



advice series

thatch

A GUIDE TO THE REPAIR OF THATCHED ROOFS

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An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

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1. An Overview of Thatch in Ireland

Thatched houses in Ireland generally belong to the tradition of vernacular construction; simple buildings built according to the established traditions of an area. Such buildings were usually constructed by owners or their near neighbours using natural, locally available materials. The location, layout and setting of vernacular buildings were determined by the lives and work patterns of the people who built them. Owners generally maintained and repaired their own buildings – usually in wintertime when the demands of agriculture were less pressing. The same materials and methods were used for agricultural and storage buildings and for simpler commercial and administrative buildings in villages and towns. In all of its aspects and practices, thatching was historically entirely vernacular in nature. It forms a significant part of the material culture of the Irish people and persists as an iconic symbol of the country.

Kevin Danaher (in *Ireland's Vernacular Architecture*, 1975) summarised the breadth of vernacular construction in Ireland as follows:

‘... it includes all dwellings from the smallest hut to the largest farmhouse, as well as shops, inns and houses in villages and towns insofar as all of these belong to the vernacular tradition and were not designed by professional architects. Agricultural buildings include all those of the farmstead outside of the dwelling-house, the byres, barns, stores, fowl-runs, pigstyes, cart sheds and so on, as well as isolated buildings in the fields and the lime-kilns, well-houses and gateways on the farm. Industrial vernacular building includes craftsmen's shops, forges, boatyards, corn-kilns, windmills and water-mills for grinding, pumping and the working of iron and textiles, and all such installations and workshops which in age or in style antedate the industrial revolution.’

From earliest times until the seventeenth century, thatch was the dominant roof covering used in Ireland; gradually giving way, in the eighteenth, nineteenth and early twentieth centuries, in urban, and later rural, areas to tile and slate. Although now mostly associated with small, rural houses, thatch was historically used as a roof covering on a variety of building types from tower houses and churches to urban terraced houses, farmhouses and smaller industrial buildings.



The characteristic image of the Irish thatched house is of a simple, modest building made from locally sourced materials, sited in the landscape to maximise shelter from the elements

Today there are close to 3,000 thatched buildings in the republic and approximately 175 in Northern Ireland. The majority of thatched buildings now surviving are in rural areas and are generally single-storey farmhouses sometimes with smaller, associated outbuildings. Many of these buildings were built using traditional materials and construction methods, often with specific regional variations. Construction included solid stone walls bonded with clay or lime mortars; walls made entirely from earth or from a mixture of earth and stone; wattle partitions and wattle chimney canopies. The timbers used in the roof structures were often branches from nearby woodlands and hedgerows or, in coastal areas, driftwood found on the beach. Generally, a support structure of hazel rods and/or laths of wood was laid on the roof timbers. In western and northern regions of Ireland, scraw (long strips of carefully cut sods) was laid from ridge to eaves on this framework, generally tied to the roof structure with straw ropes. In much of the east of the country, a thick base coat of straw bundles was tied directly to the roof timbers before a weathering coat of thatch was applied. Throughout much of Ireland, the weathering coat was scoloped, or pinned, into the base coat using long, bent and twisted hairpin-shaped rods of hazel or willow called scollops. In many eastern and midland districts, the weathering coat was applied in knotted handfuls of straw which were thrust firmly into the base layers of thatch. In exposed coastal districts of the north and west where wind speeds can be very high, thatch was frequently further secured with an external network of ropes. The thatching material, scollops, scraw, rope and all the other elements of the roof were usually sourced locally.

A wide variety of cultivated and wild plant materials was traditionally used as thatch, including straw, water reed, sedges and wild grasses. Nowadays the thatch materials are usually straw (wheat, oat and sometimes rye) or water reed. In the past, the straw which was used was usually a by-product of the agricultural activity of the house owner or his neighbours and there was therefore an abundant and regular supply of thatch material. The crop was cut by hand and, latterly, by reaper-binder machines. Both of these methods harvested the straw without damaging it. Straw intended for use as thatch was threshed carefully by hand to ensure that the stems remained unbroken. The thatch was generally repaired every year by the occupants, often assisted by neighbours. Thatching practices and materials changed as the local economies changed – for example when wheat was less widely cultivated, oat straw was used instead. A cross-section through an old thatched roof provides clear evidence of the agricultural practices and crops of former times in the earlier layers of material. Unfortunately, modern intensive farming methods cultivate short-stemmed cereal varieties which are unsuitable for use as thatch. In addition, mechanical threshing crushes the straw to varying degrees, rendering it unfit for thatching. As a result of these developments, the supply of useful thatching straw has diminished considerably. Nowadays thatchers often have to source straw from specialised growers who may be located at a considerable distance. The traditional preference for the use of local materials for thatching has been affected, while improvements in communications and transport enables thatchers to travel greater distances to take up work. These factors have resulted in the incorporation of new materials and techniques into thatch which has diluted the rich variation of regional styles which once existed.



An example of roped thatch from County Donegal – a method of construction developed in response to the high winds experienced along the exposed Atlantic coast



Thatched roofs were once a common feature, not only of the Irish countryside, but of towns and villages too

The maintenance of a thatched roof can be more challenging and costly than that of slate or tiled roofs; however the conservation of thatch is important for many reasons. Historic thatch has significant cultural heritage value because of the record of traditional materials and skills it contains. The use of these traditional materials and their visual attractiveness greatly increase the aesthetic appeal of a thatched building, and the rural landscape in general. The insulation value and energy efficiency of such roofs are well established. Because of the organic and heterogeneous nature of the material, the conservation of historic thatch requires particular attention to be paid to maintenance and to safety. Good maintenance practices are essential for all roof types but particularly in the case of thatch. Frequent minor repairs are important and can include patching the roof or renewing the ridge at regular intervals between major re-thatchings. Thatch should be renewed when the

existing weathering coat has deteriorated to the point where it no longer protects the drier bottom layers of thatch from water damage. Because it is an organic material, thatch must be allowed to breathe or it decays. If a building is left unoccupied and unheated for a prolonged period of time, a thatched roof may quickly deteriorate.

This publication has been compiled as a general guide for owners and custodians of thatched buildings and for their advisors. While it does not offer comprehensive technical advice, it is hoped that thatchers, too, will find it useful in preparing and carrying out projects and in explaining their methods of work to building owners.

It is intended that this guide will help owners to look at their thatched roof in a new light with greater understanding of the extraordinary heritage, skill and craftsmanship of many generations which it embodies. It is also intended to equip them with the necessary information:

- > To understand how a vernacular roof is constructed and to recognise how the different elements of the roof function
- > To be aware of the particular traditional materials and thatching techniques used in their area
- > To address issues which may arise as to the general maintenance of the thatched roof in order to prolong the life of the roof
- > To broadly assess the condition of the roof and decide what repairs are necessary or when re-thatching has become necessary
- > To know where to look for necessary information and expertise
- > To know what questions to ask the thatcher to ensure that the work is planned and carried out satisfactorily

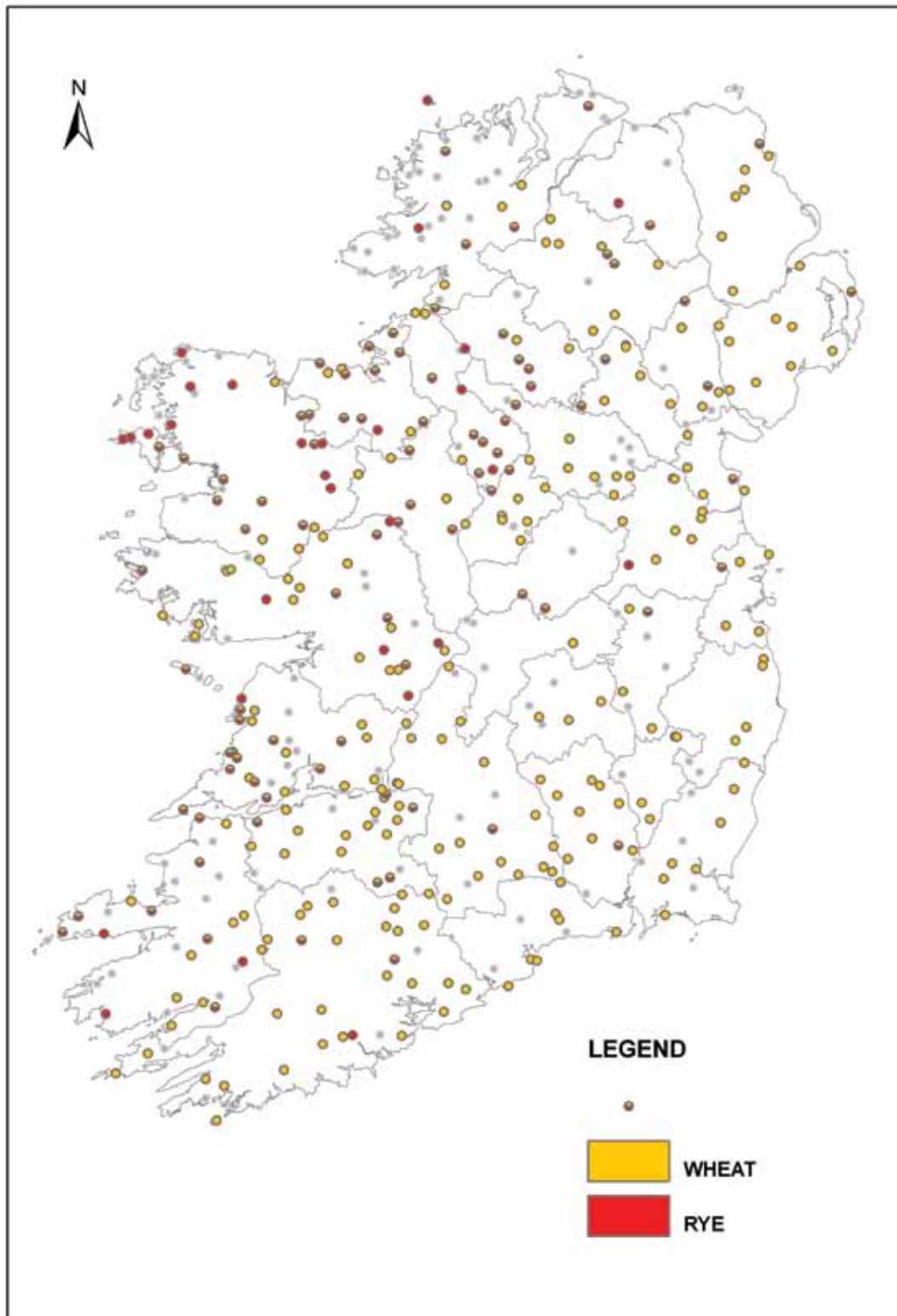
It is also hoped that this guide will be of interest to general readers, including local historians, teachers and those involved in promoting the understanding of the conservation of this important aspect of the built heritage.

Irish Folklore Commission Questionnaire Roofs and Thatching (1945)

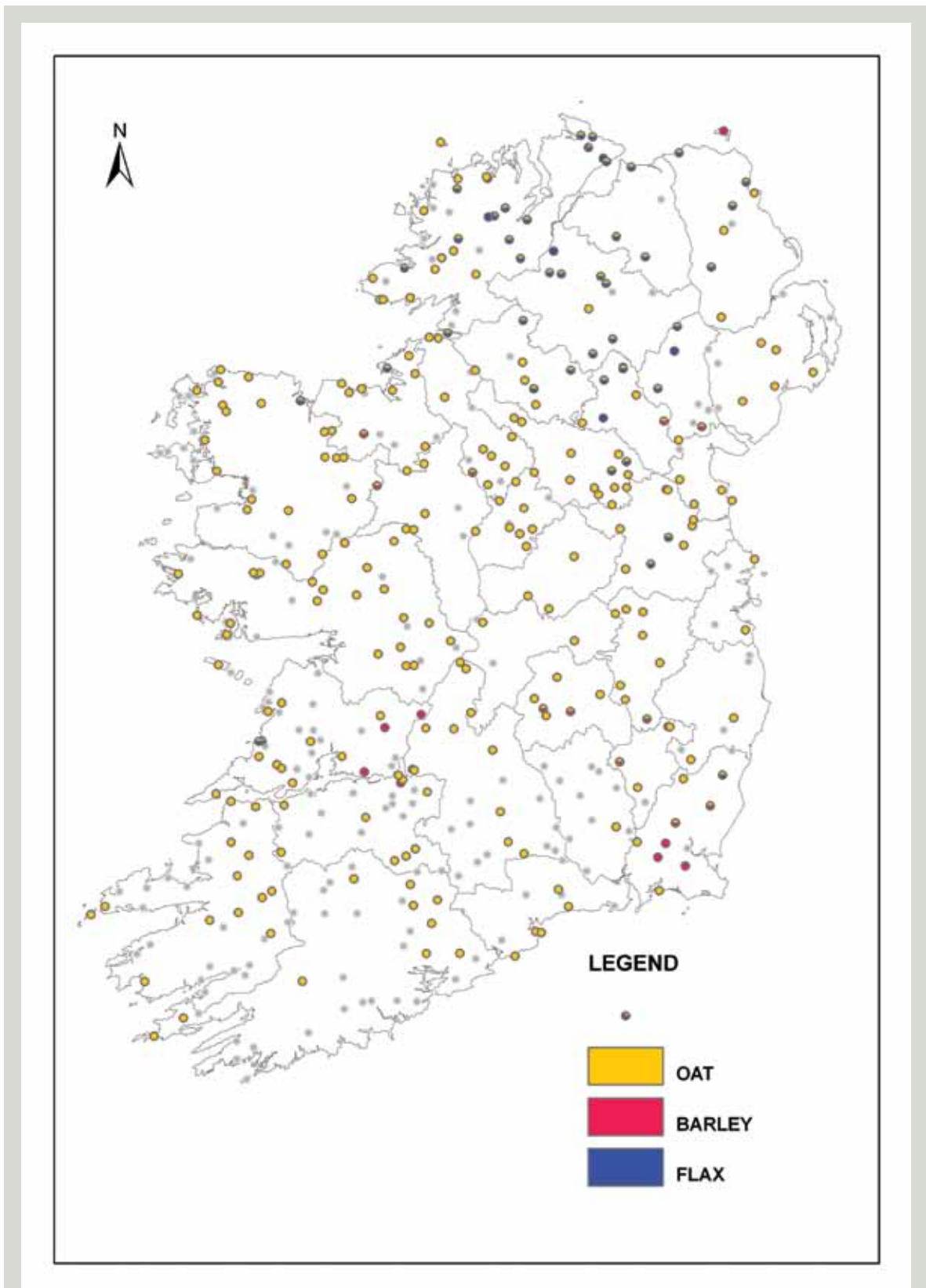
In 1945, Irish Folklore Commission ethnologist and vernacular building specialist, Caoimhín Ó Danachair (Kevin Danaher), drafted a postal questionnaire, *Roofs and Thatching* (see below), and circulated it to the Commission's network of 450 respondents throughout Ireland. The clearly defined and concise questions invited unambiguous responses from respondents, the quality and depth of detail of many of which are remarkable. The initiative resulted in more than 900 pages of valuable information about an aspect of vernacular construction and craftwork which was still strongly in evidence at the time. A surprisingly diverse range of thatch materials and regional methods was documented, and while much of the technical information recorded has still to be tested by detailed field observation, analysis of the questionnaire establishes clear regional trends in the choice of materials and the techniques employed by thatchers. The questionnaire thus serves as a useful baseline for the study of historic thatch in Ireland, and is an informative guide for thatch owners and thatchers researching regional styles of thatch. Below are the questions posed by the Commission, while the maps on subsequent pages indicate the geographical spread of different thatching methods and materials based on the responses received.

All over Ireland, thatch is the traditional roofing material. Several different methods of thatching are (or were) used. Below is a series of questions about thatched roofs of the traditional houses of your district. Please fill in the answer in the blank space after each question.

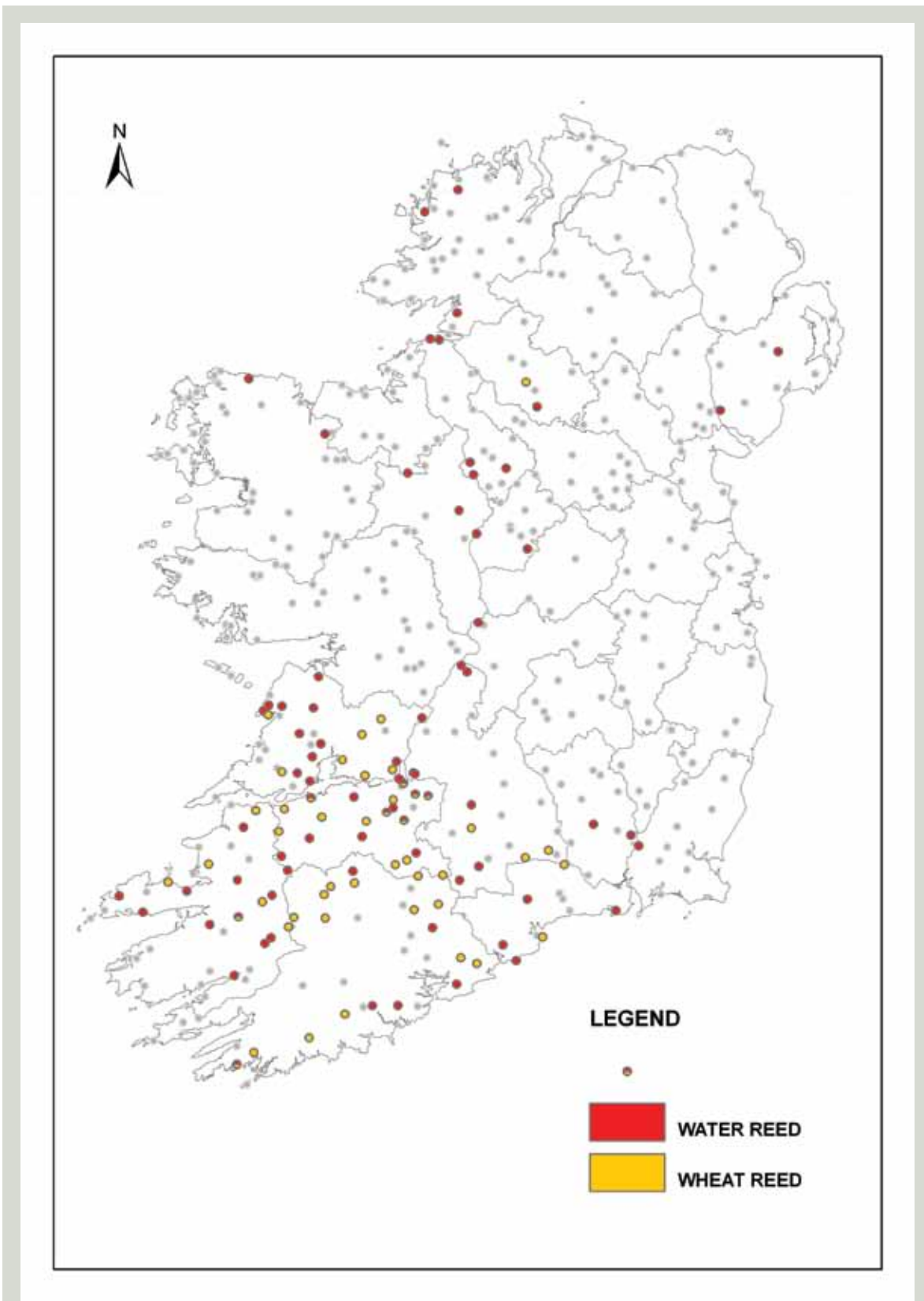
1. *In some districts the thatched houses have hip-roofs, that is the end walls of the house are about the same height as the side walls, and the roof slopes down at the ends as well as at the sides. In other places the thatched roof slopes only at front and back, and the gables rise up to the ridge of the roof. Which type is found in your district? If both are found, in what proportion (roughly) do they occur?*
2. *Is there a layer of some material, such as sods, attached to the roof timbers under the thatch?*
3. *What material is used for thatch? Reed, different kinds of straw, heather, rushes, mountain grass or other materials?*
4. *Which is considered the best material?*
5. *How often is a house thatched?*
6. *Is the thatching done by a professional thatcher, or by the occupants of the house?*
7. *Is all the roof done at the one time, or is it thatched in patches at different times?*
8. *There are several different methods of putting on the thatch and securing it to the roof. Please give a short description of the way in which it is done in your district.*



