a conversion, resist the temptation to standardise the form or domesticate the style (for instance by making all windows sash and case) instead of retaining the original diversity.

Alterations to openings. No attempt should be made to create larger openings by heightening, lowering or widening the existing ones. It may be possible to satisfy any need for additional daylighting or ventilation by other means.

New openings. The number of new openings should be kept to an absolute minimum, and restricted to the least visible and important parts of the building. Matching natural stone should be used for the surrounds to new openings, tooled and detailed in the same way as existing surrounds. Design and locate new openings in a manner which is appropriate to the style of the building.

Altering external doors. A disused door can be retained in position and locked, or blocked behind. If a window is needed, the masonry opening can be neatly filled with a window in the upper part and a recessed blocking below, or the door can be retained and partially glazed.

Wide openings. Leave cart arches, pends and implement sheds unenclosed if at all possible, and use for an appropriate purpose such as garaging, storage or children's play areas.

Doors to wide openings. Retain double or sliding doors to openings where these remain, or renew to match if in poor condition. If an opening is to be blocked, doors can screen the alteration, or if it is to be glazed, the door can be closed at night, preserving authenticity and giving additional security. Even where there are no existing doors, the provision of new doors of an appropriate type (based on doors elsewhere in the building or buildings) can be a useful way of treating an arch infill.

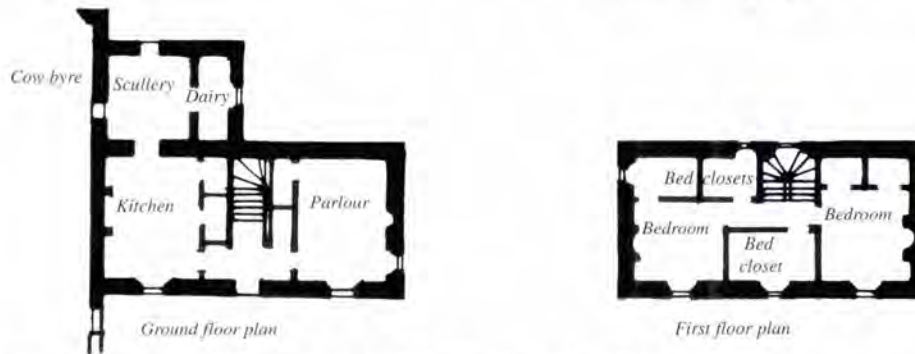
Glazing to wide openings. Use glazing for the full height of the opening and deeply recess it; keep window divisions to a minimum, and make the framing as slender as possible and dark-coloured.

9 INTERIORS

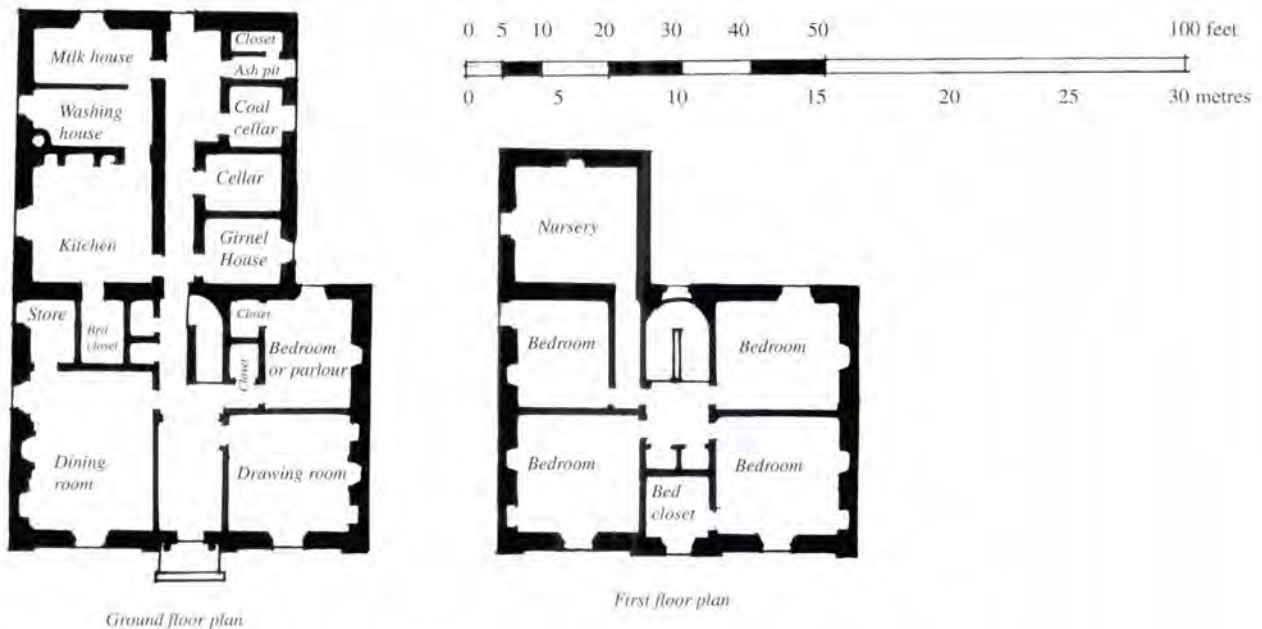
9.1 The Lothian Tradition

Most parts of the Lothians were wealthy farming areas in the vanguard of Agricultural Improvement. This resulted in early and extensive changes to the rural building forms, and the way their interiors were planned, finished and fitted out. The plan forms and standards gradually developed during the late-eighteenth and early-nineteenth century.

The farmhouses became separated from the farm buildings and were larger and more luxurious than before. Farmworkers' cottages followed model patterns, more solidly built and provided with better space and amenities than the thatched buildings they replaced. Steadings became more formally arranged, and as time went on, larger and more clearly organised. Each building or space in an agricultural or industrial complex had a specific function, and the way it was finished and equipped reflected this use.



a) Design of smaller farmhouse at Burnshot, West Lothian (after 1826 alterations)

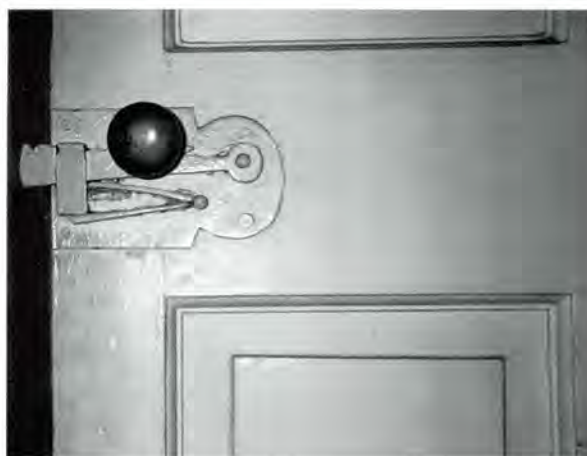


b) Design of larger farmhouse at Glendevon, West Lothian 1820

295 Typical farmhouse plans.



296 An East Lothian farmhouse entrance and stair, with six-panelled inner door.



297 Door knob and latch to panelled door. The panels are raised and fielded.

9.2 Residential Buildings

9.2.1 Original Materials and Construction

Farmhouses were the best finished, most spacious and well furnished of the rural residential buildings. They were usually of two storeys, with bedrooms upstairs and public rooms on the ground floor. The kitchen was often in a single-storey wing at the rear or side. As the nineteenth century passed, new farmhouses were larger and better appointed, mirroring the increasing prosperity in agriculture (illus 295, 296).

Grieves' houses, farm cottages and other tied workers' cottages were also finished to a higher standard than non-domestic buildings. Until the mid-nineteenth century, Agricultural Improvement had placed more importance on the betterment of conditions for housing stock than for workers. However, by the second half of the century, cot houses had developed from very small and basic buildings (which provided accommodation for humans and animals under a turf roof, with only one or two rooms, often with an earth floor and no masonry chimney) to a layout providing a lobby or corridor and two or more rooms (a kitchen/living room and bedroom or bedrooms, sometimes a scullery,

perhaps even a parlour) (illus 11). The fire was located within a fireplace. The few tiny windows were replaced by larger sash and case windows. Only in the outhouses (perhaps a privy, stores and wash-house) did the finishes remain very basic.

Bothies were a little different from other residential accommodation, being for single working men or seasonal workers, instead of families. They often consisted of a couple of rooms, one a living room with a fireplace, the other a dormitory, sometimes above the living room. As David Jones describes in *The Scottish Home* (page 40), 'Typically the bothy was a small building near the byre or stable, lined with deal planking and sparsely furnished with high-sided crib beds, a form or bench and the labourers' own kists.' Previously, unmarried farm servants were accommodated in a loft above the stable or in the farmhouse, and this was probably still the situation for female workers.

Floors. Floors were generally timber-boarded, but stone-flagged in the potentially wetter areas of kitchen, scullery, outhouses, entrance lobby and sometimes the corridor. Later in the nineteenth century, the entrance areas in the better houses were decorated with designs in encaustic tiles. In the twentieth century, concrete was used in the more utilitarian spaces.

Floor coverings. Carpets and rugs were traditionally used on the polished or painted boarded floors. In cottages it was perhaps just rag rugs or oilcloths. In lobbies there may have been painted floorcloths and hair or hemp mats. However, from the late-nineteenth century, linoleum became very widely employed as a floor covering, until other sheet materials were developed in the second half of the twentieth century, when fitted carpet also became fashionable.

Walls and ceiling. Walls and ceilings were plastered with lime plaster. On solid internal partition walls the

plaster was applied 'on the hard' (ie directly onto the brick or stone of the wall). Alternatively, the plaster was built up on wooden lathes which were fixed to the vertical studs in framed partition walls, to joists on the ceilings and battens on the inner face of external walls (to give a dryer and better insulated surface). There were usually decorative cornices in the more important rooms - perhaps just the front parlour in a cottage, but possibly all the rooms except the kitchen in a well appointed farmhouse - and sometimes a decorative ceiling rose in the drawing room as well. Wall tiling became widely used by the late-nineteenth century for sculleries and for bathrooms and lavatories where these were provided.

Plaster. The lime plaster was generally applied in three coats. Cornices were run in situ, with extra enrichments cast separately and fixed on. For more information on plasterwork, see Historic Scotland's *Technical Advice Note 2*.

Internal plasterwork was often painted with distemper (a very basic interior paint, cheaper than limewash, which used crushed chalk as a pigment), but where a coloured finish was required, a pigmented limewash was common. Emulsion paints have only been used in the second half of the twentieth century.

Joinery. Doors were panelled or vertically boarded, depending on the status of the house or of the room within the house (panelled being better quality). Boarded doors were usually very simple, having one layer of wide (100 to 200mm) boards, sometimes V-jointed, backed by two or three horizontal battens, on which the hinges and latches were mounted. Occasionally there was bracing between the battens, but internal doors were rarely framed. Panelled doors had four or six panels (depending on size and date), and were nearly always single leaf (ie single not double doors) (illus 296, 299). The door handles would usually have been brass or wooden knobs (illus 297).

Windows (as described in chapter 8) were nearly always sliding sash and case, made of red Baltic pine. Internally, the window recesses had shutters and panelling in the better appointed houses and more important rooms, or vertical timber boarding in rooms with fewer pretensions, or perhaps just plaster in an even simpler interior (illus 298, 299). The windows would have had iron or brass ironmongery and the shutters wooden or brass knobs.

High status public rooms might also have had dado rails and occasionally dado panelling in addition to the standard timber skirtings (150 to 200 millimetres minimum, with a moulded top).

Most of the best timber used for internal joinery (doors, shutters, etc) was yellow pine (from Quebec or occasionally Siberia) and was generally of a higher



298 Farmhouse window, with raised and fielded panels to the shutters.



299 Restored cottage interior to Bennie Museum, Bathgate, West Lothian, showing a four-panelled internal door, shutters at the window and a marble fire surround with cast iron register. However, the joinery would have been painted (and the door handle has not yet been provided), and the original floorboards would have been wider.



300 A farmhouse fireplace with stone surround and cast iron register.



301 A kitchen range.



302 Modest stone stair with cast iron balustrade and polished timber handrail.

quality than modern softwoods. Boarding was often of redwood (Baltic pine), while concealed battens etc were of whitewood (spruce). Either redwood or whitewood was employed for structural timbers.

Joinery in the eighteenth and nineteenth century was almost always painted with a matt or semi-matt finished lead-based oil paint, occasionally grained to imitate hardwood. Only in better houses were hardwoods sometimes used and left unpainted, with a waxed or varnished finish. The fashion for stripped or stained joinery is relatively recent.

Fireplaces. One of the major changes introduced in the late-eighteenth century to newly-built cottages was the location of the hearth in a fireplace. Almost every room would have had a fireplace, as open fires were the only heating method generally available until the Victorians reintroduced central heating, and most of the more modest rural homes would not have had this.

In larger houses and the more important rooms (where fires had long been in fireplaces), the fire surrounds were of marble (commonly white marble in drawing

rooms and black marble in dining rooms), stone or painted timber with applied composition decoration (illus 300). In smaller houses and cottages, surrounds were of stone, painted yellow pine, or in the smallest rooms sometimes of cast iron, painted.

Within the surrounds, the firegrates and registers were of burnished cast iron (earlier grates occasionally with wrought-iron front bars). From the mid-nineteenth century, tiles were often inset on either side of the register. In the kitchens, there were cast iron ranges (illus 301). Hearths were stone, set flush with the floor boards.

Staircases. Stairs in the more substantial houses were of stone until the latter part of the nineteenth century, with cast-iron balusters and a timber handrail covering the iron rail (illus 296, 302). In more modest cottages, stairs were wooden, often narrow and steep. By the end of the nineteenth century, most internal staircases were of timber construction.

Built-in furniture. Box beds were the principal furniture in poor rural homes, built into bed recesses



303 Ceramic sinks in a farmhouse scullery.

(bed-sized alcoves) or used as room dividers. Very little built-in furniture is likely to remain, but originally, as well as box beds there may have been kitchen dressers, pantry or larder shelving and cupboards, shelves and hooks in the hall and lobby etc. There may still be ceramic sinks in the kitchen and scullery (illus 303). Internal water closets were only common in the twentieth century, and bathroom appliances are usually of relatively recent origin, but some dating from the 1920s or 30s may remain. Occasionally, Victorian or Edwardian light fittings survive.

9.2.2 Repair and maintenance

The original spaces, fixtures and fittings in older properties can still be appropriate to modern dwellings. Only kitchens and bathrooms have changed radically in their layouts and fittings. The presence of original interiors and detailing will add interest, authenticity and value to a house. Although past neglect may necessitate repairs, and current expectations of convenience may require the installation of better heating and more modern bathroom and kitchen appliances, it should normally be possible to retain and maintain what remains of the original features. Where strong evidence of the earlier interior is available, its restoration, or the reinstatement of an appropriate second-hand item (such as a fireplace of the same date and character) is sometimes feasible.

The most essential remedial works are to eliminate longstanding or critical defects which can lead to escalating problems and major structural repairs. The most common of these are: -

Rot eradication. With all types of rot, the most important remedial action is to remove the damp conditions which led to the rot. Common causes of damp and therefore rot, are faulty rainwater goods, leaking roofs, rising damp and condensation.

Wet rot (cellar rot or *conioophora cerebella*) is most often the result of very localised dampness, such as that

caused by a leaking pipe or rafter ends built into a wet wall. It requires a higher moisture content than dry rot in order to develop (50%-60%). Once the source of damp has been eliminated, the affected timber has to be cut out and replaced by sound timber.

Dry rot (*merulius lacrymans* or *serpula lacrymans*) is much more invasive than wet rot and can survive in less damp conditions (20%-40% moisture content). Therefore a larger area of timber is usually taken out and burnt, before being replaced by preservative-treated timber. The removal of structural elements of timber may necessitate temporary support.

There are proprietary fungicidal treatments, which may help to inhibit spread and reoccurrence, and are usually required for a guarantee (normally against reoccurrence in the new and treated timber only). However, a 'green' approach without the use of fungicides may be preferred, particularly if the interior is to be used for human habitation or is particularly fine.

The critical factor in eliminating and preventing rot is to maintain dry enough conditions to ensure that the rot cannot develop. Isolation of the timbers from potentially damp stonework in the walls is an important factor, and the provision of ventilation to keep the wood dry is essential. For instance a suspended timber ground floor can be supported entirely on dwarf walls (incorporating damp-proofing) instead of joists being supported at their ends by being built into the walls. And underfloor vents in external walls should be kept clear of soil or rubbish.

Advice on rot treatment is contained in *Remedial timber treatment in buildings - a guide to good practice and the safe use of wood preservatives and Pesticides* (the most recent edition) both published by HMSO.

Prevention of rising damp. Until the late-nineteenth century, buildings rarely had a damp-proof course incorporated in their walls, or a damp-proof membrane in their ground/basement floors. Reliance was placed on heating and ventilation to prevent dampness. Where dampness is apparent in a ground or basement floor, or in walls near ground level, it is important to check and eliminate other possible causes before deciding on remedial action for rising damp. For instance, leaking drains, defective rainwater goods and condensation can all, in some situations, be mistaken for rising damp.

Penetrating damp from a basement wall which is below the outside ground level may be resolved by lowering the ground level, or tanking and/or providing field drains. An unusual feature occasionally found against walls which are partially below the adjoining ground level, as at Dalkeith Palace stables, is a stonebuilt underground ventilated channel, presumably intended to isolate the wall from the outside earth, and to allow

any damp coming from the ground to disperse by ventilation. This might be a useful device in similar circumstances.

Rising damp in timber floors. The main part of the ground floor in Scottish domestic building construction is usually a timber suspended floor, requiring underfloor ventilation by means of ventilation grilles in front and back walls (or any two opposing external walls) to keep the timber substructure dry.

Often the vents have been covered up (unknowingly by earth or rubbish, or deliberately to stop draughts), and need to be cleared and perhaps supplemented to get a good through draught. Rubbish from past repair works is often left under the floor on the solum (the ground surface underneath the floor), and can both block the through draught, and transmit dampness from the earth to the timber joists. In this situation, the solum needs to be cleared.

If the ground is wet enough and the ventilation inadequate, the brick (or, less often, stone) dwarf walls supporting the joists may suffer from rising damp. Unless there is an existing damp proof course (a course of slate), they will transmit dampness to the joists and it will be advisable to insert damp proofing between the floor joists and dwarf walls, in addition to improving the ventilation in the underfloor area.

Where floorboarding and joists are damp and severely affected by rot, they will have to be removed. In this case, the solum should be cleaned out and sterilized, blinding laid (usually twenty five millimetres of sand), and then bitumen, to prevent the growth of plants and to reduce the humidity caused by the moisture from the soil. Another option is to lay blinding, then one layer of bituminous felt, covered by fifty millimetres or more of site concrete. *The Tenement Handbook*, published by RIAS, recommends laying 100 millimetres of clean gravel as an alternative to bitumen. This may be easier to put in under an existing floor, but will not be acceptable where the full building regulations have to be complied with (however, a repair should not usually invoke the need to bring the floor construction up to the current standard). There should be at least 150 millimetres of ventilated space between the joists and the solum.

Rising damp in solid floors. Where the ground floor is of solid construction, but lacks a damp-proof membrane, the floor (usually of stone slabs or clay or ceramic tiles) will not be completely proof against damp. It may be that this causes no problems, since this type of floor finish is unaffected by damp, but care must be taken, for instance not to leave rugs or other organic items on these surfaces, as these might develop mildew or rot. Timber skirtings etc might also be at risk.

