Conservation of

Historic Timber in Traditional Farm Buildings

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Overview

- The problem
- Value of historic timber
- Understanding timber defects
- Some typical solutions

The problem ?

Value of historic timber

- **Intrinsic to the special character & interest of the building**
- **Enhances authenticity**
- **Better strength & durablity**
- **Irreplaceable resource**

What categories of historic Interest?

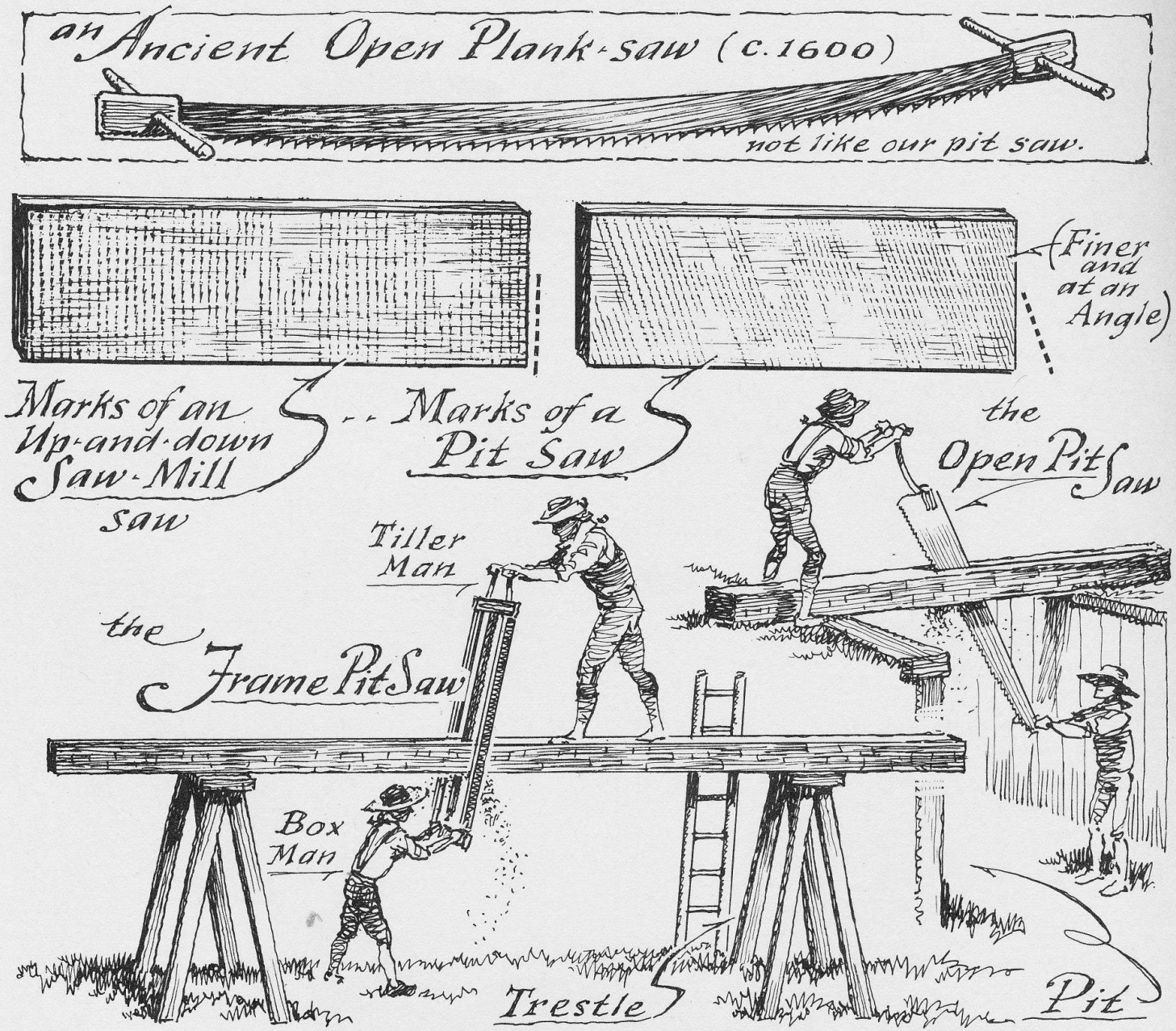
Conservation?