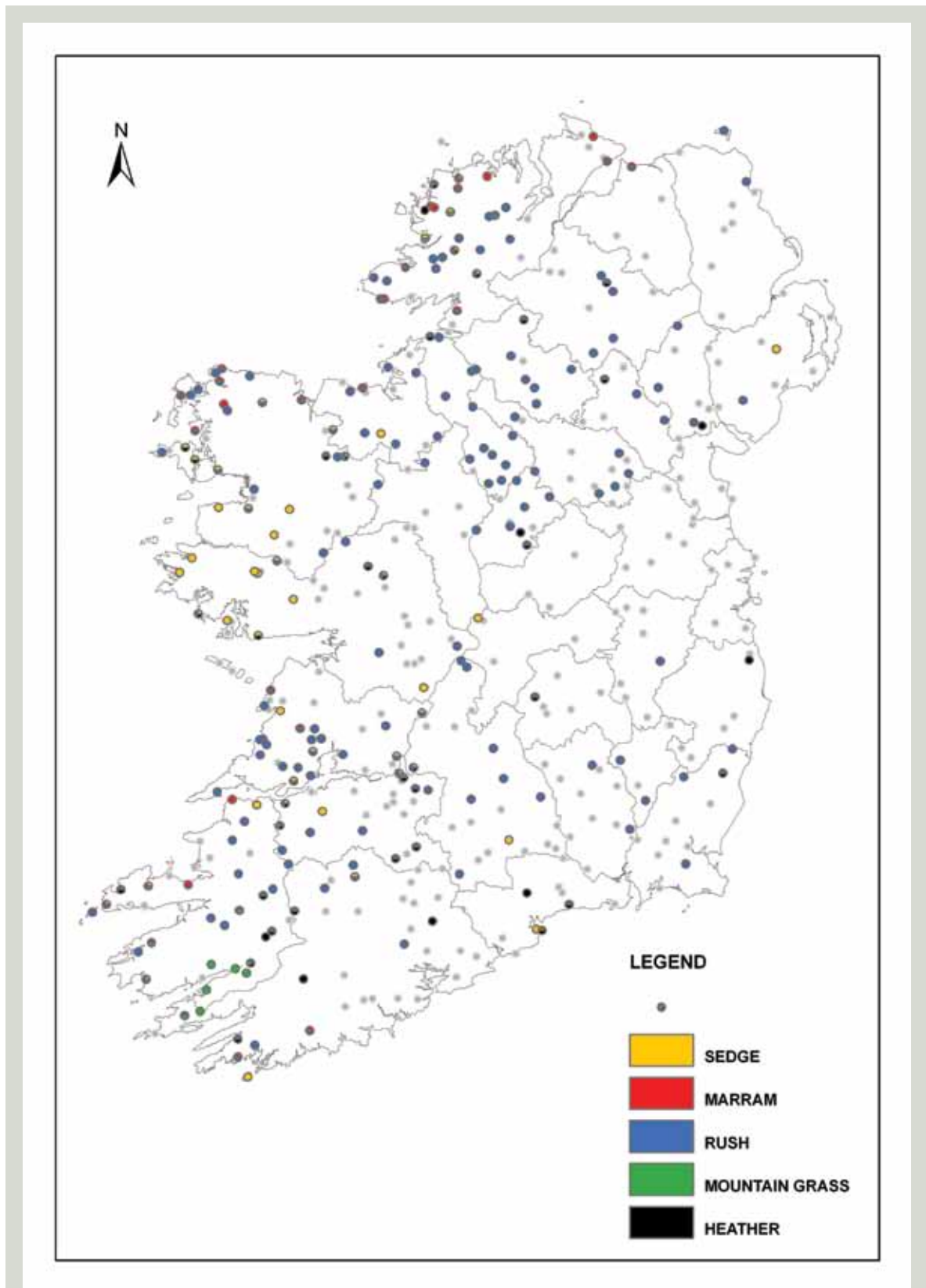
In 1945, over much of Ireland, wheat was preferred for thatch because of its durability. Its distribution is most pronounced in the traditionally intensive cereal-growing districts of the south and east. The cultivation of rye specifically for thatching, a cereal better suited to lighter, less fertile soils, was common in the western half of Ireland



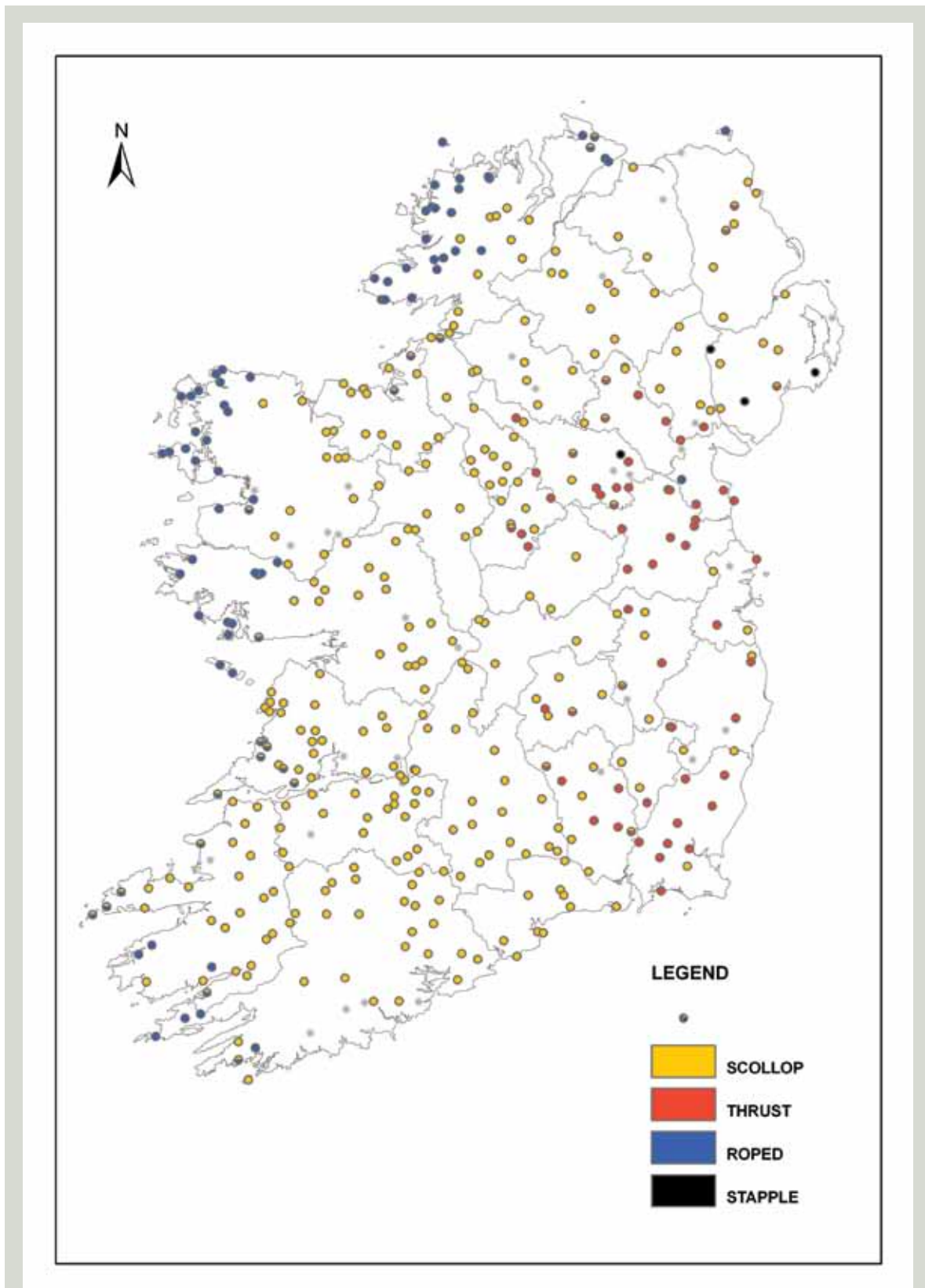
While oat was second in popularity to wheat, it had a wider distribution, noticeably in western counties, and less frequently elsewhere. Barley straw thatch was comparatively rare in 1945, while flax was strongly represented in northern counties, traditionally associated with the linen industry



In 1945, water reed was best represented in Munster, where it was harvested on river banks, rivers and estuaries. Interestingly, wheat straw (sometimes referred to as 'wheat reed'), which is applied in the same 'butts down' fashion as water reed had a very similar distribution



In the mid-twentieth century, rush was by far the most popular wild plant used in thatching, chiefly in the western half of Ireland, where it was used both as a weathering coat and as part of the foundation course for thatch. Less frequently, heather was also used as a foundation for straw. Both sedge and mountain grass are also mentioned in the 1945 Roofs and Thatching questionnaire, while in western coastal districts – especially Mayo and Donegal – marram grass was still commonly used as thatch



By far and away the most common and widespread method of thatching in 1945 was scolloped thatch, using both straight and hairpin-shaped rods to pin thatch to roofs. Second in popularity was thrust (or sliced) thatch, the dominant technique employed in the lowland parts of Leinster. Roped thatch was closely associated with exposed Atlantic fringes of the west and north, while the exceptional method of thatching, known as stapple thatch, appeared to be restricted to south-east Ulster

2. Features of Historic Thatched Roofs

Historic thatched roofs may contain a considerable variety of materials that have been used to thatch and to repair them over many years. These materials may include several varieties of straw or rushes and grasses used to repair roofs or as packing during re-thatching. Each roof has a unique history, and knowing the story of one's own roof is of practical use when planning maintenance and repairs. One way to learn more about a roof is to observe and talk with the thatcher as the decayed thatch is being stripped away in advance of carrying out repairs or applying the new thatch. It also provides the opportunity to examine the lower layers and discarded materials as the work progresses.



A single-cell thatched Mass house at Tomhaggard, County Wexford is believed to date from the eighteenth century and contain fabric of an even earlier building in its walls

All the elements of the roof tell their own story and assist in building up a complete history of the house. The thatch finishing details such as the bobbins, ropes, finials and the like should be noted. The details of the timbers of the roof structure, the make-up of the ceiling, ridge, eaves and verge details should all be examined and recorded.

The archaeology of historic thatch

When examining a historic thatched roof, attention should be paid to surviving evidence of regional differences in thatching methods and materials. Organic roof coverings (in particular the lowest, or base, layers and the fixings of thatch) can be of significant heritage and scientific value and worthy of preservation in themselves. Houses which have been occupied and thatched continually for successive generations have built up accumulations of thatch that preserve, in situ, a unique record of thatching materials and methods. This evidence can shed light on the historical agricultural practices, land management and ecology of an area. Distinct layers separated by thin, dark layers of decayed plant matter (composed mostly of moss and lichen) can be clearly identifiable in archaeological investigation of abandoned historic thatched roofs. Each layer typically represents a distinct phase of re-thatching of the roof in which the bulk, but not all, of the weathered and decayed thatch of the previous phase was stripped away before being renewed. Only in exceptional circumstances, such as following severe storm damage or prolonged disuse, were the base layers of a thatch replaced.

In a well-maintained thatched roof, the dry conditions of the underlying layers form an effective barrier to the decomposition of older thatch. This preserves evidence of older cereal varieties and associated weeds besides a variety of wild plants used as foundation material. These layers of thatch, including scraw, tyings and fixings, may be an original feature of the building's construction. Traditional thatching methods and practice preserved this historic membrane intact.



An archaeo-botanist examining historic thatch preserved under a corrugated metal roof

The sampling of historic thatch provides evidence of an extraordinary range of cultivated and non-arable plants formerly used as thatch. They may include wild grasses such as marram and various mountain grasses, flax, sedge, rushes, water reed, heather, even seaweed. As it is likely that uncultivated plants used in thatch were sourced locally, their presence can be interpreted as an ecological indicator, and their condition can show how they were harvested, whether pulled or cut, and how and in what quantities they were applied. Straw preserved in base coats is crushed to varying degrees by the weight of the thatch above it, but close examination of the morphology of the ears and stem can help identify cereal varieties, some of which may be very old, depending on the age of the house. Evidence of early landrace varieties of cereal not recorded in modern seed banks may thus be preserved in a roof. Furthermore, the condition of the stems can show how the straw was harvested: whether it was cut with a reaping hook or scythe, or by machine, and at what height above the ground. Evidence of the manner in which it was threshed can also be recognised: whether it was lashed to limit damage to the stem, as was widely practised in Ireland; or whether it was threshed by flail, or by mechanical means. Field weeds intermixed with cereal straw in base layers can provide evidence of local tillage practices, for example, if the land was drained. Other elements including ceiling linings, straw and other natural fibre tyings, wooden fixings, mud fillets, plasterwork and the like, constitute an integral part of the fabric of a historic thatched roof. They also shed light on local patterns of material culture.

Each thatched roof develops its own unique flora and fauna over time. A natural cycle of botanical and zoological processes occurs in thatch. As thatch decays, it is digested by fungi, the fungi in turn are grazed by insects, and the latter are preyed upon by birds that burrow into thatch in search of nesting material and larvae. Bird droppings introduce nitrogen into the surface of the thatch, encouraging the growth of weeds and larger plants. The accumulation of intrusive plant and other material on the surface of a roof further encourages plant growth, including moss and lichen, all of which contribute to its botanical profile. A range of plant and invertebrate material can be identified by visual examination of historic thatch in archaeological contexts; microscopic analysis identifies an even greater range.

Structural timberwork

At the time of construction of many of these buildings, timber was generally considered an expensive commodity and was therefore sourced and used as sparingly as possible. This resulted in a wide spacing of floor joists and roof timbers. In coastal areas, beaches were scoured for driftwood, whether from fallen trees and branches, or from shipwrecks. Second-hand timbers from abandoned or derelict buildings were salvaged for reuse, and locally grown timbers were gathered from woodlands, hedgerows and bogs. Few sawn, or wrought, timbers were used in vernacular construction before the end of the nineteenth century.

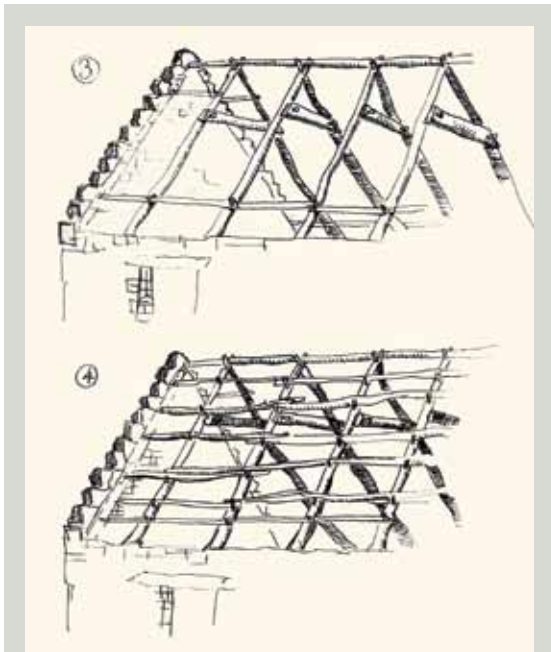
Older roof structures typically consist of A-frame trusses of rough, or unwrought, timber placed at 1200–1500mm (4-5ft) centres. In the south-east of the country, this form of structural system is referred to as 'couples and runners'; the pairs of sloping timbers, rafters or blades, of the A-frame forming the 'couples' and the horizontal timbers, the 'runners'. The timbers used may be of various sizes and species and far from uniform. The joints were secured with tapering timber pegs driven through holes drilled in the timbers. The ends of the rafters were embedded in the wall head. The tops generally crossed at the apex and supported a horizontal ridge pole. To prevent the ends, or feet, of the rafters spreading outwards, a collar-beam was used to tie the rafters together at high level, usually about two-thirds of the way up. Horizontal timbers were placed over the trusses, spanning between the couples. Known as battens, or ribs, these are smaller pieces of timber, or light branches, to which the scraw, if any, was fixed. Other roof types included the use of purlins, horizontal beams supporting the rafters at their mid span.



A vernacular roof structure in County Kilkenny having widely spaced, unwrought timbers with a pegged collar piece

As these roof structures were made up from field timbers, that is, gathered timbers such as driftwood, small trees or fallen branches, they may retain bark and sapwood making them vulnerable to decay and insect attack. Where roof timbers failed, repair usually involved installing new timber frames beside the failed timbers; such repairs are commonly found in vernacular roofs.

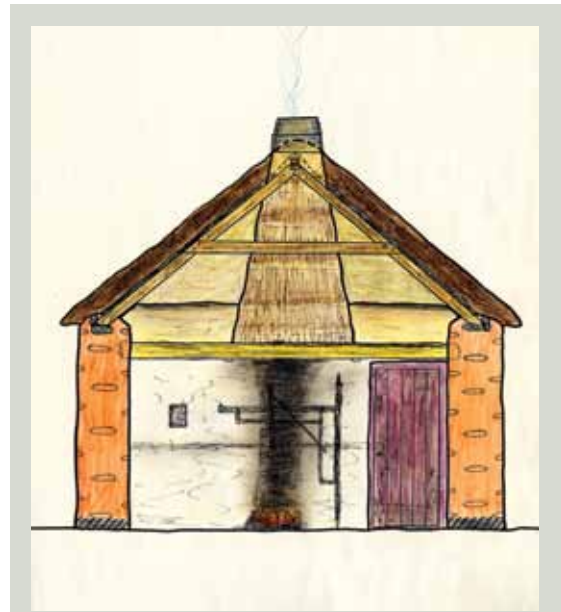
Towards the end of the nineteenth century, the use of unwrought timbers began to be superseded by sawn timbers, generally spiked or nailed together with iron fixings. The spacing of the frames also gradually decreased, with a truss spacing of 400mm (16in) commonly found in many sawn-timber roof structures.



Drawings of the typical roof construction of a vernacular house in County Galway, by the artist Simon Coleman, 1959 (Image from the National Folklore Collection, University College Dublin)

Roof profile

Many factors affect the lifespan of thatch, especially the degree of exposure to wind and rain. Roof pitch (the angle the slope of the roof makes with the horizontal) is a key factor in this regard. The steeper the pitch of a roof the quicker it sheds water and, by doing so, increases the longevity of the thatch. Therefore the pitch of a thatched roof is usually 45° or greater which is considerably steeper than that used for tiled or slated roofs.