As stated in *The Care and Conservation of Georgian Houses*, 'the introduction of a damp-proof membrane at basement level only prevents the floor from 'breathing', by concentrating water at the base of the walls, a dpm and impervious floor coverings such as linoleum can often increase the damp problem. Where basements are lived in, and are properly ventilated and heated, rising damp is rarely a serious problem.'

To insert a damp-proof membrane below an existing floor, there will be the disruption of taking up the floor slabs, excavating the subfloor sufficiently to allow the laying of 100 millimetres or so of hardcore and about 150 millimetres of concrete, plus a damp-proof membrane, screed and floor finish. If the existing stone slabs or tiles can be lifted without damage, it should be possible to relay them in their previous place. If not, a matching floor may be obtainable.

Rising damp in walls. If the external walls are partly below ground level, as in a basement or semi-basement, or if footings are below the water table, water is likely to be drawn up the walls by capillary action, often to a height of a metre or so, and sometimes more. Until the late-nineteenth century, damp-proof courses (initially of slate) were rarely incorporated into external wall construction, and their introduction into internal walls was even later.

There are two main approaches to tackling rising damp in walls; improving the ground water conditions and improving conditions in the walls (either by allowing any damp to dry out naturally before it causes damage, or by preventing its ingress). The most appropriate method will depend upon the individual circumstances and the reasons for the problem.

Providing field drains alongside the building to take ground water away, reducing the ground level if it has been raised, and improving the surface water drainage on the uphill side of the house can all be helpful ways of improving ground water conditions.

Alternatively, there may be specific factors causing the rising damp which can be more easily and cheaply remedied. For example, the building may already have a damp-proof course which is broken or being bridged in places. Or there may be an impermeable external render which is preventing rising damp in the walls from drying out. Removing any impermeable finish (and if appropriate replacing it with a permeable lime harl), should allow walls to dry out naturally. It may take a couple of years for complete drying out, but this period should be allowed before any more drastic remedial action is taken.

However, if none of these solves the problem, a damp-proof course might be considered. The most usual damp-proof courses for installation into existing buildings are electro-osmotic and chemical. They come

with guarantees, but in rubble walls particularly, their long-term success is likely to be very limited. In addition there are visual implications as chemical courses leave a line of substantial injection holes.

Woodworm infestation treatment. The common furniture beetle is the main cause of damage to timber by infestation. The beetle can be identified by small boreholes of about 1.5 millimetres diameter. The climate is too cold for deathwatch beetle in Scotland, but there may be evidence of other wood-boring insects. The timber most commonly attacked is the less dense outer sapwood, or fast-grown modern softwoods. Damp timber also seems more vulnerable to infestation.

Where timber is very badly attacked, it will need to be replaced by pretreated timber. In most cases, however, it should be possible to retain and treat the existing timber by pressure spraying, using an insecticidal preservative. Care is required when choosing which preservative to use, and which specialist company to apply it. Health risks have been alleged to exist with those containing Lindane and Pentachloro Phenol (PCP) chemicals, and there are also restrictions as to which can be used in bat roosts. For up to date information see *Remedial Timber Treatment in Buildings: a guide to good practice and the safe use of wood preservatives*.

Joinery repairs. For joinery, the best timbers are yellow Quebec pine, now very expensive, and Douglas fir, which is of very good quality but nearly logged out. Secondhand timber or a good red pine are recommended for use in repairs, although new pine has more knots than it used to.

The insertion of central heating or other services, or rewiring, often causes damage to floorboards, requiring at least partial replacement. Older floorboards were usually wider than the standard sizes currently available, and this can make it difficult to match in new boards.

References Much good advice and information is available on the subject of repairs to Georgian and Victorian interiors; for further information see the following publications, listed in the bibliography:- *The Care and Conservation of Georgian Houses*, *The West End Conservation Manual* and *The Tenement Handbook*. Guidance is also produced by the National Trust, the Victorian Society and SPAB. For repairs to doors and windows see chapter 8 'Openings'.

9.2.3 Alteration and conversion

House interiors are seldom left unaltered for long, and it is doubtful if there are any entirely unaltered kitchens or wash houses in the humbler rural homes of the

Lothians, except where they have been empty for several decades. Living rooms and bedrooms, whose functions have been subject to less change, more often remain much as they were, only superficially changed by paint and wallpaper. Nevertheless, these rooms too have often been modernised (but not necessarily improved), for example by the flushing up of doors, the removal of shutters or fireplaces, and the installation of new doors, windows, fireplaces, radiators, even partition walls or staircases. The restoration of any altered original features should be a priority. If there is good evidence of missing items (eg fireplaces), these too could be reinstated by the introduction of suitable second-hand replacements.

Much twentieth-century alteration has been of an inappropriate nature and of poor quality. There are now more skilled tradesmen/craftsmen who are able to carry out good quality repair and restoration to Georgian and Victorian interiors, so with care, a good standard of work can be achieved.

Kitchen and bathroom improvements. Some of the most frequent alterations to existing houses are the installation or renewal of modern fittings in existing kitchens and bathrooms. Other common changes include the provision of a bathroom where none exists, the addition of an extra bathroom inserted into an existing bedroom, living or cupboard space, and the incorporation of the kitchen area into the living space.

If additional bathrooms, shower rooms or WCs are needed, it is better to use store rooms or small bedrooms rather than compromise a good room by dividing off a part of it. If a room must be divided, consideration should be given to making the alterations reversible. Some good individually-designed bathrooms are fully self-contained. In addition, new details should match the existing, particularly the cornice and skirting on any new partition wall, and any new doors. New pipe or duct runs should be unobtrusively located.

General internal alterations. Proposals often include extensive changes such as the removal of sections of wall, and the stripping out of original fittings or finishes. A careful assessment of the significant qualities of the existing interior and its features should be made before any alteration plan is chosen. Retention of all the important elements of the interior should be a priority. Where the building is listed, removal of period features or any other alteration will need listed building consent.

Roof dormers. A room in the roof, or a larger room in the attic can be a way of increasing the accommodation if existing space is limited. However, if it means constructing a new dormer or enlarging an existing one, caution would be advisable. It should be noted that

box dormers (which allow a greater area of good head height in a coomed room and are therefore often chosen instead of other dormers) are not traditional and are visually obtrusive in form. They are consequently never appropriate for older properties (illus 192). Care should also be taken to make the insertion of any additional roof ventilation unobtrusive. For further advice on dormers and roof ventilation see chapter 7 'Roofs'.

Extensions. See chapter 10 'Outside spaces' for advice on extensions. However, extensions not only affect outside spaces, but also the existing building and its interior at the junction with the extension. It is preferable to minimise the changes to the existing building, so as to make any extension work reversible, in case at any time in the future it is decided to remove the extension or replace it.

Amalgamations. Farm cottages are often too small to accommodate a family, but where they are semi-detached or terraced, an amalgamation can solve the space problem. Resulting alterations to cottage interiors (where these are unmodernised) should retain as much as possible of the original form, and be kept to the minimum necessary to effect the amalgamation.

If there is a choice between providing extra space either by extension or by amalgamation with an adjoining cottage, consideration should be given not only to practical aspects such as space planning, but also to the most important qualities of the cottages and how these can be preserved. If the setting and the external appearance are attractive, an amalgamation may be less disruptive than an extension. However, if the interiors are of high quality, an extension may involve less alteration, and therefore be the better option.

Change of use. It is rare to find modest residential buildings being converted to other uses, as there is a good market for residential property in the Lothian countryside.

Nevertheless, a grieve's house, a cottage or a bothy, which is in the middle of a working steading, might now be used as a farm office or for an agricultural purpose rather than as a dwelling. If the farm is still working, a return to housing use for these buildings may be unwise because of the practical problems of noise, smell and farming activities. The planning authority usually has strict policies on new dwellings in the vicinity of agricultural operations.

Because conversion of residential buildings to other uses is uncommon, this advice has concentrated on alterations rather than conversions.



304 Byre floor in West Lothian, with stone slabs and drainage channel.



305 Cobbled stable floor (Wester Gormyre, West Lothian).



306 Stable interior (East Barns, East Lothian) after removal of stalls and hay racks, showing setted floor draining to a gully, whitewashed or plastered walls and timber roof structure with rafters, ties and sarking.



307 Nesting boxes and whitewashed, plastered walls in a poultry house (Cuilken, Midlothian).

9.3 Agricultural Buildings

9.3.1 Original materials and construction

A wide range of very different buildings is included in this category, and the specific characteristics of some are highlighted, but in general they are clearly differentiated from residential buildings in being less well-finished internally, because they were intended as storage, animal accommodation or working space.

Floors. These varied, depending on their use. In stables, byres and cowsheds they were cobbled, setted or stone slabbed, and drained to a gully (illus 304). Some buildings (for instance doocots) had earth floors. Floors have often been concreted at a later date, particularly where hygiene regulations required it.

Stable floors were often well finished, with stone setts of a larger size than usual (eg square) and finished with a textured pattern to prevent slipping (illus 305, 306). Brick paviors are not a common material in Scotland, but blue engineering-brick paviors were occasionally used in stables. Engineering bricks are of well fired clay, usually with a non-slip texturing, either chamfered edges or a square or diamond chequered pattern, and laid with a very tight joint, only about three millimetres.

By the early 1800s, the old damp threshing floors in East Lothian barns were being replaced by floors of sleepers and wooden boards, or as described by Fenton and Walker in *The Rural Architecture of Scotland*, 'a uniform stratum of round gravel,' covered 'with a coat of well-tempered clay, above which a mixture of clay, brick-dust, forge ashes, and a small proportion of lime, will make a hard uniform floor'. Variations on this sort of finish are common, and are sometimes known as 'lime concrete'. Cartsheds and barns were also occasionally floored with Caithness stone flags.

More recently, in the twentieth century, cement and concrete floors (usually with drainage gullies) have commonly been laid.

Ceilings. These were normally unlined under the pantiles and battens. Granaries were an exception, and often had slate roofs and sarking to prevent rainwater blowing in and wetting the grain (illus 308). Ground floor spaces below upper floors had the underside of the floorboarding and exposed joists as a ceiling (illus 309).

Walls. These were generally unplastered, but often whitewashed in areas used to accommodate animals (illus 306). This would have been renewed regularly, and over time built up to a considerable thickness. Occasionally stables and henhouses were plastered internally (illus 307, 313). The grandest stables might be tiled, incorporating the names of the favourite



308 Granary interior (Slatebarns, Midlothian), with boarded floor; exposed roof structure, and timber stud partition wall.



309 Interior of a cartshed (East Barns, East Lothian) showing cobbled ground surface and exposed joists at ceiling. A hatch from the granary above allowed grain to be loaded directly into the carts.

hunters. Dairies were plastered and tiled, with varying degrees of decoration. Dooocots were lined with brick or stone nesting boxes, and had open flight holes at high level (illus 310, 446, 447).

Fittings. Most original fittings have long been removed, but those which may remain include timber stairs (illus 311). In stables, cattlesheds and byres stone, there may be concrete, timber, or timber and iron trevises, and hayracks or feeding troughs, saddle racks and hooks for tack, tether posts or poles etc (illus 312 to 315). In granaries, hoppers and hatches for feeding the grain into carts below may be found (illus 309). In threshing barns and engine houses, mill machinery may remain; millstones, driveshafts, hoppers etc. Iron fittings were often made by Musgraves of Belfast. In doocots there may be a pole and ladder (or potence). And in dairies, marble or slate shelves and worktops may survive, in addition to a few other items such as cheese presses (illus 318).



310 Interior of converted doocot (Newliston, Edinburgh).

9.3.2 Repair and maintenance

Floors. In order to maintain the character of a space it is preferable to keep the original floor, rather than removing it and laying a new floor.

Where the floor finish is stone paving see 9.2.2. For stone paving, setts or cobbles, the advice on repair given in chapter 10 'Outside spaces' should be appropriate for internal floors as well. The main differences for internal floors are that (depending on the use) they will rarely be subjected to the sort of loadings exerted by vehicular traffic (so that bedding can be sand rather than cement or bitumen, for example), and the surface will usually be required to be finished to a higher standard. A new method being tried out (at Alderston Coach House, East Lothian) to

prevent surface dampness and give a better finish to an old flagged floor is to apply a microporous sealant. However this is still too experimental to be recommended.

Retention of any surviving nineteenth century blue engineering-brick paviors is encouraged. A number of companies continue to manufacture these to the original nineteenth century patterns, and in addition they may be obtainable secondhand.

Floors in agricultural buildings have often been resurfaced with a cement screed. Where this is breaking up, it is desirable to re-expose the original floor surface, repairing it if necessary. If the original surface is not acceptable for safety or hygiene reasons,



311 A typical internal stair, to the upper level of the barn or granary, with open timber treads (Slatebarns, Midlothian).



313 Free-standing trevises in use at Bush Home Farm, Midlothian.



314 Stone stalls in a byre (Cauldhame, West Lothian).



312 Stable interior (Kippielaw or Southside, Midlothian), showing trevises linked to the ties of the exposed timber roof structure, and hay racks.



315 Cattle feed from a trough and hay heck at Torcraik, Midlothian.



316 Feeding hatches opening between the turnip store and byre or shelter shed at Torcraik, Midlothian.

the screed can be taken up and a different material laid over the original floor. Alternative materials which might be used (and which will be easier and less damaging to remove if at any time in the future it is decided to re-expose the lower floor) include timber boarding on joists, lime concrete, and paving slabs or flagstones on a sand bedding.



317 Covered cattle court at Eastfield, East Lothian, with cast iron columns and stout timber fencing and gates. The ground surface is cobbled.



318 Dairy interior at Hedderwick Hill Stables, East Lothian. There are tiles below the dado and the upper walls are plastered. The window is small, and the ceiling high and vented, to keep the space cool.

Timber ceilings and floors. The advice given in paragraph 9.2.2 above (on treatment of rot and woodworm infestation, and remedies for rising damp etc) is also relevant to timbers in agricultural buildings. In general, fewer timbers were concealed in unventilated spaces, so there may be fewer problems than in houses. If timber has been previously painted or limewashed, this can be easily renewed.

Walls. For renewal of limewash, see chapter 6 'Render, Harl and Limewash'. For repair or repointing of stonework or brickwork, or penetrating damp, see chapter 5 'Masonry and Pointing'. For plaster repairs, refer to 9.2.2.

Fittings. The minimum of intervention is preferable. If there is a need for repair of original fittings, a competent joiner, mason or blacksmith should be able to deal with straightforward problems. With unusual or specialist items, museum-type conservation may be required, and advice could be sought from the National Museums of Scotland or Historic Scotland.

9.3.3 Alteration and conversion

Floors. It is always preferable to retain and use the original floor finish. If this is not possible, for instance for safety or hygiene reasons, but preservation of the floor is desired, there are two alternative approaches which can be suggested.

Firstly, the original floor can be retained intact in its original position, and used as a base for another floor finish laid above it. Ideally the upper finish should be capable of being laid and removed without damage to the original floor. A damp-proof course can be used as an isolating membrane, and insulation can be incorporated if desired. A raised floor level has to be acceptable if this method is to work. The hope is that in retaining the original finish intact, it remains as a record of the original construction and may in the long term be re-exposed. The nature of the new, upper finish will depend upon the needs of the space; for instance it could be a timber floor on battens, or a soft lime concrete screed, or even paving slabs or flagstones on sand bedding. This option gives no visual indication of the nature of the original floor, but retains it intact, and may be most appropriate where the floor is of particular archaeological interest.

The second option (as used at Hopetoun House stables) is to take up the floor and relay the same materials over a good base, a damp-proof course, insulation and a levelling screed as necessary. If the original floor slabs or blocks are in a good enough condition, some or all of them can be reused (laid sound and level), but otherwise new ones matching as closely as possible can be substituted. Great care should be taken to match the original joint widths and pattern of laying. At

Hopetoun, the stone setts were deep enough to allow them to be cut horizontally to provide twice as many setts (to substitute for damaged ones etc). They were relaid over underfloor heating, which eliminated the need for a visible heating system.

If no original floor finish remains, it may still be appropriate to put in a new floor which stays within the range of traditional materials used in this type of property. The opportunity should be taken to put in a sound base and damp-proof course if these are needed.

Roofs/ceilings. Roof structures can be of interest when visible, particularly in horse mills, because of the shape of the roof (illus 185, 186). The retention of an exposed ceiling and roof structure can be a problem if the building regulations are newly applicable. The outer structure or internal finishes may have to be altered in order to incorporate a vapour barrier, insulation and ventilation, as required.

Walls. For guidance and information on plaster finishes see Historic Scotland's *Technical Advice Note 2*. Traditional Scottish plasterwork had a generally smooth, but not perfectly flat finish, with rounded corners, not sharp beaded edges and angles.

Fittings. Where possible, existing fittings should be retained in any scheme of renovation. For instance, trevices can be retained as low partitions between tables in a restaurant, and hayracks and saddle racks can be used for hanging up utensils in a kitchen.

9.4 Industrial Buildings

The main characteristics of rural industrial buildings were covered in chapter 4. There is little else in the interiors that differs from agricultural buildings, or that requires different treatment, so that paragraph 9.3 above includes all the necessary guidance for the interiors of small, rural, industrial buildings. Illustrations 319 to 321 show a range of industrial interiors.

9.5 Building regulations applicable to interiors

9.5.1 Building regulations in relation to residential buildings

Where an existing residential interior is being altered or extended, the general principles have already been explained in chapter 2 'Legislation'. Residential accommodation in houses and flats is controlled by the building regulations, but not retrospectively. Building warrant for an alteration therefore does not require the whole of an older house to be brought up to standard, as long as any new element or situation complies fully with the regulations. Replacement items must comply at least to the same extent as those items they replace,



319 Interior at Mavishall Sawmill, East Lothian, including machinery.



320 A double-height rooflit interior at Bank Paper Mill, Midlothian, with machinery and equipment in evidence.

and no situation must be made worse by the alterations and replacements. One example of an alteration which could affect other existing elements of a building is a roofspace conversion.

Those regulation requirements which may be more difficult to satisfy in existing buildings than in new, include the following:-

Regulation 13. Technical Standards Part E: Means of escape from fire etc. - Where an extra storey is added by an attic conversion, there may be additional requirements invoked. For example the escape route (ie the stair and corridors), may need to be a protected zone, with additional fire resistance. There may also need to be emergency escape and access windows from the attic storey.

9.5.2 Building regulations in relation to agricultural and industrial buildings

Where an existing agricultural or industrial building is being altered or converted, and has to comply with the building regulations, difficulties may arise in the following areas:-

Regulation 11. Technical Standards Part C: Structure - The existing structural system, for instance in a mill with internal columns and beams, needs to be assessed, so that the required stability and loading capacity can be provided, and the need for supplementary reinforcement or additional structural elements can be ascertained.

Regulation 12. Technical Standards Part D: Structural fire precautions - It will be necessary to assess the fire resistance and combustibility of existing structural elements, so that they can be upgraded where necessary. In a large building, upgrading may be needed to existing walls and floors, where these divide the building into fire compartments. Fire stopping and protection of openings will need to be considered while detailing compartment walls or floors, particularly where these incorporate or adjoin existing walls or floors.