Unusual roof forms & details

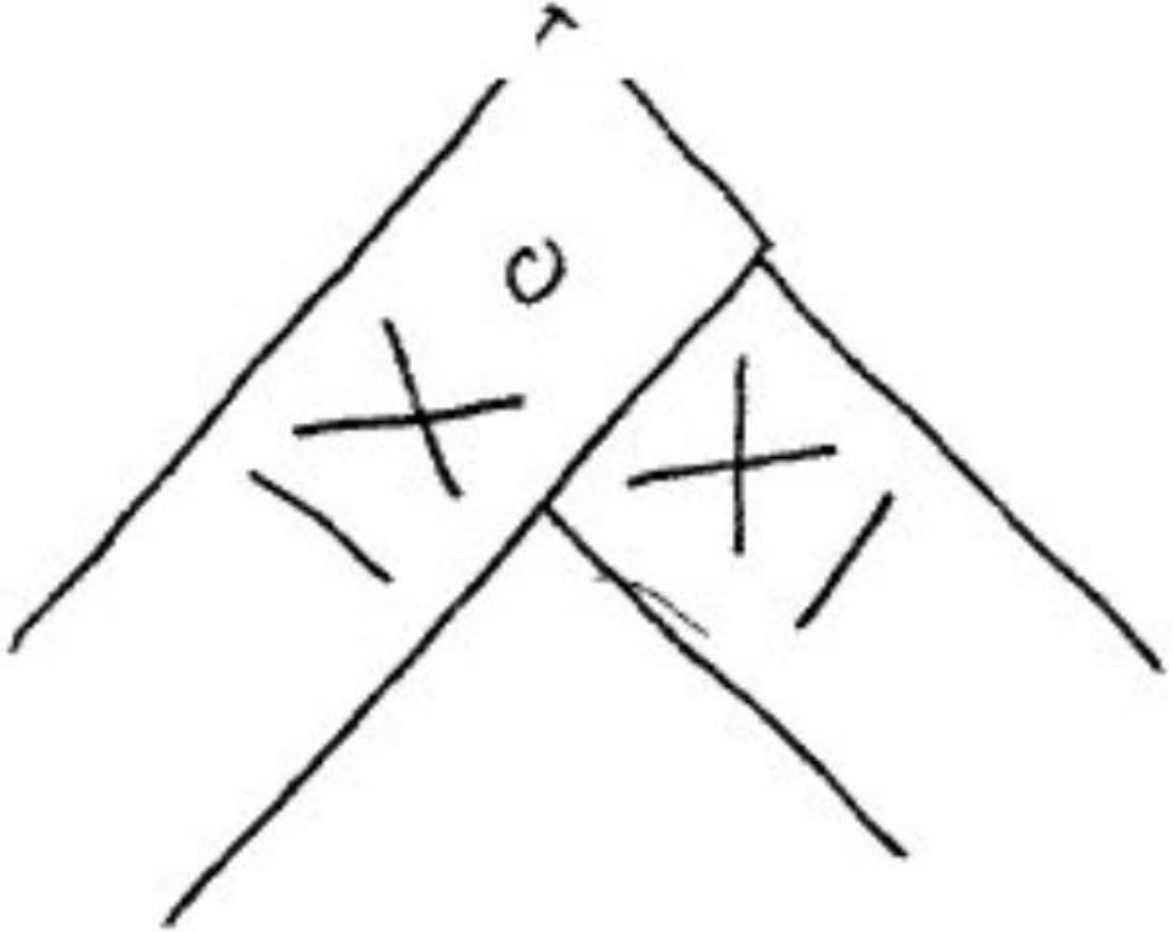
Historic conversion methods

Pit sawn surface: the finish is characterised by saw-marks at about 75 to 85° to the length of the timber and a cleave-off at one end in the shape of an irregular triangle.

Mill sawn surface: wind or water-powered reciprocating saw blades cut at about 90° to the length of the timber, leaving evenly and closely spaced saw marks with no cleave off.


an Ancient Open Plank-saw (c.1600)
not like our pit saw.
(Finer and at an Angle)
Marks of an Up-and-down Saw-Mill saw
Marks of a Pit Saw
the Open Pit Saw
Tiller Man
the Frame Pit Saw
Box Man
Trestle
Pit
the box man wore a big hat because of the shower of sawdust.

