

Traditional American Slate Roofs

Their Anatomy, Maintenance and
Repair

By Joe Jenkins

JosephJenkins.com

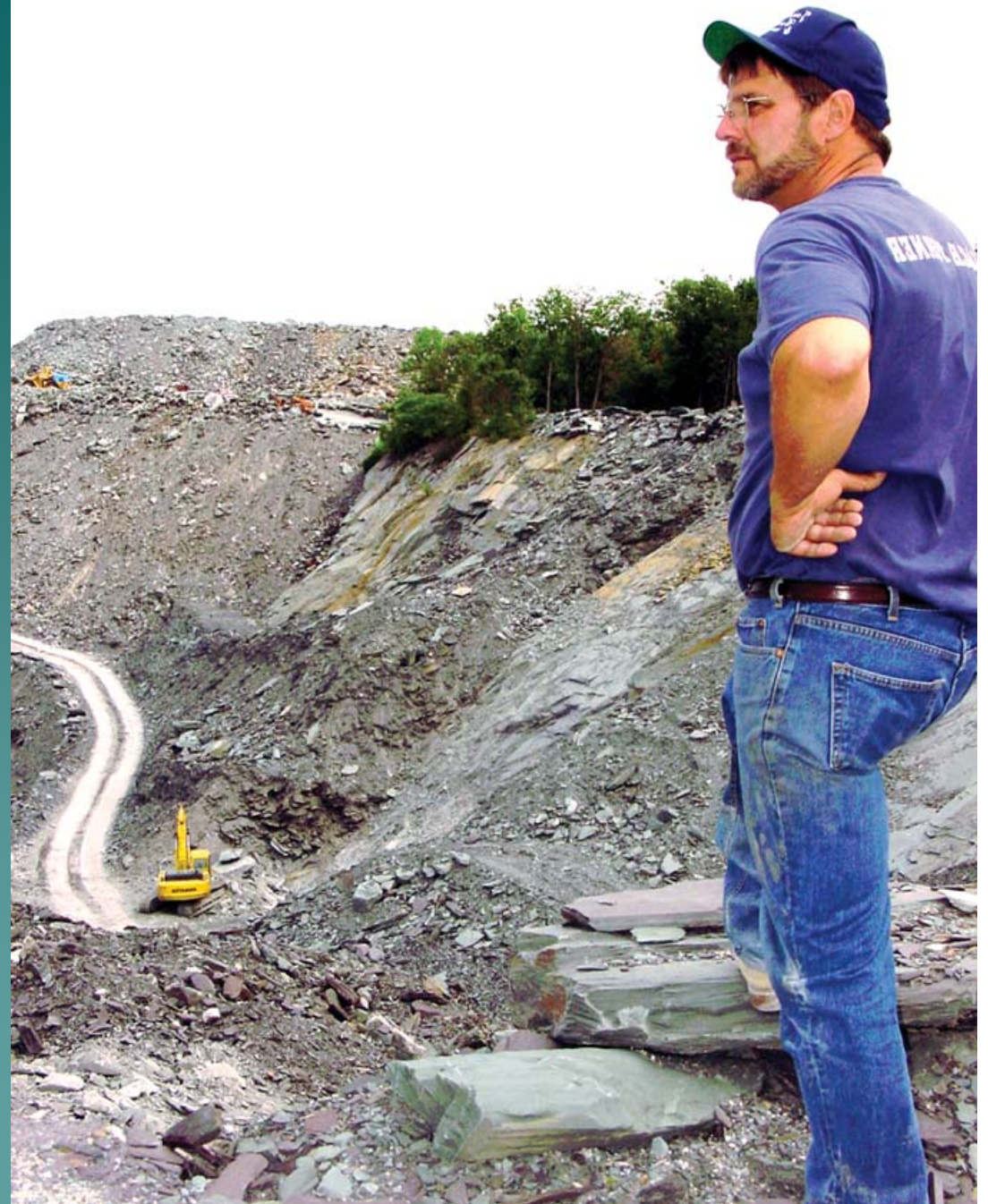
A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the page.