Regulations 16, 17, 18. Technical Standards Part G: Preparation of sites and resistance to moisture and resistance to condensation - G2 specifies treatment of the solum and G4 the construction of a building so as to protect it and its users from any harmful effects caused by condensation. The deemed-to-satisfy specifications give sample constructions for the preparation of a solum below timber and concrete

floors. The solum below a suspended floor must be ventilated. Where the floor is of timber construction, the solum must not be below the outside ground level.

Regulations 19, 20, 21. Technical Standards Part H: Resistance to the transmission of sound - These regulations only apply to dwellings which are not detached. Achieving the required sound reduction through existing floors can be particularly difficult, and modifications may be necessary to incorporate extra layers of plasterboard, deafening or floating floors, for example.

Regulation 22. Technical Standards Part J: Conservation of Fuel and Power - This applies to almost all buildings, with only a few exceptions. The aspect most likely to present problems is the assessment of U-value in existing outer walls, floors and roofs, and the need for, and best method of upgrading. Increased insulation may have to be reflected in new internal finishes. The permitted number and size of new openings (such as rooflights) will also be restricted by the standard of thermal insulation provided in the walls and roof.

Regulation 23. Technical Standards Part K: Ventilation of buildings - It is often difficult to provide the required amount of trickle ventilation in old or listed buildings, particularly in new internal kitchens and bathrooms. Proposals should be discussed with the local authority to ensure the provision is 'adequate' as required by the regulation.



321 The smiddy at Cousland, Midlothian, with two anvils and a large hearth.

9.6 Guidelines

The following guidelines are suggested as a good basis for repair, alteration or conversion of an interior:-

Survey. Thoroughly investigate the condition of the interior and the reasons for any problems. Seek specialist advice if necessary.

Conservation. Give consideration to the architectural and historical qualities and relative importance of the elements of the interior. Retain as much as possible, restoring any altered details if there is good enough evidence, and reinstating

missing features if suitable second-hand replacements can be found.

Intervention. Keep intervention to a minimum. Design any changes sensitively, and incorporate existing features into the scheme in an appropriate way.

Consultation and approvals. Before finalising any design for alteration or making any changes, check if listed building consent, building warrant or any other approvals are needed. Consult the planning and building control authorities for advice on policies and requirements.

10 OUTSIDE SPACES

10.1 The Lothian Tradition

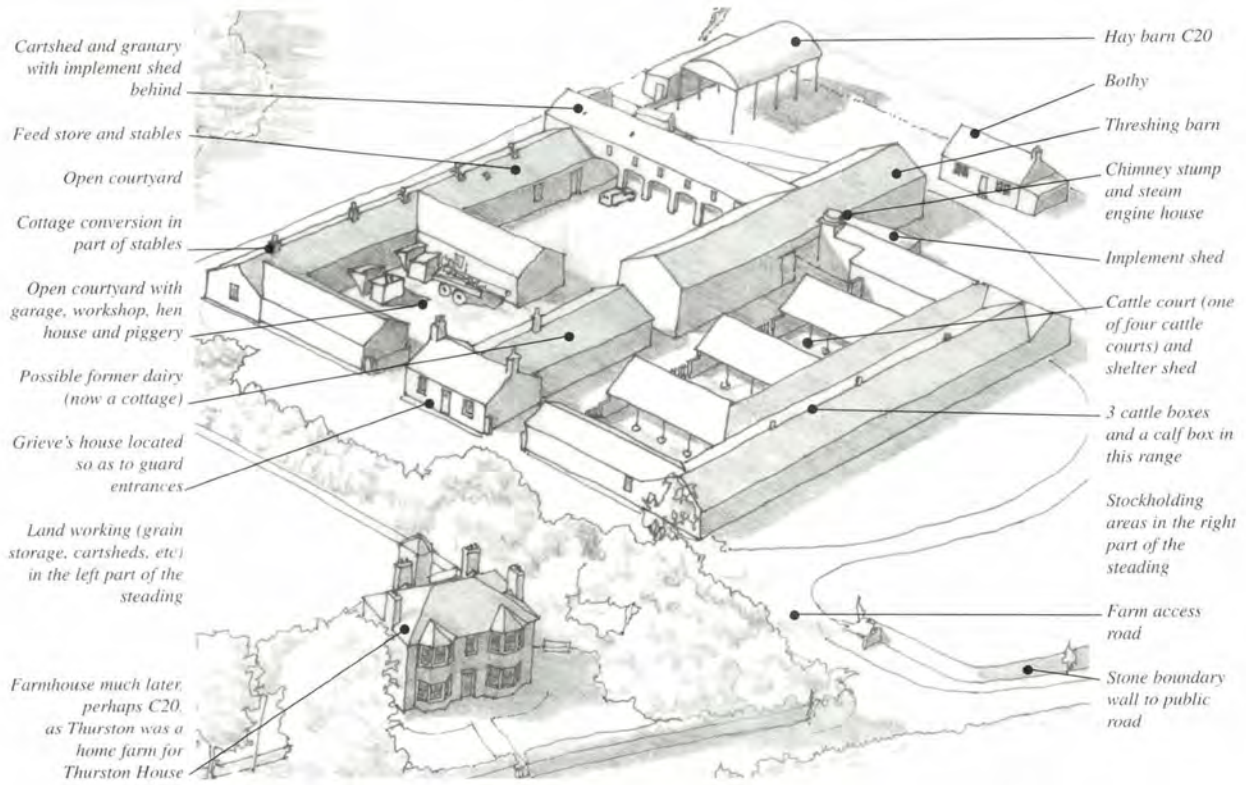
The countryside of the Lothians includes upland, woodland, rich arable farmland, open coastal plain, and even old mining areas littered with spoil heaps. The topography and geology, climate and microclimates, and the natural vegetation determined the types of agriculture and industry which developed in this area. They have contributed to the making of the landscape, which forms an essential context for the rural buildings housing these enterprises and their workers. The size of the farm groups ranges from small hill farms in West Lothian to the large arable farms of East Lothian. The layouts vary from simple U-shaped or quadrangular, to the highly complex multi-courtyard arrangements (illus 22 to 25, 35, 322, 323). Housing for the owner (or tenant) and the farmworkers is in close proximity to each farm.

There are large estates such as Hopetoun and Dalkeith, where the main house forms a focus for a network of rural buildings with subsidiary functions, such as stabling, mains farms, workshops (as in 11.6), and staff housing.

Industries of various types are mainly concentrated along the rivers, (particularly the Esk, the Almond, the Water of Leith, the Tyne and the Avon) where they could use the water for power, or for cleaning or cooling processes. In contrast, windmills stood on exposed sites to exploit their power source. There is great diversity in the scale of industrial building groups. Compare the distillery at Glenkinchie or the paper mill at Currie with the seventeenth century Preston mill or a roadside smiddie (illus 26, 81, 377, 378).



322 Small steading at Stonepath Tower showing modern additions and outside spaces



323 Aerial sketch of Thurston Home Farm, East Lothian, showing the large, formally-designed and complex steading layout and separate farmhouse.



324 Exterior view of a medium-sized, vernacular-style steading at Pressmennan, East Lothian, showing the simple quadrangular form of the original steading and the farmhouse set in trees beyond.

Workers' housing is often provided on industrial sites, as at Glenkinchie Distillery on an extensive scale, and at Redhall mill, where there were just two mill cottages.

The initial impact of a building or group of buildings in the countryside depends on distant views of it and the way it relates to its surroundings. The form of any planting, particularly trees, and the shape and complexity of the built form are essential to its character (illus 6). Closer to, the materials and detailing of the buildings and the hard landscape become important, as do individual trees, hedges and shrubs.

The outside spaces include not only those around the buildings, but also those spaces between and enclosed by them. This is particularly important for farms, where there is usually at least one courtyard in the centre of the steading. There can be enclosed garden space too. Farmhouses, especially the larger, later ones, usually have a garden around them, often walled, and a shelter belt of trees. Cottages also have walled or fenced gardens.

Trees and shrubs. There are marked differences in plant species and their growth patterns across the Lothians, in response to altitude, soils, aspect and proximity to the coast. Planting around buildings on or adjacent to large estates (eg Hopetoun), will also be influenced by their management regimes.

10.2 Residential Buildings

10.2.1 Original spaces, materials and features

Farmhouses. In the eighteenth century these were attached to the steading or detached but forming one side of the courtyard (illus 326). During the nineteenth century they started to be built separately, to one side of the farm buildings (illus 327). Larger farmhouses were surrounded by a walled and wooded garden, and had their own entrance and drive, and sometimes even their own stableyard (illus 327, 328).

Farmworkers' cottages. These were usually laid out either in a row or in a formal group (for instance as a U-shape) (illus 329 to 332). They were near the farm, but separate from the steading. In some cases there was a shared green at the front. Those cottages which were within the steading area are included in the description of agricultural buildings in 10.3.

Gardens. Most gardens were enclosed by simple mortared rubble walls. The height related to the status or function; walls were often higher for farmhouses than cottages, and highest of all for kitchen gardens (where these existed). Farm cottages rarely had walled front gardens, and treatments of the space between the road and the cottages varied. Cottages sometimes had pigsties



325 The conversion of Whitekirk 'tithe' barn in East Lothian to a dwelling has retained the uncluttered and open setting.



326 A formal late-eighteenth century type of steading layout at Saltoun Home Farm, East Lothian, with the manager's house located on one side of the courtyard.



327 The farmhouse set within its own extensive garden, surrounded by trees and walls, at Standingstone, East Lothian.

and individual or shared privies in their back gardens. Many gardens contained sheds or outhouses, and kitchen gardens had greenhouses. Paths would have been stone slabbed or cobbled, and there would have been flags outside kitchen doors and on other larger areas where an even and clean surface was required, for instance for the preparation of foodstuffs, or butchering.



328 A separate stable and stableyard at Balgone, East Lothian.



332 Rear view of Sheriffhall Cottages, East Lothian, showing brick and stone outhouses.



329 Farm cottages can be on their own, as at Huntly Cot, Midlothian, probably the shepherd's cottage. The garden is enclosed by protective netting.



330 Terraced farm cottages opening directly onto the road at Temple, Midlothian.



331 U-plan terraced farm cottages with a central common green at Phantassie, East Lothian.

The larger Victorian farmhouses often had a shelter belt of trees planted around them, to give shelter and screening from the farm. Earlier farms may also have had shelter belts in exposed locations (illus 324, 327).

Housing for industrial workers. In some cases housing was provided for workers on the same site as the industry (or nearby). For instance on a large scale, Glenkinchie Distillery has rows and rows of terraced houses and cottages, complete with front and back gardens, laid out along streets in a designed village (illus 49). But this is much more extensive than most of the other workers' housing found with the smaller rural industries.

At a watermill there is more likely to be an individual house, perhaps for the mill owner or manager, plus a small row of cottages (see the case study of Redhall mill at 11.2). The house will have its own entrance and garden adjacent to the mill site. The cottages, by contrast, usually form part of the group of mill buildings, facing onto the same open space (they are therefore discussed with industrial buildings in 10.4). Like farm cottages, industrial cottages usually have back gardens.

A workshop (smiddy, joiner's shop, or hand-loom weaver) almost invariably has a cottage alongside for the craftsman. An estate group of workshops, on the other hand, will be separated from the housing, although it may be close by (as at Thornybank steading, case study 11.6).

10.2.2 Maintenance and repair

An essential part of conserving rural buildings is the protection of their settings. Specific advice on trees and planting is not covered in this guide, as it is a specialist



333 This later back porch (Fountainside, Midlothian) is in an unobtrusive position, screened by other rear wings.



334 This new rear extension (Phantassie Farm Cottages, East Lothian) is carefully designed to replicate the original stonework and slated roof, and is centrally positioned.

field, and very different from building conservation. Scottish Natural Heritage and the local councils will be able to give guidance on where to find further information. Some of the councils also issue information on recommended tree species for local use (eg West Lothian) and approved contractors for landscape work or tree surgery (eg City of Edinburgh).

The maintenance of hard ground surfaces is as described for agricultural buildings in 10.3.2. Advice on the maintenance and repointing of walls is given in chapter 5, and advice on gates in chapter 8.

10.2.3 Alteration and conversion

Alterations. In any alteration it is desirable to retain the essential character of a space, to complement the buildings and act as a reminder of the original function. Original features such as boundary walls, gatepiers and entrance gates should be preserved, as well as the general structure of the original garden (or other space). The mature trees should be conserved, if in good condition.

Extensions. If extensions are limited to the rear of the house, cottage or row, and well designed, they can be unobtrusive and yet satisfy the need for extra space (illus 334). However, they can reduce privacy and overshadow neighbours, or inhibit the adjoining owners' future chances of extending, so care is necessary. And the rear elevation may be a visible part of the landscape or a carefully designed facade in its own right, so it should not be assumed that extending here will always be acceptable.

New porches or conservatories at the front of a house or cottage are likely to be clearly visible, and unless designed very carefully to harmonise with the



335 The later porch at this cottage (Fountainside, Midlothian) hides the central entrance doorway, and changes its original character.



336 An added conservatory (Huntly, Midlothian) unbalances a symmetrical facade.



337 These new wings at Myreside, East Lothian, have been carefully designed to retain the symmetry of the existing frontage. They have been constructed of a different material (timber), recessed, and painted a different colour, so as to leave the original building visible as a separate element.



338 Cobbles along the entrance frontage at Almondhill, Edinburgh. There is a stone drinking trough on the right.

materials and style of the existing building, can be unsightly (illus 335 to 337). Few housefronts can satisfactorily accommodate an extension without adversely affecting their appearance, so it is preferable to find an alternative location.

Conversions. Conversion of a building in residential use for another purpose is unusual, and would not often require much alteration to the external spaces. Conversion to offices might demand an increase in parking spaces, or an ancillary industrial or farming use might involve access for larger vehicles. In either case, it would be desirable to retain any boundary walls and as much as possible of the existing planting to screen the enlarged roads or parking areas.

10.3 Agricultural Buildings

10.3.1 Original spaces, materials and features

External surroundings and setting. The spaces around farm buildings are generally functional, simple and uncluttered, with ample space to move animals and manoeuvre machinery. The ground is usually covered in plain and simple materials, often originally cobbles or compacted earth with an admixture of lime, ashes or clay (illus 338 to 342). More recent ground finishes include concrete, gravel, granite or whin chippings and dust, or in mining areas, blaes. There is always a road to the steading, sometimes only an access road, sometimes a passing major or minor through road. Fields usually surround the farm, the character of the countryside being dependent on the locality (illus 343 to 345).



339 Cobbled entrance at Lorne, East Lothian, with timber gates to the entrance arch.



340 Access route to cartshed surfaced with flagstones and setts at East Barns, East Lothian.



341 Setted access route and cobbled yard at Temple Mains, East Lothian. The cobbles have been carefully arranged so that they lie in the same direction.

Access to the cartsheds and equipment store could be either from inside the courtyard or outside. Space was provided for manoeuvring carts, wagonloads of hay, teams of carthorses and agricultural machinery. However, in recent years the increasing size of vehicles and machinery, livestock transporters, etc., has resulted in larger areas outside the steading becoming devoted to vehicle movement, causing growing problems with existing access arrangements.

Boundaries around farm buildings are generally simple and plain, often rubble walls of the same stone as used in the buildings, or simple timber post and wire fences (illus 345, 346). Walls were mortared where they enclosed farmyards or gardens, but field boundaries were more commonly drystone walling or hedges. There is very distinctive drystone walling in parts of Midlothian, rumoured to have been built by French prisoners of war (who were also reputed to have built the walled garden to Luffness House in East Lothian, as well as walls in the Borders). Elaborate wrought iron fencing is rarely seen, although estates sometimes used iron fences (with two to five flat horizontal bars).

Courtyards (illus 347 to 350). Within steading courtyards there were a variety of treatments. Because many farmyards are now concreted, it is often not clear what the original ground surface was.

In the smaller farms, the single yard was very simply treated, having no divisions, and a basic ground material, perhaps cobbles or earth stiffened by compaction with incidental detritus, ashes, stones, straw and dung. Portland cement was available from about 1820, but it is unlikely that it was much used until the twentieth century. There may have been cobbles or setts along the most-used routes, and there are examples in Lothian where the whole yard is still setted or cobbled.

Blue engineering brick paviors were also used, especially in stable yards.



342 Typically informal treatment of ground surfaces around the steading at Brunstane, Edinburgh. The track is compacted earth and stones, shading into grass in front of the buildings, but with no edging or kerb.



343 Field and access merge outside Stoneypath, East Lothian.

The larger farms sometimes had two or even three yards, one of which often contained cattle courts enclosed by stone walls, forming subsidiary yards, each with an open sided cattle shelter on the north side.



344 A formal setting at Rosebery Home Farm, Midlothian, where the farm entrance faces a drive to the main house, with impressive gate piers at the driveway. The castellated roadside facade and the steepled doocot pend behind an outer courtyard are designed to close a vista from the policies. A simple wire fence is used alongside the drive.



345 Distant view of Easter Inch, West Lothian, set in open fields, with a stone field wall (mortared) in the foreground.



346 The approach to North Mains, West Lothian, is along a fenced track. A variety of fencing types has been used.

These cattle courts were sometimes later roofed over (illus 351, 352). They would probably have been earth floored, often later concreted, but the other yards and circulation routes might have had a harder finish, possibly cobbles or a mixture of clay and ashes, reinforced by stones or grit if necessary. Closes and passages often had cobbles or setts, and areas outside kitchens were usually flagged.

There may have been temporary fences, stores, huts or other structures put up during the long life of these farms, and some of these may survive, albeit in a dilapidated state (illus 57, 58). However, the original features remaining are most likely to be stone drinking troughs, stone gateposts (found in many styles, including round or square, with conical or rounded copings), iron hinges and either metal or stone protective bollards at gateways and entrances (illus 105, 350, 353). Sometimes there are also painted, vertically boarded, timber gates, (although these have often been removed or replaced by later five bar gates, in timber or steel) (illus 274, 275, 339, 352). No evidence of original outside lighting remains, though purely functional electric lights were often later additions.

10.3.2 Maintenance and repair

Concrete needs only to be kept clean, with cracks weeded, and any crumbling or cracked areas cut out and recreted. It would be preferable to consider a better quality material in the long term, such as gravel, cobbles, or stone slabs, depending on the location and use.

Gravel will need to be topped-up periodically, and is most easily contained by a flush kerb or some other edging.

Setts, cobbles or horonizing may need to be reset when stones become loose. This should be effected by bedding new stones on sand or whin dust, setting the stones tightly together and brushing in the finest grade of whin dust. This traditional use of whin dust is recommended over the more usual method of brushing over a wet mortar slurry mixed with sawdust, and covering this with a layer of sawdust which is left overnight and brushed clean the next day (illus 375). However, the whin dust may need to be topped-up periodically.

Stone slabbing may need occasional replacement of broken slabs in matching stone. Caithness slabs are the most usual, and are readily available new. Bed the stones on sand or whin dust, ensuring that joints are tight (two to five millimetres approximately) and brush in the finest grade of whin dust to the joints (illus 374).

For advice on walls see chapter 5 'Masonry and pointing'. For advice on gates and ironmongery see chapter 8 'Openings'.

10.3.3 Alteration and conversion

Countryside policies and legislation. A useful reference source is the *Lothians Landscape Character Assessment* as a background guide for understanding the broader landscape context to any large-scale changes to outside spaces.