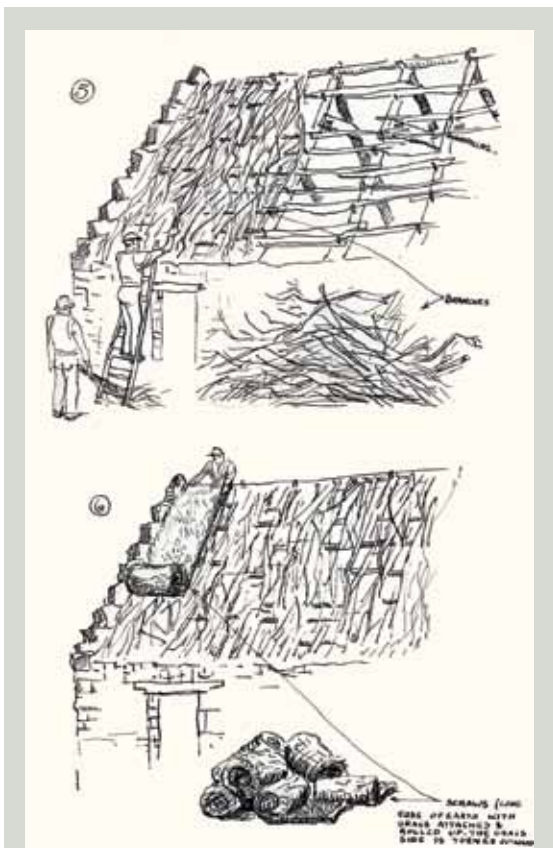


Thatched vernacular dwellings, such as this example surveyed by Caoimhín Ó Danachair in 1939 at Gortnagross, County Limerick, typically have a steep roof pitch (Image from the National Folklore Collection, University College Dublin)

Scraw and base courses

Thatched buildings in many parts of Ireland, particularly northern and western regions, have an underthatch layer of sod, called scraw. This scraw, preferably from the matted top of a peat bog or grass sward, needed to be tough, its roots and fibres binding it tightly together so as to make a solid, even and consistent layer 20-30mm (approx. 1in) thick on the roof. The loose earth was beaten out of it as this would tend to hold moisture and encourage the growth of grass and other plants in the roof. The scraw was cut in rolls 750mm (2½ft) wide and about 6m (approx. 20ft) in length or the height of one slope of the roof allowing for a lap of about 300mm (1ft) over the ridge to the other side. This underthatch was applied to the roof structure, grassy side upwards, prior to thatching. This layer is not technically necessary and may be a survival from a time when sod alone was used as a roof covering. However, it gives additional thermal insulation which benefits the occupants and provides a firm grip for scollops. It also has fire prevention qualities. In general the weight of the scraw was enough to hold it on the roof, but in many cases it was tied to the roof with súgán – a rope of straw or hay made with a rope twister. In parts of counties Down and Tyrone smaller sections of scraw

(900mm x 600mm, or 3ft x 2ft) were tied to the roof. In some cases, a layer of heather, furze or coarse straw or a matting of woven straw was sewn to the timbers instead of a scraw. In some areas a straw lining, or fleeking, was placed between the roof structure and scraw.



Rolls of cut scraw, or sods, laid on the roof's timberwork over a bedding layer of branches, County Galway. Simon Coleman, 1959 (Image from the National Folklore Collection, University College Dublin)



Scraw laid on a reconstructed roof

In the east and south of Ireland, scraw was not used and instead a bedding course of straw bundles was tied to the roof structure. Examples have been found

where a bed of wickerwork fulfilled the same purpose. In all cases the underthatch was tied to the roof timbers by means of straw rope, tarred twine or other manufactured rope. The process of tying involved two people, one on the roof and the other inside the building, each in turn pushing a thatching needle through the material. The rope or twine was then knotted to secure a fixing. The thatching needle is an iron rod about 900mm (3ft) long with an eye and point at one end and a T-shaped wooden or metal handle or hoop at the other. The needle was also used in scollop thatching for sewing the base coat of thatch onto a new roof to the scraw and roof timbers.

Thatching materials

A wide variety of wild and cultivated plants has traditionally been used as thatch in Ireland. Any stiff-stemmed grass or reed, at least 900mm (3ft) long, can be used. The stems of cereal grasses should be hollow, so that they can be adequately dried before use. As a rule of thumb, the longer straw is stored following harvesting the better it is for thatching. Fresh straw seasoned from September to February can lose as much as 20% of its weight in lost water content. The stems should be straight for ease of application to the roof structure. Straw thatch is distinctive for its swept appearance in which long lengths of straw are visible, and rod fixings at ridge, gables and eaves are often prominent. Wheat, and more especially oat, straw retains an attractive yellow colour in the initial years of a re-thatch, particularly if treated regularly with a copper sulphate solution, known as 'bluestone' which deters the growth of moss and algae. The cylindrical, woody (or lignified) structure of straw is the source of its strength, while its natural coating of wax, most noticeable in winter-sown cereals, resists moisture.

Wheat straw: This was formerly a by-product of bread wheats which were generally taller and hardier than cereals grown today and included varieties such as Squarehead wheat, or Rivet wheat which was more suited to biscuit and pastry making. However, higher yielding, short-stemmed cereal varieties, unsuited to use in thatching, have been preferred since the Second World War. To compound matters, the combine harvesters now used to harvest cereals generally crush the straw beyond use, effectively breaking the link between cereal production and thatching. The threshing mill, developed in the nineteenth century was less damaging, capable of producing straw which, though partially crushed, was still of acceptable length and sufficiently unbruised for use by thatchers.



A threshing mill at work, Riverstown, County Sligo in 1993 (Image courtesy of Joe McGowan)

Formerly, flailing or beating the ears to extract the grain was an even less damaging process, limiting the bruising to the tapered head of the stem. In many parts of Ireland, straw was threshed more judiciously still by grasping handfuls of straw and lashing the heads on a barrel or a stone to prevent breaking the stem. Thatching straw produced in this manner was sometimes termed 'reed' – a term which also covered oat, rye or even barley straw, but was more generally used for wheat.



The traditional method of flailing or scutching straw, Aran Islands, County Galway (Image from the National Folklore Collection, University College Dublin)

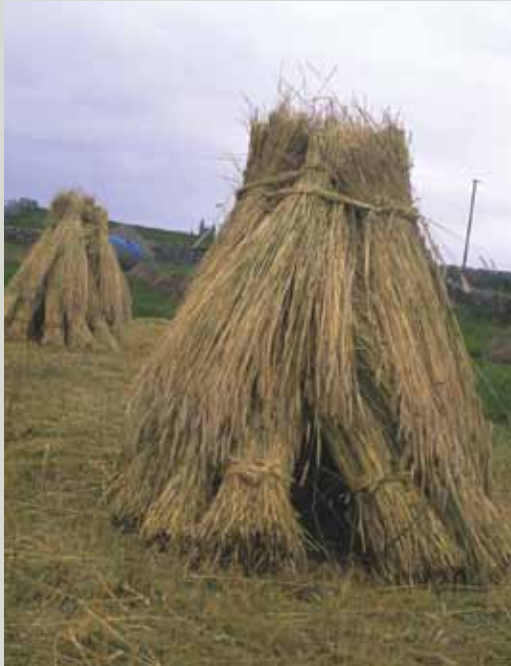
Oat straw: A great many small farms in the west and north-west of Ireland grew half a hectare or more of oats annually for human and animal feed, making use of the straw for thatch and other purposes including furniture making. Oat straw is not as long lasting as wheat, nevertheless, it continues to be a popular

thatching material and is generally easier to source than suitable wheat straw. In regions of high rainfall, with which it is traditionally associated, the shorter lifespan of oat straw suited the prevailing mixed-farm economy and the thatch was easily renewed. Oat straw is a very pliable material which is easy to work and is therefore popular with thatchers. It has a distinctive yellow colour which is visually attractive. It became more prevalent for thatching from the mid-twentieth century when farmers switched from growing long straw varieties of wheat to high yielding short straw cereal varieties. Common varieties of oat that produce good thatching straw include potato oat, black oat and barra oat. While oat straw may not be as enduring as wheat straw, the cost of cultivating and harvesting it is nonetheless comparable.



Stooks of oat, Scattery Island, County Clare. Caoimhín Ó Danachair (Image from the National Folklore Collection, University College Dublin)

Rye straw: In the past, rye was grown on some farms as a specialised crop for thatch and was often grown in rotation with potatoes. The cultivation of rye was particularly popular along the west coast of Ireland and its offshore islands because its tolerance of salt made it suitable as a tillage crop. Rye straw is generally longer and compares well with wheat straw in terms of its durability. Because it was carefully harvested with a scythe and threshed by hand, the bundles could be arranged in 'butts down' fashion and fixed to the roof in a similar way to wheat straw, thus limiting the effects of weathering. The practice of domestic rye-growing has virtually died out and sourcing sufficient rye for thatching a full roof has become difficult.



*Stooks of rye, County Sligo
(Image courtesy of Joe McGowan)*

Water reed: This thatch has a cropped, compacted appearance, typically dull in colour except in the initial phase of its life on a roof. Healthy reed has a cane-like appearance but should have a fibrous quality and not be brittle. The tube-like structure of reed increases its longevity because it provides resistance to compaction even when it is packed together tightly in bundles. Reed for thatching is cut in lengths of 900–2000mm (3–6½ft). It cannot be harvested until frost kills the long leaves on the main stems and so it is usually cut in the winter, between January and March. During harvesting the stems are cleaned and tied in bundles.

Munster has a strong tradition of indigenous water reed thatch, and, at the time of writing, it is the dominant roof covering in that part of the country. It is harvested between November and March along the river Shannon (in particular its estuary), the Suir, the Blackwater, the Slaney and other major rivers of Munster and also in south Leinster, where it is frequently known as 'spire'. As thatchers and owners look to source material locally and more cheaply, smaller reed beds, which may have been previously overlooked, are now being harvested. There was some concern that excessive nitrate run-off, until recently, had the effect of reducing the lifespan of water reed. However, recent significant improvements in water quality should mean that reed quality will also improve.



*Water reed thatch, harvested from the river Suir, County Kilkenny. Caoimhín Ó Danachair, 1963
(Image from the National Folklore Collection, University College Dublin)*



Bundles of water reed in readiness for thatching work, also in County Kilkenny

Water reed has also been imported into Ireland since the 1950s and, due to its longer lifespan, has grown in popularity in areas that historically used straw for thatch. Native water reed is generally coarser in appearance to imported reed. Natural kinks or doglegs characteristic of native reed can make it more difficult for the thatcher to dress bundles into position. However, it has the advantage that the inherent coarseness of stems prevents the material from being compacted too tightly, allowing it to breathe more easily, thus arresting decay.

Rushes, mountain and sea grasses, and other

materials: Historically, and to some extent still today, rushes (from wet pastures, moor and marshlands) and some tough grasses such as sedge (from marshlands), bent (from hill pastures and sand dunes) and marram (from sand dunes) were used in many districts as thatch. Sedge, a tough grass with a three-sided leaf which can grow to 3m high, is rougher but more flexible than water reed and can be cut at any time of year, though preferably in late summer. It was also widely used for ridging, typically on reed roofs. As it matures it turns a golden brown colour. The availability of sedge suitable for thatching is very limited. Some of the areas where the material was traditionally harvested may now be protected for natural heritage reasons and the requirements of the National Parks and Wildlife Service should be ascertained before any sedge is disturbed.

Bent and marram grass were used to thatch both dwellings and outbuildings, mainly in upland areas and coastal districts of the north and west coasts. A variety of mountain and moorland grasses was also widely used in these same districts. Heather, a covering of rather less durability, was generally reserved for use on outbuildings, although long heather was available and (where suitably fine) is reported to have been used to thatch houses too. Long-stemmed heather was cut while still in bloom, giving an initial purplish colour to the roof but turning a black colour as it dried out. Both flower-head and roots were used and laid with the roots intertwined and pointing upwards. Heather was more widely used as bedding for base coats of straw thatch.



Stooks of harvested marram grass at Magheraroarty, County Donegal. George McClafferty, 1980 (Image from the National Folklore Collection, University College Dublin)

Historically, the use of flax was closely associated with the linen industry in the north of Ireland, and is still occasionally grown in places as a specialised crop for thatch. Flax crops when of inferior quality, or when linen prices fell, were widely used as thatch. It is considerably coarser than straw and therefore harder to work.



Flax thatch, County Donegal

The use of rush as a thatching material was confined largely to outbuildings or as a substitute when superior materials were scarce. Like marram and bent, it is closely associated in coastal districts with roped thatch where it is simply laid on the roof and secured with ropes. Bracken, potato stalks and hay are among other thatching materials used in former times. Such humble materials were also used for thatching hay and corn stacks. These materials, having a short lifespan, are associated with what is sometimes termed 'scavenger thatch'. Traces of these materials may still be visible in the older, lower layers of a thatched roof and, where they do survive, they can be botanically and archaeologically examined and may provide important information about older types of thatching.

The ridge



Thatched roofs in parts of Leinster were sometimes finished with decorative external ridge boards such as this example from County Wexford

The term 'ridge' refers to the apex of a double-pitched roof and also to the capping that covers it. The various ridge treatments do not merely provide decorative features to a thatched roof, they also have a practical function in reinforcing the ridge and helping to dispose of rainwater quickly from the most exposed part of the roof. Generally, ridge decoration on Irish vernacular roofs is restrained and plain. However, thatchers sometimes use the ridge or eaves as an opportunity to display their trademark or signature, so that all the roofs of a particular thatcher in a certain region or district have a distinctive look.

RIDGE FINISHES

Flush or plain ridge: With a straw roof, an evened out layer of straw is bent or wrapped over the ridge rolls and secured on each side of the ridge with stretchers. This wrap-over layer should be a minimum of 100mm (4in) thick at the apex. For reed roofs, the ends of the top layer are butted together along the apex of the roof on both sides to form a slightly raised but flush ridge and pinned with a line of stretchers.



Roped thatch with flush (rounded) ridge

Twisted or bobbin ridge: This type of ridge is formed of a series of straw bobbins strung together on a scollop stretcher, and applied to one or both sides of the ridge. To make a bobbin, a handful of clean, long straw is twisted at its centre and folded in two, and a loop or eye is created in the fold by tightly twisting several wisps of the straw around the folded bundle close to the top. About fifteen bobbins are strung on a single stretcher, equal to the width of the strake, leaving several inches of rod free at either end to drive into the adjacent row of bobbins. This is secured to the ridge with scollop pins. Where bobbins are applied to both sides of a ridge, the line of bobbins on the weather side of the roof is normally set above the line of bobbins on the sheltered slope to prevent rain entering the apex of the ridge. In this way too, a single scollop pin can secure both lines of bobbins to the apex of the ridge at the same time.



*Straw flush ridge with bobbins and rodding
(Image courtesy of Brian Simpson)*

Ridge capping or coping: The ridge is sometimes capped by timber boards or V-profile metal strip. Clay or mortar copings were employed in some places and these are still occasionally used.

Block ridge: This is not a traditional Irish method of finishing a ridge, and is more usually associated with the cottage-orné style. It is not recommended for use on a vernacular thatched roof in this country. A block ridge is built up with rolls and a number of additional layers, or skirts, of thatching material so that the surface of the ridge rises above the surface of the main roof by about 80mm (3in) to form a skirt and is fastened in place with scollops. The block is sometimes cut into a decorative pattern, typically with a scalloped edging.

Each of the above methods can be given a distinctive appearance through the use of decorative straw-work or scolloping. These include:

- > **Rows of stretchers:** Horizontal scollops can be placed in rows or by crossing smaller rods into patterns such as lattice, herring-bone, lozenges, chevrons, or diamonds.
- > **Trellising:** A trellis pattern can be created using thin laths (or other materials such as plastic electrical conduit). It should be noted that this approach can encourage water to lodge and hasten decay in the ridge.
- > **Finials:** The ends of the ridge can be raised into points or pinnacles by securing them and then cutting them into shape. Bobbins are also used to form finials.



Rows of horizontal stretchers can provide a decorative detail in addition to their functional role of securing the ridge and other vulnerable parts of the roof, County Limerick

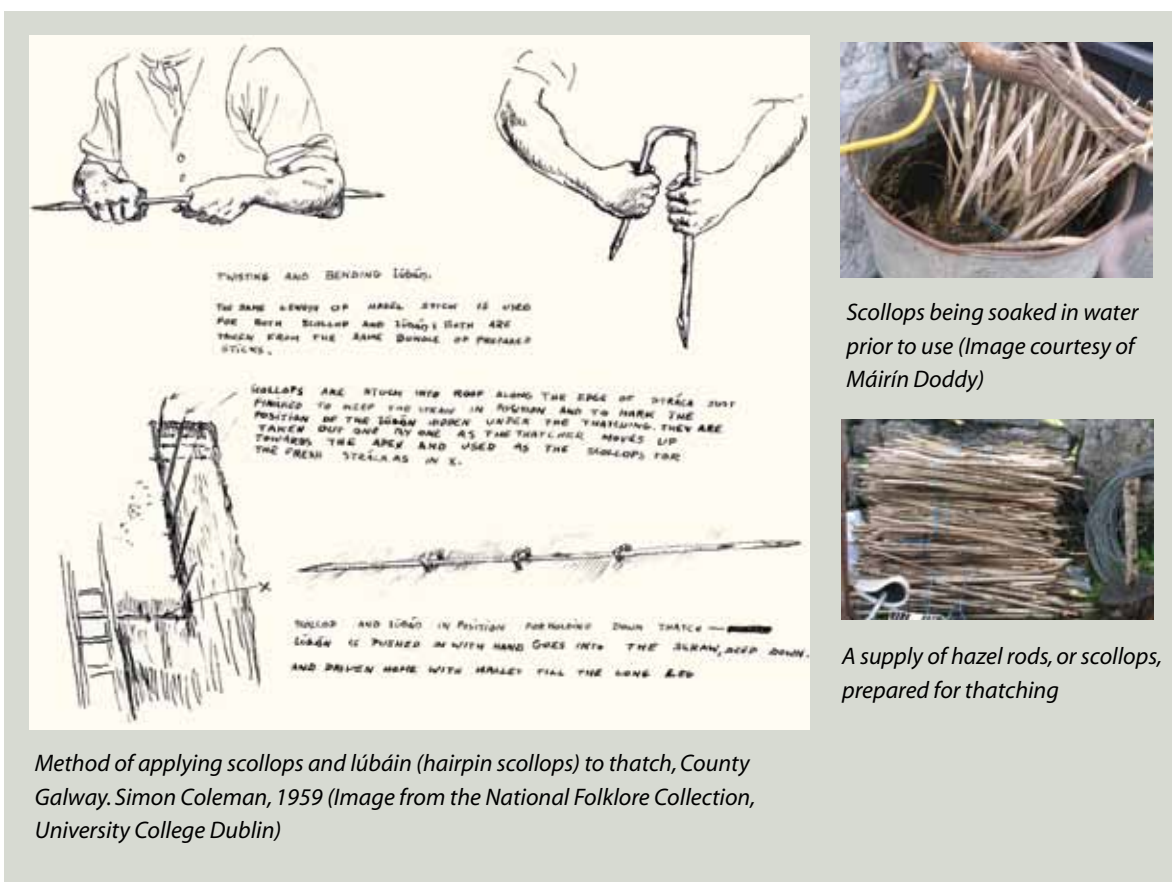
Verges and eaves

East of the Shannon, where many thatched buildings are mud-walled, roofs were usually hipped so that the thatch could provide protection to the tops of the end walls. West of the Shannon, where the walls tend to be of masonry rubble construction, the buildings were more generally gable-ended with the thatch continued partly over the gable wall. The gable walls usually have a narrow stone upstand or coping which protects the ends of the thatch from wind uplift. In some areas (for example, County Mayo and on the Aran Islands) these upstands are stepped so that the horizontal ropes of a roped thatch roof can be passed across the steps and tied to fixings in the walls below.



A hipped roof of oat straw thatch on an earth walled house in County Offaly

As with the ridge, the eaves can have a plain or decorative finish. Straw thatch generally has horizontal scolloping to pin and tighten the eaves. A more decorative finish is sometimes applied through the use of scollops arranged in patterns similar to those described at the ridge.



Method of applying scollops and lúbáin (hairpin scollops) to thatch, County Galway. Simon Coleman, 1959 (Image from the National Folklore Collection, University College Dublin)

Fixings and tyings

Scolloped thatch, the most widespread thatching technique found in Ireland, is defined by its method of securing straw to a roof. A scollop (from the Irish word *scol/b*) is a slender rod of hazel or willow. Willow, grown in managed osieries along rivers, is not as durable as hazel which is reserved for external fixings, except where the greater flexibility of willow favours its use in tight turns such as on gables, porch features and dormer windows. Briars, ash, laurel or slips of bog-deal were also widely used for fixings. Scollops are harvested between October and March, so providing thatchers with a winter activity when the weather is generally not suitable to working on a roof. The scollops are cut into lengths of up to 1800mm (6ft) and further cut into lengths of 600mm (2ft) or 900mm (3ft). As many as 7,000-8,000 scollops may be used in the roof of a typical four-bay house. In the past, the preparation of scollops was a task often undertaken by the house owner. Some thatchers cut and prepare their own supply of scollops; there are several commercial producers in Ireland but hazel scollops are also imported from, for example, Poland.