FABRICATION

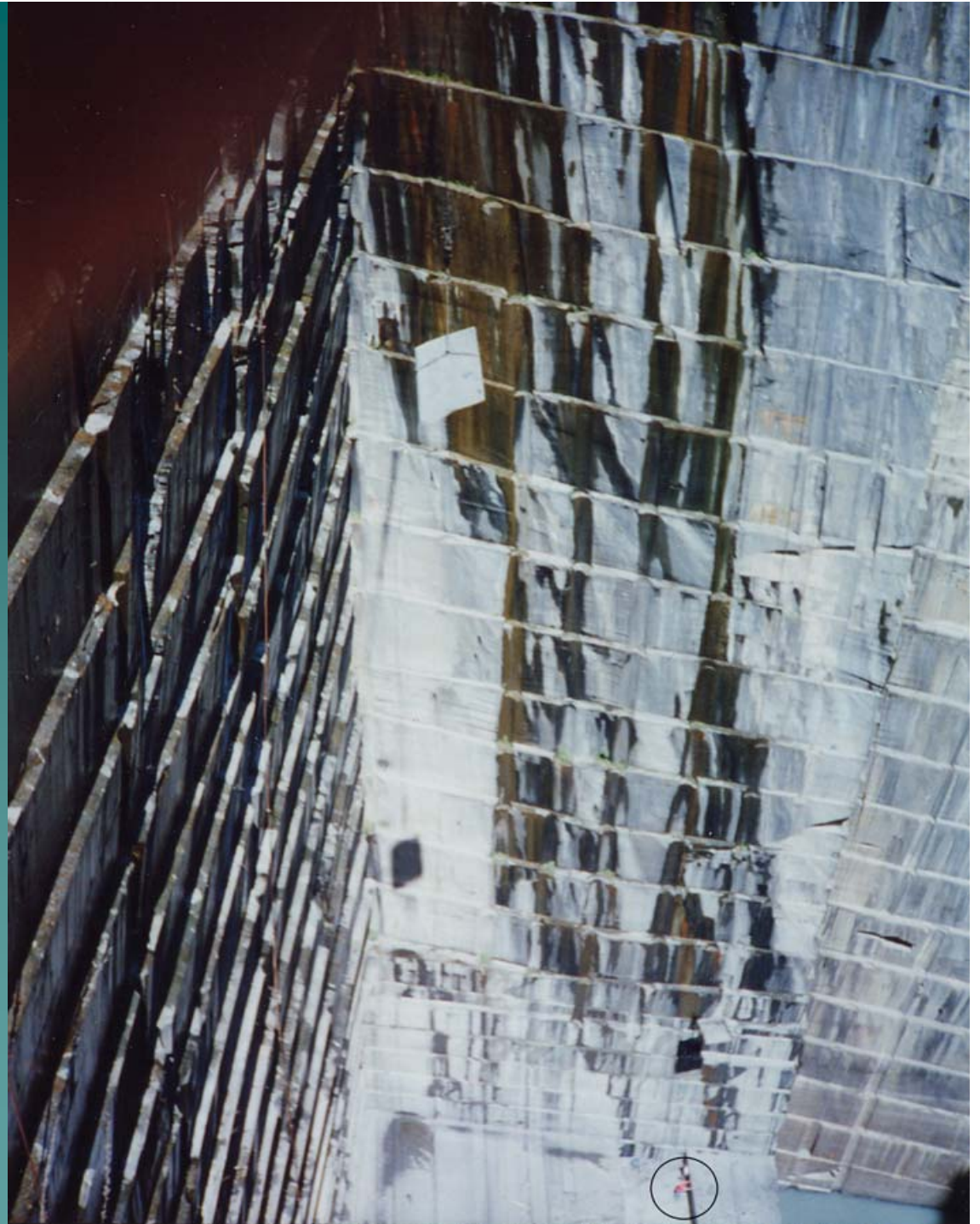
Slate roofs are made of rock. The rock is mined or quarried from the Earth. This is a quarry, or an open hole (at Camara Slate Co., VT).



Here, slate is being extracted from a quarry by the U.S. Quarried Slate Company in Vermont.



A
Pennsylvania
quarry carved
into solid
slate rock.