Legislative protection is given to 'Sites of special scientific interest'. Consult Scottish Natural Heritage on the location of these sites and the policies affecting them.

Local authority policies may relate to areas identified as 'Sites of interest for nature conservation'. The impact of any proposed development on wildlife, habitat and the overall landscape is likely to be an important consideration in the determination of planning applications and other proposals in the wider countryside. Where appropriate, developers may be encouraged to maintain and possibly increase the nature conservation value of proposed development sites by enhancing existing or creating new wildlife habitats.

Barn owls, badgers and bats are protected species, and Scottish Natural Heritage must be notified of any evidence of occupation by them as a part of the assessment of planning applications. Building works must be timed to avoid the animals' breeding season and there are further specific requirements relating to each different species.



347 Pend (with doocot above) giving access to the courtyard at Drem, East Lothian. The arch is higher than many, and will allow entry to modern farm vehicles and machines.



348 A small courtyard at Stoneypath, East Lothian.



349 A typical large undivided and uncluttered farmyard at Moorfoot Farm, Midlothian. Note the use of skylights and vents on the stable roof.



350 Stone gate piers at the entrance to the farmyard at Westcraigs, West Lothian, which was originally the stableyard for the coaching inn.



352 These cattle courts at Phantassie Steading, East Lothian, were roofed over and enclosed, and the openings altered, but some original gate piers and gates remained when it was photographed in 1975.



351 A row of cattle courts at Thurston Home Farm, East Lothian, separated by shelter sheds and byres, with walls and gates to the outer area.



353 Stone drinking trough (Preston Mains, Midlothian).

Alterations to farms still in agricultural use. There have been major changes in the way farms operate, particularly in the last half century. The physical results include altered fields and field boundaries, and in some cases removal of hedges or trees. The increased size of farm machinery and delivery and transport vehicles is demanding larger manoeuvring areas. This is resulting in increased circulation spaces around farms. Large new multi-purpose sheds are being erected on previously open ground. Sometimes the existing steading has been incrementally altered to cater for farming innovations. For instance courtyards are often infilled to provide a greater area of covered space. In other cases the steading has been abandoned as the main centre of farming activities, in favour of newer and more flexible accommodation elsewhere.

It is always preferable that farm buildings should remain in agricultural use if this is possible, and local authorities will be sympathetic to the need to make changes to the buildings so as to allow this. But it is important that the processes of change are managed so that they involve the minimum loss of original fabric and are reversible.

Conversion of farm buildings to other uses.

Although conversion to residential is the most common change encountered, there are a few office, workshop and even museum conversions as well. The advice given here concentrates on the more numerous residential conversions, and the specific demands they make upon the outside spaces, but similar considerations apply to all conversions.

Priorities. At an early stage in planning a conversion, it should be decided where the main significance and character of the building lie. For example, they may be principally in the location and relationship to the landscape, the formal entrance elevation, the historical importance, or perhaps in the story of the different functions distributed around the courtyard. These considerations can identify priorities in the building's treatment, and establish whether it might be appropriate to allow more change in lower priority areas. In turn, this can help to determine, for instance, whether it will be primarily an inward or outward-facing development.

New requirements. Perhaps the most far-reaching of these is the need to accommodate vehicular access, parking and perhaps garaging on a much greater scale than before. In addition, there are requirements for pedestrian and disabled access to individual houses, safety rails and security lighting. There are storage needs, both for gardens and rubbish, and sometimes also for fuel. The provision of an oil or LPG storage tank, often wanted when buildings are sub-divided or converted, requires planning permission and building warrant, and will benefit from a concealed location or



354 Oil tanks can be obtrusive and require screening (Easter Carriber, West Lothian).



355 The conversion of Hallhill, East Lothian protected the openness of the outer garden area by forbidding boundary walls or fences, but garden features added by individual owners will still affect the character.

screen planting (illus 354). Drying areas, play areas and locations for fires and barbecues can all be provided either within private gardens or in communal spaces specifically designed and set aside for these purposes. Property owners may want clearly defined boundaries between the gardens in different ownership.

Variations in taste and the external treatment of individual homes by their owners is one of the most difficult issues either to control or to agree a mutual policy for on a detailed scale. It is often a contentious subject between neighbours. The installation of



356 The treatment of the outer space is successfully kept open and uncluttered at Doon, East Lothian, because it is communal. But the tree planting will gradually change this.

individual artefacts such as nameplates, outside lights, rotary clothes dryers, flower baskets, garden furniture and barbecues can cumulatively result in an inappropriate change to the character of a previously agricultural or industrial group of buildings (illus 355).

A fine balance is called for between the desire for convenience and safety, and the retention of the rural character which people choosing to live in these locations are seeking.

Vehicles - access and parking. One of the major decisions in any residential conversion of a steading is to determine the limits on vehicular access. Steading courtyards were designed to facilitate both movement and parking of vehicles, although those where cartsheds faced outwards, or where equipment sheds had opened either outward or into a subsidiary yard, had a more complex pattern of traffic movement. It is desirable to provide car-free areas for children's play or peaceful occupations such as gardening or sitting out. New roads and garages, and a proliferation of parked cars, can drastically alter the appearance of a farm group, even from a distance, so require careful planning (illus 357 to 359).

There are various alternative approaches, the main options being -

- **Vehicular courtyards.** Where cars are allowed into the courtyard, but are restricted outside to a single access road, the courtyard becomes the 'street', with parking and access to the front doors of the dwellings. Cart arches and equipment sheds can offer garaging. This allows the outer area around the steading to remain green, and perhaps to provide



357 New areas of car parking and garages, together with conversion and some newbuild, can suburbanise a rural steading (Newbyth, East Lothian).



358 Vast parking areas dominating the converted steading at Lauriston Farm, Edinburgh.



359 Simple treatment without kerbs for the access road at Myreside, East Lothian, although it is a generous width. This steading is now occupied by workshops and offices.



362 The pedestrianised courtyard (Hallhill, East Lothian), has been left undivided and treated simply with grass and concrete paving slabs to the paths. However the paths are striking and their pattern has become over-dominant. Stone slabs would have been preferable, or gravel, perhaps around the edge of the yard, or in a softer central path layout.



360 A gravelled vehicular courtyard at Newton, West Lothian.



361 A pedestrianised courtyard at Calder House Steading, West Lothian. The circular stone wall to the flower beds existed previously (see illus 261). The ground has been paved with concrete paviors. While a natural material would have been preferable, the colour chosen matches the stonework, and the design of the whole space is straightforward and unfussy.

garden areas. Only a limited number of dwellings can safely be provided for in this manner, as it will be necessary to have sufficient space to turn and park cars in the courtyard. This approach will work best where cartsheds and equipment sheds open into the yard, and where access is not too restricted (for instance by a pend), which might prevent delivery, removal and emergency vehicles from entering. With this option, the character of the yard need not be altered greatly (illus 360).

- **Pedestrianised courtyards.** Where the courtyard is kept free of vehicles, and car access is provided only to the outside of the steading, the courtyard can be maintained as a safe, quiet, pedestrianised space, but increased external change results (illus 361, 362). This approach will work best where cart arches and equipment sheds already open to the outside of the steading, and can be used as garages which can be reached without entering the yard. Alternatively garages can be converted from other buildings (or if absolutely necessary newbuilt in an unobtrusive location) and screened parking can be provided, in an appropriate outside position. It is preferable for car parking and garages to be located close to the courtyard entrance, so that the courtyard will be used as the usual pedestrian access to the houses. This makes it less likely that outside-facing back doors will become the most common access, or that cars will be parked outside individual houses or gardens along an outer road (illus 363, 364).
- **Both vehicular and pedestrianised courtyards.** If the steading is a large one, with several courtyards, it may be possible to pedestrianise one or two, but to



363 New garages at Newbyth Stables, East Lothian. The red-brown stained timber blends well into the colours of the landscape, but the new buildings could benefit from screen planting, and the stable building is partially obscured from this viewpoint by one of the garages.



364 Closer view of a new garage at Newbyth Stables, East Lothian. The slated roof and stained timber are simple and successful (but cars would have been better accommodated within the existing building).

allow vehicles into others. This approach might achieve the best balance between the need to preserve the character of the steading while accommodating the reasonable desires of the new occupants of the buildings for amenity and convenience (illus 365, 366).

Parking and servicing. In each case the best solution will depend on the individual factors involved and the layout of the building or complex. Needs such as waste collection, access for emergency vehicles, deliveries and removals will have to be considered, and discussed with the relevant authorities. Parking will need to be provided to the local authority standard (usually one and a half or two spaces per dwelling).

The design for roads and parking should be carefully considered at the outset, and any new parts well screened to ensure that the rural character is retained. It is only too easy for an inappropriate suburban appearance to develop when areas of new car parking and rows of new garages are introduced (illus 357, 358).

As already suggested, good use can often be made of existing buildings as garages or stores, especially those which cannot easily be converted to housing.

Access roads. The specification for access roads will depend on whether the roads are to be adopted and maintained by the local authority or not. If a road is unadopted, it can be unmetalled, with an appropriately informal character, but the steading owners will be responsible for its upkeep. If adopted, the roads authority will decide on its specification. Preferably, this should be appropriate for a small, lightly-trafficked rural road, and should not need to be the same as for a suburban housing estate (illus 359). Formal roads with pavements and street signs should be avoided within a steading development. The local authority will advise on the minimum width for roads. Junctions with main roads should be simple and low key if possible, preferably without kerbs.

Lighting. Streetlighting along access roads and car parking areas will make the building group look suburban rather than rural. The amount of strong lighting should be kept to an absolute minimum, for instance restricted to the car parking areas. Paths can



365 Vehicular outer courtyard at Mortonhall, Edinburgh, very simply treated with gravel, and a little paving and grass.



366 Pedestrianised inner courtyard at Mortonhall, completely setted, except for the central circular feature. The picnic tables add clutter, but are removeable.



367 The courtyard at Newbyth Steading, East Lothian, has been divided into gardens with timber fences. The path is surfaced with concrete paviors.

look better with low level lighting, and specific lights can be provided for particular locations (eg at front doors).

Security lights which are activated by movement can be useful in a location which is not much used, but where it is essential for safety to have lighting. They can also alert residents to unexpected activity (although there can be confusion when animals activate the lights). However, care is needed to minimise their visual impact, as harsh, glaring lights are often used.

Solar-powered lights are another modern development which may prove useful. These are not powerful, but may be effective as guide lights for footpaths for example, and do not require power provision to outlying locations.

The use of a steading courtyard for vehicles can have the advantage of concentrating the lighting in this one area, screened from distant views. Light fittings mounted on the buildings (even on the outer walls) are generally less obtrusive than lights mounted on posts, and good lighting may even enhance the architecture if carefully designed and located. Well intentioned embellishments such as coachlamps, ornamental wrought ironwork and bottle glass are anachronisms

and should not be used.

Boundaries. Proposals to construct walls or fences or to plant hedges in the court or surrounding area as a means of defining individual property boundaries should be resisted (illus 367 to 369). Fences and railings between gardens are usually an intrusion into the original landscape and setting, where the only divisions were field boundaries. It is important to avoid a former farmsteading taking on the appearance of a suburban housing development.

Planting can be more successful as a boundary if it is sufficiently varied and subtle. Formal privet hedges, or worse, fast-growing lines of leyland cypresses will be too dominant, as well as being potentially annoying to the neighbours. Other possible solutions might include discreet ground-level boundary markings (eg stones), and the use of grass to define communal areas (illus 370). Hawthorn or beech hedges sometimes make effective boundary markers outside the steading.

Conversions should aim to keep the existing simplicity and match or complement existing forms of walling and fencing. If, for example, all walls and buildings are stone, new brick walls or wooden fences are unlikely to fit in well. Rendered brick boundary walls are never traditional and should not be used.



368 Timber fences and concrete paviors at Forkneuk, a converted steading in West Lothian.



371 New extensions to a steading at Hillhouse, West Lothian, constructed since the building was converted to houses. Planning permission was given for the extension on the left, on account of its modest scale and acceptable design, and consequently the owner of the neighbouring property sought and obtained consent for that on the right. The cumulative effect of small extensions can work against the character of a steading.



369 A new low stone wall to mark the garden boundary and red granite chippings at Newmains, East Lothian. A less formal treatment, with grass between the road and building, would have been more traditional.



372 Pink and cream concrete paviors at Bonaly Farm Cottages, Edinburgh.



370 Unobtrusive ground-level boundary markers between gardens at Boghall, West Lothian.



373 Concrete paving slabs and a whirligig drier added to outer garden at Calder House Steading. A natural material would have been preferable.

Within the courtyards, too, new walls and fences will introduce clutter and detract from the original form (either a clear open yard or one divided into rectangular walled cattle courts). The sense of a yard space enclosed by the farm buildings should always be maintained. Different ownerships can if necessary be indicated by the paving pattern. A central courtyard might be protected and kept private by the use of a simple vertically-boarded timber gate for example (illus 339).

Outhouses and extensions. An addition or extension should always play a subordinate role. It should never dominate the original building as a result of its scale, detailing, materials or location, and should not be attached to, or in any way overlay, principal elevations. Where an extension must be built adjacent to a principal elevation, the new work should generally be lower and set back from the existing facade. Any proposal to extend in a way which would unbalance a symmetrical elevation, and thus destroy the original concept of the design, should be resisted. Whilst the ability of each site to accommodate new work must be carefully assessed, a proposal which is modestly scaled, skilfully sited so as not to affect the overall architectural composition and built to complement the materials and detailing of the original buildings is most likely to be acceptable.

Additions such as porches, conservatories, patios, sheds, greenhouses and garages can have a dramatic effect on the character of a traditional farm group (illus 371). The materials, form, detail and location will have to be carefully considered if any of these are proposed. For instance, standard 'traditional' conservatories (designed to complement nineteenth century houses) can be highly inappropriate when attached to a mill or steading, and if a conservatory is acceptable at all, it may be that a good modern design is better. It is for this reason that many planning authorities restrict the rights of householders to make minor changes to their properties, through the use of an Article 4 direction, as described in chapter 2.

Bin stores have to be provided, or a discreet location for wheelie bins, and this needs to be carefully considered at an early stage.

However, there are some ways in which the the visual impact of the provision of outhouse accommodation can be reduced. Garden sheds and bin stores can be accommodated in existing buildings, or grouped together adjacent to, or even inside, garages (at Hallhill there are garden sheds in otherwise wasted corners of the covered parking building). Greenhouses, too can have separate areas allocated for them, perhaps a little like allotments. Screen planting can help to integrate or conceal new buildings.

There are some examples of quite radical recent alteration to farm groups, for instance the covering over of the courtyard with a (partially) glazed roof. This can be successful in particular cases, when designed with care and sensitivity. Late-nineteenth or early-twentieth century glazed roofs over earlier stable courtyards are not unusual, and cattle yards were often covered in corrugated iron as a later adaptation, so in some cases there is an historical precedent for this.

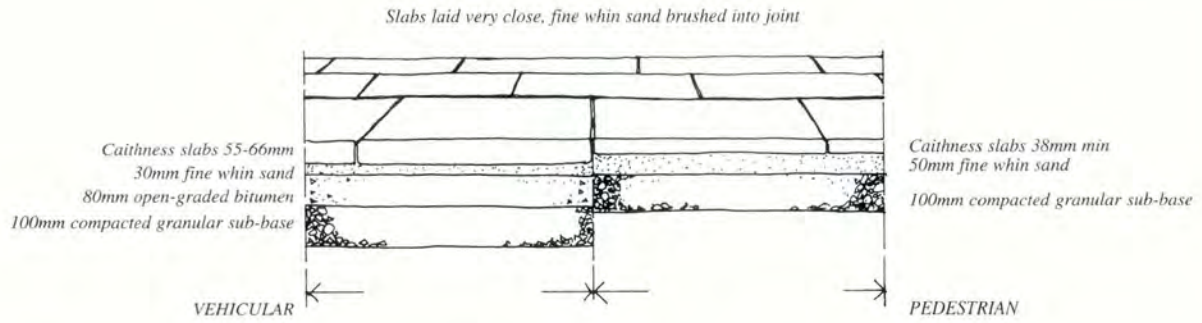
Hard landscaping - materials and details (illus 338 to 341, 374, 375). The existing materials and details ought to form a guide for new hard landscaping in any conversion. Cobbled, setted and paved surfaces should always be retained and carefully repaired to match the original detail. Where new hard landscaping materials must be introduced, these should be carefully selected to complement the existing surfacing materials. Many successful steading or mill developments use gravel, setts or cobbles in courtyards or around the buildings.

Gravel. River-washed gravel is both more attractive and easier on the feet than angular whin chips. A well-graded mix will be better than 'no fines'. Granite chips are not a local material and should preferably not be used. If gravel is laid on a permeable membrane, the growth of deep-rooting perennial weeds should be eliminated, although there will always be some annual weed growth. The membrane should be laid on a base of whin dust or sand. The provision of a timber kerb or other edging will confine the gravel to the intended area. Topping up with additional gravel will be required periodically.

Flagstones. Newly-quarried Caithness slabs are available. The specification should be appropriate for the location and expected traffic (bedded on sand or whin dust for foot traffic with a bitumen macadam base below for vehicular traffic). The slabs should be laid with very tight joints, and whin dust or sand brushed into the joints. Traditional laying patterns should be followed (illus 374).

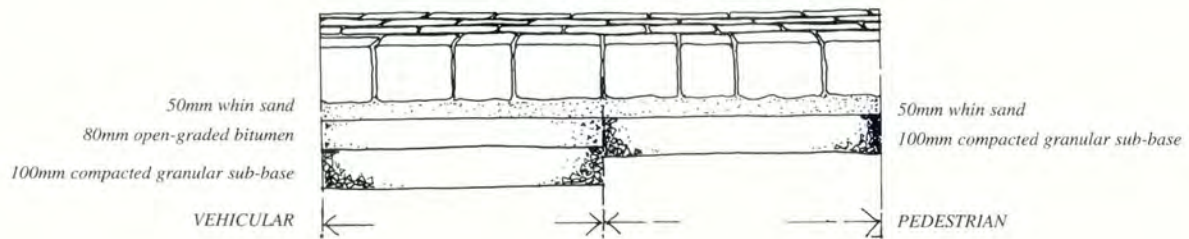
Cobbles and setts. Whin dust (the finest grade) is a suitable bedding for new or relaid cobbles or setts. Setts subject to vehicular traffic are now generally laid on a bitumen macadam road base, as it is more flexible than concrete (illus 375).

The most usual method of filling the joints is that a wet mortar slurry is poured over the newly bedded stones. This is covered with a layer of sawdust, left overnight and brushed clean the next day. To avoid defacing the stones with mortar, a dry mix can instead be brushed into the joints, and dampened with a spray from a watering can. A lime mortar should be used if this method is to be adopted. However, the more traditional method is for whin dust to be brushed into the joints instead of mortar, and this is the preferred method.