Carpenters & merchants marks



Timber in farm buildings

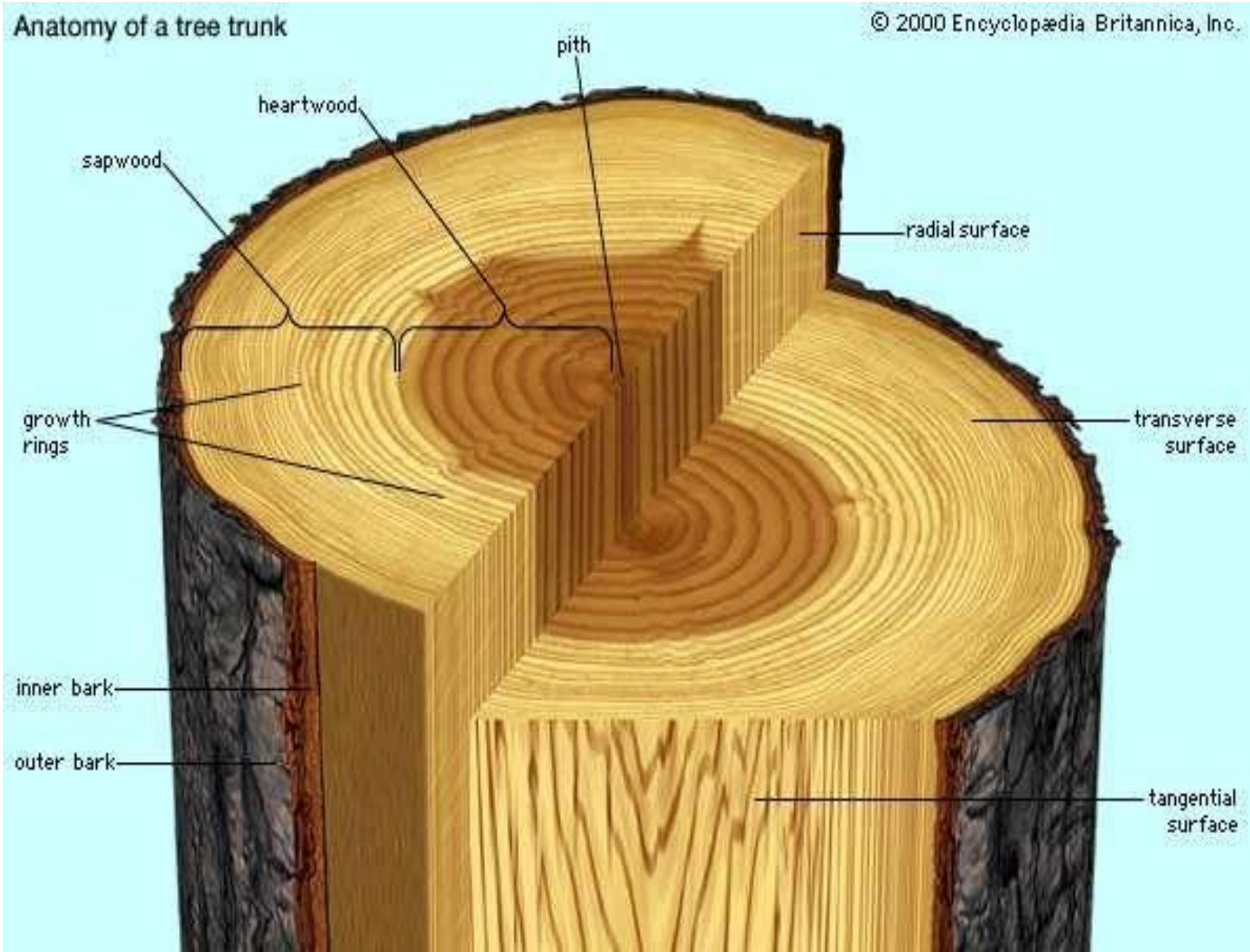
- **Good quality indigenous timber such as oak, elm etc. are rare in farm buildings**
- **Split logs of various timber species used for framing roofs, livestock stalls etc. especially in vernacular buildings**
- **With depletion of Irish forests building timber was usually imported from 17th century onwards and mainly