Slate is still quarried in VT, PA, VA, NY

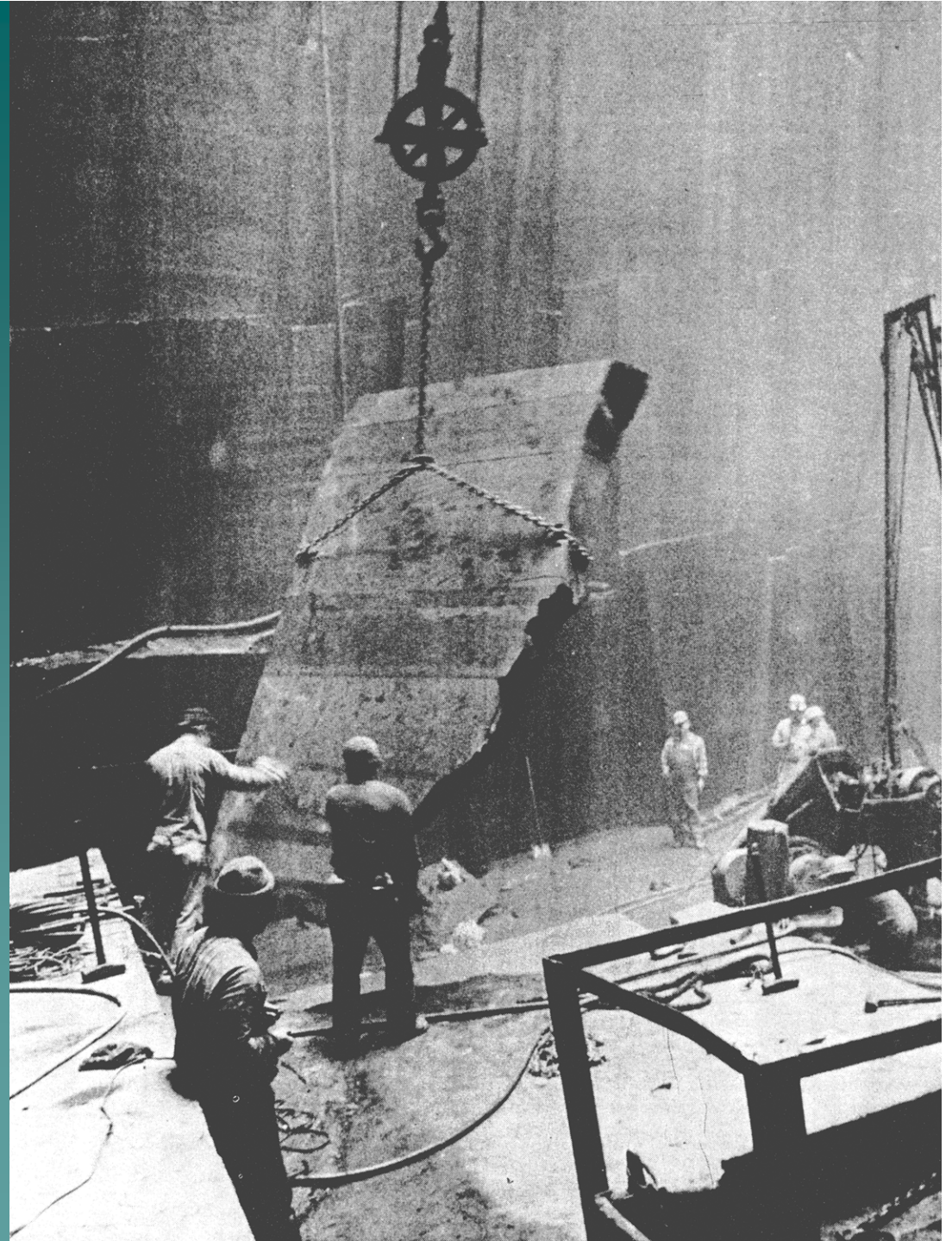


Figure 3.5

LOCATION OF KNOWN SLATE DEPOSITS IN THE UNITED STATES

Solid marks are (or were) productive districts, hollow marks are prospective districts. The five commercially important U.S. roofing slate districts are: 1) Monson District, Maine; 2) New York/Vermont border; 3) eastern Pennsylvania; 4) Peach Bottom (PA/MD border); 5) Buckingham District, Virginia, although only #2, #3, and #5 are still productive.