374 Detailing for stone paving: examples for vehicular and pedestrian traffic.

*Second hand whin setts, laid individually and hammered down until tops are level
Whin dust brushed into joints (alternative detail is to 'dry pack' joints with 1 to 4 lime/sand dry mix, watering well afterwards)*



375 Detailing for setts: examples for vehicular and pedestrian traffic.



376 West Bearford Mill, East Lothian. This is a small rural mill now redundant attached to a farm.

Brick paviers. Blue engineering brick paviers were occasionally used in or around stables, and in these cases, their retention should be encouraged. A number of companies continue to manufacture these to the original nineteenth century patterns, or they may be obtainable second hand. Engineering bricks are of well fired clay, usually with a non-slip texturing, either chamfered edges or a square or diamond chequered pattern, and laid with a very tight joint, only about three millimetres.

Local bricks are also a common ground surface in and around vehicle and implement sheds.

Planting. Attempts to soften the essentially hard landscape which surrounds most farm buildings by the use of inappropriate suburban planting should be firmly discouraged. As previously mentioned, there are often mature trees around the farmhouse, and a shelter belt protecting the farmstead. An extension of this planting can be formed to screen car parking and any new garages etc, but planting at some distance from the farm buildings (if it can be negotiated with the landowner), is usually a more effective screen from the wider view than trees close to the buildings.

Any new planting scheme should seek to retain the feeling of unity provided by the trees growing around the farmhouse, even if the new situation consists of several ownerships.

Trees and shrubs which are already growing locally give a good guide to the species which will thrive.

Indigenous or commonly-occurring species, mainly deciduous, should be used in preference to exotics or fast-growing evergreens. In most parts of the Lothians, beeches, sycamores, planes and limes do well, but the common native species are oak, ash, rowan, birch, hazel and elm. Elm is unlikely to be used now because of the problem of Dutch-elm disease. Sycamores cope well with both coastal and upland conditions, and will outperform any native. In coastal East Lothian the evergreen oak is fairly characteristic as a specimen tree in large gardens.

In the marginal farmland of West Lothian, hedges will often be more appropriate than tree belts, which would look out of scale and character with the surrounding landscape. The local authorities can advise on tree and hedge-planting species and methods in farming areas.

10.4 Industrial Buildings

10.4.1 Existing spaces, materials and features

Riverside sites (illus 26, 377). The majority of the smaller rural industrial buildings in the Lothians are watermills of one sort or another. These all have riverside settings, although sometimes fed by a lade set back from the river. Their locations are often attractive, with steeply sloping wooded banks dropping to the river, or an open and level floodplain site. Subsidiary features on the sites can include millponds, lades, bridges, and waterwheels (now rare). A setted or



377 Bank Paper Mill, Midlothian, now used as a fish farm. Note the mill lade and all the functional paraphernalia, some original and some resulting from the new use.



378 An old photograph of a typical smiddy at Niddrie, Edinburgh, sited alongside a road, with a working area in front of the smiddy. The cottage garden is walled with railings.

cobbled track would have provided access to the site, and there may be boundary walls and gates surviving. Other industries also needed water for their cleaning or cooling processes (eg tanneries, paper mills, scutch or lint mills) or had to have a pure water supply (eg distilleries or breweries) and were therefore located by rivers, lochs or burns.

Windmills (illus 78). Windmills are located in exposed positions to catch the wind. There are only a few left in Lothian; one or two have been converted to other uses, some are ruinous and none have sails surviving. It is difficult now to know how the spaces around them were treated.

Smiddies, workshops etc (illus 29, 84, 85, 378). These usually face directly onto a road, with an area of hard ground in front of the building for outside working. A cottage providing accommodation for the craftsman is often attached. There may be a modest garden at the back.

10.4.2 Maintenance and repair

Details of maintenance for most of the materials used in the hard landscaping can be found in section 10.3.2.

Advice on stonework repair and repointing is in chapter 5, and on fences and gates in chapter 8.

10.4.3 Alteration and conversion

The principles and references given in 10.3.3 for agricultural buildings also apply to industrial buildings. In addition, there may be artefacts and remains with significance for industrial archaeology. Report any finds to the local museum or local authority archaeologist.

Apart from these, the main point to stress is the value of preserving any remaining features of the sites, as an explanation of the buildings' pasts, when alterations are made. The general character of the building group needs to be retained. Consents may be required for what is proposed, and it would be advisable to discuss plans with the relevant authorities. Local and statutory authorities can be sources of useful information on the position of service runs, supply pipes and drains.

To find one of the smaller workshop buildings still in use for its original purpose is rare. Most will already have been converted to residential use, and this is the most likely future for any which are still unconverted.

The outside spaces rarely have features to preserve (although there may be interesting equipment and pieces of work which have been thrown out into the garden), and no major changes should be necessitated because of conversion.

Watermills are sought after for dwellings because of their wonderful situations. If the number of units can be kept small, a conversion need not demand too much change in the outside space. If the number of units is high, there is less chance of a conversion which preserves the original character.

The type of requirement imposed by conversion is access for large vehicles, car parking and garaging, safe pedestrian access to each front door (perhaps soon for the disabled as well as the able-bodied), provision for bin storage, new lighting and the supply of new services. Although 10.3 3 is focused on farm buildings, the principles of conversion to other uses given there apply equally to industrial buildings.

10.5 Building Regulations Applicable to Outside Spaces

In a conversion there are several regulations which may have a direct effect on the use and treatment of the outside spaces:-

Regulation 13. Technical Standards Part E: Means of escape from fire etc. Access for the fire brigade ladder is required to an area of cleared ground below each emergency access window.

Regulation 15. Technical Standards Part F: Combustion Appliance Installations and Storage of Liquid and Gaseous Fuels. The provision of an oil or LPG storage tank, often introduced as a result of subdivision or conversion, requires building warrant.

Regulation 29. Technical Standards Part Q: Access and Facilities for Dwellings. Safe and convenient access from a suitable road must be provided to each dwelling. Access to at least one entrance must be suitable for disabled people.

Regulation 30. Technical Standards Part R: Solid waste storage. This sets out the requirements for the provision of accommodation (often just stances) for containers or bins.

Regulation 31. Technical Standards Part R: Dungsteeds and farm effluent tanks. This details the required construction, location and drainage or ventilation of dungsteeds and farm effluent tanks.

Regulation 32. Technical Standards Part S: Access to and Movement within Buildings and Protective Barriers. This section details the access requirements for buildings other than dwellings. Access to at least one entrance must be suitable for disabled people.

10.6 Guidelines

The following guidelines are suggested for the repair or alteration of outside spaces:-

Landscape context. Any development should respond to the qualities of its own particular landscape setting, and priorities should be set accordingly.

New requirements. Consider these at an early stage and discuss them with the local authority, so that they can be properly integrated into the design. Be realistic about how many new dwelling units can be fitted into an existing complex, without major changes to its character.

Setting. Try not to affect the setting adversely by the introduction of obtrusive suburban clutter such as roads and lamp posts, garages, unscreened parking areas, fences and pavements.

Gardens. Only the dwellings originally had gardens. Keep new garden areas around other converted buildings as simple, open and unobtrusive as possible.

Steading courtyards. Retain the original character as far as possible. Do not introduce new divisions, walls or fences, and do not add clutter with street furniture, planting and new paving materials.

Vehicles. Vehicular access should be restricted either to courtyards or to outside areas. Adequate provision for parking and servicing should be made, but with as little change as possible to the outside spaces and landscape setting.

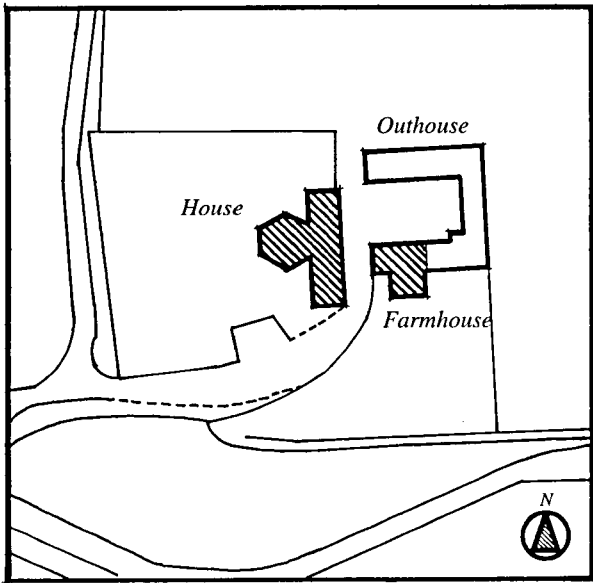
Lighting. Restrict the areas of strong lighting and use lights which answer the needs of each location.

Boundaries. Do not over-domesticate an agricultural or industrial setting with new fences, walls and hedges, particularly in new materials.

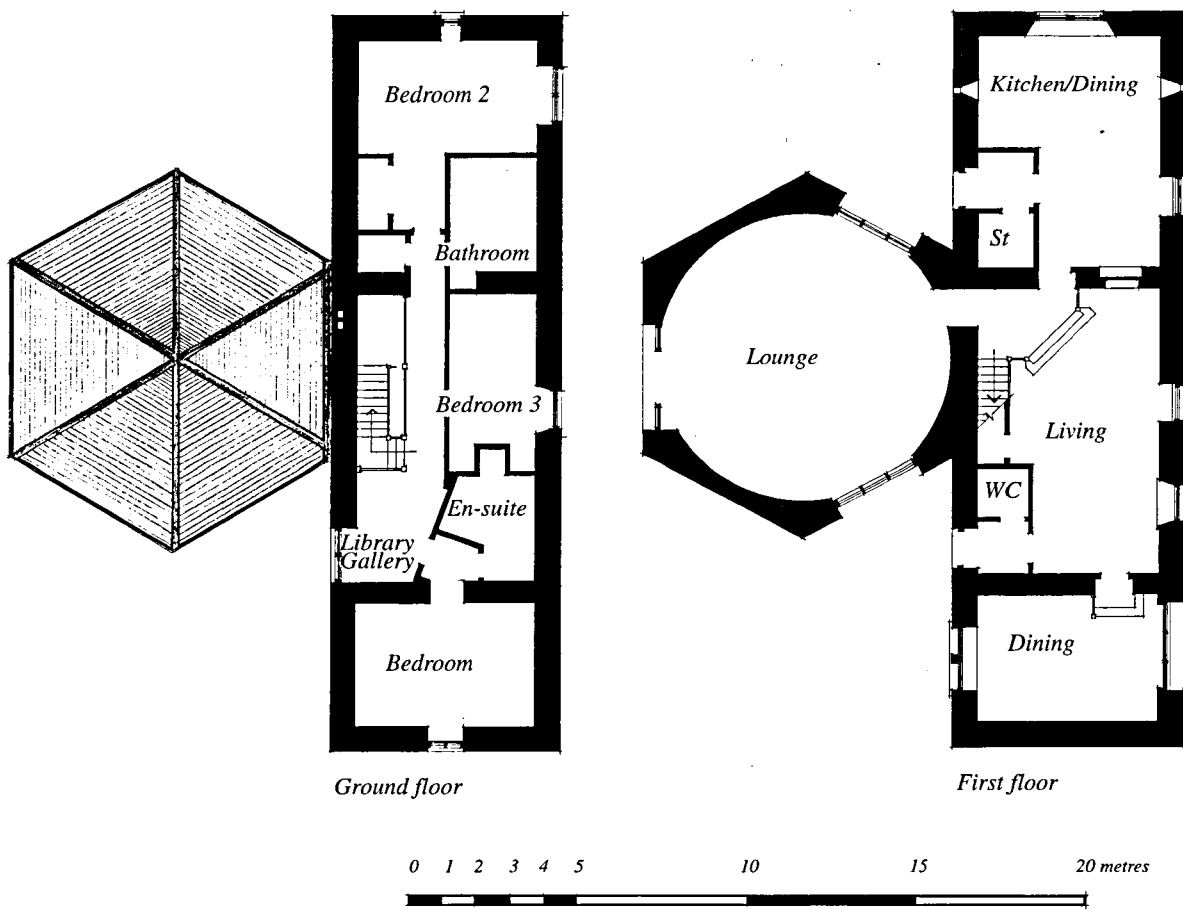
Outhouses and extensions. Reuse existing buildings rather than building additions where possible. Ensure that any extensions, sheds and greenhouses are sympathetic in scale, discreetly located and designed to fit in with the character of the existing buildings.

Hard landscaping. Use traditional local materials and detail them appropriately.

Planting. Use species already growing successfully in the vicinity. Do not plant exotics in an agricultural countryside setting, or impose strong new forms with hedges or evergreens. Any new planting should relate to the existing planting and landscape.



379 Plan of Cauldhame farm, scale 1 to 1250.



380 New house plan following conversion.

11 CASE STUDIES

These case studies are a selection of rural buildings throughout the Lothians which have been repaired, extended or converted. They do not necessarily illustrate the best or only way to carry out such works, and should not be taken as exemplars, being a mixture of good and bad like most projects. It is hoped that highlighting the main features involved, the most successful aspects and the missed opportunities, will be illuminating.

11.1 CASE STUDY 1

Cauldhame farm steading, by Linlithgow, West Lothian (illus 379 to 387).

11.1.1 Background

This courtyard group comprises a single-storey cottage (once thatched), a substantial barn with granary and horse-engine house (or horse mill) from the early-nineteenth century and two ranges of earlier buildings of lesser scale and quality. The complex is listed category B. The walls are of sandstone rubble with droved ashlar dressings and the roofs of pantiles with the exception of a slated early-twentieth century extension to the cottage. The cottage walls have been rendered later. The horse mill, which is octagonal on the outside and round on its inner face, has a complex open timber roof structure constructed radially, and there is a stout cross-beam which retains the bearing which once supported the vertical axle.

The overall condition of the steading before conversion was, at best, poor. Entire sections had collapsed due to rot and failure of the roof structure and supporting walls.



381 General view of the steading at Cauldhame before conversion.

11.1.2 Conversion

The steading was acquired by an extended family for their own use, and planning permission, listed building consent and building warrant obtained. In compliance with local authority policy, the applicant submitted an engineer's report in support of his application, to prove that the buildings could be converted without any need for substantial dunting and reconstruction. A Historic Scotland repair grant was given for works to the barn section.

11.1.3 Main features

The cottage (illus 382, 383). The cottage was tackled first. The roof was reclad in salvaged and second-hand traditional pantiles which were laid with slate easing courses as existed before. The lowest line of pantiles was bedded on mortar. The walls were picked clean of the modern grey cement-based render and a lime-based harl applied, which dried to a somewhat pinkish hue. The windows were replaced by new timber sash and case windows, with heavy astragals matching the previous windows but made to take double-glazed sealed units, and given a subtle, dark, translucent stain to imitate untreated weathered wood.

The barn (illus 384 to 387). New roof trusses were erected on the barn and again second-hand pantiles were used, although without slate relieving courses. Original glass pantiles were salvaged for use elsewhere. Modern rooflights were approved, but following discussions with the local planning authority, these were of the smallest possible size and placed higher up the roof than originally proposed. Cast-iron rainwater goods were introduced for the first time, the gutters being fixed with sarking straps.



382 The cottage at Cauldhame before repairs and refurbishment.



383 The cottage after repair: the later chimney has been removed from the extension and the render stripped and replaced by a lime harl. The windows have been repainted in a dark stain.



384 The horse mill and barn before conversion. The openings were boarded up and the roof in very poor condition, partly recovered in corrugated iron.



385 The north end of the east elevation after conversion. Secondhand pantiles have been used on the roof, successfully avoiding a bright new shiny appearance. A new dormer window has been allowed on this elevation, the details matching those of the loading door on the west elevation. The new window is an inward-opening casement. A plain single-pane glazed door has been inserted in the existing door opening, with a two-pane fanlight above. The ventilation slit has been unobtrusively glazed. The new rooflight is a 'conservation' type, small, divided into two panes and made of cast iron. There are two roof vents showing on the pantiles (but not very obtrusive), and a new masonry chimney has been constructed at the gable (rather a domestic detail). Cast-iron rainwater goods have been provided.

A small area of gable walling which was leaning was taken down and rebuilt, and a cracked lintol over a hay loft opening was repaired using epoxy resin.

Stonework was repointed in lime mortar, missing pinnings being replaced. A large stone threshold was salvaged and reused.

External joinery has been coloured a traditional hue of deep blue-grey in imitation of the flat colour which survived on the original woodwork. An opaque wood stain was used in an attempt to achieve an appropriate flat finish with a one-coat maintenance period of five to six years.

Redundant door openings were fitted with plain glazed frames. The original windows had long gone and the openings had been boarded up, so no evidence remained on which to base the design of new windows, which were all constructed as inward-opening casements (it was considered that sash and case windows would be inappropriate). The main entrance was fitted with a new vertically-boarded door to match the original pattern.

New window openings were kept to a minimum (about four); these were restricted to the smallest size possible and formed with cills, lintels and reveals in natural stone to match the adjoining openings. A second wall-head dormer was originally proposed for the same elevation as an existing loft-access dormer, but this was relocated to the other side following discussion with the local planning authority.

In the interior, large cracks on the inner wall face were raked out and deep tamped and repointed to match the adjacent walls. The walls were then strapped and lined. Timber safe lintels to the windows were replaced in precast concrete.

The horse mill (illus 384, 387). In the horse mill the large arched openings were infilled with glazing which, following negotiations, was designed to have as generous a reveal and as much glazing as possible, with the glazing brought right down to ground level.

The original rafters of the horse mill were retained, although some splicing on of matching sections was required in defective areas. In order to make the mill habitable and satisfy the requirements of Building Control, a layer of insulation was applied between the rafters under the pantiles. The rafters were faced with plasterboard internally, and mock rafter plates applied to its face along the lines of the originals behind. The principal timbers of the roof, in the centre, were left exposed as an open roof to the apex.

11.1.4 Comment

The introduction of rainwater goods and the heavier nature of the modern half-round clay ridge tiles have had an effect on the character of the complex. However, the overall massing and form of the building has not altered, and from a modest distance it is difficult to detect that the group has changed from its original use. This was not a development for commercial sale and as a consequence the owners have treated parking and surrounding spaces in an appropriately informal and sensitive manner.

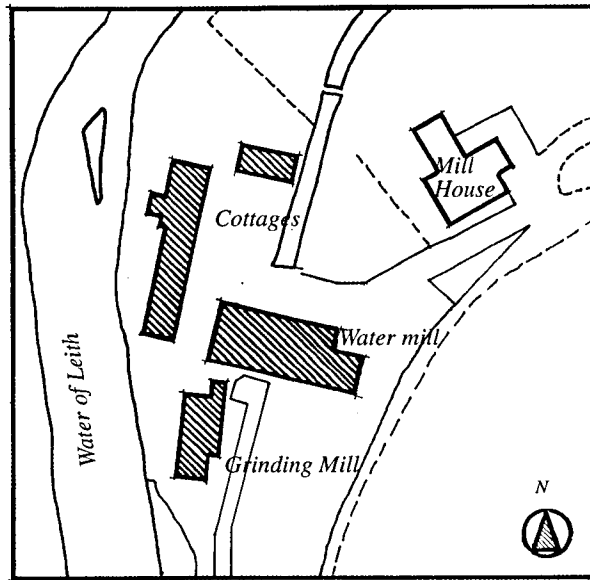
References. For further information on these buildings see the *Statutory List of Buildings of Special Architectural or Historic Interest : Linlithgow Parish* (Item 10), Richard Jaques and Charles McKean *West Lothian: An illustrated architectural guide* Plate C7 and Nils White *The Farmsteadings of the Bathgate Hills* pages 34-37.