Scollops are used in two different ways to fix thatch to a roof – as a horizontal fixing rod (sometimes referred to as a stretcher or keeper) and as a doubled-over and pointed, hairpin-shaped rod which clamps the fixing rod in position. Hairpin scollops are made by steeping the rods in water to make them supple, and 600-900mm (2-3ft) lengths are then twisted into shape by hand. Freshly cut scollops need little or no soaking while dried scollops generally twist well after an overnight soaking. One leg of the hairpin is about 50mm (2in) longer than the other, to allow for the fact that this top leg is driven deeper into the thatch towards the ridge. The ends of hairpin scollops are shaped by three swift cuts. Hairpin scollops are pushed into the roof by hand, sometimes protected by a hand-leather, or with a wooden mallet. The saying, 'the drop follows the scollop', emphasises the importance of always driving scollops into the thatch at an upward angle.



Súgán tying the base coat of thatch to the roof timbers in County Limerick. Caoimhín Ó Danachair, 1963 (Image from the National Folklore Collection, University College Dublin)

Coverings and weights

Throughout much of Ireland, thatch is generally secured to the roof with scollops. However, in exposed upland and coastal districts thatch is tied down using súgán or cordage of various kinds. Typically, the network of ropes was laid at intervals of 300-450mm (12-18in). The ropes may be laid horizontally, vertically (with horizontal ropes at the eaves and ridge only), or both vertically and horizontally throughout and fixed to the upper face of the side walls and gables with wooden or iron pegs or tied to projecting stones. There are regional variations in the details.



Detail of gable tyings in a roped thatch, County Mayo. Caoimhín Ó Danachair (Image from the National Folklore Collection, University College Dublin)

Wire netting is sometimes fixed onto vulnerable areas of the roof such as the ridge, eaves, gables and around the chimney. Wind pressure and suction are strongest in these areas of the roof and can result in loosening or dislodging of thatch. Wire netting applied to these areas can be of assistance in resisting the depredations of the wind.

Thatch covered by metal roofs



Many examples of historic thatch are still preserved under metal coverings. Colloquially referred to as 'corrugated iron', the material used, since the 1880s, has in fact been mild steel

From the early twentieth century onwards, a number of thatched roofs were covered over with corrugated-iron roofs. This sometimes entailed completely removing the existing thatch covering and perhaps even the timber roof structure, but in many instances owners chose to retain the thatch in situ and simply placed the metal covering over it. This was sometimes achieved by raising the wall tops by approximately 300mm (1ft) and adding a separate roof structure above the thatch, connecting it to the older roof structure by means of short timber struts, thus preserving its foundation layers and the original roof structure. In other cases, the eaves thatch was cut back to expose the wall heads, and a new wall plate added supporting an A-frame timber structure that would carry the metal sheeting.

The retention of the thatch under corrugated sheeting provided a ready-made thermal insulation and it also provided sound insulation by minimising the noise made by heavy rain falling on the metal sheeting. A fortunate consequence of the procedure is the availability of a preserved record of early thatch materials and construction methods. Unfortunately however, in some instances, where insufficient ventilation was provided, the metal roof accelerated the decay of the thatch beneath.

Dormer windows

A full dormer window is one that projects from the slope of the roof and has its own roof. These are not found on Irish vernacular thatched roofs. Half-dormers, sometimes called eyebrow windows, are a feature of some older thatched houses especially in the east of Ireland. These are normally level with the eaves and incorporated into the main roof. Many vernacular houses retain their original windows, generally two-over-two pane timber sliding sashes.



A half-dormer window within a straw thatched roof, County Wexford

Chimneys



Thatched chimney, County Clare. Caoimhín Ó Danachair (Image from the National Folklore Collection, University College Dublin)

Early vernacular buildings were not fitted with chimneys. Instead the smoke from the kitchen hearth passed out through a hole in the roof; or in the absence of a smoke hole, the smoke simply filtered through the thatch or left the building through open windows or doors to be dispersed to the air outside. While these crude arrangements were obviously not ideal they had one advantage – the smoke killed off insects and, in particular, furniture beetle (woodworm) which was always a major threat to the integrity of roof timbers. The presence of smoke-blackened thatch may be an indication that the building was constructed before the installation of chimneys became commonplace. Early chimneys were frequently of basketry or timber construction and thatched around externally, rising no more than a few inches above the ridge. Other early vernacular chimneys were made from earth bricks or from square or curved timber frames bound tightly on the outside with súgán or other rope. This was then flashed into the thatched roof by bringing the thatch up around the flue or using a fillet of earth, or earth and lime, around the chimney. These types of chimney were obviously highly perishable and had to be regularly repaired or replaced. No examples of these early chimneys are known to survive. In the nineteenth century, as burnt clay bricks became more commonly available and affordable, they were used to replace the earlier crude constructions. Most thatched buildings now have either stone or brick chimneys.



Typical rendered masonry chimney with mortar flaunching at the base and firmly scoloped thatch around it

The natural vulnerability of thatch to fire meant that it was essential to ensure that sparks were prevented from coming into contact with the thatch material. Very large chimneybreasts ensured that sparks rose slowly from the fire and were extinguished before reaching the top of the chimney.

Chimneybreasts were traditionally constructed of masonry or wattle fabrications of clay plastered onto a wicker framework. Some rare examples of chimneybreasts constructed of unfired clay bricks are also found. Chimneybreasts were supported above the fireplace opening on large timber lintels called bressumers. Such structures typically provided an outlet for the fireplace in an adjoining room as well as for the kitchen hearth.



The interior of a farmhouse in County Wexford prior to conservation works

Ceilings

Most thatched houses originally had no ceilings of any kind. During the nineteenth century, occupants began to install various types of ceilings. These were often simple attempts to increase the comfort of the house by preventing straw, dust and insects from falling from the scraw, or exposed base coats of thatch, onto the inhabitants and contents of the building. Covered beds were sometimes used for a similar purpose. At first canvas, usually from flour sacks, or other similar material was draped below the roof. Later, rigid ceilings of various types were introduced. These were made of the timber from dismantled tea-chests and other packing to more sophisticated overlap boarding in the later nineteenth century. The timber was fixed to the soffits, or undersides, of the roof trusses or of the floor joists where an attic existed. In more recent times, plasterboard has been used. Sometimes original ceiling materials survive, hidden above later ceilings, and care should therefore be taken when removing a ceiling to avoid damaging an earlier one above. Where an early ceiling survives it should be carefully examined and recorded and left in place.

A fleeking, or woven mat of water reed, straw or sedge, is sometimes found in association with straw base coats, having a dual function of sealing the thatch from the inside (restricting the ingress of dust and insects) and providing an aesthetic appeal. A similar role was played by a layer of vertically hung straw beneath the thatch, held in place by horizontal scollops or small branches. Another type of ceiling known as a ribbery is occasionally found formed by the careful placing of a layer of hazel rods fixed directly to the underside of the roof structures. In other examples, the roof trusses are wrapped in carefully placed straw-work. All of these ceiling types are now quite rare and should be protected.



Ceiling made from reed fleeking



Straw lining to the underside of a roof in County Limerick

3. Traditional Thatching Techniques

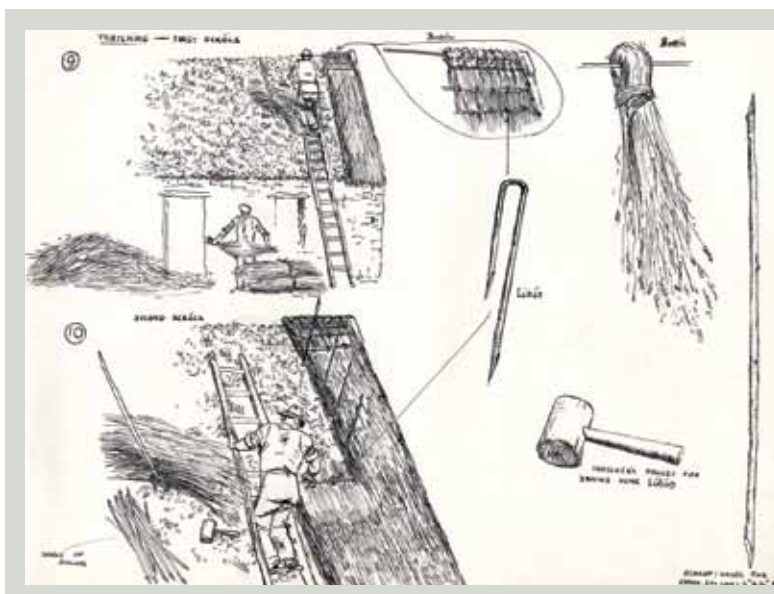
Four principal techniques for applying thatch to roofs have been recognised in Ireland, each with distinctive regional distributions. Most widespread is **scolloped** thatching, followed by **thrust** thatching and, more rarely found, **roped** and **stapple** thatching. Roped thatching has a variant – pegged thatch – and both are features of thatching along the exposed Atlantic coast. All of the methods are used for straw work, but only scolloped thatching is used for reed. Pegged thatching and stapple thatching are now considered to be historic methods that are rarely, if ever, used today.

The knowledge of relatively few techniques is partly a consequence of the lack of detailed survey, the reduced numbers of surviving historic thatched structures, and a corresponding drop in the number of thatchers, each of whom would have had his own approach to the craft. Today, the greater emphasis on speed and cost effectiveness has also contributed to the loss of variation in thatching techniques. The modern requirement for longer lasting materials has led to the adoption of work methods more suited to these materials.

The general method of thatching is as follows: the thatcher, working from a ladder laid against the roof slope, completes a strip (also 'stroke' or 'strake') 600-900mm (2–3ft) wide from eaves to ridge before moving along the roof. He then starts work on the reverse side of the roof. In the case of water reed, a more robust material than straw, the thatcher sometimes works in wider, staggered sections from scaffolding. The thatcher may use temporary wooden stakes or iron

side pins to mark the edge of the area he is working on. Thatching is more efficient and faster if the thatcher has someone (known as a server) to hand materials up to him, saving him time on the ladder. As with other roof coverings and claddings, each course of straw or water reed overlaps the course below it to ensure the proper run-off of water. As the thatcher proceeds, he uses a thatching comb to remove any loose straw. The comb is a long wooden handle with a row of nails driven into it at right angles. In the case of 'butts down' reed, a thatching knife (often part of an old scythe blade with a handle attached) is used to trim down the roof as the thatcher works, ensuring an even surface. A sheep shears is used to provide a neat fringe for the eaves; the eaves of a thatched roof always oversails the wall top widely in order to protect the walls from driving rain and from water dripping from the roof and saturating the ground at the base of the walls. Often the thatcher fixes a row of twisted straw bobbins to the ridge of straw roofs to protect it, as well as for decorative effect, sometimes adding a straw knob or finial to each end.

The gable ends of pitched roofs have verges to accommodate the thatch and the roof structure beneath and to ensure that the upper surface of the thatch is kept below the top level of the gable wall and therefore not subject to wind uplift. A fillet of mortar or clay is frequently applied over the thatch to seal its junction at the verge. The roofs of roped thatch buildings are streamlined with rounded ridges and verges that do not rise above the thatch surface.



When thatching with scollops, the right-handed thatcher generally works from right to left in bays or strakes, finishing each strake at the ridge with a row of bobbins and lines of rods. Simon Coleman, 1959 (Image from the National Folklore Collection, University College Dublin)



A roof in County Cork with raised gable copings to protect the edge of the thatch from wind uplift. These gable copings also cover the edge of the thatch as can be seen at the eaves detail

Scolloped thatch

This method of thatching, also known as pinned thatch, is found throughout Ireland, with the exceptions of western and northern Atlantic fringes, much of Leinster and the south-east of County Down. The technique is traditionally associated with both wheat straw ('butts down') and jumbled ('head and tails') straw, but is also employed when thatching with water reed.



Thatcher driving home a hairpin scollop. Caoimhín Ó Danachair (Image from the National Folklore Collection, University College Dublin)

Straw: When used with straw, this technique is sometimes referred to as 'hidden scollop' thatch as the hazel or willow fixings that secure each course are hidden by succeeding courses. External fixings are applied, often in a decorative criss-cross pattern, only at the ridge and eaves and perhaps at the hips, all locations where extra strength is desirable. An inferior form of scollop thatching, no longer used, was where the fixings were left exposed on the surface of the thatch, but this reduced the roof's effectiveness in shedding water, causing the fixings to perish more quickly.



A thatcher drawing straw

Before it can be applied to the roof, straw should be thoroughly wetted on the ground to make it pliable. Handfuls of loose straw, of which the butts and ears are jumbled, are drawn or teased out with both hands to remove waste and arrange the stems in straight, compact bundles. These are handed up to the thatcher who works in narrow strakes, occasionally in wider sections, from eaves to ridge, and normally, from right to left.

Hairpin scollops are carefully driven in by hand, or with a mallet, as near to the horizontal as possible to ensure a secure grip and to prevent rainwater from seeping along the rod into the thatch. The eaves course of straw thatch is fixed at a greater tension than succeeding courses, and a tilting fillet of timber or straw rope is inserted between it and the wall top to firm the course further and encourage it to 'kick up' a little to shed rainwater more effectively.



A course of thatch is fixed firmly in position with a scollop keeper and several hairpin scollops



An oat straw thatch in County Kildare with external fixings at the hips and eaves providing extra strength to the more vulnerable parts of the roof

The thatcher should ensure that all scollops are well concealed below the weather surface of the thatch, typically 150-200mm (6-8in). The edge of each strake should be left loose so that the adjoining strake can be inserted under it. This ensures that the joint between the sections of thatch does not become a weak point in the roof surface. The thatcher should allow for the tapering effect of each course to ensure that the correct pitch and depth of material are maintained throughout as he progresses upwards towards the ridge. Often it is necessary to 'back-fill' the heads of bundles above their fixings to maintain correct pitch and to facilitate dressing. At the apex of the roof, about one-third the length of each bundle is bent over the ridge and three to four horizontal scollops applied to secure the bundle. The outermost lines of these scollops are necessarily left visible and may be supplemented by an extra line of rodding. The space between the lines of scollops is often worked into a decorative chevron or lozenge pattern of crossed rods. The main coat is then beaten down and raked smooth, and the eaves are trimmed with a sheep shears to tidy them and to trim the overhang.

Water reed: Water reed is a heavier, more compact material than straw and for this reason needs to be fixed more securely, particularly if the pitch of the roof is steep. The eaves course can be secured by tying with tarred cord or baling twine; alternatively two rows of horizontal straight rods, or sways, can be used here. As with straw thatch, the eaves of a water reed roof require a greater degree of tension than elsewhere in the roof; to this end, thatchers normally

insert a timber fillet or roll of reed close to the wall face causing the thatch to tilt or 'kick' up. Water reed is applied in a similar manner to straw in overlapping courses from eaves to ridge using the scollop method of thatching, in narrow strakes and frequently in wider bays. Water reed is measured in square metres, typically 11 bundles per square metre. The bundles, cut in lengths of 900-2000mm (3-6½ft), are laid with the butt ends of the stalks together to present a quill-like exterior that encourages rainwater to run off quickly. Its compactness means that water reed can be applied in thinner coats than straw. If the reed is very long (2500mm - 8ft - or more), it would be normal to apply a 350mm (14in) thick coat for new work. However, if the reed is short (1500mm, 6ft, or less), then a coat of approximately 250mm (10in) thick would be appropriate. A coat of 400mm (16in) or more results in flat-lying reed which has a shorter lifespan than a thinner coat. Because reed wears more slowly, the fixings require less cover than with straw, a minimum of 100mm (4in) and preferably 150mm (6in). As a rule of thumb, reed wears away at a rate of approximately 6mm (¼in) per year so that a 150mm (6in) cover should last about 24 years.

Reed is not as pliable as straw and cannot be bent over the ridge in the way that straw can and so the ends are butted together to form a flush ridge. To seal the ridge a more pliable material such as straw or sedge, can be used to wrap over the ridge. Repairs can be carried out using tapered and shortened bundles of new reed which are inserted into the main coat and dressed in.

Thrust thatch

Today, thrust thatch is associated with north and east Leinster but it has been used elsewhere, for example in south-east Ulster and east Galway. It is also known as sliced, spliced or fletched thatch. Oat straw, which is more flexible than wheat, is preferred, though the latter is also used. Thrust thatch lasts well depending on workmanship and material, although most thatchers agree that it has a shorter lifespan than scolloped thatch. The straw should first be prepared by wetting it and handfuls of straw pulled or teased from a bed of straw to make bundles. The wetting makes it easier to manipulate and bend the straw as the method relies on the thatcher being able to knot the bundles for thrusting, knot first, into the base layer.



An exhibition of contrasting methods of thatching – showing scolloped rye thatch to the left and thrust wheat straw thatch on the right (Image courtesy of Brian Simpson)

In a full re-thatch, a base coat of straw is sewn to the roof structure using a straw rope and thatching needle. The thatcher begins by laying thick straw rope along the eaves. Bundles of straw (known variously in Leinster as ‘wangles’, ‘eaves wads’ or ‘dolls’) are tightly tied a third of the way down their length and pinned to the eaves with wooden pegs which are driven through the ties and straw rope into the top of a clay wall or a clay topping to a stone wall. The remaining eaves bundles are tightly fitted against each other to provide a good bed into which the upper, or weather, layer is now secured. The individual small bundles of straw for this upper layer are knotted at one end. A homemade implement (known variously as a ‘slice’, ‘beating pin’, ‘spurtle’, ‘thatching fork’ or ‘thatching stick’) with a wooden handle generally having two prongs at one end is used to grip the knot and the bundle is then thrust into the base layer. The thatcher continues until he is satisfied that the roof has a sufficient depth of

straw, damping it down and beating it flat to form an even surface. The roof is finished off by applying scollops to the ridge and eaves. Finally, the top coat is dampened, side-raked and beaten back to provide a smooth finish. The eaves are usually trimmed and the ridge can be finished in a number of ways but traditionally a simple bobbin ridge was applied. Various other types of copings are applied to the ridge such as clay or timber boards.

A fresh weather coat of straw can be applied in the same manner, and thrust thatching is a very useful and simple way to carry out small spot repairs to a roof.

Roped thatch



An example of roped thatch in County Donegal. Ropes passed over the roof at regular intervals secure the thatch against high winds and are tied to stones projecting from the walls

This method, the simplest of all thatching methods, is found in the Atlantic coastal districts of the north and west which are subject to high winds. Rushes and tough mountain and sea grasses, which are plentiful in these exposed locations, were frequently used. This form of thatching is always associated with an underthatch of scraw which provides a firm base for the thatch and an additional layer of thermal insulation. The thatcher works in widths across the roof, securing each section with ropes as he proceeds. In this method, the upper layer of straw is not fixed into the scraw underthatch with stretchers and scollops but is rather laid directly on it in rough bundles some 150-225mm (3-9in) deep, each course overlapping the other. The entire coat is held in place by a network of ropes laid at intervals of 300-450mm (12-18in). This network can be laid horizontally, vertically (with horizontal ropes at the eaves and ridge only), or both vertically and horizontally throughout. A layer of straw is laid along

the ridge, above the capping, to prevent the ropes cutting into the thatch. A line of thin battens just above the eaves to which the network of ropes is often tied is used to similar effect. The ropes oversail the edges of the roof and are fastened to projecting stones or to wooden or iron pegs built into the front and back walls just below the eaves or into the gable walls just below the verges. Otherwise, the ropes are tied to stones of 1½–2½kg (approx. 3½–5½lb) weight lying on the thatch itself just above the eaves. This keeps the ropes taut but can lead to localised rotting of thatch. Old fishing net or wire mesh was frequently used instead of ropes for securing the thatch in this method.

The longevity of a roped thatched roof is about four to five years and the ropes need continual replacement because of the harsh climate of the Atlantic coastal areas and the effects of salt air. Historically, the advantage of roped thatch is that four or five men could thatch a roof in a few days, using wild grasses, rye or the oat straw which was a ubiquitous by-product of the farming economy of these districts. Stepped gables are often part of the building's design, facilitating the horizontal ropes that run across the roof and which are tied securely to fixings below them. Horizontal ropes are omitted where the copings rise above the gable ends obstructing effective tying. Such copings are designed to protect the roof from high winds which might otherwise lift the thatch.