softwoods such as Spruce, Scots pine & Douglas fir from Scandinavia & Eastern Europe**

Timber is not a uniform material

Strength & Durability is dependant on:

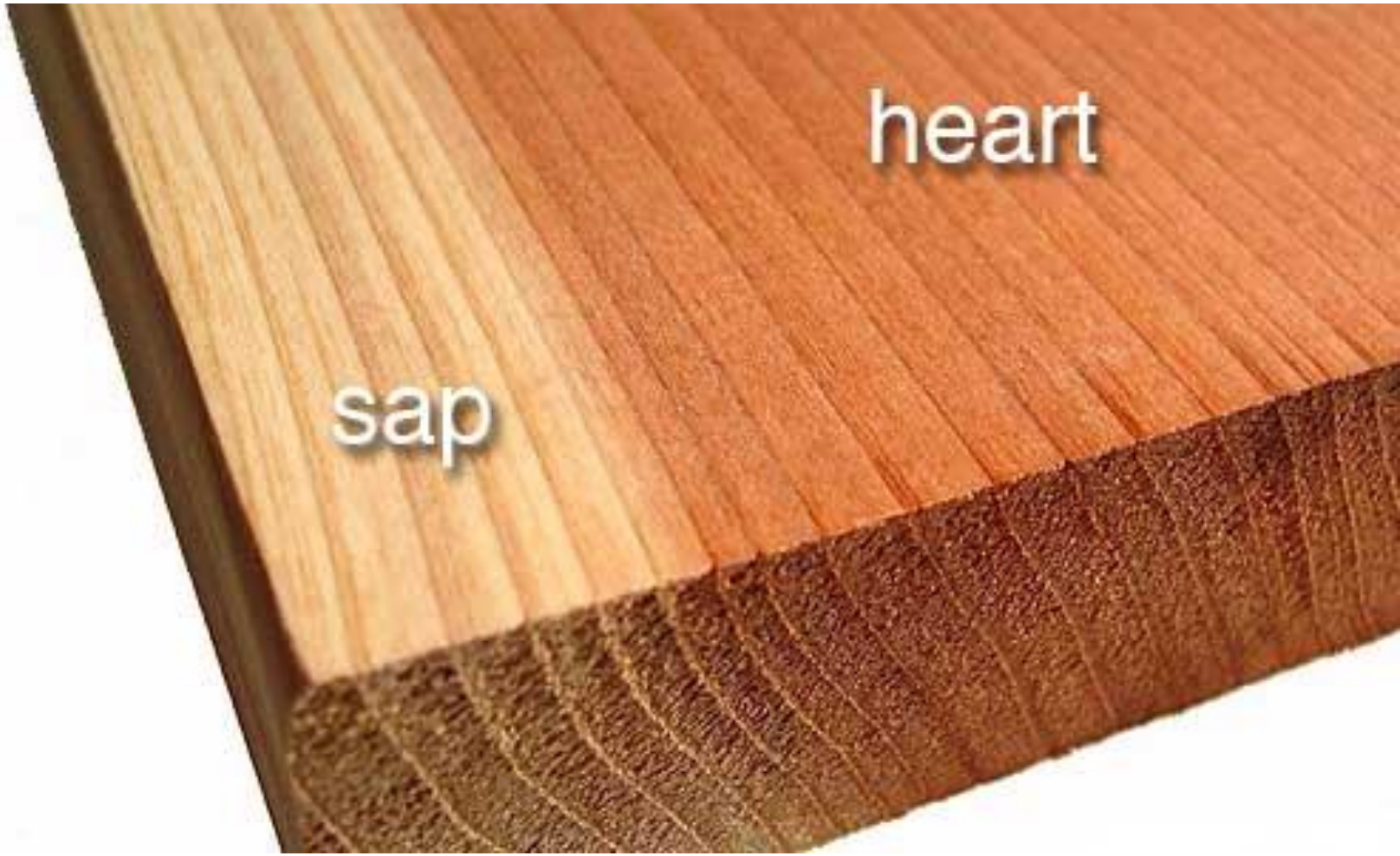
- Species & growth characteristics
- Age – older wood is generally stronger and more resistant to decay
- **Extractives** – natural resins including aromatics, tanins, steroids, oils etc. which can enhance durability