386 The south gable after partial reconstruction. Stones were numbered and reused, so that the rebuilt area is not visibly different from the original. Inward-opening casement windows have been provided in the existing openings.

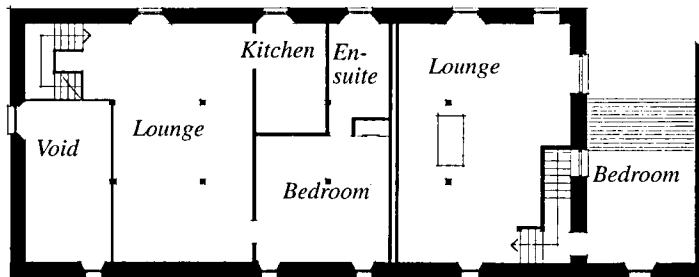
387 The horse mill and barn at Cauldhame after conversion. A new opening has been made to the right, one of only four allowed. The existing openings have had simple inward-opening dark-stained windows provided, partly-boarded for the dormer (which would have been fully boarded). They are generally successful. A new ridge terminal has been fitted to the horse mill, perhaps to ventilate the roof.



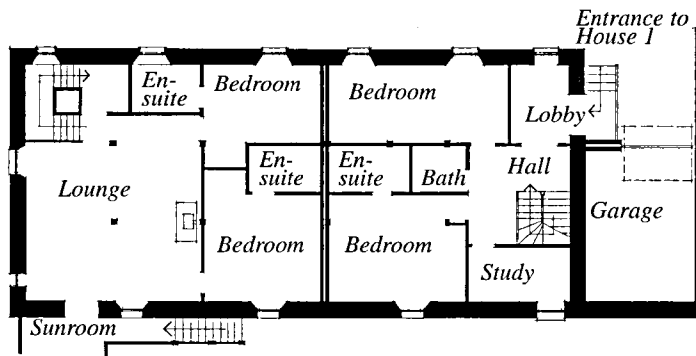


388 Plan of buildings and site at Redhall Mill, Edinburgh, scale 1 to 1250.

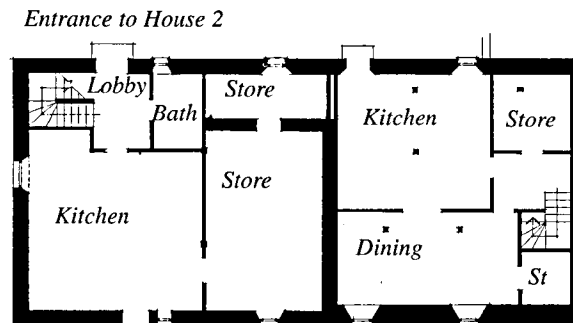
Level 3 plan



Level 2 plan



Level 1 plan



0 1 2 3 4 5 10 15 20 metres

389 Plans for the watermill following conversion to residential use.

11.2 CASE STUDY 2

Redhall Mill, Colinton, Edinburgh (illus 388 to 400).

11.2.1 Background

This mill building is part of a picturesque group situated in a sloping, wooded setting on the east side of the Water of Leith, comprising Redhall Mill, Redhall Mill Cottages and Redhall Mill House, all listed category C individually and C for group value and located within the Colinton Conservation Area. This is a non-statutory listing.

In its present form, the watermill dates from the mid-nineteenth century, although the lower part at the west end is older, at least eighteenth century. The building is two to three storeys high, and constructed of rubble sandstone with scabbled dressings, a slated roof and piend-dormered loft doors (now two, but probably only one originally). There was a grain-drying kiln attached to the east gable, long gone. The mill had a wood-

framed, three-aisled interior on the upper two floors, with an internal water wheel at the centre of the lower level. The original supporting arch for the wheel is still visible, although it has been infilled with rubble below.

The water wheel was replaced by a turbine which was connected to a grinding mill sitting at right angles behind the original mill and attached by a small wooden walkway. The grinding mill was erected in 1902, and was three storeys high, built of brick with external piers to the gable ends and a single-storey lean-to to the south. This mill was in use until September 1958, when it was burnt out and left in a very poor condition.

11.2.2 Conversion

The Watermill. Planning permission was granted in 1985 to convert the old mill into three residential units. The building was subsequently divided, but only into two three-floored 'townhouse' type properties.



390 The watermill at Redhall from the north-east in 1975/6 before conversion.



391 View of the watermill at Redhall from the north in 1985 before conversion.



392 The grinding (or wood flour) mill at Redhall in a ruinous state in 1985 before conversion.



393 The cottages at Redhall in 1975/6 before conversion.



394 View of the watermill at Redhall from the north-east after conversion to two houses. In the roof there are four large new rooflights, a flue and a chimney. There are new glazed windows in the existing openings, even where these would have been boarded. New stone walls divide the road from the other ground.



395 View of the north elevation of the watermill at Redhall after conversion. Only one or two of the openings at the lower level have been altered, and the ground level lowered in front of the mill.



396 The south elevation of the watermill at Redhall, showing the new dormer window, new rooflights, chimney and flue.

The Grinding Mill. Planning permission was granted in 1986 to convert this building into a dwelling house on two floors with a workshop below. The upper floors are now used as offices, but it is thought that it would be appropriate to convert the whole building to residential use.

The Mill Cottages. There are two cottages now amalgamated into one dwelling, with a new extension at the south end constructed in stone with a slated roof. Another building adjacent to the cottages which was demolished some forty years ago, has been recently reconstructed to form ancillary accommodation.

11.2.3 Main Features

Watermill (illus 389 to 391, 394 to 396); **stonework and roof.** When the mill was converted, the stonework

was cleaned and hard cement mortar used in repointing. This work was done some years ago, and it is worth noting that these methods are no longer encouraged in conservation projects. The mortar, although recessed, was feathered around the edges of most of the stones including the supporting arch for the original mill wheel.

There were approximately four new openings inserted, and a few existing openings were modified to allow doors into window openings and vice versa. There have been a number of alterations to the openings over the building's history, and it is not easy to tell when these took place, but the stonework around many is characterised by narrow sills and lintols, and small stone rybats, rather haphazardly inserted. The piended dormer at the rear is probably new.



397 The grinding mill at Redhall after conversion, with a new balcony (using the two cast iron columns from the original interior), new access stair, cement-based render over the brickwork, and modern doors and windows.



398 The cottages at Redhall, now amalgamated and extended and in use as one dwelling. The roofs have been slated.

A new square chimney (or vent) close to the west gable looks more domestic than industrial. The honest tubular steel flue further along the roof seems preferable.

Watermill; windows, doors and rooflights. The windows were replaced by timber single-glazed side and top-hung casements painted white, with astragal patterns similar to those existing prior to the conversion. They would have looked less domestic if painted a dark colour.

Boarded loading doors to the upper floor were replaced by glazed doors (matching the other large windows) with simple black-painted metal railings. Ground-level doors were replaced by new timber-boarded doors.

Four large rooflights were installed to the front elevation, and six to the rear. Originally there were only two small rooflights high up on the front pitch, and these still remain. Smaller new rooflights, even if more numerous, set higher up the roof, would have been more appropriate.

Watermill; vents, lights. Small metal vents have been inserted into the front wall and there are four metal roof vents to the front and one to the rear. Small electric lights have been installed at the entrance to each residential unit. These are all relatively unobtrusive.

Watermill; downtakings and additions. The original first floor link to the grinding mill has been removed.

There is a small single-storey extension, glazed to the front, constructed on the site of the former grain-drying kiln. An original millstone has been built in as a feature on this building. This extension might have been more sympathetic if the glazing pattern had been simpler, perhaps larger scale like the other windows, and with darker, less visible framing.

Grinding Mill (illus 392, 397). The missing parts of the outer walls were reconstructed up to eaves level.



399 Looking east across the site at the cottages and reconstructed ancillary building.



400 The new garage.

The front and east elevations were rendered with a cement-based harl. The existing openings at ground-floor level and in the gables were retained, but the windows and doors were replaced with modern plate-glass timber-framed versions. The roof was reinstated and slated with second-hand Scottish slates. A cast-iron verandah, supported by columns saved from inside the original mill, was added to the front and an external staircase added to the east. The roof of the lean-to (originally slated) was re-formed as a flat roof with a synthetic bituminous finish.

The conversion has destroyed much of the character of the mill, albeit already a ruin before work was started.

Cottages (illus 393, 398, 399). A further extension is being added to the two single-storey mill cottages running alongside the river on the north of the site (which have been amalgamated into one dwelling), and a previously demolished building adjacent has been reconstructed. One of the cottages used to have a pantiled roof, but now all roofs are slated. There are new, rather clumsy astragal windows, over-large glazed doors, and external blind boxes at lintel level for awnings. There is a relatively new decorative metal gate, rather too elaborate for these straightforward and simple cottages. In spite of all these alterations, the modest domestic character is retained, and the original function is clear. Further incremental alterations to the site may eventually erode this clarity.

Garage (illus 400). More recently, a garage has been built to serve the watermill conversion. It is located to the east of the mill and built into the banking. The front facade is of stone (a good example of 'crazy paving' as mentioned in chapter 5, 5.2.1 and 5.2.3) and the gables are cement-rendered. The roof is Scottish-slated with a non-traditional timber fascia and bargeboards.

Mill lade, bridge and walls. The mill lade was retained, as required by the planning authority, and the bridge has been rebuilt in natural stone (recycled stones from a demolished building) pointed with cement mortar. There is a new stone wall alongside the access road, but unfortunately the detailing is not traditional; for instance the coping is too shallow and the wallhead is stepped instead of running parallel to the ground. The new stones do not match the old - they may be granite not sandstone - and are bedded vertically instead of horizontally in many cases. The workmanship is poor.

Ground surface (illus 395). The original sloping ground level against the watermill has been excavated, levelled and retained by new walls. The rather puzzling new basement area in front of the mill obscures the earlier layout, and complicates its previous simplicity. Original setts have been retained and give a measure of

authenticity to the hard landscape, although parts have been relaid. It is likely that the unmetalled track is soon to be surfaced. The ground around the grinding mill is enclosed by a picket fence.

Machinery. All the original mill machinery has been removed from site, apart from a few relics which lie outside and presumably belong to the owner.

11.2.4 Comment

Although the old watermill building has been retained and reused, it now looks domestic in character, despite the survival of many non-domestic features. However, the siting and scale of the watermill and cottages still make the original functions clear.

The former grain mill, luckily less visible from the east bank, has been changed beyond recognition and gives very few clues to its earlier purpose.

The new garage is probably the most obvious and intrusive intervention, because of its very visible location and anachronistic character.

The site overall is now much more formalised and domestic in nature than it would have been, despite the continued domination of its character by the steeply wooded river valley environment. The charm of the setting and of the arrangement of stone buildings makes this an attractive and interesting group still, despite the fact that more of the original form, detail and machinery have been lost than might have been hoped for.

It should perhaps be noted that this conversion was carried out some years ago; current projects have to satisfy more rigorous conservation policies and conditions.

References. For further information on these buildings, see the RCAHMS survey and NMRS photographs, as well as the Dean of Guild/building warrant drawings held by the local authority and *Statutory List of Buildings of Special Architectural or Historical Interest*.

11.3 CASE STUDY 3

Bield Cottage, Linlithgow, West Lothian (illus 401 to 404).

11.3.1 Background

This cottage, originally built overlooking open fields on the south boundary of Linlithgow, dates from around 1800 and is a good example of building in local whinstone with droved sandstone ashlar dressings, which is typical of the rural scene in this part of the Lothians. The building is listed category C(s).

11.3.2 Extension

The owners sought planning permission and listed building consent to remove a small, single-storey extension and replace it with an extension containing improved accommodation. Consent was granted subject to the construction of the walls in whin and the use of natural sandstone dressings to match the original cottage.

11.3.3 Main features

Rubble stonework. As whin for building purposes is no longer quarried, the applicant had to spend a considerable amount of time sourcing second-hand

material of an appropriate nature. By its very nature, whin occurs in outcrops of highly localised colour and perfect matching is rarely possible. Once a suitable supply was found, the applicant undertook trial masonry samples for inspection by the local planning authority. The success of the finished wall treatment has been achieved through the use of a generous number of pinnings and an appropriate lime mortar chosen to match the texture and cream colour of the original.

Sandstone dressings. These were tooled in the manner of the original windows, but were not toothed into the rubble in the same informal fashion, being cut rectangularly on all sides (illus 403). The new stone at first contrasted greatly with the dark whin, but has since toned down considerably.

The windows. These are timber, sliding sash and case, have been painted green with white astragals and putty in a traditional manner.

Roof. Although the main cottage roof is in clay pantiles, it was felt appropriate to extend in second-hand slate, to differentiate between the new work and the existing. This has resulted in a less heavy appearance than would be achieved with pantiles, which is appropriate given the lower height and smaller scale of the extension in relation to the main cottage. The minimum number of low-profile slate-sized vents



401 Rear elevation of Bield Cottage, showing previous (rendered and slated) extension.

have been used. Cast-iron rainwater goods, painted black, have been employed throughout.

11.3.4 Comment

This is in many ways an exemplary example of an extension, beautifully built with carefully selected materials, matching where appropriate, although one or two details could have been improved. The local planning authority placed particularly stringent conditions on materials because of the listed status and high visibility of the building.

References. For further information on this building see the *Statutory List of Buildings of Special Architectural or Historic Interest: Linlithgow Burgh* (Item 144), West Lothian.



402 New, larger extension, built of whin rubble with sandstone dressings around windows and at quoins and skewing. The slated roof differentiates it from the original building.



403 The quality of the new rubble stonework is exceptional, although the dressings are a little too square-cut and the stones beneath the lintel should have been long ones (outband instead of inband), with those below adjusted accordingly.



404 New nine-pane sliding sash and case window, painted green and white in a traditional manner. The panes are double-glazed, so the astragals are slightly thicker than in the original windows.

11.4 CASE STUDY 4

Redside Steading, East Lothian (illus 405 to 417).

11.4.1 Background

Redside is an early to mid-nineteenth century steading located in open countryside between North Berwick and East Linton.

The steading appears to have been built in two stages; the earlier part with pantiled roofs is to the north and the later, slate-roofed mid-nineteenth century part (dated 1849) to the south. The steading has rubble-stone walls throughout, with droved ashlar dressings. The overall architectural style is simple, but of good vernacular quality.

The steading comprises a double quadrangular group of buildings, including a slated five-bay cartshed with granary above in the east range; a piend-roofed engine house with chimney stump attached to the barn (which has a hayloft door) in the west range; and a symmetrical stable block in the south range, with wide-arched projecting central pend and projecting end gables.

The farm had moved its operations to more modern buildings located well away from the steading, which as a result had been redundant for some time and had fallen into serious disrepair. It is category B listed.

11.4.2 Conversion

The steading has recently been converted into thirteen houses following the granting of planning permission, listed building consent and building warrant.

The principle of conversion to residential use was considered acceptable by the planning authority because the steading was no longer required for agricultural use. No demand had been shown for any other alternative use. It was essential to secure a suitable new use for the steading so as to reverse the process of decay and help preserve the historic building group.

The main challenge was to enable thirteen houses to be accommodated within the conversion without undue loss of the special historic and architectural character of the steading. Thirteen houses is a high number for a steading conversion and produces pressure for considerable change to the buildings to satisfy modern living standards. A reduction in the number of proposed houses would have reduced the extent of physical alteration, but the developer in this case was not willing to accept a lower number.

Following lengthy negotiations involving considerable amendments to reduce the amount of alteration, the conversion scheme was granted planning permission

and listed building consent, subject to a considerable number of detailed planning conditions aimed at safeguarding the historic and architectural character of the steading and its setting. 'Permitted development' rights were removed by a planning condition to ensure that the planning authority retains control over the domestic paraphernalia such as garden sheds, greenhouses, and satellite dishes, which if not controlled can erode the special character of the steading and its setting.

The conversion was carried out by a private developer, and did not receive any grant from Historic Scotland or the local authority.

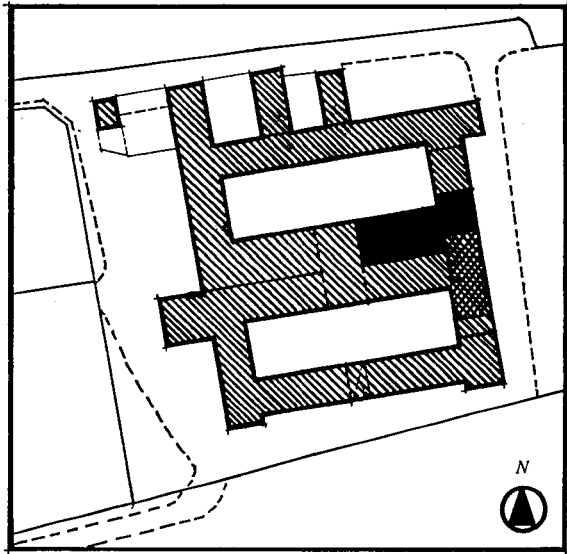
11.4.3 Main Features

Downtakings and Reconstruction. Downtakings were limited to a few corrugated iron roofs within the inner courtyards, plus a dilapidated shed in the north-west outer courtyard. Areas of reconstruction comprised most of the old pantiled roof structures, some of the rubble walls, a byre in the east range (which was rebuilt with eaves 800 millimetres higher to provide habitable room space; this unfortunately altered its scale) and the south range central arch, which was carefully dismantled to enable essential structural repair work to be carried out, and reconstructed to match its previous form. An engineer's report would have been useful in establishing at the outset how much reconstruction was going to be needed, and making sure that only the minimum was allowed.

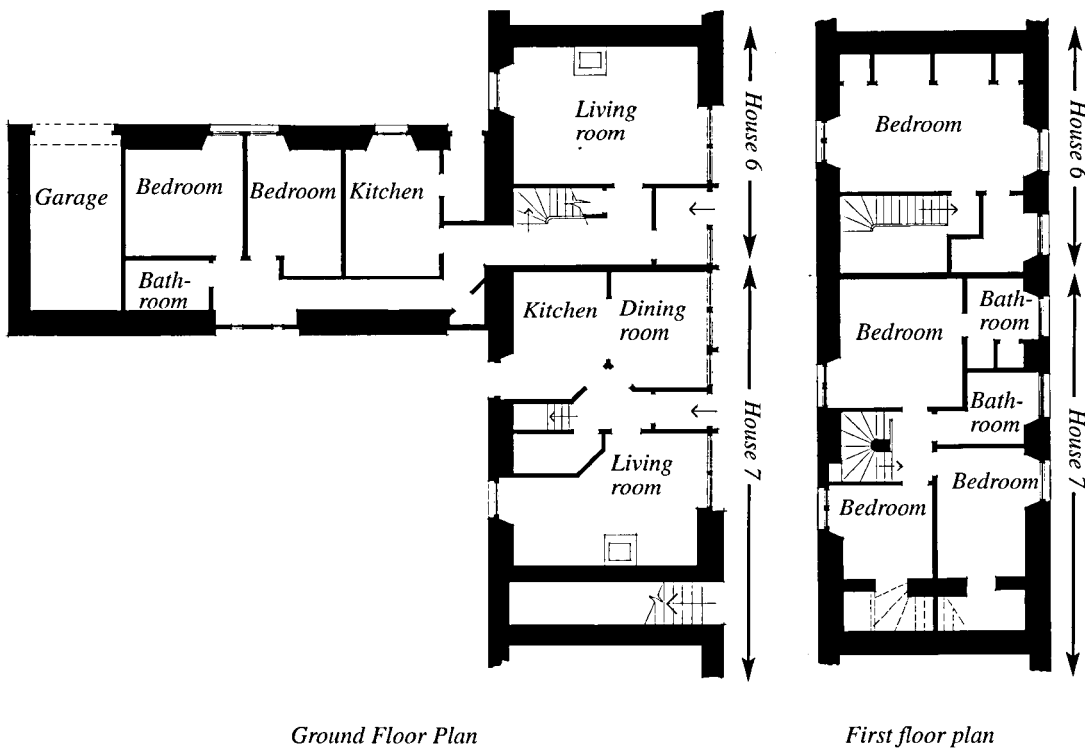
New Openings. The size and number of new door and window openings was kept to the minimum needed to satisfy daylighting and access requirements. However, this still resulted in a relatively large number of new openings (around forty in all), because of the high number of dwelling units involved.