Pegged thatch

This is a variant of roped thatching and was once common along the north coasts of counties Derry and Antrim and in an isolated district of south Connemara. Examples are also found in counties Galway and Sligo. In this method, timber pegs are pushed at close intervals through the ply of the network of straw ropes, further anchoring them to the thatch. The pegs were inserted at the junctions of the horizontal and vertical ropes or, at intervals along horizontal ropes where only these were used. In Antrim and Derry the ropes were traditionally of twisted bog-deal and the pegs were of the same material.



Now in poor condition, this example of a straw, pegged thatched roof in County Sligo is an increasingly rare survival

Stapple thatch

Stapple thatch was a method of thatching confined to the barony of Lecale in east County Down, and north County Dublin. It may be a variant of thrust thatching because tightly knotted bundles, or stapples, were used, but instead of thrusting the stapples into the underlying straw layer, they were held in place by lenses, or fillets, of clay (up to 80mm, or 3in, thick), at the eaves, ridge and midway up the roof slope. Sometimes these lenses were placed at every course. A layer of clay was applied under the heads of the eaves course in order to establish the correct pitch for the roof. At the top of the roof, bundles of straw were bent over the ridge and scolloped in. A capping of clay completed the ridge. Sometimes a line of stretchers was used to secure the thatch at the ridge and eaves. The clay used for sealing the layers of thatch was fine gritty mud found locally and mixed with cow dung to make it bond more firmly to the thatch. In north County Dublin, 'cutting clay', a stoneless clay obtained from Loughshinny, was used. The thrust thatch technique applied to stapple thatch tends to result, over time, in a very thick and heavy roof, with each new addition of thatch and mud.

Conservation principles

The primary aim of conservation is to prolong the life of something of value, and to do so in a way that protects what is valuable about it. The built heritage enriches our lives and provides a connection with, and a means of understanding, our shared past. Historic buildings have incalculable value as tangible records of those who have gone before us, of the lives they lived and of their aspirations and achievements. Each structure provides unique and irreplaceable evidence of the past and should be passed on to future generations with that evidence intact.

As each historic building is unique, each requires an individual assessment of its significance, its condition and a solution to the particular conservation issues that have arisen. Building conservation requires highly specialised skills in all aspects of the works. Expert advice is needed in assessing the extent of works required, designing and specifying those works, and overseeing the project on site. Skills are required of the thatchers, craftworkers and others who carry out the works to the building.

An aim of good conservation is that there should be minimal intervention into the historic fabric of a structure. Conservation works should do as much as necessary, yet as little as possible to the structure to ensure its future. This means that elements, including the thatched roof, should be repaired rather than replaced. Conjectural reconstruction of any part of the structure should be avoided and only undertaken where there is good reason and where the works can be based on reliable documentary or other evidence. Appreciation is needed of the various phases of construction. Later additions or alterations may be of equal, or in some cases more, interest than the original built fabric.

Carrying out maintenance or repair works to a thatched building:

- > **Do** use the experts - get independent advice from the right people
- > **Do** record the materials and construction details of the historic roof before altering it
- > **Do** establish and understand the reasons for failure before undertaking repairs
- > **Do** repair the parts of the structure that need it - do not replace them unless they can no longer do the job they were designed to do
- > **Do** make sure the right materials and repair techniques are used and that even the smallest changes made to the structure are done well
- > **Do** use techniques that can be easily reversed or undone. This allows for any unforeseen problems to be corrected in future without damage to the special qualities of the structure
- > **Do** record all repair works for the benefit of yourself and future owners
- > **Don't** overdo it – only do as much work to the structure as is necessary, and as little as possible
- > **Don't** look at problems in isolation – consider them in the context of the structure as a whole
- > **Don't** use architectural salvage from elsewhere unless certain that the taking of the materials has not caused the destruction of other old buildings or been the result of theft



Examples of thatching in the cottage-orné tradition including the Swiss Cottage, County Tipperary; Adare village, County Limerick; Rockspring, County Wexford and Killarney, County Kerry

The Cottage Orné

Cottage orné is the term applied to a picturesque cottage built in a romantic rustic manner, usually located within the demesne of a large country house. Gate lodges, follies, summer houses and bowers were also designed in this way. Several of these survive and they can be very beautiful and worthy of protection in their own right. However, they should not be confused with the vernacular thatch tradition; nor should the materials and detailing appropriate to a cottage-orné be used when re-thatching historic vernacular buildings and vice versa.

The decorative use of thatch in formal architecture was instigated by architects such as Robert Adam and John Nash in the late-eighteenth and early-nineteenth centuries at a time when thatch as a roof covering was beginning to lose ground to other materials, especially in Britain. Architects and their wealthy clients sought to create a romanticised version of vernacular construction, but with a formal design. A hundred years later, the Arts and Crafts Movement of the late-nineteenth and early-twentieth centuries promoted a second revival of the use of thatch within a formal architectural context. Thatchers working in this style thatched in water reed and combed wheat straw, materials which are better suited to producing sculpted forms.

In Ireland, many features not typical of the vernacular thatching tradition, were introduced as part of cottage-orné designs such as dormer windows and porches, and ornamental block ridges of straw or sedge, fixed with rods, the edges of which were scalloped or cut in diamond patterns.

One of the most striking examples of a cottage orné in Ireland is the Swiss Cottage built by Richard Butler, later the earl of Glengall, on his demesne at Cahir House, County Tipperary. Designed by John Nash, it was constructed in the second decade of the nineteenth century. Having fallen into decay, it was restored in the 1980s by the Office of Public Works.

In the village of Adare, County Limerick the Dunraven estate constructed terraces of thatched houses in the 1820s adjacent to the entrance to Adare Manor. These picturesque thatched cottages are a rare example in Ireland of the cottage-orné aesthetic used within a planned village.

4. Identifying Problems in a Thatched Building

Thatched roofs require consistent maintenance and attention. It is very important for owners to regularly examine the roof, carefully monitor any defects which may appear and undertake minor repairs where necessary. Some or all of the following signs should alert an owner to the need for repairs:

- > The development of channels in the roof from ridge to eaves is an indicator of serious damage to the thatch. These often appear at weak points such as downslope of a chimney. If not repaired quickly these grooves deepen and water may penetrate to the building's interior
- > The occurrence of depressions and unevenness in the top surface of the thatch. These can be due to deterioration and loss of thatch or failure of roof timbers
- > A loose or uneven ridge
- > Loose straw on the ground and, in severe cases, actual bundles of thatch slipping from their fixings on the roof
- > Fixings such as scollops, that should be concealed, becoming exposed on the external surfaces of the roof. This is due to weathering removing the topmost surface of the thatch, making lower layers in turn vulnerable to erosion. Re-thatching needs to be done urgently as each exposed fixing may cause further lodging of rainwater that may quickly penetrate to the interior
- > Brown/black rivulets running down the interior or exterior of the walls. This excess moisture indicates that the entire roof is wet and in an advanced state of decay



A major re-thatching emphasises the degree to which weathering and decay in time reduce the thickness of thatch



Fixings becoming exposed on the thatch surface indicate that the roof needs re-thatching

Good maintenance practice

A well-maintained thatch which is inspected and repaired regularly will have an extended lifespan and improved performance. In the past, many householders were sufficiently skilled to carry out minor repairs to a roof including filling holes and channels in the thatch, or renewing the ridge and external fixings. Thatchers were also more readily available than is the case today and straw and reed suitable for thatching were more abundant. The smaller pool of thatchers available today and the decline of skills and knowledge of thatch amongst householders have lessened the amount of small-scale, remedial repair work that is carried out. Increasingly, the pattern is for owners to apply a main coat of thatch every seven years or so. However, this may result in unnecessary expenditure on the part of the owner and loss of historic fabric. Interim remedial work on the thatch is sometimes unavoidable in the event of storm damage or to temporarily extend the life of the thatch until the owner is able to raise the necessary funds. Repairs or patching may also be necessary if the owner has difficulty finding a thatcher (and suitable materials) and agreeing a programme of work. While some thatchers may be reluctant to commit to small patching jobs, an owner should take the time to find one who will undertake necessary repair works. A good thatcher will understand the value of repair and not try to steer an owner into carrying out unnecessary large-scale re-thatching work when a good quality repair will extend the life of the roof for a number of years.



The results of lack of maintenance. Due to the fragile organic nature of the materials used in thatch, buildings can deteriorate rapidly when neglected

Inspecting the roof

It is important for owners to carefully inspect thatch on a regular basis or make arrangements for others to inspect; at least twice a year and always after extreme weather events such as storms, high winds and snowfalls. The defects referred to above should be looked for and noted. Visual inspection should involve a walk around the entire building. Binoculars can be very helpful in identifying problems at high level. It is also useful to keep a photographic record so that deterioration over time can be identified.

Inspecting the attic

The survival of a thatched roof is dependent on the integrity of the timber structure supporting it. Failure of the structure will cause the collapse or partial collapse of the thatch. Regular inspection of the attic space, where one exists, is therefore very important. Many thatched buildings have poor, or sometimes no, access to the attic space. It is recommended that a safe and comfortable access to roof spaces be provided by making hatches in the ceilings. Treatment of the roof timbers with an appropriate biocide is recommended. Although not all timbers in a thatched roof are readily accessible, a spray application provides effective treatment to most of them. This inhibits infestation by furniture beetle (woodworm) and other wood-boring insects as well as fungal attack. An environmentally friendly boron-based biocide should be used. A single application will be effective for many years. It is essential to take expert advice on the appropriate type of treatment to use and to ensure that the manufacturer's instructions are carefully followed.



A variety of roofing solutions to thatch problems

Identifying potential causes of decay

As a rule, precipitation in counties in the south-west and west is twice that of eastern counties, but elevated inland districts are also subject to higher levels of rainfall. The development of white rot fungi (often known as wet rots) is a natural process of decay in thatch, fuelled by moisture. It generally occurs in the layer directly below, rather than on, the weather surface of the thatch. Capillary action draws moisture from the surface to this middle layer, therefore the more effective the weather surface is in shedding water and drying out, the slower is the rate of decay. The shade of overhanging trees slows the ability of thatch to dry and encourages microbial activity below the exposed surface. The build-up of leaves and other organic material on the surface of the thatch, particularly where there is netting or ropes, can encourage the growth of moss and lichen, further shortening the lifespan of the thatch.

Until the mid-twentieth century, farmers were largely reliant on organic manure and crop rotation in cereal growing. Since that time there has been increased reliance on artificial fertilisers in farming. The development of 'soft rot' fungus is believed to result from nitrogen concentrations in straw whose growth has been stimulated by the use of artificial fertilisers. In the case of water reed, similar concentrations resulting from nitrate run-off are believed to speed up the process of natural decay. However, recent actions to prevent the pollution of water courses should reverse this trend.

WIND DAMAGE

Wind damage to thatched roofs is primarily caused by suction or uplift and the areas of the roof worst affected are the eaves, the ridge and the gable ends. Wind forces can be twice as strong on these areas as on the rest of the roof. Uplift forces can, in extreme circumstances, lift off an entire roof but it is much more likely that the upper layers of thatch may become separated from the base layers so that the thatch is loosened and gradually becomes insecure as it is subjected to repeated cycles of wind action. Loosened and insecure thatch should be suspected when straw is found lying on the ground under the eaves or when strands of straw can easily be withdrawn from the bundles which make up the thatch.

POOR VENTILATION

Vernacular houses had more or less permanent fires lighting for cooking purposes as well as for heating. High rates of ventilation were of great importance to remove smoke and provide an air-flow to maintain the fire. The location of front and rear doors directly opposite to each other in many vernacular houses in the west and north of Ireland facilitated and permitted control of ventilation. These conditions also provide optimal conditions for preservation of woodwork, particularly roof timbers, as they prevent the development of fungal decay and discourage wood-boring insects. However, such conditions are not always conducive to human comfort or thermal efficiency.

Because it is an organic material, the thatch itself must be allowed to breathe or it decays. If a building is left unoccupied and unheated for a prolonged length of time, the thatched roof will quickly deteriorate. The use of impermeable materials adjacent to thatch should be avoided as thatch which is laid on felt or other impermeable material retains moisture in internal layers and decays more quickly.

INADEQUATE RAINWATER DISPOSAL

Having a steep pitch is important for the longevity of a thatched roof. It should be borne in mind that after a re-thatching, or a partial re-thatching, the roof pitch may have been altered to accommodate existing anomalies in the roof and, in some cases, this can result in a reduced pitch. Ideally, when it rains, it should be possible to see the rainwater moving freely down the roof surface and dripping off at the eaves. If this is not occurring it may be because of one or more of the following reasons:

- > The roof pitch is too shallow
- > The thatch surface has been loosened and water is penetrating into the thatch
- > Exposed roof fixings or netting are obstructing the flow of water, or
- > Vegetation growing on the roof is retaining water

If the eaves overhang is inadequate, rainwater can be discharged against the wall and this can cause erosion of protective limewash or plaster from the face of the wall. Saturation of the ground at the base of a wall by rainwater can also lead to rising damp, to an outwards rotation of the wall and to weakening of earth walls or of clay mortar in stone walls.



As thatched roofs do not have gutters to collect rainwater coming off the roof, a deeply overhanging eaves is essential to throw water well away from the walls to avoid saturation

BIRDS AND BURROWING ANIMALS

Damage caused by birds gathering material for nesting or searching for insects can be quite serious. The ridge (including bobbins and finials) and eaves are especially vulnerable and damage should be repaired as soon as possible. Removal and loosening of straw by birds should be suspected when loose straw is observed on the roof or lying on the ground below the eaves.

Problems arising from rodents and small animals burrowing into thatch are more unusual but, in some cases, the damage caused can be quite severe.

MOSS AND VEGETATION GROWTH

All growth of moss or vegetation on thatch is potentially bad for the roof and should always be identified as a problem and dealt with. Mosses retain water after rain which can lead to rotting of the underlying thatch by preventing it from drying out in the normal way. Grasses and other weeds that take root in thatch can have a similar effect.



Severe moss growth on a roof will encourage the saturation of the thatch below leading to its decay

Plants such as ivy can grow on and through thatch where their roots and shoots can disrupt and loosen the material. Such plants can also provide an amenable environment for insect life which in turn attracts foraging birds, that may cause additional damage. Vegetation of this type should be prevented from growing around the house or close to the thatch.

The application of bluestone (a solution of copper sulphate) can be a useful and inexpensive way to help with the maintenance of a thatched roof. Yearly application by spraying prevents the growth of moss and other vegetation on the roof. Bluestone acts as not only as a fungicide but also as a herbicide and insecticide and therefore discourages birds from foraging in the thatch for insects. However, it should be borne in mind that the copper sulphate solution will corrode any wire netting covering the roof or part of the roof. Bluestone products are widely available through garden centres or agri-farming centres. Copper sulphate can cause eye and skin irritations and it is essential to follow the manufacturer's instructions closely when using these products.



The typical blue run-off of copper sulphate solution can be seen on the verge of this roof indicating that a treatment of bluestone has been applied to the thatch

OVERHANGING TREES

In Ireland's damp climate it is inevitable that thatch frequently becomes wet. This is not a problem provided it can dry out in a relatively short time. Natural drying is effected by the sun and by the free flow of air around the building. It is therefore important that overhanging trees and bushes be cut down or cut back if they are keeping the roof in shade or preventing wind drying from occurring. Fallen leaves that are allowed to accumulate on a thatched roof can also accelerate deterioration.

Defects in the roof structure

One of the most significant immediate causes of the collapse of a roof structure is the activity of furniture beetle, or woodworm, in destroying the integrity and strength of the timbers. The most important sign of damage, or of imminent collapse of a roof timber, is the apparent sagging of the thatch. In many houses there is no access to the loft and sagging viewed from the exterior may be the first evidence of a structural problem in the roof. It is essential that a thatcher, or a structural engineer with an expertise in vernacular construction, assess the condition of the roof structure before commencing repairs or re-thatching. Re-thatching has the potential to overload the often-fragile structure of a roof. The average thatched house may have some three tonnes of thatch applied during a re-thatch and it is essential that the roof should be able to take this additional weight and the weight of anyone working on the roof.



Broken roof timbers in a thatched house with evidence of furniture beetle infestation

When a building falls out of use and becomes derelict, the interior usually becomes damp and optimal conditions for timber decay are created. This is exacerbated if regular maintenance of thatch ceases and the roof covering begins to fail, leading to an ingress of rainwater into the roof. Waterlogged roofing material weighs a great deal more than dry material and this can cause failure of roof timbers which are already stressed to capacity even in optimal conditions. In some cases, crude repairs may have been made to the roof structures in the past which sometimes have little remedial value and may even create new or further problems. All of these problems naturally tend to come together in abandoned or poorly maintained buildings and in some cases roof collapse can occur after a relatively short period of time.

Many thatched houses have ceilings made up of overlapped timber boards frequently dating from the early part of the twentieth century. These reduce the level of ventilation and air flow around the roof timbers and through the roof material. This can exacerbate the problems noted above.

Defects in chimneys

Chimney canopies are generally supported on large timber lintels or bressumers. In most cases these are reasonably sound because, although they may be theoretically undersized, the timber actually carries a relatively small area of wall. Where there is a tendency for the bressumer to deflect, this causes a crack in the shape of an inverted 'V' in the masonry, the bulk of the masonry then forms a natural arch transferring the load to the support ends of the lintel. However, the ends of the lintels are often supported on narrow masonry stub walls forming the sides of the hearth which may be unable to resist the thrust from the canopy.

Exposed chimney tops are frequently damaged due to the washing out of mortar from the joints by weathering and may need to be re-pointed. Traditionally the chimney tops are not raised very high above the apex of the thatch and in modern circumstances this may be regarded as constituting a fire hazard.



The shrinkage of thatch in vulnerable areas of the roof such as at the base of chimneys facilitates water ingress and should be repaired quickly

Defects arising from earlier interventions

Thatched buildings were constructed in an earlier period when people's expectations for a comfortable lifestyle were much less than they are today and when most occupants were generally unable to afford to carry out major refurbishments or extensions. Insofar as extensions were carried out they usually involved lengthening the building. During the twentieth century, government grants for the installation of bathrooms encouraged the construction of extensions to the side and rear. Many people also built new kitchens at the back of their building. While the construction of such facilities greatly increased the comfort of the occupants, some of the extensions were poorly built and have created their own problems. These extensions are often subject to leaking roofs, rising damp and condensation and they sometimes have ill effects on the fabric of the original building. Openings, sometimes quite wide, were formed through rear walls to provide access to the new extension and this not only damaged the walls and but also frequently necessitated altering the roof support arrangements. Most of these extensions had flat roofs or mono-pitched roofs which were built into the existing thatch. Problems are invariably caused where the eaves or edge of thatch sits directly on an impervious surface such as a flat roof. Rainwater can no longer drip off the thatch but stays in position and the base of the thatch becomes water-logged and begins to rot. The rot may spread up along the thatch and repairs are soon necessary. The eaves thatch should be cut back at this point to prevent it soaking up water collecting on the flat roof. However, this should not undermine the tension in the eaves or it will adversely affect the ability of the thatch to shed water in that section of the roof. A carefully installed lead-flashed valley at the junction of the original building and the extension may be an appropriate solution.



The end of the thatch sits on the lean-to metal roof of an extension. Rainwater shed from the thatch cannot drain properly and will eventually lead to rotting of the thatch



Temporary protection provided by canvas sheeting may provide a short-term solution in an emergency but can accelerate the deterioration of the thatch by preventing it from drying out

Temporary roof coverings

In some cases where a historic thatched building is considered to be of exceptional heritage value and at imminent risk of being lost, temporary roof coverings may be installed. Such coverings may be used in cases where funding is not immediately available for repairs, where appropriate repair materials or thatchers are not available or where time is required to make a detailed study and record of a particularly important site. Where it is considered appropriate to install a temporary roof covering, the covering must be fixed in a way that allows for adequate ventilation to the thatch to prevent decay and damage due to saturation. Erecting a covering of profiled metal sheeting on a steel frame is an ideal, if expensive, means of providing temporary protection and it can be installed sufficiently high above the historic roof to permit re-thatching to take place under cover.