Varies across softwoods & hardwoods



Importance of Heartwood

- Heartwood (dead) contains higher amounts of extractives - natural resins which have natural preservative & anti-septic properties
- Resins can reduce water absorbing properties of the wood
- Resins accumulate as tree matures
- Heartwood can vary in a single plank due to conversion process

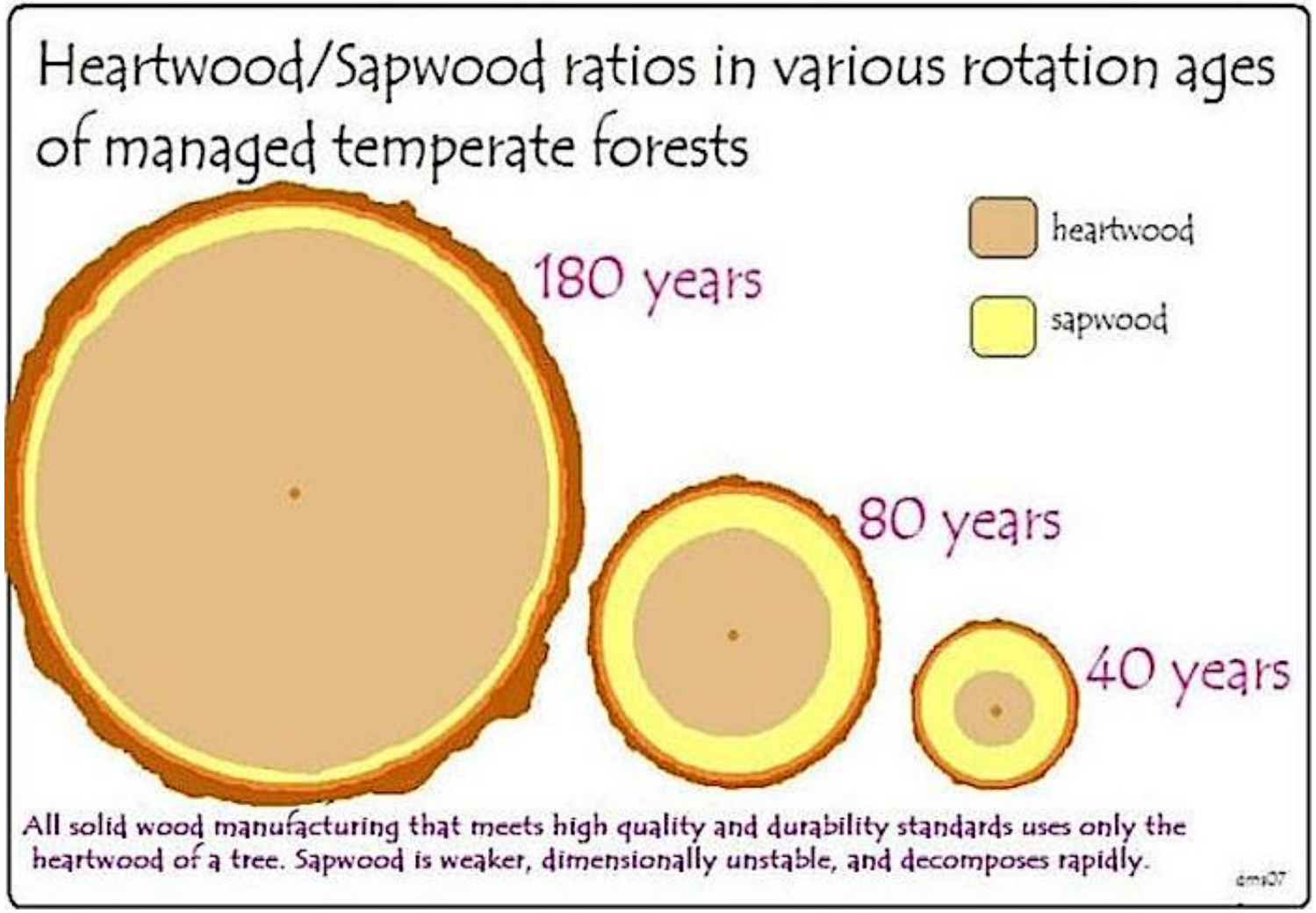


Historic timber is an irreplaceable resource

Historic Imported timber:

Generally slow-grown from old-stand forests with relatively high heartwood content resulting in greater durability

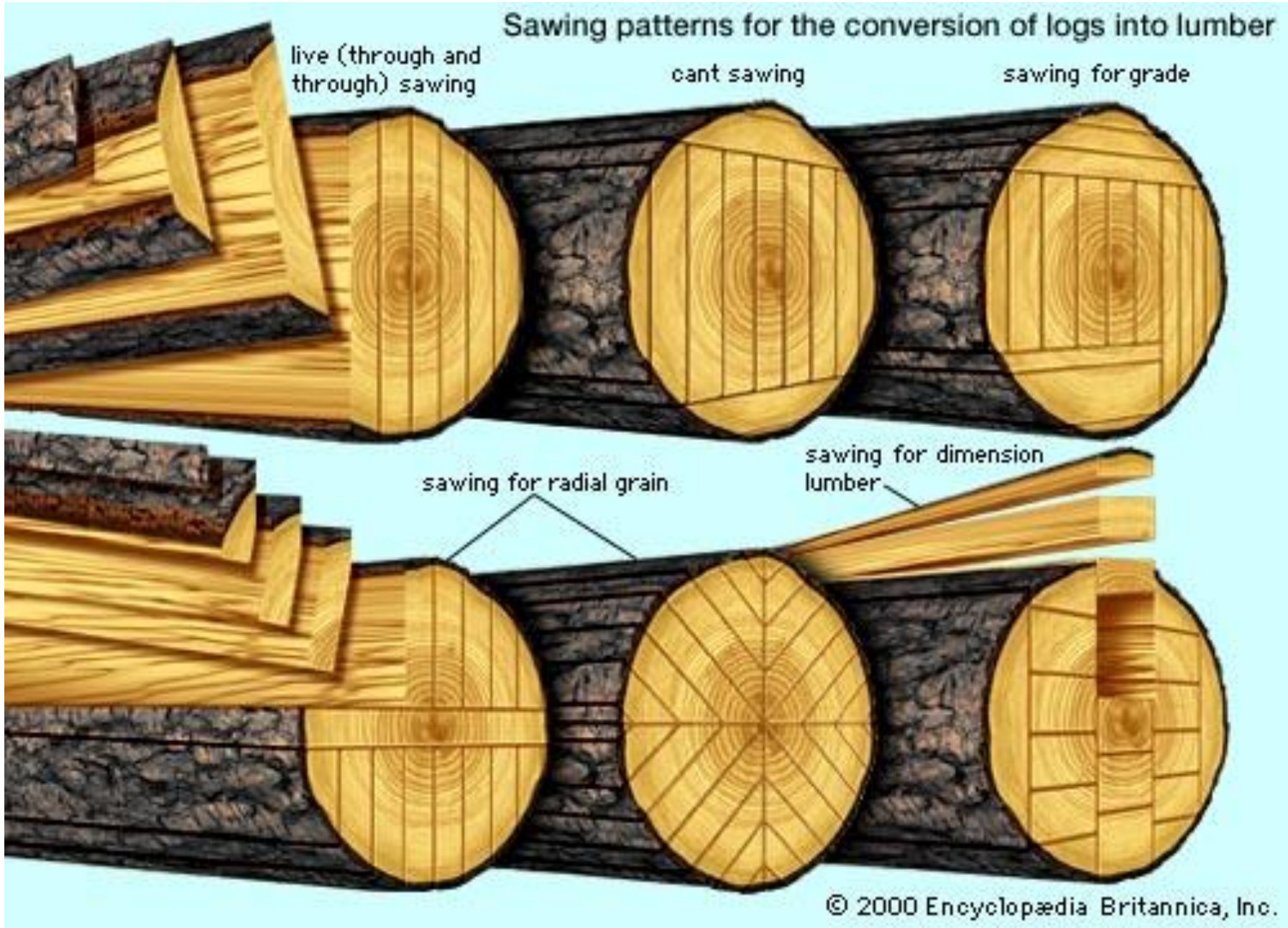
Timber from cold northern climates with short summers and long winters resulted in timber with tighter growth rings and greater density.