Wider openings. All the existing wider openings were retained and infilled with dark-stained timber-framed and glazed screens. These include the east range cartshed openings, where the glazed screens are deeply recessed behind the columns so as to retain the shape of the original openings and prevent reflections in the glass disturbing this character. Glazed parts of the timber screens and doors are non-astragalled, to minimise the amount of timber framework. The approved 'dark' stain has turned out to be a rather obtrusive red-brown. It would have been better if a really dark, matt colour had been used, or a reinstatement of the blue-grey and dark green colours evident before conversion.

With the exception of the arched opening in the west range, all wider openings have been provided with 225-250 millimetre deep dark-stained timber lintels to replicate the original timber lintel detail.



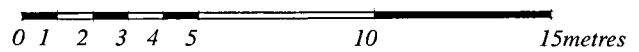
405 Plan of Redside steading, East Lothian, scale 1 to 1250.



Ground Floor Plan

First floor plan

406 Plans of houses 6 and 7 following conversion to residential use. (House 6 shown black and House 7 shown cross hatched in illus 405 above).



A timber sliding door was retained for the wider 'engine house' opening. Regrettably the adjoining arched opening has lost its original timber side-hung double doors.

Sash and Case Windows. There were previously only a few sliding sash and case windows, with nine or twelve panes in the formal south range, and four panes in the cottage in the north-east corner. New and replacement windows (except in the granary) are nearly all nine or twelve pane sash and case, although four-pane were approved for the cottage.

The new windows are double-glazed, but this is only apparent on close inspection, when it is evident that the astragals are slightly thicker than they should be in order to accommodate the double-glazed units. In

general the windows are too standardised. With hindsight, a more varied window style would have been more appropriate to the agricultural character of the steading.

Shuttered Windows. The new granary windows were specifically designed to replicate, as closely as possible (though fully glazed), the pattern of the original timber-shuttered openings with small top lights. The small hayloft door above the centre of the cartshed opening has been reduced to a smaller window opening to match the granary loft windows. It would have been preferable to retain the door opening unchanged.

Timber Colour. All windows frames are dark-stained timber. See previous comments on appropriate colour choices.



407 Redside steading from the south-west before conversion, showing the entrance front at the right (behind the caravan), chimney base, engine house and barn in the centre, and the cattle court complex to the left.



408 Redside steading from the south-west after conversion. The chimney base has been retained. The road has been moved away from the buildings, outside a new stone wall enclosing the gardens, and parking and garages have been provided on the outer side of the road. Box vents on the roofs have been reconstructed, and there are two additional symmetrically-placed window openings in the entrance frontage.

Rooflights. These have been kept to the minimum necessary for daylighting and ventilation requirements. They are located mostly on the inner courtyard roof slopes and are flush-fitting with minimal flashing. Rooflights are of the modern type, but approval was given for a central dummy glazing bar to reduce the scale. The skylights sit well and fairly unobtrusively in the slated roofs, but the dark colour of the frames and flashings stand out too much on the pantiled roofs. It would be beneficial if the manufacturers produced terracotta-coloured frames and flashings for rooflights to be used in pantiled roofs.

Roofs. Vents were concealed wherever possible. Eaves ventilation was hidden behind cast-iron rhones and overhanging tiles or slates. Ridge ventilation is flush-fitting under the clay ridge tiles. Original-style timber louvred ridge vent boxes were reinstated or repaired to provide further outlet for vents, including outlets for bathroom mechanical extractors. Their retention was important for the roofline, but they would have been better painted a darker colour. Metal flues were used instead of new masonry chimney stacks, as they were considered more sympathetic to the character of the farm steading (although they appear too shiny; a matt finish would have been less obtrusive).

Masonry. The use of artificial stone for new and replacement stonework was not allowed. 'Blaxter' natural stone was used for new dressings - rybats, cills, lintels, skew copes etc. - and tooled to match the existing. Second-hand rubble was used for the remainder of the stonework.

Mortar. Mortar analysis was carried out by the Scottish Lime Centre, who recommended a 1.3 mix of mature lime putty and 'Gowrie' fine sand for ashlar joints, or 'Gowrie' coarse sand for rubble stone work. Inspection on site shows new pointing to be considerably lighter in colour than the original, but it is hoped that it will darken over time.

Central Courtyard. Internal courtyard walls, stone gate piers and feeding troughs were retained. The walls provide useful boundary lines whilst preserving an original feature of the steading. Some of the feeding troughs have been used for planting flowers. There are no new walls or fences. The internal courtyard was surfaced with loose chippings where previously it was concreted and gravelled. Simple timber field-style gates were used between the stone piers. These are rather too small in proportion to the walls; the original gates were probably the same height as the walls.

Outer areas. The perimeter of the site around the steading has been treated simply with grassed areas sub-divided by 500 millimetre high knee-rail fencing to delineate each garden. The fencing was kept low to try to minimise its impact, and illustrates the difficulty

of meeting the need for boundaries between ownerships while keeping the area uncluttered. Further means of enclosure is provided by existing field boundary walls.

A new site access road around the perimeter of the steading was reduced from the originally proposed 5 metre width to 3.9 metre width - the minimum necessary to allow for refuse collection vehicles. The new road is set further away from the buildings than the original access, so as to leave space for gardens next to the buildings. This unfortunately intrudes into the field pattern and so increases the impact on the countryside.

Parking needs are met by four relatively small new garage blocks positioned around the perimeter of the site. These have harled walls and slated piended roofs. There are also open parking bays beside the garages.

Additions. Apart from a small infill extension in the north perimeter courtyard and the detached garages described, the conversion required no additions to the steading. The infill is of rubble stone with a pantiled roof to match the existing buildings. It replaced the previous metal-roofed structure. The extension cannot be seen from outwith the steading site, and does not detract from its general character. Garages are detached from the steading and positioned outside the perimeter road. This allows the clear view of the steading to be retained.

Subsequent to the completion of the development, a conservatory has been approved and built for the house in the north-west corner of the steading. It is positioned in the outer north-west courtyard, where a previous timber farm shed was located. This shed was dilapidated and removed as part of the approved downtakings. The conservatory was considered acceptable in view of the previous existence of the shed, and in view of its design being tailored to fit in alongside the stone wall of the north courtyard, and between the house and a stone outbuilding. It has a stained finish to the timber frame, to match the other external timberwork in the steading. Given its particular location and design, it is not obtrusive.

11.4.4 Comment

This conversion includes a large number of dwelling units, and shows the substantial demand for alteration to a steading in such a conversion. The finished scheme is a significant improvement on the original application, illustrating the importance of investing time and work to achieve a more satisfactory solution. Even so, in this case the high number of dwellings resulted in new garages, and more extensive changes (for instance new windows and rooflights) than would otherwise have been needed. Detailed design was rather standardised and the treatment of gardens and outside spaces generally has had an inevitable



409 Redside from north-west before conversion.



410 Redside from north-west after conversion. Ruinous roofs have been reroofed in machine-made clay pantiles, and skew copes renewed in stone, giving the roofs a new and uniform appearance. There are some new rooflights visible, one of them rather large and shiny new metal flues. The most obvious change is the provision of parking spaces and low fences, as well as new garages (the latter not visible in this view).



411 Redside from the south-east corner before conversion, showing the cartshed and granary, and cottage beyond.

412 Redside from the south-east after conversion. All the wide openings have been infilled with windows and doors to form living accommodation. These are well-recessed, but would have benefited from a darker colour to the timber, and having either more timber and less glazing (like boarded doors) or more glazing and less timber (similar to open arches). The granary windows replicate the previous framing pattern, but the larger loading door has been reduced in size to match the windows. There are a number of large new rooflights. The gardens are divided by low post and beam fences, a compromise between the need for boundaries and a desire to keep these inconspicuous.





413 Detail of granary windows after conversion

suburbanising effect. However, it is considered that the agricultural character of the buildings has generally been maintained and that they have been restored to a viable use which should ensure the long-term conservation of the steading.

References. For further information on this building see the *Statutory List of Buildings of Special Architectural or Historic Interest*, North Berwick Parish (Item no 20) East Lothian.



416 Redside steading before conversion; cattle court and shelter shed.



414 Redside steading during conversion; arched opening with double doors, and sliding door to engine house at right.



417 Redside steading after conversion; shelter shed removed and cattle court used as a private courtyard for a dwelling. The left pillar has been rebuilt, but is still waiting for its cope. The stonework does not match the original in course heights, numbers of stones in each course, dressed finish or width of joints, though it is constructed in natural stone and pointed with lime mortar. The granite chippings were used throughout to provide a straightforward and practical ground surface, but are not a local material, nor a very comfortable one to walk on. Agricultural gates were retained to the courts. However the original gates were probably taller (hooks remain for their hinges) and had either solid or slatted vertical boarding.



415 Redside steading after conversion; glazed infill to openings, but sliding door retained as outer door to right-hand opening. The right side of the arched opening has been crudely rebuilt (although natural stone and lime mortar were used).

11.5 CASE STUDY 5

Tigh-mam-muc, Damhead Farm, Lothianburn, Midlothian (illus 418 to 429).

11.5.1 Background

The main steading forms an open U-shaped courtyard facing west, of rubble with ashlar sandstone dressings and slated roofs. It was constructed about the middle of the nineteenth century, and used for farming until a few years ago. There is a large farmhouse just in front of the steading, and a few recent houses built around it. All the buildings are unlisted.

11.5.2 Conversion

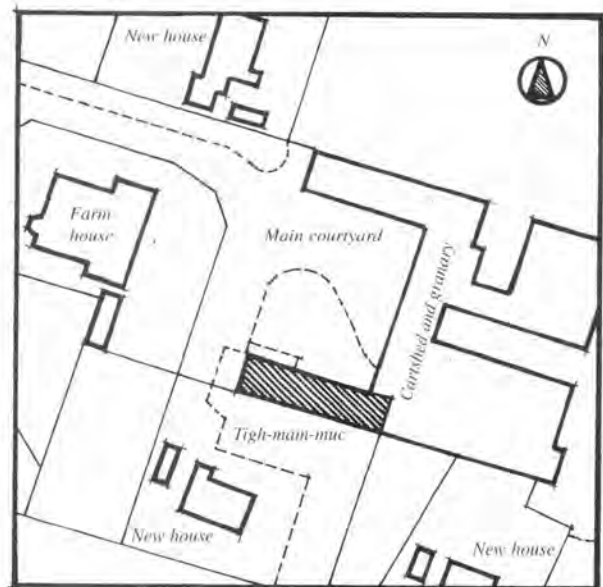
Two years ago the steading was divided into several lots, offered for sale individually for conversion to houses. The property known as Tigh-mam-muc, which forms the case study, comprises the south-west wing, previously a barn, stable, pig house and subsidiary agricultural spaces. Because the houses were individually converted, there are very different treatments within the same complex. Only in a few instances are treatments coordinated (as in relation to the colour used for windows and doors in the two dwellings on the south side of the courtyard, for example). Since the buildings are not listed, changes were not subject to the same level of control by the planning authority as in some of the other case studies.

11.5.3 Main features

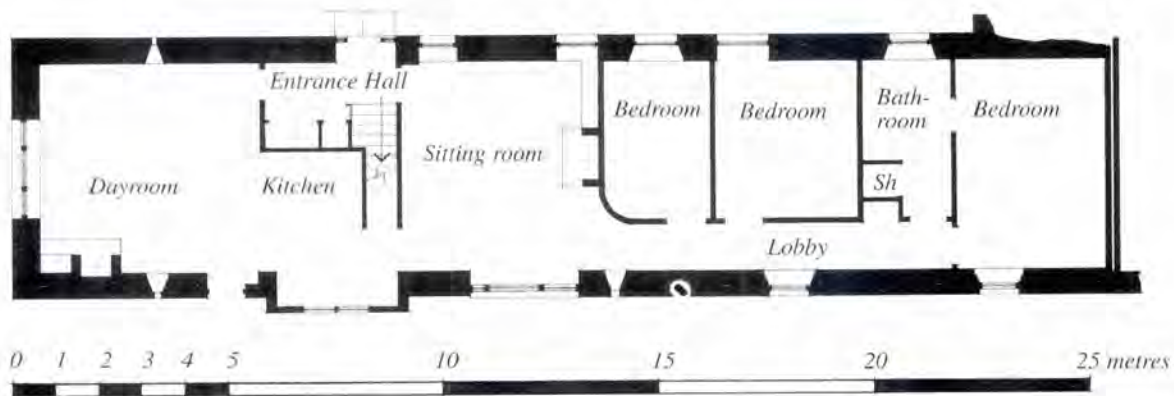
Roof. The roof has been reconstructed as it was in poor condition. At the eastern end, above the bedrooms and bathroom, the timber rafters and ties have been renewed, the ties being exposed in the corridor, but hidden above the ceiling in most parts of the rooms. Above the living room, the roof has been left open, the

structure being tied with two cross ties and a longitudinal truss system, all in steel, painted bright colours and exposed. Rafters are concealed behind the plaster. The extra height allows a gallery over the kitchen, beneath a glazed dormer (roofed in stainless steel) leading to a metal balcony at the rear.

Externally, the reslated roof has been carefully detailed to reduce the clutter of pipes and vents needed for modern services and roof ventilation. Eaves ventilation has been incorporated with a twenty five millimetre gap above the wallhead, concealed behind the cast-iron gutter and protected by gauze. This is virtually invisible. The soil ventilation pipe terminates in a proprietary 'slate' so that it does not protrude above the roof. The mechanical air extract from the bathroom,



418 Plan of Damhead steading, Midlothian, scale 1 to 1250.



419 Plan of house called Tigh-mam-muc, Damhead farm, following conversion to residential use.

instead of being taken out through the roof in a pipe, is taken out above the bathroom window with a twenty five millimetre slot above the window externally being the only visible evidence of it. This is a proprietary system.

There are two new rooflights in the rear roof pitch, one small, but the other larger than it had to be to satisfy building regulations. The reason for this was to make it the same width as the window below, with which it is aligned. However, it would have looked more in keeping with the agricultural character of the building if it had been smaller. Another change was the construction of a rendered chimney in the rear roof pitch. It is similar to an existing one at the far side of the steading, which is why it was decided to construct it as a chimney rather than as a metal flue pipe. This serves to confuse the reading of a steading's history and is therefore not recommended. The chimney cope is still to be added.

Masonry. One of the positive aspects of this conversion is that very little has been done to the masonry. There is no patching or recent cement mortar. There is a good existing mortar, which only needs to be replaced where loose or missing. There has been no alteration to the masonry at the front, but at the rear two substantial lengths of wall have been removed, to allow the insertion of large windows letting light and sun into the living room. Previously this rear wall had very few openings (as is characteristic of outer steading walls) and opening up a wall in this way is to be discouraged, particularly for the adverse effect it has in changing the views and character of the steading in its setting. However, in this case the setting had already been compromised by the construction of new houses behind this wall.

Openings. Windows within existing openings are new, but follow the form, details and materials of the earlier ones as closely as possible, and the masonry openings have not been altered. For instance, where there were four-pane fixed lights with two-pane hoppers above, building regulations required a larger opening light. The windows are now six-pane side-hung casements with the same timber frame dimensions and astragal sections as before. Slit vents have simple deep-set unframed glazing. Doors, however, have been more obviously altered. Boarded doors at the front were replaced by glazed timber-framed double doors, within the existing openings, where daylighting and ventilation were needed to the bedrooms. The front door is in a previously heightened stable door opening, and retains this height, but glazed sidelights have been included in the opening.

The new window to the wide-arched opening in the west gable has been set back well behind the internal wall face, so as to retain the feeling of an open arch. Although some window divisions are visible, these are painted a dark blue (as are the other doors and windows) and are unobtrusive from outside. It is evident from hinges remaining here that there were previously double outward-opening doors, and the intention is to reinstate these in vertically-boarded timber, for privacy.

Where new openings have been inserted by the removal of wall and roof at the rear, there has been no attempt to make the windows and doors appear traditional. The character is uncompromisingly modern, the material is uPVC (dark blue externally to match the other paintwork) and the design, particularly of the glazed dormer and balcony, is successful despite being so radical.



420 *The south side of the courtyard during conversion.*



421 *The same range seen from the rear before conversion.*

The dark blue is a good colour for window frames, but the earlier green (used across the courtyard) could have been matched.

Interior. The detailing is modern.

Landscaping. This has still to be completed. To the courtyard at the front the ground surface has been treated very simply, with lawn and gravel paths. Although the original surface would have been hard, this is a reasonable and unfussy way of satisfying the need to indicate public and private spaces without fences or walls. Wire fences have been used for boundaries at the rear wherever possible, in view of their agricultural character and unobtrusiveness (illus 427).

11.5.4 Comment

This is an unlisted steading, divided into several lots with individual conversions. The information from the owner/architect of the house used as a case study was that the poor condition before conversion resulted in a need for reroofing, replacement of doors and windows and complete internal refurbishment.

Because the setting had been altered and the views blocked, the preservation of the existing form in relation to the landscape was not given such a high priority as it might otherwise have had. In this house, a



422 *Interior during conversion.*



423 East end of the south courtyard front, adjoining the cartshed and granary (which is in different ownership), during conversion. The ridge vents have not been renewed.

fairly radical and interventionist policy was adopted towards the treatment of the interior and the opening up of the rear wall in particular, while a more conservative approach was maintained to its courtyard frontage and to the traditional external materials and details. There may be differing views on how appropriate it was to make such a major alteration to the rear of the existing building.

This conversion scheme of part of a steading group has been successful in terms of producing a good quality refurbishment and a viable long-term use.

Despite the varied nature of other conversions within the scheme, this one has tied in as well as it could to the adjoining buildings, and much of the agricultural character has been retained in the courtyard. The



424 The north side of the courtyard (in different ownership) is unconverted.



425 The cartshed and granary to the left of the pend. The similar building on the right of the pend has been converted. It is not clear if the double doors to the arches are original or later. At each corner there was a door to the upper floor, with a stone forestairs.



426 Boarded doors to the front have been replaced by glazed doors, but windows have retained the six-pane pattern and astragal section. The cart arches belong to the adjoining house, but frames are the same dark blue. The white garage door is more obtrusive; it could have had boarded double doors similar to those on the remaining cart arches. The granary windows (above the cart arches) appear to have been four-paned to the right of the pend, a fenestration pattern which has been retained. The stone forestairs in the corner has been removed.