Where emergency short-term protection is required, canvas sheeting custom-made to fit the roof can be installed. Such coverings should be made from very strong material and tied down securely. Before installing a cover of this type it is important to check the integrity of the roof timbers to ensure that they are capable of resisting the compression induced when the cover fixings are tightened. It is essential that such coverings are only used for a short period of time – perhaps over one winter – as the lack, or reduced rate, of ventilation may cause the thatch to rot quite quickly. If not properly installed, these coverings can sag over time creating ponds of water that add significantly to the loading on the roof structure.

5. Repairing and Re-thatching



Regular patching and repair have always been features of maintaining a thatched building, a process which extends the life of a roof until such time as a full re-thatch is necessary

A thatch which is regularly maintained and repaired should last longer and function well. A level and tight roof with a good thickness of thatch (say, 350mm or 14in) enables scollops to fix better into the old thatch when a fresh coat is being applied. The thickness of a thatch coat decreases as it weathers and a clear sign of the need for re-thatching a scolloped straw roof is, for example, when internal, formerly hidden, fixings become exposed. The thatcher responsible for the most recent re-thatch, who is familiar with the roof, or an otherwise experienced thatcher, should be consulted before deciding whether to patch or re-thatch. Individual roof slopes perform differently – south-west facing slopes, subject to more adverse weather conditions, may not last as long as other parts of the roof. Before undertaking a major re-thatch, it is wise to clearly identify the materials that make up the roof, both base and weather coats. The weather coat is easily accessible and, by drawing a few wisps of straw from an exposed area in the roof void or from the innermost part of the thatch in the eaves outside, it should be possible to identify the material in the base coat. Bear in mind that the base coat (or substantial parts of it) may be quite old and contain more than one type of straw: in many parts of east Munster and Leinster, for instance, wheat straw gave way to oat straw thatch over the course of the twentieth century.

Thatch fixings on steep roofs must be strong enough to prevent slippage of material. A distinction should be made between the slope of the rafters of the roof and the finished pitch of the thatch itself, which is

determined to some extent by the varying depth of thatch on the roof. Accumulations of thatch (resulting from previous repairs and re-thatching) on the roof slopes of older buildings, particularly at ridge and eaves, can change the surface pitch of the roof. The local depth of thatch on a roof can be tested using a long thatching needle to probe the old thatch in different places. The results may require stripping a little more thatch from the eaves or ridge to bring the roof back to an appropriate pitch before re-thatching.

When fixing thatch to a roof, a thatcher takes account of the inherent taper in thatch bundles, which are normally laid 'big end down' and are naturally thicker at that end. Furthermore, the shorter the bundle length, the greater the degree of taper. These factors affect all forms of thatch material to varying extents and should be taken into account when seeking to maintain an optimal pitch in a roof. Such problems are less significant in the case of water reed, which is longer and has a more gradual taper than straw.

Use of new materials

Introducing new materials into an older thatched roof should be carefully considered and executed. In the context of a historic building, it is desirable to replace building materials on a 'like-for-like' basis, providing that the material to be replaced is correct for the building and not a later, inappropriate alteration. Many older thatches may preserve evidence of varieties of types of straw and wild plant material. In practice, successive generations of thatch owners have resorted to alternative materials depending on their availability. Native water reed was also more widely used than is sometimes thought, and it is recorded in combination with straw in various parts of Munster and Leinster. For a variety of reasons (principally the possibility of slippage), some water reed thatchers may be reluctant to thatch reed onto an existing straw base, proposing instead to strip the roof entirely and start afresh. However, this approach is not acceptable when dealing with a historic thatched roof, whether or not the building is a protected structure. Water reed can, however, be applied to a straw base with the aid of longer scollops that penetrate deeper into the old thatch or by tying it to the roof structure with the aid of a thatching needle but this is a slow, labour-intensive method.

Patching and repairs

In former times, when thatchers were plentiful and good thatching straw more abundant, regular repair and patching were used to significantly extend the lifespan of thatch. Early twentieth-century photographs provide strong evidence of the widespread practice of patching. In 1945, some 60% of respondents to an Irish Folklore Commission questionnaire on roofs and thatching indicated that owners of thatched houses were capable of carrying out minor repairs such as patching themselves. This is rarely the case today when most owners rely on a commercial thatcher to repair their roofs.

The merits of patching should be weighed against the likely remaining lifespan of a thatch. Increasingly, the pattern is for owners to apply a fresh main coat of thatch when the thatch as a whole has deteriorated beyond repair. In practice, this is often done every seven years or so when they are eligible to re-apply for a state grant under the present arrangements. However, this may result in unnecessary expenditure on the part of the owner as well as the unnecessary loss of historic fabric. A decision to undertake major re-thatching work should be based on the significance and condition of the roof rather than an arbitrary one such as the availability of grant aid. It is important for an owner to build up a relationship with a thatcher who understands the particular roof and who can be relied upon to give the right advice on when and how to repair the roof and who will not recommend unnecessary works.

Remedial work on the thatch is sometimes necessary in the event of storm damage or to temporarily extend the life of the thatch. Repairs or patching may also be necessary if the owner has difficulty finding a thatcher (and suitable materials) and agreeing a programme of work.



Renewing the ridge of a thatched house in County Meath (Image courtesy of Brian Simpson)

Certain parts of a thatched roof require renewal or repair on a regular basis. A thatch owner should expect to renew the external ridge and eave rod fixings every six to seven years or following damage such as in a storm, work which is best carried out by an experienced thatcher. At the same time, the surface of scolloped straw or water reed thatch should be raked to remove perished butts and the thatch dressed with a legget to tighten the roof. This can extend the life of the thatch for several years. In the event that holes or dips have formed in the roof, these should be cleaned out to a firm base and patched. Where a roof is thrust thatched, patching can be carried out with fresh bundles of straw secured in position by thrusting them into the existing thatch and building up the level of the depression to match the surrounding surface without using fixings of any kind. Where the roof is of scolloped thatch, patches can be scolloped in position using scollops as external fixings.



Renewal of vulnerable sections of a roof, particularly the ridge and base of the chimney can extend the lifespan of a thatch

It should be borne in mind that while patching may extend the life of a roof, it is only a temporary measure. Excessive patching should be discouraged as the integrity of the thatch surface is compromised each occasion a thatcher works on the roof. Indeed, repeated patching is a sure indicator that a re-thatch is required, and the cost of patching has also to be weighed against that of a full re-thatch. Furthermore, the junctions between patches and the existing or original material can constitute weak points in the thatch.

Adding wire netting

The parts of the roof most vulnerable to wind damage are the ridge, eaves and gables. Installing wire netting in these areas can be of assistance in resisting the depredations of the wind. Wire netting can also prevent birds and rodents from nesting in the roof and make it more difficult for birds to retrieve straw from the roof during the nesting season. However, covering a roof entirely with netting is not recommended as it can slow down the natural drying process of thatch. It may also encourage the growth of moss and lichen and catch fallen leaves and other debris. This delays the run-off of rainwater from the roof and so promotes the decay of thatch. Wire netting in vulnerable areas like the ridge, chimney, gables and eaves limits the damage caused by birds and severe weather.



Wire netting can trap fallen leaves, delaying the run-off of rainwater and so accelerating the decay of the thatch

Rodents and small burrowing animals can pose a threat to thatch. Where serious and repeated damage is being caused to thatch from burrowing, it may be necessary to consider installing wire netting over an entire roof. Specialised galvanised wire netting of 20mm (¾in) mesh is recommended; 50mm (2in) wire netting is not recommended as it does not keep out rodents and nesting birds. Where netting is used, it should be installed in such a way that it can be easily stripped off to carry out repairs or in the event of fire so that areas of burning thatch can be removed to limit the damage.

Re-thatching with straw

It should not normally be necessary to strip the old thatch back to the timberwork when re-thatching with straw. It is usually sufficient to ensure that weak spots are strengthened and decayed patches in the base coat made good to provide a sound base for the scollops securing the overcoat to 'bite' when driven.

Replacing straw with water reed

Replacing a straw thatch with water reed is not advisable for several reasons. The proposed change in material may include the complete stripping back of the thatched roof to the principal roof timbers which is not acceptable with a historic thatched roof as it would result in the loss or damage of historic elements including the base coat and fixings, scraw, bedding, interior ceiling features and wattle work. The base coat may contain valuable evidence of diverse wild and domestic plants, including early cereal varieties and associated weeds of interest to agricultural historians and botanists. The loss of building fabric of historic and archaeological significance will preclude a switch from straw to water reed. If the building is a protected structure, the alteration may require planning permission and the advice of the architectural conservation officer in the local authority should be sought at an early stage.

The ridge

Because the ridge is the most exposed part of the roof, it is most vulnerable to decay. It requires repair or replacement a number of times during the lifetime of a thatched roof and certainly long before the rest of the roof needs a full re-thatching. When a thatcher is building up the ridge it is important that its pitch be equal to, or greater than, that of the main roof in order to inhibit water lodging. To form the ridge and to achieve a good pitch, tightly packed rolls of the thatching material are tied along the ridge-board. These ridge rolls need to be consistent in size and density. In the case of straw, the last layer of thatch applied to the ridge is allowed to over-sail it and is then cut off or twisted back at its ends and secured with scollops. The ridge is then finished in one of the ways set out below. Water reed cannot be manipulated to bend over the ridge as it is not supple enough and so the ends are butted together to form a flush ridge. A more pliable material, such as straw or sedge, can be used to wrap over the ridge to seal it.

Traditionally, thatchers often use the ridge or eaves to display their trademark or signature. However, where a technique is proposed that is not traditional to an area, it may give the roof a different or novel appearance which may not be appropriate for a vernacular building.

The eaves

The eaves course must be fixed more securely than other parts of the thatch. A tilting fillet of timber or twisted straw rope inserted between the eaves course and the wall top is designed to make the eaves 'kick up' a little when tensioned with fixings. As thatched roofs do not use gutters and downpipes to take rainwater away from the building, the depth of the eave overhang is extremely important. It should be about 600mm (24in) to ensure that rainwater is discharged well away from the base of the wall. It is important to note and record the existing depth of the overhang prior to commencing re-thatching in order to allow for it to be replicated, where appropriate, in the finished roof. The eaves are finished by trimming and cutting at an acute angle to ensure that rainwater is shed effectively from the thatch.

Dormer windows

Where elements such as dormers and porches are features of a roof, the pitch of the roof above the element should be kept as steep as possible, and the shape as a whole finished with scolloping. Angular turns of thatch should be avoided to prevent water channelling which quickly leads to decay; as far as possible, the thatch should be swept into the plane of the main roof. Generous packing and back-filling of valleys is required to discourage water lodging. Prominent elements such as porches and dormers can also be separated with a flashed valley, and flashings can also be fitted below the surface of tight turns in the thatch to arrest water damage.



Trimming the eaves following a re-thatch



Straw thatch, in County Wexford, using horizontal stretchers to pin and tighten the eaves

Repair of roof timbers

Roof structures on vernacular buildings may require to be upgraded even in cases where damage has not occurred because the existing timbers are frequently inadequate to carry loads that may occur. The most critical of these would be snow loading and the loads imposed by operatives carrying out thatching work or other roof repair works. In cases where the roof has not been damaged, it may be appropriate to install additional A-frames between the existing ones, leaving the existing historic timbers in place. The size and spacing of the new timbers should be determined based on:

- > The span of the roof
- > The member sizes and the spacings between the existing frames
- > The sizes and spacings of the battens
- > Due regard should be given to aesthetic considerations where the roof structure is exposed to view. It is generally appropriate to seek to locate the new frames near the existing ones to avoid obscuring the underside of the roof with the new timbers

Various difficulties may be encountered in installing new timbers. These include the existence of ceilings and the fact that the underside of the roof is seldom a plane surface – particularly where rough field timbers have been used in the original frames or where sagging has occurred between the frames.

In cases where wood rot has affected rafter ends, damaged sections should be cut out and new timbers spliced on or, where damage is extensive, it may be necessary to place new frames beside the existing and attach the damaged frame to the new frame. Fractured timbers should be treated in the same way. In cases where furniture beetle (woodworm) has caused damage, the timbers should be carefully examined to estimate the extent and seriousness of the problem. If necessary, timbers should be spliced or new ones added.

In examining timber elements, it should be borne in mind, especially in cases where water has penetrated the roof, that the top (or hidden) side of a timber may be quite badly affected while the soffit (underside) shows little or no damage.

In cases where repairs have been carried out to roof timbers in the past a careful assessment has to be made as to whether:

- > The repairs are adequate and functional
- > The extant repairs form part of the history and character of the building

Depending on the outcome of these considerations it may be necessary to retain (and even repair) the work or it may be possible to remove it and replace with more suitable repairs.



A new roof structure has been inserted beneath an old roof, strengthening and, at the same time reinforcing, the original structure which has been left in place above. However, a major intervention of this type is only justifiable where there has been a widespread failure of the existing structural elements



Low-rise chimneys are traditional on thatched buildings. They rely on large chimneybreasts below to ensure that sparks from the fire are extinguished before they reach the upper parts of the chimney



The poor quality flashing detail at the foot of this chimney stack is causing localised deterioration of the thatch

Chimney repair

Generally speaking, chimneybreasts do not present major structural problems. The weakest element of the chimneybreast is usually where it is carried by a narrow stub wall dividing the hearth from a doorway or a cupboard recess. If the adequacy of such a support is suspect it may be necessary to take down and rebuild it, possibly as a thicker wall, using methods and materials appropriate to the building. Where structural defects are identified, it is strongly recommended to seek the advice of a structural engineer with a knowledge and experience of older buildings. It is important to ensure that there are no openings or cracks in the chimney through which sparks might escape into the roof space or the thatch. Chimneys should be regularly checked and any unintended openings sealed with lime mortar. Exposed chimney tops are vulnerable to weathering and washing out of mortar in the joints and they should be monitored and repaired as necessary.

Chimney tops should be as high as possible above the thatch. A figure of at least 1800mm (6ft) is the recommended clearance under building regulations for a new flue from a solid flue appliance above an ignitable roof covering such as thatch. However, this is not the traditional height of a chimney, where 600mm (2ft) would be more usual, and even lower on thatched roofs. There is no doubt that, to appreciably alter the height of a chimney would have an impact on the character of a house. If the chimney level has to be raised it is preferable to use chimney pots rather than raising the entire chimney structure.

Water damage in thatch is often most apparent at the base of chimneys. To ensure the thatch is fixed as tightly as possible underneath a chimney, many thatchers insert a ridge roll of straw at the base into which the top course of thatch can be scoloped, making it as compact as possible. A fillet of mortar, or the more traditional mud, covers the final scollops, and a flaunching of mortar (or traditional mud) then seals the join. Lead flashing can also be used though many thatchers and householders often resist using it for aesthetic reasons. New thatch naturally compacts over time, sometimes leaving a gap around the chimney which allows ingress of rainwater. It is necessary to remake the flashings around the base of the chimney from time to time to overcome this.

Repair of other parts of the building

The repair of masonry elements such as walls and chimneys, and joinery such as windows and doors will require the involvement of other trades and skills besides thatching. It is important for an owner to know when specialist advice is needed and where to find the right help. Bad repair works can be difficult and expensive to undo and can damage a building in the long term. It is therefore a false economy for an owner not to get the best advice before having work carried out.

WALLS

The walls of vernacular thatched buildings are either of rubble masonry construction or unbaked earth construction and sometimes a mixture of both. Settlement due to poor foundation conditions is seldom a problem because thatched buildings (even where there is a second storey) are low rise and do not excessively stress the soil. However, if drainage patterns change due, for example, to alterations in ground water levels, leaking drainage pipes, or new yard paving, the soil can be softened, leading to settlement and cracking in the walls. Softened soil can also cause walls to lean outwards. Roofs also put considerable loading on walls.

Because of the vulnerability of earth walls to rising damp and splashback of rainwater, the base of such walls is usually constructed of stone. This masonry base is usually about 300-600mm high (1-2ft) and the earth walling was built up from this. The walls of some outbuildings have no masonry base and the earth walling is built directly off the ground. Earth walls expand and contract significantly as their moisture content changes and this almost always leads to cracking at the corners of the buildings. Where plaster has fallen away earth walls can be vulnerable to erosion by rain leading to gradual recessing of the wall face. Sometimes such recesses have been filled in the past with a dense impermeable material such as cement, causing further problems.

Earth walls are very vulnerable to erosion by rainwater. Traditionally an annual coat of limewash was applied by the owner. A thick build-up of limewash can often be seen on the walls of many old houses to the extent that the wall effectively carries a coat of lime plaster. It is an important maintenance task to continue this regular application of limewash. This can be done cheaply and easily using a roller or large brush. If this is not done, the protective coating begins to erode after a few years. As a rule of thumb one coating of limewash lasts one year. Therefore the careful application of several coats of limewash can be repeated on a 3-5 yearly basis as an alternative to applying a single coat annually. Limewash is a form of thin lime putty used as a paint or coating. It should not be confused with whitewash which is a mixture of chalk and water that does not carbonate and, as a result, washes and rubs off easily. Lime is highly caustic and poses a potential health risk. It should be used with great care in accordance with all current safety regulations, preferably only by those skilled and experienced in such work.

REPAIR OF WALLS

Different repair techniques are required for masonry and earth walls. Where a wall stability problem is suspected or identified it is important that advice be obtained from a structural engineer experienced in working with vernacular buildings before repairs are undertaken. It is essential that the causes of failure or defects be correctly diagnosed in order to plan and specify the appropriate repair works.

Masonry walls were frequently constructed using mud as a mortar – sometimes with a small lime content. This mortar can be vulnerable to washing out if the plaster or limewash coating fails. Stone walls may require re-pointing and, where minor cracks exist that are not due to settlement, these can usually be simply filled. Where larger sections of wall have become displaced by settlement it may be necessary to investigate the foundations which, in vernacular construction, are often shallow.

In cases where roof failure occurs, an outward thrust may be exerted on the front or back wall pushing it out of the vertical or in extreme cases causing partial collapse. If the out-of-plumb is not severe (say less than 50mm or 2in) and there are no other serious problems it may be possible to carry out minor repairs as necessary before reinstating the roof while continuing to monitor the wall for any further movement. In cases of more severe damage, partial taking down and re-building may be required. The local authority should be contacted before proceeding with any taking down. If the building is a protected structure, planning permission may be required.

Earth walls require different treatment. Where holes exist in earth walls or where the face has become recessed it is important to cut the earth back to provide a squared-out recess. This is then filled using small pre-dried earth bricks which are laid in a 'mortar' of mud slurry. It is not possible to simply fill holes with wet earth because, as it dries, the natural earth shrinks by up to 15% and simply falls off the wall. Cracks in the corners of earth-walled buildings are very common and are very difficult, if not impossible, to prevent because of the natural movements of the clay as its moisture content changes seasonally. Cracking can be minimised by cutting out horizontal chases at the corners and building back with two or three courses of earth bricks. The horizontal corners should be reinforced by installing strong fabric or even stainless steel mesh in the corners to tie the wall. The cracks may then be filled with a mud slurry. This type of treatment minimises cracking.



Repair of a corner crack in an earth wall

Most walls (earth and stone) were originally plastered externally in lime render or were annually painted with a coat of limewash which over time builds up to the equivalent of a thin plaster coating. It is essential for the structural integrity of earth walls that they should be able to 'breathe'. Unfortunately, the limewash coating has frequently been replaced by cement render or even by concrete poured against the wall. Cement render and concrete are inappropriate materials for use on historic buildings because of their rigidity and impermeability. Wherever possible, these materials should be removed and replaced with a lime-based render. However, in cases where removal would cause excessive damage to the original fabric it may be better to leave the cementitious material in place providing it is not actively causing deterioration. It is generally much easier to remove cement render from an earth wall than from a stone wall – and is also more important as the moisture trapped by cement render can cause disintegration of an earth wall.

REPAIR OF WINDOWS AND DOORS

The condition of timber doors, window sashes and frames can be quite variable. The most vulnerable areas – the bottom rail of the door or sash and the sill of the frame are usually the worst affected. However, most of the timber elements can be readily repaired by a skilled craftworker using normal joinery methods. For more information see *Windows – a guide to the repair of historic windows* in this Advice Series.