Modern fast grown plantation timber

- Growth rings further apart
- Lower density and higher sapwood content
- Higher levels of moisture & nutrients in sapwood increases susceptibility to fungal decay and insect attack
- Preservative treatment is usually necessary for durability

Heartwood & conversion



Structural timber -Typical issues

- **Moisture related deterioration in timber**
- **Undersized timber**
- **Inadequate support - roof spread**
- **Loss of bearing**
- **Previous alterations/repairs**

Some basic principles of conservative repair

- **Recording** - before and after - includes understanding the building and what has gone wrong before any action is taken
- **Minimum intervention** - as little as possible and as much as necessary
- **Like for like repairs** – use of proven methods & compatible materials
- **Reversibility of repairs** – repair should not preclude future repairs
- **Sympathetic repair** – respect the special character

Moisture related deterioration

Insect Attack

- Usually woodworm
- Recognition
- Usually only in sapwood
- Timber with elevated moisture content (especially over 20%)
- Can weaken & eventually destroy timber but slowly

Dealing with woodworm

- Relatively new problem
- Over reliance on preventative chemical treatment
- Establish extent & rate of decay
- Distribution usually varies & relates to conversion & sapwood content
- Active or inactive?
- **Reduce moisture content – effective repairs & ventilation**
- Targeted treatment to active woodworm monitoring
- Safe & bio-degradable?
- Role of natural predators & parasites

Fungal decay

- Dry rot rare in farm buildings
- Usually wet rot
- Can destroy timber
- Sapwood most vulnerable
- Timber with elevated moisture content (typically 30-70%)
- Embedded timbers in damp masonry - wall plates, rafter feet, lintel bearings
- Timber exposed to frequent wetting - ends of doors/windows.

Dealing with fungal decay

- Only cut out and replace damaged timber
- Widespread preventative treatment of in-situ timber not necessary – can be activated from within timber
- Find & repair fault
- Dry out the structure
- Enhance ventilation
- Ensure maximum breathability and hygroscopicity of adjacent materials (lime)
- Treatment may be required where timbers remain exposed to damp masonry during drying out period

Repairs to structural timbers

Maintain structural integrity & historic significance - requires holistic & balanced approach

Understanding whole structural performance

Specialist engineering advice may be required

Roof spread

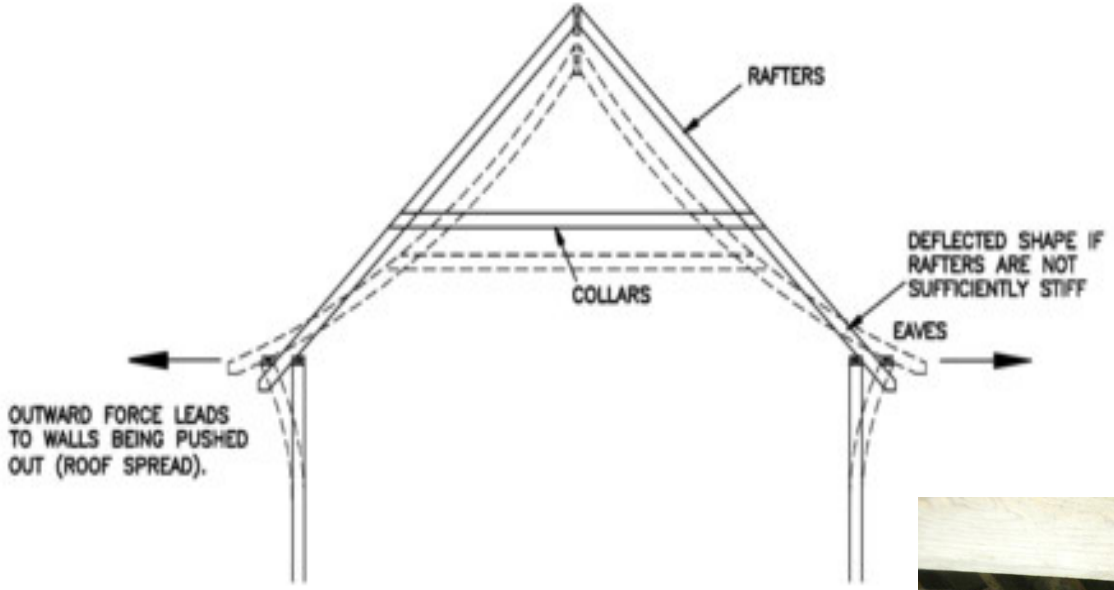
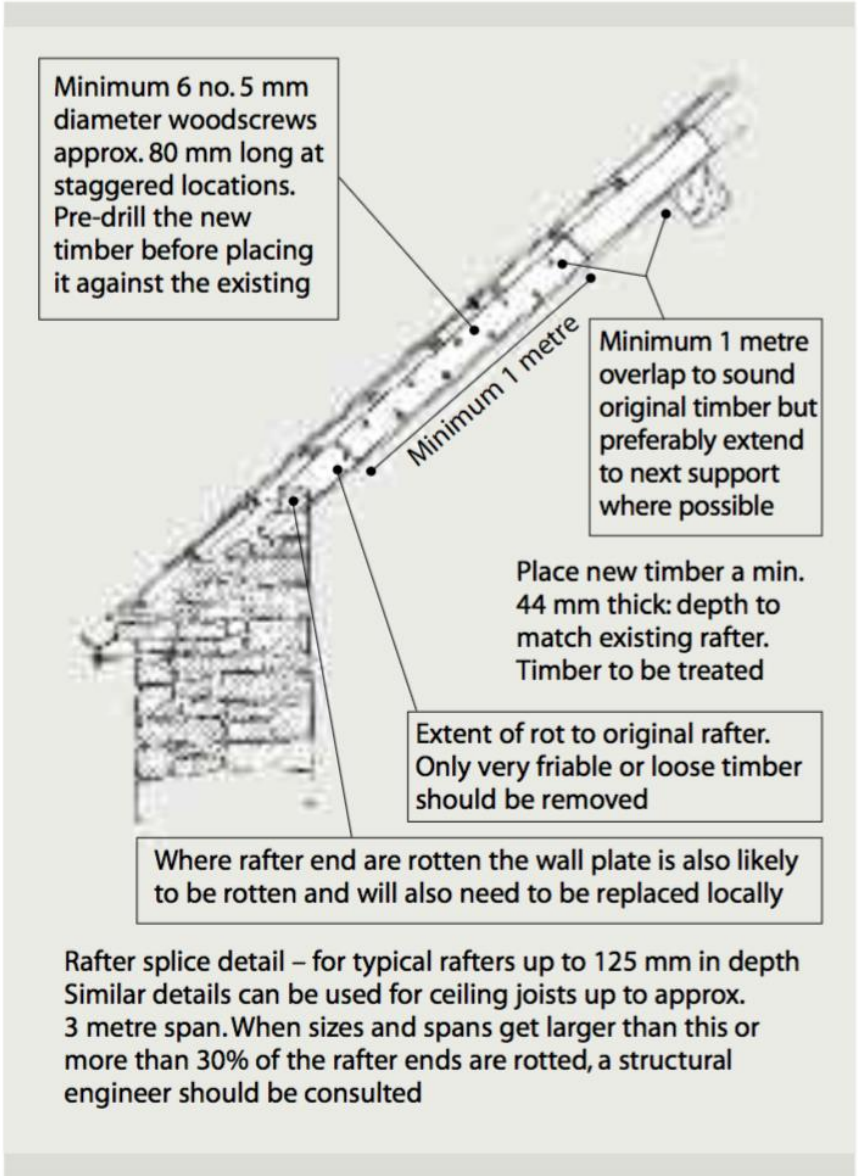