427 Rear elevation showing openings (to left) where masonry has been replaced by windows and roof by the new glazed dormer and balcony. A major change to the character; but limited to one area. See also the open wire fence (to left) in contrast to the neighbour's solid timber fence (to right). As the window head in the bedroom (centre) is low, a rooflight was required for ventilation, but could have been smaller.



428 The gable arch has deeply recessed window with a dark frame. Original hinges remain, and double doors (vertically-boarded and outward-opening) may be reinstated.

unconverted buildings on the north side of the courtyard make a major contribution to this. The modern garage door in the adjoining property is the most jarring intervention in the courtyard frontage. However, the new dormer could also have been designed less obtrusively, as it is visible above the roof from the courtyard.

The relatively small number of dwelling units contained in the steading (about five) means that there has not had to be any special provision for parking or improved vehicular access.

The treatment of the arch in the south-west gable is a good example of how to infill such an opening. At the rear (south side) where the surroundings have become residential, the new glazed sections of wall and the dormer are disruptive to the character of the original building, but are not visible from any distance.

The setting of this steading had already lost the clarity of the relationship between farm and landscape, because of the building of new houses around it. Fortunately the mature trees sheltering the farmhouse and drive conceal much of this recent development from the road view.



429 Slit vent glazed in a single sheet of glass, seen from inside.

11.6 CASE STUDY 6

Thornybank Steading, Cousland Road, Dalkeith, Midlothian (illus 430 to 438)

11.6.1 Background

This mid-nineteenth century group of single-storey cottages and workshops, constructed in squared and necked rubble sandstone with ashlar dressings and slated roofs, is on the Buccleuch Estates. There is a separate two-storey former farmhouse alongside. In the yard there was a later sawmill (apparently the first electric sawmill in Scotland), closed and burnt down in 1974. The cottages are in residential use, but the workshops were no longer needed for estate use. The main structure of the workshops was in a reasonable condition, although doors, windows and interiors were needing attention. Thornybank Cottages, House and the gates to the Steading are listed category C(s).

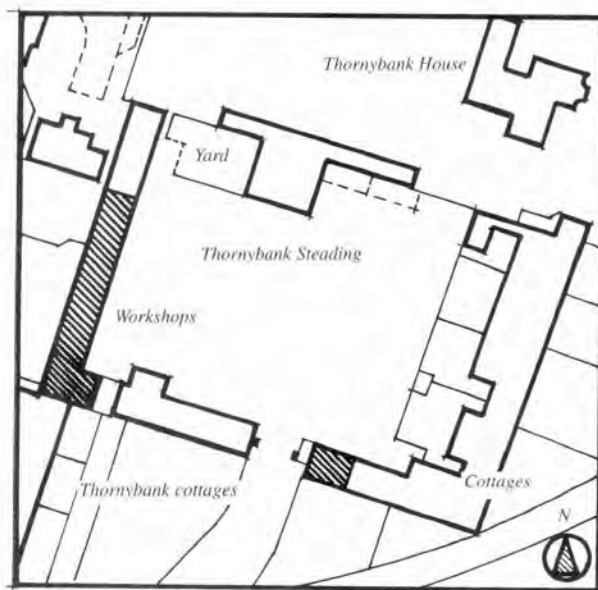
11.6.2 Repair and alteration

A joinery firm specialising in the repair of traditional windows moved into the empty joiner's shop, tractor shed (probably originally a cartshed) and smithy some three years ago. These occupy most of one side of the courtyard. A conservation philosophy of minimal change was adopted, and only a few alterations were made. There was no change of use, so no planning permission was required (although listed building consent has to be obtained for alterations where in the opinion of the local planning authority they affect the character of the listed building). The company has recently gone out of business, so is no longer using these premises.

11.6.3 Main features

Windows. The large cast-iron fixed-light windows are typical of workshops, with the work benches (most of which have been retained) located in front of the windows for well-lit working conditions. Three of these windows were modified to provide opening lights. The two sections of cast-iron frame in each were taken out and cleaned down, repainted and reglazed with old float glass, then hinged at their junction and resecured, so that the top half now opens inward as a hopper. The only visible change is that externally there is a narrow timber plate masking the joint. Nevertheless, the detail could have been made less obvious. Although there is a change to the original method of functioning and a visible change of detail, the existing window has been kept and the alteration is reversible.

Doors. Originally the wider openings are likely to have had side-hung outward-opening double doors, but



430 Layout plan of Thornybank Steading 1 to 1250.



431 Thornybank Steading before the recent changes to windows and doors. Previous alterations of an ad hoc nature included glazing inserted into the sliding door.



432 This illustration also includes the same part of Thornybank Steading after window alterations and renewal of the door.



433 Late-nineteenth or early-twentieth century sliding doors to wider openings seen here before renewal.



434 Sliding doors have been renewed to match the existing ones which were in poor condition. The right-hand end of the range is used by a different business.

these were replaced in the late-nineteenth or early twentieth century by sliding doors. These vertically boarded, V-jointed sliding doors have where necessary been remade to match, and stained dark brown, as before. The existing kickplates and sliding mechanisms have been repainted and refixed. The hinged doors to smaller openings have also been renewed to match the existing ones.

Wider opening. One opening has been infilled with a modern window and timber boarding below. This is screened by a sliding door when the room behind is not occupied, but looks out of place when the door is open. Even within the constraints of a cheap solution, a more appropriate secondhand window could have been used.

Internal alterations. Since these were workshops, the interior finishes are basic. There have been some changes to partition walls (none original), but the main change was the laying of a concrete floor over what was left of the original in the smithy. The stone slabs were broken and patched, and did not provide a

sufficiently safe and level floor for machinery. The original floor was left in place and the concrete laid over a breather paper. In theory, therefore, this is also reversible. In the office areas, walls and ceiling were lined and insulated, and the existing concrete floor levelled for carpeting.

Open storage area. The covered but open-fronted accommodation on the other side of the entrance gateway was also used by the same company. It was enclosed by the erection of a horizontally-boarded screen wall, the erection of a horizontally-boarded screen wall, two nine-pane windows, and vertically-boarded outward-opening double doors, painted grey. There was no evidence of previous enclosure, so this was a new intervention. The screen wall and doors could have been neater if constructed in brown-stained, vertically-boarded timber to match the other sliding doors, and without visible windows (these could have been concealed behind a sliding or hinged door, as the new window in the other range is). They should preferably have been recessed more deeply, to retain the sense of an opening.

11.6.4 Comment

The repairs and alterations to these buildings have been carried out very much in the vernacular tradition. Because the basic function was still similar, it was possible to restrict change to a minimum, making ad hoc adjustments only where needed to suit a changed method of operation. All were cheap, some ingenious and some temporary. Only where existing elements of the fabric needed repair or renewal were long-term, better quality standards used, as with the external doors. However, all the changes are reversible and all the original elements were kept where their condition allowed.



435 Unaltered original cast-iron fixed-light workshop window.



436 Workshop window after alteration to include opening hopper.



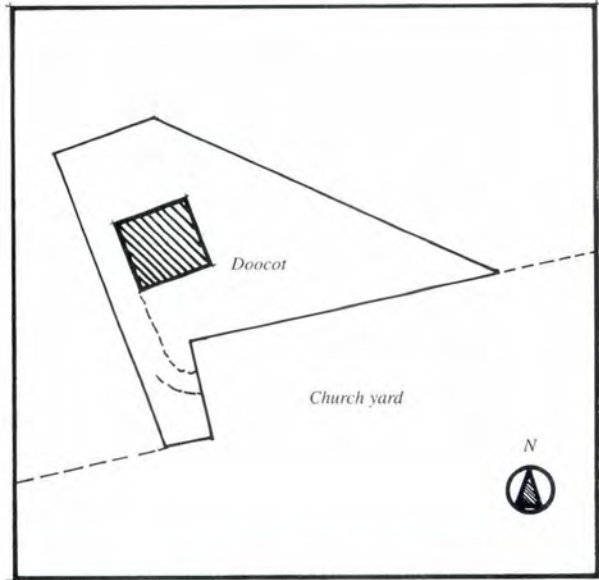
437 Open-fronted store at Thornybank standing before enclosure.



438 Store after erection of screen wall with doors and windows.

Because this is a coherently designed building group, with most of the original elements intact, it might be desirable in the long term to restore any original features which have been lost, but for which there is good evidence, for instance double doors to the arched openings.

References. For further information on this group of buildings, see the *Statutory List of Buildings of Special Architectural or Historic Interest: Dalkeith Parish* (Items 22 and 23), Midlothian.



439 Site plan 1:500 of Athelstaneford doocot.



440 Athelstaneford doocot from south-west before works.

11.7 CASE STUDY 7

Athelstaneford Doocot, East Lothian (illus 439 to 447)

11.7.1 Background

This sixteenth-century lectern-type doocot, category B listed, is located in a field behind Athelstaneford Parish Church. The construction is of rubble sandstone with stugged dressings, two rat courses (projecting string courses intended to prevent rats from climbing up and entering the flight holes) and crowstepped gables. The roof is Scottish-slated with a line of flight holes across the centre of the pitch. The entrance doorway is in the west elevation and has a carved lintel dated 1583 with the initials GH. There is a small opening above the first rat course in the south elevation. Evidence of original lime harling can be seen on the rubble masonry. The north elevation has been partly rebuilt in brick, possibly early in the twentieth century.

The bare rubble interior has brick to the north wall (where rebuilt) and brick nesting boxes (probably original) to approximately half of the east wall. There are also original stone nesting boxes on all the walls, but only at low level on the north and south walls. During the repair works, brick was found in the centre of the rubble masonry of the walls. Since this appears to be part of the original construction, it suggests that the brick was made locally in the sixteenth century.

The building was repaired and reroofed in the nineteen eighties to protect the fabric.

11.7.2 Conversion

There is an existing Saltire memorial in the churchyard of Athelstaneford Parish Church. The doocot adjoins the north side of the churchyard, and is owned by East Lothian Council. A long-term lease was granted in 1995 to the Trustees of the Scottish Flag fund, at a nominal annual rental. Since then, the doocot has been restored and converted to form a Flag Heritage Centre. The purpose of this centre is to enable visitors to learn about and appreciate the origins of the Scottish flag and its usage through the centuries.

The main source of funding was a grant for £46,000 for the audio-visual display facility from the Heritage Lottery Fund. The former East Lothian District Council gave a grant of £10,000 for repair and restoration. A £24,000 repair grant came from Historic Scotland and a £10,000 grant from the Lothian and Edinburgh Enterprise Company.

11.7.3 Main features

Masonry. Cope stones and crowsteps were rebedded and repointed. New matching sandstone cope stones



441 Athelstaneford doocot from south after repair and reharling, showing the new gravel path and simple wire fencing.



442 West gable showing new crowsteps, dressed stone unharled, and flight entry holes in the roof.



443 Skew detail between slating and crowstepped skew copes. There is a newly introduced lead underflashing to give additional protection against water ingress, but it is hidden beneath a mortar fillet, so that the detail does not appear to have changed.



444 The boarded replacement door is similar to the previous one. There are Caithness slabs set into the gravel path at the entrance.

were provided where required. Rat courses were retained, rebbed and repointed, with some new stone indents. Lime mortar was used throughout.

The west elevation doorway was retained unchanged, despite its low height. The later brickbuilt part of the north wall almost collapsed during restoration works, and was repaired and rebuilt using engineering brick and resin ties.

The rubble stonework was covered with a new lime harl, based on the analysis of an original sample, and limewashed in pink. Stone dressings and the rat courses were neither harled nor limewashed.

Roof. The roof was reslated using the existing slates, redressed, and secondhand Ballachulish slates to match the existing. An increase was made in the eaves overhang to shed rainwater more efficiently. New code six lead watergates at skews were inserted, chased into the masonry, and the top edges pointed in lime mortar. Mortar fillets were reinstated in hydraulic lime mortar.

Unobtrusive weatherproofing of the flight holes was carried out to prevent rain and bird ingress. New grey-painted marine-grade plywood was fitted to the flight holes with a glass panel behind.

Openings. The previous entrance door was in a dilapidated condition, and a new boarded door was provided in pre-treated redwood, with dome-headed carriage bolts fixed to new mild-steel bands on the inner face of the door. Black-painted ironmongery was provided, including a reused wrought-iron locking bar from the earlier door.

A new wrought-iron grille was fitted in the south elevation opening, using the existing fixing holes in the jambs. Clear toughened glass was fitted direct into the existing channel in the stone rybats.

Interior. Extensive cleaning out involved the removal of a 1.7 metre-deep pile of pigeon guano, a health hazard requiring careful removal. Existing brick and stone nesting boxes were retained. Internal stone and



445 A wrought-iron grille has been provided at the window, reusing the original fixing points into the masonry, and glazing has been introduced behind it, set into the existing rebate.

brickwork were washed and repointed in lime mortar, then pigmented limewash was applied. The existing earth and ash concrete skim to the floor was replaced with Caithness slabs laid on a semi-dry three to one sand:cement screed, seventy five millimetres thick, and pointed in sand-cement mortar. The interior visual display design included a wall-mounted high-level projector, sound equipment, a security camera and control gear, as well as a map and reading material.

External works. The ground level outside was lowered to facilitate access, and the outer entrance to the doorway slabbed with Caithness flagstones. River



446 Existing brick and stone nesting boxes have been retained.

gravel with a timber edge kerb was used on the path linking the doocot to the churchyard. A new opening was formed in the churchyard wall to allow access. The grounds of the doocot were grassed over and left open, except for a timber-post and rail enclosure fence.

11.7.4 Comment

This case demonstrates an excellent restoration and conversion of a derelict doocot. No new openings were formed, and no alterations to existing openings were made, other than the installation of a sympathetically-designed replacement door, and an unobtrusive glazed



447 Interior at ceiling level after conversion, with part of the visual display screen and other equipment mounted on the roof structure.

screen and wrought-iron grille to an existing small opening. The change of use to the Flag heritage centre is not apparent externally and the works to the interior are generally reversible.

However, this scheme has not maintained the interior as a doocot; in order to achieve the building's conservation, it had to have a viable use. Nevertheless, the historic and architectural character of the doocot has not been lost; the original doocot use is still clearly evident. This is still an important feature of the surrounding landscape and an attractive historic building. Evidence of the past use, including most of the nesting boxes, has been retained.

Its use as a flag heritage centre is appropriate to the location, and trust status ensured that the project was eligible for a wide range of grant funding. The flag heritage centre is attracting increasing numbers of visitors to the Saltire Memorial and has led to wider appreciation of the doocot. Visitor facilities include an information board about the doocot. The existing doorway was preserved unaltered in the interests of the historic character of the doocot, but unfortunately this will inhibit access for the disabled.

References. For further information on the doocot see the *Statutory List of Buildings of Special Architectural or Historic Interest*, Athelstaneford Parish, (Item 4) East Lothian and the booklet *Athelstaneford History* by Athelstaneford Community Association 1998. See section 2 of the bibliography for further references on East Lothian Doocots.

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RCAHMS	Royal Commission on the Ancient and Historic Monuments of Scotland
RICS	Royal Institution of Chartered Surveyors
SPAB	Society for the Preservation of Ancient Buildings
SVBWG	Scottish Vernacular Buildings Working Group

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14 GLOSSARY

Architrave (in joinery) Timber facing around door or window opening, covering junction between outer frame and wall surface.

Astragal Window bar.

Bargeboard (or vergeboard) An inclined timber fascia covering the ends of roof timbers (or thatch) at the gable skew.

Beehole Recess in a garden (or farm) wall designed to hold a beehive or beeskep. Usually in a line of three or four.

Blaes Shale (blue when excavated, but usually used after burning when it is red in the Lothians).

Broached (definition taken from *The Care and Conservation of Georgian Houses* see bibliography, but there may be local variations in terminology; not all descriptions agree) A broached finish is produced by either a toothed tool or a gouge, to form a series of equally-spaced horizontal (or vertical) furrows. Individual stones treated in this way usually exhibit chisel-drafted margins, the furrows being stopped 15-30mm short of the dressed edges.

Came H-section lead frame for glass within leaded lights or stained glass windows.

Cobbles Rounded stones used as paving.

Cot house Farmworker's cottage.

Cottar Married farmworker who has a cottage as part of his contract of employment, tenant in tied house.

Doocot Dovecot.

Dressed (of stone masonry) Cut and tooled or worked smooth.

Droved (definition taken from *The Care and Conservation of Georgian Houses* as for *broached*) A droved finish is produced by a hammer and booster to form a series of 35-50mm wide bands of more or less parallel tool marks. It is commonly applied to relatively inexpensive work.

Feu Feudal tenure of land.

Freestone Building stone (usually sandstone or limestone) which is fine-grained and uniform enough to be worked in any direction, and can therefore be carved.

Gig house Shed for housing a small horse-drawn vehicle.

Galleting Use of small pieces of stone, terracotta tile etc (pinnings) to fill between larger stones in masonry, to reduce the joint size.

Graip Fork.

Harl A thrown finish of lime and aggregate.

Harl point, sneck point, sneck harl or slaister point Pointing spread over the surface of adjoining masonry, so that the faces of larger or projecting stones are left uncovered. Sometimes with 'bag rubbed' finish.

Hind Ploughman.

Horonizing (or shivers) Small off-cuts of stone set into mortar, to provide a hard ground surface.

Horse engine house Circular or polygonal building housing horse and driveshaft equipment to power threshing machine. Also commonly known as horsemill or horsegang.

Hydrated lime Stored in the form of a dried powder.

Hydraulic lime Impure lime derived from limestone containing clay minerals that give mortar a chemical set which is quicker and harder than the carbonation of pure limes. Limes can be feebly, moderately or eminently hydraulic. Hydraulic limes cannot be stored for any length of time because the chemical set will cause them to harden, and they are therefore stored as dry hydrate.

Inband and outband Dressed stones around an opening with alternately longer and shorter stones projecting into the adjoining masonry.

Led Subsidiary, amalgamated.

Led farm A smaller or outlying farm managed through an employee.

Ludge Open-fronted shelter used as a workshop.

Pend Covered passageway or entry.

Piend-roofed Hip-roofed.

Potence Rotating ladder for access to the nesting boxes of a doocot.

Rat course Horizontal line of projecting stone (string course) used on doocots to prevent rats climbing up the walls and entering the doocot.

Rebate Rectangular section cut out along a masonry or timber edge.

Rendering An external plaster system.

Reed Cattle court.

Rhone (or rone) Gutter.

Rybat Dressed stone to the side of an opening.

Safe lintel Inner timber lintel used behind the outer stone lintel to an opening in a wall.

Sarking Roof boarding.

Scabbled (of stone) Roughly faced with pick, chisel or hammer.

Setts Rectangular granite or whinstone blocks used as paving or a road surface.

Skew The edge of a sloping roof at its junction with the gable wall, verge.

Smiddy Blacksmith's workshop, smithy.

Solum The ground below the lowest floor in a building.

Stell A walled enclosure to shelter sheep.

String course Horizontal line of projecting stone.

Stugged (definition taken from 'The Care and Conservation of Georgian Houses' as for *broached*) A stugged finish is produced by forming depressions on the rough stone surface with a mason's punch. A droved margin is often worked on individual stones.

Trevis (or trevis) Stall partition.

Vernacular Native or indigenous, not designed or taught.

Whin Basalt or other dark igneous rock.