A small sash window with simple internal shutters is typical of vernacular houses



A traditional timber half door

Keeping a thatch log

Keeping a clear record, or log, of maintenance inspections and repair work is of great assistance in the ongoing care of the house. The log should include dated and, where possible, annotated photographs indicating the locations, for example, where defects were noted as part of a

maintenance inspection or where patching and repairs were carried out. For further information on general maintenance and undertaking maintenance inspections see *Maintenance: a guide to the care of older buildings* in this Advice Series.

The log of maintenance and repair work should contain the following information:

General information on the history of the house

- > Construction date (if known)
- > Who built it (if known)
- > Any extensions or alterations and when these were carried out
- > Previous owners or occupants (if known)
- > How long the present owner's family has lived in the house

Maintenance inspections

- > Date of inspection
- > Weather conditions on the days before the inspection
- > Any items of concern noted
- > Follow-up action required

Re-thatching information

- > Dates when work was carried out (from ... to ...)
- > Name of thatcher
- > Contact details
- > Materials and methods used (including thatch, scollops and other traditional materials)
- > Where the materials were sourced
- > Cost

Patching

- > Details of work carried out, including the location and extent of the works (south / north slopes, hips etc.)
- > Dates when work was carried out
- > Name of thatcher
- > Contact details
- > Materials and methods used (including thatch, scollops and other traditional materials)
- > Cost

Minor repairs

- > Details of work carried out (ridge, eaves, gables etc.)
- > Dates when work was carried out
- > Name of thatcher
- > Contact details
- > Materials and methods used (including thatch, scollops and other traditional materials)
- > Cost

Legal protection of historic buildings

It is important to establish at an early stage whether a building is protected by legislation and what types of notifications, permissions and/or consents it may be necessary to obtain before undertaking any works. This section is intended as guidance only and is not a legal interpretation of the legislation referred to below.

Planning and Development Acts

A thatched building may be protected under the Planning and Development Acts by being included in the Record of Protected Structures (RPS) of a particular planning authority or by being located within an Architectural Conservation Area (ACA). Where a building is a protected structure (or has been proposed for protection) or is located within an ACA, the usual exemptions from requirements for planning permission may not apply. In the case of a protected structure any works which would materially affect its character will require planning permission. Legal protection also extends to other structures and features within the curtilage of a protected structure such as outbuildings, boundary walls, paving, railings and the like. In an ACA, any works to the exterior of a building which would affect the character of the area also require planning permission. Owners and occupiers of protected structures have a responsibility to maintain their buildings and not to damage them or allow them to fall into decay through neglect.

A notice is sent to every owner and occupier of a protected structure when the building first becomes protected. The RPS can be consulted in the development plan for the area. If a building is a protected structure, or if it is located in an ACA, the planning authority will be able to advise what this means for a particular property.

The owners or occupiers of a protected structure are entitled to ask the planning authority in writing to issue a declaration which will give guidance on identifying works that would, or would not, require planning permission. Maintenance and repair works, if carried out in line with good conservation practice and the guidance contained within this publication, may not require planning permission. If an owner or occupier is in any doubt about particular proposed works, the architectural conservation officer in the relevant local authority should be consulted.

For general advice on planning issues relating to architectural heritage, a publication entitled *Architectural Heritage Protection Guidelines for Planning Authorities* (2011) is available to download from www.ahg.gov.ie.

Wildlife Acts

Under the Wildlife Acts it is illegal to destroy (whether by cutting, burning, grubbing up or spraying) vegetation on uncultivated land during the bird-nesting season, that is between March 1st and August 31st in any year. While it may not be illegal to cut back ivy or other vegetation growing on a wall or other built structure during this season, best practice should avoid doing so if at all possible. Consultation with the National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht is recommended and may assist in decision making. While the unchecked growth of ivy can cause serious problems to a building, its benefit to wildlife, in particular to bees and birds, is immense and therefore where ivy is not causing problems it should be left alone.

Nesting birds and/or roosting bats are often associated with historic roofs and in certain circumstances it can be illegal to disturb them. While nests are commonly recognised on the external parts of buildings and bat roosts are often associated with intact roofs, both bats and birds can be found in small cavities in stonework such as exist in some masonry structures. If there is any concern that nesting birds or roosting bats may be present where vegetation is about to be cut back or removed; in a structure about to be repaired; or in trees due for felling, advice should be sought from the NPWS. For further guidance on dealing with bats in historic roofs see the NPWS publication *Bat Mitigation Guidelines for Ireland* (2006) which can be downloaded from www.npws.ie.

Safety, Health and Welfare at Work legislation

Construction works, particularly to roofs, are potentially dangerous. When commissioning roof repair works, the owner or custodian of the structure should be aware of the requirements of the Safety, Health and Welfare at Work Act and the Safety Health and Welfare at Work (Construction) Regulations. The duties of owners/clients, contractors and relevant professionals are mandatory under this Act and its accompanying Regulations. Helpful guidance is provided on the website of the Health and Safety Authority: www.hsa.ie.

6. Thatchers, Materials and Methods

Thatching is naturally a labour-intensive activity and, depending on weather conditions, it can take some time to complete a job. Labour costs and materials can also make it a relatively expensive procedure. There are only about forty thatchers in Ireland, of whom perhaps two-thirds are full-time thatchers. This skills shortage means that some owners can expect delays and increased prices when seeking the services of a thatcher and should plan accordingly. Few thatchers who entered the trade in recent years are skilled in the use of straw, or in scollop thatching. At present about 40% of thatchers in Ireland are proficient in straw thatching. Generally, these thatchers can also thatch with water reed whereas reed thatchers rarely thatch in straw. Fewer than 10% of thatchers are proficient in thrust thatching.



Re-thatching with rye straw, County Leitrim

As thatchers retire within the next decade or so and there will be a need to ensure that their skills and expertise are passed on to a new generation of thatchers. In particular, there is a need for thatchers to be trained to work with historic thatch. At the time of writing there is an accredited traineeship developed by the Further Education and Training Awards Council (FETAC), however it is not currently on offer through any training centre.



*Tidying the ends of drawn bundles of straw
(Image courtesy of Brian Simpson)*

Sourcing materials

In keeping with the vernacular tradition to which thatch belongs and in the interests of sustainability, it is always preferable that a local source of suitable materials be used in re-thatching and repair work. This not only protects the special character of the building but helps to support local suppliers and ensures the continuity of supply.

Straw thatchers prefer straw with a minimum stem length of 800mm (32in). As a rule, the longer the stem, the greater the lifespan of the straw. Suitable long straw wheat varieties include Squarehead Masters, Maris Widgeon, Maris Huntsman and Little Joss. The durability of straw is often tested by twisting a few stems together and pulling at both ends to assess its strength. Thatch owners should ask the thatcher how the straw that is being sourced for the job was grown, harvested and threshed. There are a number of specialised growers and tillage farmers producing wheat and oat thatching straw. Wheat straw is also imported in small quantities from England, where there is a strong 'long straw' thatch tradition, and from continental Europe.

Thatching straw is best harvested before it is fully ripe when the uppermost nodes of the stem are still green and the straw is still flexible. Cut with a reaper-binder machine, the sheaves are stacked in stooks in the field to mature before being made into larger ricks and threshed in the field. A number of growers use a header-stripper to remove the grain. However, this is unsatisfactory as the straw is generally allowed to ripen more fully to permit this process to be used and the resulting straw is more brittle. Straw can be threshed in a threshing mill which crushes the straw to varying degrees, depending on the skill of the operator. The resulting tangled heap of straw, in which the ears and butts are mixed, should be straightened into bundles or rolled loosely into bales which are more easily transported. Seven or eight rolled bales amount to approximately one tonne of straw. A number of growers employ a threshing drum which threshes only the heads of the sheaves. This permits retention of the original tying which facilitates stacking of the sheaves in a frame and banding together for transport.



Careful operation of mechanical threshing mills can limit the degree to which the straw is crushed in the process

Variation in the yield obtained by growers is a constant problem and is caused by many factors. Bad weather can result in poor harvests. In particular, bad weather at harvest time can result in the crop being cut too early or too late for optimal results. Variations in the quality of straw within a single crop can also result from a grower having to harvest his crop in stages due to poor weather.

Straw was once a plentiful and cheap roofing material. Today, considerations of durability and cost dominate the trade. Good quality and carefully-threshed wheat straw thatched to a good standard should have a lifespan of up to twenty years, depending on the local environmental conditions. Oat straw, which has a shorter and less durable stem, has a lifespan of ten years at most, depending on the quality of material and workmanship. The flexibility of oat straw, however, makes it an attractive material for repairs to roofs using the thrust method of thatching. Rye imported in recent years from continental Europe has performed poorly. However, small quantities of good quality rye continue to be produced in the north-west of the country where it is still highly regarded as a thatching material.

Estimating thatch quantities



Advertisement for wheat straw, Dunmurry, County Antrim, 1945

The volume of thatch required for a roof is calculated per square metre. This is done by multiplying the length of the building by the rafter length and then doubling that figure. An extra metre is added to the rafter length to allow for the greater thickness of thatch required at the ridge and eaves. Thus a 13m (40ft) long, single storey vernacular house with a 5m (16ft) slope measurement amounts to approximately 160m² (1,600sq ft) of material. A full straw re-thatch done to a depth of 350-400mm (14-16in) requires about 50kg of material per square metre (allowing for wastage during thatching and bundle preparation), making a total of four to five metric tonnes of thatch. The existing condition of a thatched roof should be taken into account when estimating the volume of straw required. A badly worn roof requires a greater depth of straw than a roof with an existing thick coat of thatch. A lighter weathering coat requires about half the full amount of straw. When the thrust method is used, a main coat also requires about half the quantity required for a main coat of scolloped thatch. Water reed is measured in terms of the number of bundles per square metre – typically ten to eleven. Water reed bundles measure about 600mm (2ft) in circumference at the butt end. A new thatch of water reed is applied to an average depth of 325mm (13in) and a weather coat to a depth of 250mm (10in). Some of the imported rye and wheat straw bundles are up 1500mm (5ft) in circumference at the butt. Irish-produced wheat straw is generally supplied in sheaves.

Thatchers and thatching methods



A thatcher at work (Image courtesy of Máirín Doddy)

The thatcher selected should, preferably, be a local person, for several reasons. First, he or she may be better acquainted with the local style of thatching, and second, proximity to the job may help to ensure that the work is done without undue delay. It is advisable to try to get at least three written estimates or quotations for the work from suitable thatchers.

The owner should be clear when briefing the thatcher about the required quality and appearance of the finished works. The following is a checklist of some of the issues that should be clarified with the thatcher regarding the estimate provided, before accepting it:

- > Ask the thatcher for details of other houses thatched by him/her in the locality; visit them and speak to their owners if possible. Roofs which have been re-thatched for several years are the best indicator of the enduring quality of the workmanship and materials
- > Discuss in detail the condition of the existing thatch with the thatcher at the time of the initial inspection
- > Establish clearly what type of material is to be used (water reed, straw – wheat, oat, rye, etc.) and from where it will be sourced. High quality native thatch material is frequently in short supply, particularly following poor growing and harvesting seasons. However, while imported water reed and straw can often be superior to locally-available thatch materials, it can be difficult, when ordering, to ensure that the quality will be that required
- > Ask the thatcher for a method statement. This should deal with issues including the thatching method to be employed; the quantity of the old thatch that is proposed to be stripped from the roof in preparation for a re-thatch; and how the thatcher proposes to deal with any serious dips or hollows in the roof

- > Clarify the style of thatching to be used. From a conservation perspective, but also for aesthetic and practical reasons, it is advisable to maintain the existing style and method of thatching where these are appropriate to the building and the area in which it is located
- > Establish clearly how the ridge, eaves and gables will be treated; the type of flashings and copings to be used; the changes, if any, that are proposed to the existing thatch or roof structure; how the ridge is to be finished (for example, using ridge features such as bobbins and finials); the proposed treatment of the gables; and what external fixings are proposed
- > Agree how the thatcher intends to fix the thatch. The roof of an average three-bay house requires several thousand scollops. Fixings can be a significant element of the cost of thatching, accounting for up to 25% of the cost of materials in the case of scolloped thatch
- > Establish that the thatcher will inspect the internal roof structure and check the condition of the rafters before commencing work
- > Owners should satisfy themselves that the thatcher has liability cover, and assure themselves that he/she complies with health and safety legislation. A safety statement and proof of insurance cover should be sought from the thatcher.
- > For safety reasons, scaffolding is a requirement when working on roofs: clarify whether the thatcher intends to erect the scaffolding or bring in a contractor to erect it. Establish if the thatcher will have a helper
- > Agree access, parking facilities, and the removal of waste material and its correct disposal
- > Agree start and completion dates for the work
- > Keep notes of the condition of the roof before and after the works and add these to the building's Thatch Log (see Chapter 5)

Modern methods and materials

Some thatchers may propose to use modern methods and materials in their work, including the use of screw fixings, metal hooks, nylon ropes and twines, stainless steel wire, plastic tubing and the like. While in some cases, it may be expedient to use these, where the thatched roof is of historic significance, the use of traditional materials and detailing is always preferable.

Proposals to cover a historic thatch with an impermeable layer such as metal sheeting in order to apply thatch layer above are not appropriate. The result is a poor construction detail that does not provide adequate ventilation of the concealed historic thatch and is likely to promote its decay. The finished roof, while it may superficially resemble a thatched roof from the exterior, has no authenticity or heritage value.

If the building is a protected structure, alterations that involve the use of modern materials and methods may require planning permission and the advice of the architectural conservation officer in the local authority should be sought before any works commence. The use of modern methods and materials on a historic thatch roof may not be permitted without strong justification.

7. Living in a Thatched Building

Thatch has successfully provided a weather resistant and durable roofing material in this country for hundreds of years. However, because it is an organic material which is naturally permeable to both air and moisture, there are some special considerations required of those living in a thatched building. There is also a popular belief that thatch presents a high fire risk and, although this is not borne out by statistical evidence, a number of common-sense precautions should be taken to ensure the safety of the building and its occupants.



Vernacular houses range in size from a modest two-roomed example in County Wexford to large two-storey thatched 'mansions' such as this one in County Laois. Comparatively few substantial two-storey thatched buildings have survived into the modern era

Ventilation

All buildings require good ventilation but for thatched buildings, it is essential. Traditionally, in vernacular houses, the fire in the kitchen was kept going 24 hours a day, all year round, as it was needed not only for heating but for cooking too. This meant that there was a continuous flow of air through the building which helped to evaporate damp and to keep a relatively comfortable atmosphere at all times. The modern tendency to block off openings and prevent all draughts is simply not suitable for most historic buildings and can lead to excessive dampness and mould growth. Chimneys in a thatched building should not be blocked off even where not in use. However, if fires are not lit regularly, provision should be made to prevent rain falling down the chimney by installing a raised cover or cowl which permits ventilation while also allowing smoke to escape.

Heating

While the ideal form of heating in a thatched house is the traditional open fire this is not always possible or desirable in modern circumstances. Most forms of heating are suitable including radiators or storage heating. Any new heating system installed should minimise disturbance of the fabric of the building. The installation of underfloor heating may not be appropriate as its installation may require excessive works to the fabric of the building and destabilise the shallow foundations of a vernacular building.

It is recommended to keep a minimum background temperature in thatched buildings to ensure dampness is prevented; this can become a problem if the building is unoccupied for extended periods of time. Electrical storage heating can be useful for maintaining a desired background temperature in buildings that are likely to be unused for long periods of time. A minimum temperature is about 12°C is recommended. Heating should always be considered in tandem with ventilation; a balance should be sought between maintaining a comfortable temperature and ensuring that the building is adequately ventilated. This can be achieved by judicious choice and location of heating sources.

SOLID-FUEL STOVES AND FLUES

Nowadays, in the interests of increased energy efficiency, some owners may consider the installation of solid-fuel heating appliances, such as wood-burning stoves, in place of the traditional open fire. However, it is important to be aware that there is a particular hazard in the case of metal flues attached to these solid fuel burners as the flue wall can reach a sufficiently high temperature to ignite the thatch through which it passes. Inappropriate liners and/or incorrect installation can lead to failure. It is therefore essential that chimney alterations and flue installations are carried out only by specialist contractors who are aware of the specific issues and risks relating to thatched buildings. Current building regulations require that where flues discharge on or near roofs with surfaces that are readily ignitable, such as thatch, the clearance between flue and roof should be increased. This may have implications for the character of a protected structure and require planning permission. Alterations to the historic chimney and hearth associated with the installation of a solid-fuel heating appliance may also require planning permission and the advice of the local authority should be sought.



Chimney alterations and flue installations should be carried out by specialist contractors as inappropriate materials and poor workmanship can increase the fire hazard

Energy efficiency

Thatch is, by its nature, highly energy efficient and is an effective insulant, particularly older thatch which is frequently very thick and in many layers. In fact, thatched roofs have greater insulation values than any other traditional roof covering and can come close to meeting current standards for thermal insulation. In addition, the walls of vernacular buildings are usually thick and the openings (windows and doors) relatively small. However, the thermal performance of the roof is dependent on a number of variables such as the thickness and moisture content of the thatch and its overall condition. A well-maintained thatch will perform significantly better than one where the thatching material has become saturated and where the details at the eaves and verges are allowing water to seep into the building fabric. In most cases, good maintenance practice, simple repairs and appropriate draught-proofing will provide acceptable levels of thermal performance and comfort within the building. Maintaining the correct level of ventilation of the thatch is of critical importance where any improvements are being considered.



A vernacular building that uses locally grown thatch has a minimal impact upon the environment. It has low embodied energy and, at the end of its life cycle, the thatch material can be composted

There is little to be gained from insulating the attic because of the excellent insulating properties of thatch and because adding linings reduces the ventilation of the thatch. Dry-lining the internal face of external walls is not recommended as this prevents the walls receiving warmth from the interior of the building which has a necessary drying effect on the wall fabric. It also removes the benefits of thermal mass which come from the ability of thick walls to regulate extreme changes of temperature in the interior of the building. In addition, dry-lining can increase the risk of condensation forming within the thickness of the external wall where it may cause decay. Where dry-

lining has previously been installed, the condition of the wall should be regularly monitored to ensure that it is not deteriorating. This may involve opening up portions of the dry-lining to investigate the condition of the wall behind if it is suspected that damage is occurring.

A thatched building which is a protected structure or a proposed protected structure is exempt from the requirements of Part L (Conservation of Fuel and Energy) of the Building Regulations when it is subject to material alteration or change of use. Protected structures and proposed protected structures are also exempt from the requirement to have a Building Energy Rating (BER) undertaken when let or sold. For further information on upgrading the energy efficiency of a vernacular building see *Energy Efficiency in Traditional Buildings* in this Advice Series.

Fire prevention



The devastating results of a fire in a thatched building

Thatch is a naturally combustible material and it is wise to be always conscious of the risk of fire, to make efforts to prevent it and make preparations to deal with it should it occur. Dry thatch has little resistance to fire and a spark, assisted by draught, can rapidly cause a fire which may spread across the roof by flash flaming. There may also be potential sources of fire within the roof space. Once a fire occurs the most important factors in dealing with it are: an adequate usable water supply, speed of reaction and accessibility for fire fighters. It is advisable for thatch owners to consult with their local fire officer and have a plan in place in the event of a fire occurring.

POTENTIAL CAUSES OF FIRE

The main causes of fire in thatched roofs include:

- > Condition of chimneys and flues
- > Sparks exiting through the top of the chimney
- > Retrofitting of solid-fuel stoves and flues
- > Bonfires and barbeques
- > Electrical wiring or fittings in the attic

Condition of chimneys and flues: Statistics show that the majority of thatch fires are chimney related. The chimneys of many thatched houses were built in the nineteenth or early-twentieth centuries and have no linings or fire insulation. Where the condition of the walls of a chimney or flue is poor, it may allow sparks or hot gases to pass into the thatch through holes and cracks.