FIG.5a 'A' FRAME ROOF.

(SHOWING DEFLECTED SHAPE).

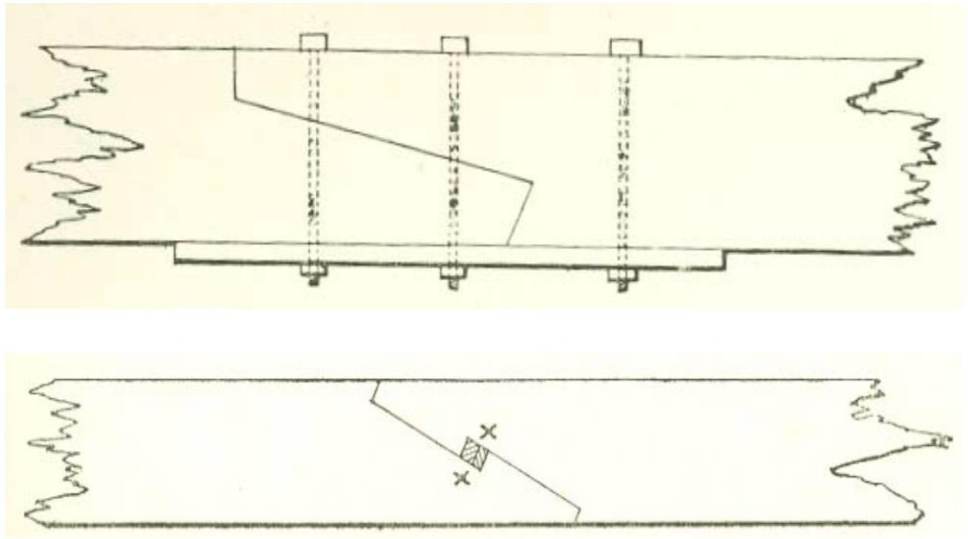
Splice repairs to roof & floor timbers



Rafter splice detail – for typical rafters up to 125 mm in depth
Similar details can be used for ceiling joists up to approx. 3 metre span. When sizes and spans get larger than this or more than 30% of the rafter ends are rotted, a structural engineer should be consulted

Rafter & wall plate repairs

Larger section timber repairs



19 C illustration - Joining of timbers, with iron plate and bolts for additional strength

Fixings & connections

Decayed timber lintels

Like for like?