Sparks exiting through the top of the chimney:

Many thatched roofs have low chimneys with the consequent risk that sparks may fall on the thatch. Traditional chimneybreasts in thatched houses were very large and the draw in the chimneys was not strong. This meant that sparks from the fire were almost always extinguished before they reached the upper parts of the chimney. In many cases alterations have been made which have resulted in narrower flues and a much greater draw in the chimney which, while improving the functioning of the fire, can create conditions whereby sparks can rise above the top of the chimney and fall on the thatch. In the past, advice often recommended the installation of spark arrestors in the chimney. However, recent research in the UK has shown that spark arrestors can become clogged with sooty material and redirect hot gases into the roof space or into the thatch itself if there are any cracks or openings at high level in the chimney. It is therefore not recommended that spark arrestors, or spark guards, are fitted to the chimneys of thatched buildings. Where spark arrestors have been previously installed, they should be professionally cleaned and maintained on a regular basis. Fuels which do not create sparks, such as dry and seasoned wood, should be used where these are available.

Retrofitting of solid-fuel stoves and flues: There is a particular hazard in the case of metal flues attached to solid fuel burners (see 'Heating' above). The flue wall can reach a sufficiently high temperature to ignite the thatch through which it passes. In addition, insulated flues that are not adequately vented increase the likelihood of unextinguished embers or sparks exiting the chimney top where they may fall onto the thatch.

Bonfires and barbeques: The burning of waste materials within the curtilage of a dwelling is generally illegal. Any other burning activity, such as bonfires or barbeques, which could give rise to wind-blown sparks pose a real danger and should be avoided anywhere near to a thatched roof.

Electrical wiring or fittings in the attic: Wiring should not be installed in the roof space except where it is absolutely necessary. All wiring should be carried out by a qualified electrician such as one on the Register of Electrical Contractors of Ireland (RECI) and should comply with all of the appropriate standards of Electro-Technical Council of Ireland (ETCI) and should be carried in conduits. Wiring should be located so that it is clearly visible and can be easily and regularly checked. It is particularly important that fittings such as junction boxes are properly sealed to prevent an ingress of dust. The installation of recessed lighting into ceilings below thatch is not recommended due to the potential for overheating. Where light fittings protrude into the roof space, they should be enclosed in a fire-proof bulkhead. External floodlighting or security light fittings should not be located close to thatch, such as beneath the eaves, as they can become very hot when in use.



House leek (sempervivum tectorum) was once actively cultivated by some residents of thatched houses in the superstitious belief that it prevented fire. Albert Nilsson, 1935 (Image from the National Folklore Collection, University College Dublin)

FIRE PREVENTION MEASURES

Maintenance of a thatched building requires constant attention to the risk of fire. There are a number of actions that can be taken to reduce the risk of fire or to mitigate damage in the event of a fire, including:

- > Fit smoke alarms throughout the house including in the attic space connected to the electricity mains and carry out regular testing
- > Pay particular attention to chimneys, both inside and out, during regular maintenance inspections. Chimneys should be regularly examined for any cracks, openings or loss of pointing which would permit sparks or hot gases to escape into the thatch and cause combustion. The opportunity should be taken when a roof is being re-thatched or repaired to strip back a narrow width of thatch around the stack to check the masonry and the thatch for damage and undertake any necessary repairs
- > Where a chimney stack is particularly low above the thatch, consider raising the height of the chimney to reduce the risk of sparks landing on the thatch. If the building is a protected structure, this may require planning permission and the advice of the planning authority should be sought regarding the proposal
- > Renew old electrical wiring, particularly where it is located within the roof space
- > Ensure that any previously fitted spark arrestors or spark guards are maintained and regularly cleaned by a competent chimney sweep. However, their use is no longer generally recommended (see above) because of the increased risk of fire
- > Ensure that chimneys are swept at least once a year
- > Keep the attic space free from clutter and any flammable material. Ensure that all parts of the attic space are accessible
- > Use appropriate fuel for heating. Avoid the use of unseasoned or wet wood as a fuel. Paper should not be burned on an open fire
- > Ensure that no 'hot' work practices are undertaken on the building including by outside tradesmen. Such practices include cutting, welding, soldering and burning-off of paint

- > Avoid bonfires, barbeques, fireworks or the use of outdoor heaters anywhere near the thatch
- > Do not install security lighting close to thatch where it could cause overheating and ignition of the thatch

Attempting to fireproof a historic thatched roof by lining it internally with modern fire-resistant boarding is not recommended. Such fire barriers can significantly reduce the level of air flow around the roof timbers and through the thatch, causing a build-up of moisture levels which can accelerate the decay of the timbers and thatch. The effectiveness of spray-on chemical fire retardants is doubtful and not recommended as such treatments require to be regularly renewed to maintain effectiveness and the chemicals used may potentially damage the thatch or encourage its decay.

MITIGATING DAMAGE

There are a number of measures that can be taken to prepare for the worst and ensure that a fire can be effectively dealt with, mitigating loss and damage. These include:

- > Ensure that the local fire services know the detailed location of, and the appropriate access routes to, the thatched building particularly where it is situated in a remote location
- > Have an adequate number of fire extinguishers and fire blankets to hand to deal with small fires to prevent their spread
- > Have a plentiful and readily available water supply from an outside tap or other source. It is recommended that the water source be provided with a hose that is long enough to reach all parts of the roof
- > Ensure that, in the event of a fire, fire-fighting personnel have full access to the roof, both inside and out. The attic space should be accessible by a hatch of a size (at least 1000 x 600mm or approximately 3½ x 2ft) sufficient to allow a fireman and equipment through.
- > Ensure that the attic floor is strong enough to carry the weight of fire fighters and their equipment

- > Fix any wire netting on the roof in such a way that it can be easily removed as this may be necessary during fire-fighting to create a fire break. This is best achieved by ensuring it is laid in strips up the slope of the roof and overlapped at the ridge. It can then be freed at the ridge and removed by rolling down towards the eaves. However, the fixing of wire netting over an entire roof is not generally recommended (see Chapter 5).

IN THE EVENT OF A FIRE

When a fire occurs, the first step should be to alert the fire services. Where it is safe to do so, the draught should be minimised by closing all windows and doors and any hatches into the roof space. Removing burning thatch from the roof is dangerous and should only be carried out by trained fire fighters and undertaken with great caution as the resulting hole may create a stronger draught and exacerbate the fire.



Useful Contacts

If the building is a protected structure, the architectural conservation officer in the local authority should be the first person to contact with queries regarding works to it.

Other useful contacts include:

Department of Arts, Heritage and the Gaeltacht,
Architectural Heritage Advisory Unit,
Custom House, Dublin 1
Telephone: 01 888 2000
Web: www.ahg.gov.ie

Department of the Environment, Community and Local Government,
Housing Grants Section,
Government Offices, Ballina, Co. Mayo
Telephone: (096) 24200
Web: www.environ.ie

Engineers Ireland, 22 Clyde Road, Ballsbridge, Dublin 4
Telephone: 01 665 1300
Web: www.iei.ie

Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny
Telephone: 056 777 0777
Web: www.heritagecouncil.ie

Irish Architectural Archive, 45 Merrion Square, Dublin 2
Telephone: 01 663 3040
Web: www.iarc.ie

National Folklore Collection, Newman Building,
University College Dublin, Belfield, Dublin 4
Telephone: 01 716 1144
Web: www.ucd.ie/irishfolklore

Royal Institute of the Architects of Ireland, 8 Merrion Square, Dublin 2
Telephone: 01 676 1703
Web: www.riai.ie

The Society of Chartered Surveyors Ireland, 38 Merrion Square, Dublin 2
Telephone: (01) 644 5500
Web: www.scsi.ie

Further Reading

Some of the older publications listed below may no longer be in print. However, they are a valuable resource and for this reason are included here. Many continue to be available to view or to borrow through public libraries.

Bowen, Laura. *Reusing Farm Buildings: a Kildare perspective*. Naas: Kildare County Council (2007)

Consarc Conservation Architects, Mullane, Fidelma and Oram, Richard, *Report on the Present and Future Protection of Thatched Structures in Ireland*. Dublin: Department of the Environment, Heritage and Local Government (2005)

Danaher, Kevin. *Ireland's Traditional Houses*. Dublin: Bord Fáilte (1993) Originally published as *Ireland's Vernacular Architecture*. Cork: Mercier Press (1975)

English Heritage. *Energy Efficiency and Historic Buildings – insulating thatched roofs*. Swindon: English Heritage (2010, revised edition 2012)

English Heritage. *Practical Building Conservation: Roofing*. Surrey: Ashgate Publishing Ltd (2013)

Evans, Emyr Estyn. *Irish Folk Ways*. London: Routledge & Paul (1957)

Gailey, Alan. *Rural Houses of the North of Ireland*. Edinburgh: John Donald Publishers Ltd. (1984)

Hampshire Fire and Rescue Service. *Thatched Property Safety Guide*. Hampshire (2009)

Heritage Council. *Irish Thatched Roofs: is their future a thing of the past?* Kilkenny: Heritage Council (1999)

International Council on Monuments and Sites (ICOMOS). *Charter on the Built Vernacular Heritage*. Ratified in Mexico (1999)

Irish Folklore Commission. Questionnaire: Roofs and Thatching. *NFC volumes 1079-1081*. National Folklore Collection. University College Dublin (1945)

Letts, J B. 'Historic thatch (Ireland) study: an interim report', *Context 56*. (December 1997)

Morgan, W E C & Cooper, F W. *The Thatcher's Craft*. London & Salisbury: Rural Development Commission (1960, revised 1977)

Ó Danachair, Caoimhín. 'The Questionnaire System: Roofs and Thatching', *Béaloideas 15* (1945)

Oram, Richard and Stelfox, Dawson. *Traditional Buildings in Ireland: home owner's handbook*. Belfast: Mourne Heritage Trust (2004)

O'Reilly, Barry. *Living under Thatch*. Cork: Mercier Press (2004)

Reeners, Roberta (ed.). *A Wexford Farmstead: the conservation of an 18th century farmstead at Mayglass*. Kilkenny: Heritage Council (2003)

Walker, Bruce; McGregor, Christopher & Stark, Gregor. *Thatches and Thatching Techniques: a guide to conserving Scottish thatching traditions*. Edinburgh: Historic Scotland (1996)

Williams, Mary Ann, Hughes, Sinead & Lanigan, Bronagh. *Thatch – voices from the traditional houses of County Laois*. Laois County Council (2011)

Thatch surveys

Many local authorities, often with the assistance of the Heritage Council, have undertaken and published surveys on the thatched structures in their areas. Copies of individual surveys may be obtained from the local authority or found in local libraries; several can be accessed online. These surveys are an excellent way of discovering more about the particular regional qualities of thatch in an area and the range of materials and detailing used. In addition, a number of unpublished surveys undertaken by the Office of Public Works in the 1980s and 90s are an invaluable historical record. The National Inventory of Architectural Heritage at the Department of Arts, Heritage and the Gaeltacht routinely records thatched buildings as part of a nationwide survey of architectural heritage. The NIAH records can be viewed at www.buildingsofireland.ie

Regional surveys of thatch include:

Clare

Carrig. *County Clare Thatched Structure Survey*.

Clare County Council and the Heritage Council (2005)

Cork

Sleeman, Mary. *Thatched Houses of County Cork*. Cork County Council (2004)

Donegal

Mullane, Fidelma. *County Donegal Survey of Thatched Structures*.

Donegal County Council (2007)

Galway

Mullane, Fidelma. *The Thatched Roofs of County Galway* (2008)

Nolan, Dermot. *Report on the Conservation of Thatched Houses on the Aran Islands* (2005)

Kildare

Duggan, Charles. *The Thatched Houses of County Kildare*. Kildare County Council (2005)

Kilkenny

Lenehan, Jimmy. *Thatch Survey of Co. Kilkenny*. Kilkenny County Council (1994)

Laois

Architectural Recording and Research. *Survey of Thatched Structures in Laois*.

Laois County Council and the Heritage Council (2007)

Offaly

O'Reilly, Barry. *Living under Thatch – vernacular architecture in County Offaly*.

Cork: Mercier Press (2004)

Roscommon

Mullane, Fidelma. *An Assessment of Thatching Needs in County Roscommon*.

Roscommon County Council (2009)

Sligo

Prins, Nicholas and Wood, Jamie. *Thatch Building Survey of County Sligo*. Sligo County Council (2003)

Tipperary

Architectural Recording and Research. *Inventory of Thatched Structures in South Tipperary*. South Tipperary County Council (2005)

Waterford

John Cronin & Associates. *County Waterford Thatched Houses: report of findings*. Waterford County Council (2006)

Wicklow

Lotts Architecture and Urbanism, *Traditional Houses of Rural Co. Wicklow: an inventory of vernacular architecture*. Wicklow County Council (2008)

OPW Thatch Surveys

Higginbotham, Michael. Unpublished surveys by the Office of Public Works including:

Survey of Thatched Houses on the Aran Islands (1989)

Survey of Thatched Houses in Cos. Dublin, Wicklow and Carlow (1983-92)

Survey of Thatched Houses in Co. Kildare (1987-8)

Survey of Thatched Houses in Co. Kilkenny (1994)

Survey of Thatched Houses in Co. Limerick (1994-5)

Survey of Thatched Houses in Co. Louth (1993-4)

Survey of Thatched Houses in Co. Meath (1993)

Survey of Thatched Houses in Co. Wexford (1987-90)

Copies of the OPW thatch surveys can be consulted by appointment at the Archive Unit, National Monuments Service, Department of Arts, Heritage and the Gaeltacht. Copies are also lodged with the Irish Architectural Archive.

Glossary

BASE COAT

A roughly thatched coat to provide a sound and even base for the final coat

BAY

A division in the architectural arrangement of a building marked by such features as windows or doors.

BLOCK RIDGE

A ridge applied to stand above the level of the roofing thatch by approx. 80mm (3in). The ridge is generally thatched in sedge or straw on a reed roof and cut with decorative, scalloped edging. It is not appropriate for use on Irish vernacular thatch but is associated with the cottage-orné style of thatching

BOBBIN

Handful of long straw twisted at its centre and folded in two, creating an eye at one end by twisting several wisps of the straw around the folded bundle. Bobbins are strung on strong hazel rods (see Comb) and secured with hairpin scollops to the apex of the ridge

COLLAR-BEAM

Horizontal timber piece tying rafters together at a high level

COMB

Row of straw bobbins at apex of ridge (also 'hen', 'jockey')

COPING OR RIDGE

Capping of clay or mortar (also 'casting cap')

DRAWING

Process of separating long and short stems of crushed (threshed) straw by wetting and drawing by hand into bundles

EAVES

The lower edge of a sloping roof which overhangs the wall head

FLASHING

Material fitted to prevent ingress of water at unsealed joints between surfaces, for example, around the base of a chimney stack

FLAUNCHING

A sloping mortar fillet, such as around the base of a chimney stack

FLEEKING

A woven water-reed mat used as an alternative to battens to provide support to the thatch between rafters

KEEPER

A horizontal scollop

LEGGET

A toothed, card-shaped wooden implement with a handle; used to dress the ends of water reed or combed wheat straw bundles tightly into their fixings

LIGGERS

Split rods, mainly of hazel or willow, used on the ridge of a thatched roof and on eaves and gables of long straw roofs. They can be fixed to form decorative patterns

MORTAR

A mixture of a binder (such as lime, clay or cement), sand and water used to bind stones/bricks. Mortar can also be used to make flashings, flaunching, copings and cappings

RIBBERY

Wattle support structure underlying thatch

RIDGE

The apex of a double-pitched roof and the capping covering it. The treatment of the ridge depends on the material used and the local thatching tradition

RIGGING

Rod fixings to the ridge

RODDING

Rods, usually of hazel, used to secure thatch to the rafters of the roof

SCOLLOP

From the Irish word *scolb* – horizontal and bent rods of hazel, willow, ash, briar, bog fir etc. used to secure thatch to the roof structure. Alternate terms for horizontal scollops include ‘stretcher’, ‘skiver’, ‘spar’, ‘spray’, ‘keeper’, ‘lier’, *sínteán/sínteoir*, *slat/slatán*. The bent rods are shaped like hairpins or staples and the ends pointed. Localised terms include ‘bolt’, ‘clasp’, ‘scobe’, ‘keeper’, ‘spray’, ‘twister’, *lúbán*, *gabhlóg* and *sáiteán*

SCRAW

From the Irish word *scaith* – a strip of pared lea (grassed) sod laid on the roof structure from ridge to eaves to provide a foundation and anchorage for fixing thatch

SLICE

Thrust method of thatching typical of east Leinster in which handfuls of straw are thrust into the old thatch with a fork-like stick

SPAR COAT

A new (weathering) coat of straw scolloped onto old thatch

STOOK

A group of sheaves of grain stood on end in a field to dry

STRAKE

Vertical course of thatch, about 600mm (2ft) wide, applied by a thatcher from eaves to ridge (also known as a ‘streak’, ‘stroke’, ‘bay’, ‘bed’, ‘course’, *stráca*, *stríoca*, or *sraith*)

STRAW

The stalks of threshed grain, especially of wheat, rye, oat or barley

STRETCHER

Horizontal scollop

SÚGÁN

- (1) Straw or hay rope used to tie sod foundation and base layers of thatch to roof structure;
- (2) External network of straw or hay ropes securing thatch

SWAYS

Rods of hazel or willow used with scollops to secure thatch

THATCHING FORK

Metal or wooden implement having two prongs at one end used to thrust bundles of straw into old thatch. Known variously as a ‘beating pin’, ‘slice’, ‘spittle’, ‘spurtle’, ‘stappler’, ‘stoppler’, ‘thatching stick’ or ‘thruster’

THRESHING

A method of removing grain from straw. Threshing can be carried out manually or mechanically. Also called ‘scutching’ or ‘thrashing’

VERGE

The sloping edge of a pitched roof above the gable

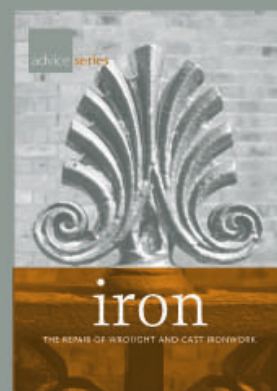
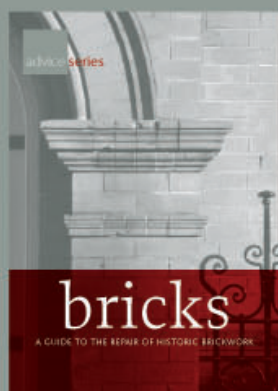
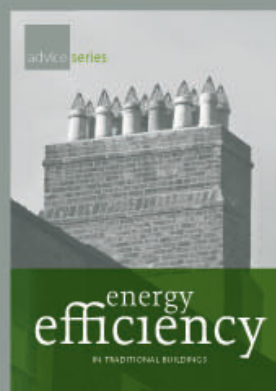
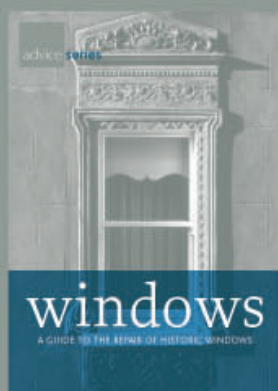
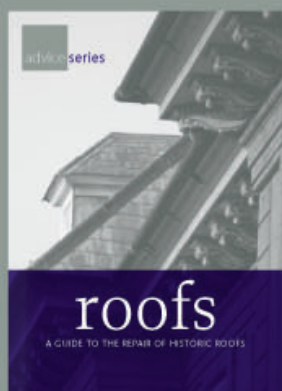
VERNACULAR

Native or indigenous form of building generally using locally available materials

WATTLE

Interlaced rods of hazel and willow used to form partition walls, the support structure for base layers of thatch, for chimneys and chimney canopies

The Advice Series is a series of illustrated booklets published by the Architectural Heritage Advisory Unit of the Department of Arts, Heritage and the Gaeltacht. The booklets are designed to guide those responsible for historic buildings on how best to repair and maintain their properties.



This guide gives advice to those responsible for the care and conservation of a historic thatched building including:

- ▶ Understanding how a traditional thatched roof is constructed
- ▶ Maintaining the roof in good condition
- ▶ Recognising when there are problems
- ▶ Making choices when repairing or re-thatching

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