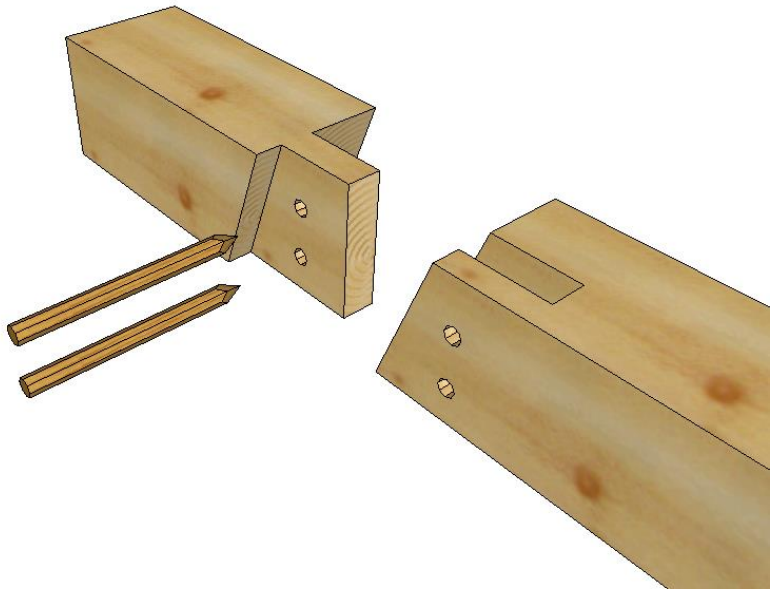
- **How to source replacement timber of comparable strength & durability?**
- **Service life of chemical treatment 15-60 years but impaired by site cutting**
- **High strength class timber**
- **Recycled timber**
- **Accoya – acetylsed pine**
- **Long lead-in time for non-standard timber**

Value historic joinery

Joinery -Typical issues

- **Moisture related deterioration in timber**
- **Unsuitable coatings**
- **Previous alterations/repairs**

Scarf repairs



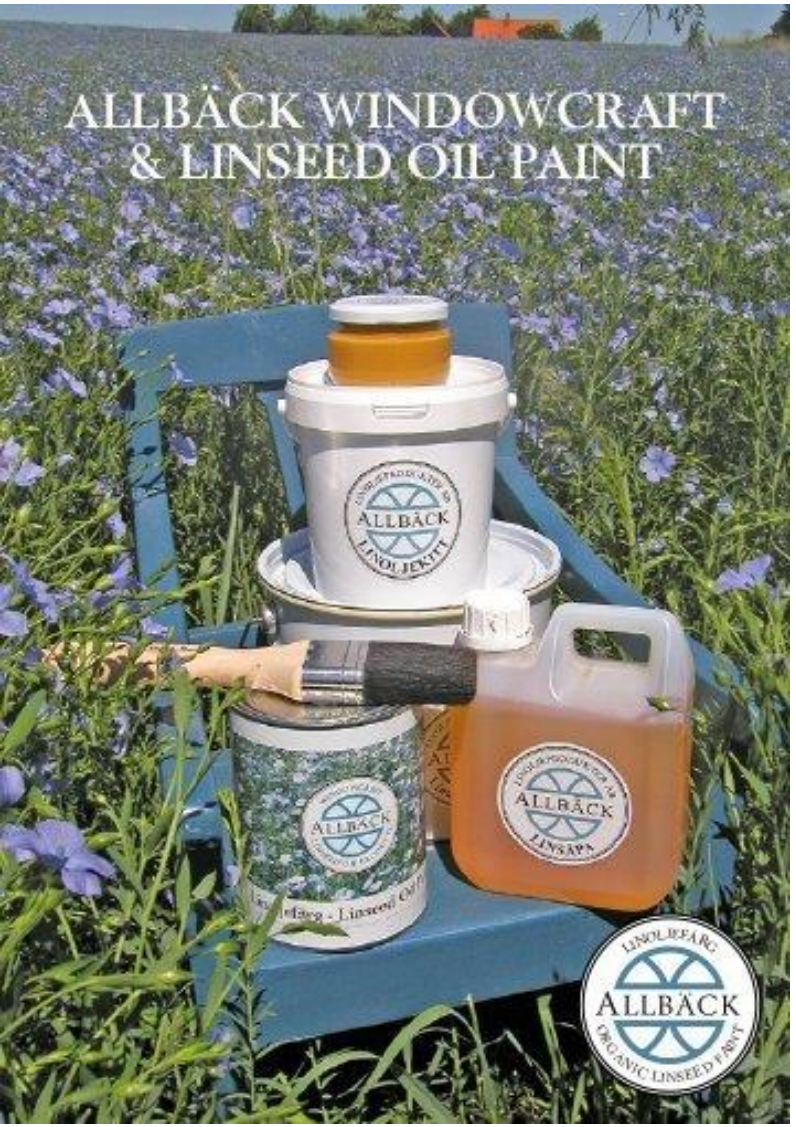
Repairs to joinery

Repairs to joinery

Importance of traditional details

Modern v Traditional coatings

Like for Like - Traditional paints



Like for Like - Traditional paints

Thank You