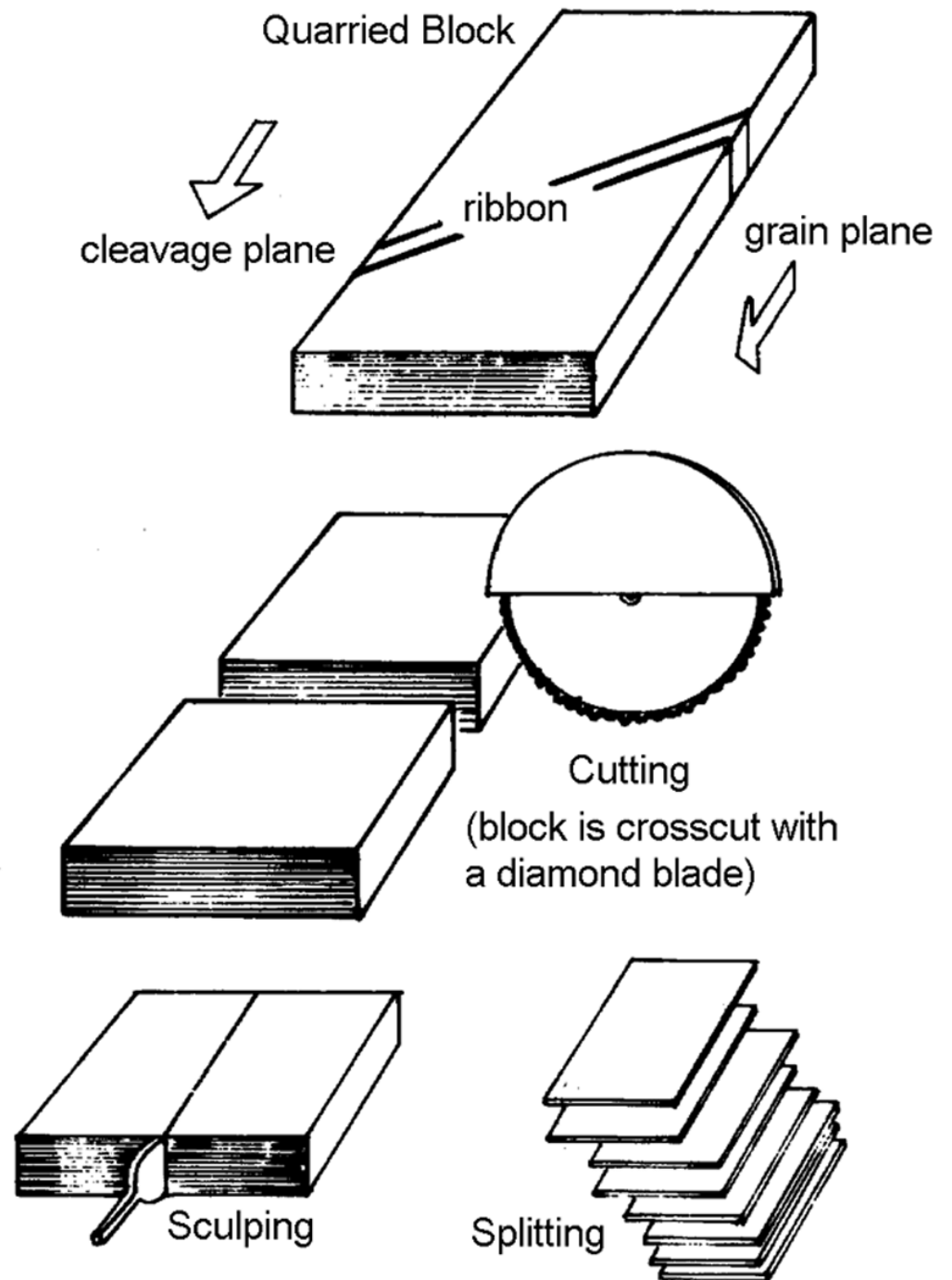
Large blocks of stone are removed from the quarry or mine.



The blocks
are split
according to
their grain
and
cleavage (VT
Structural
Slate).



Smaller blocks are cut using a diamond saw.



These blocks
are ready to
be split into
shingles
(Greenstone
Slate, VT).



The slate is split into roofing shingles with hammers and chisels (here at Camara Slate, VT).



Another
splitter
(Hilltop
Slate, VT)



The
edges
are
trimmed
to size.



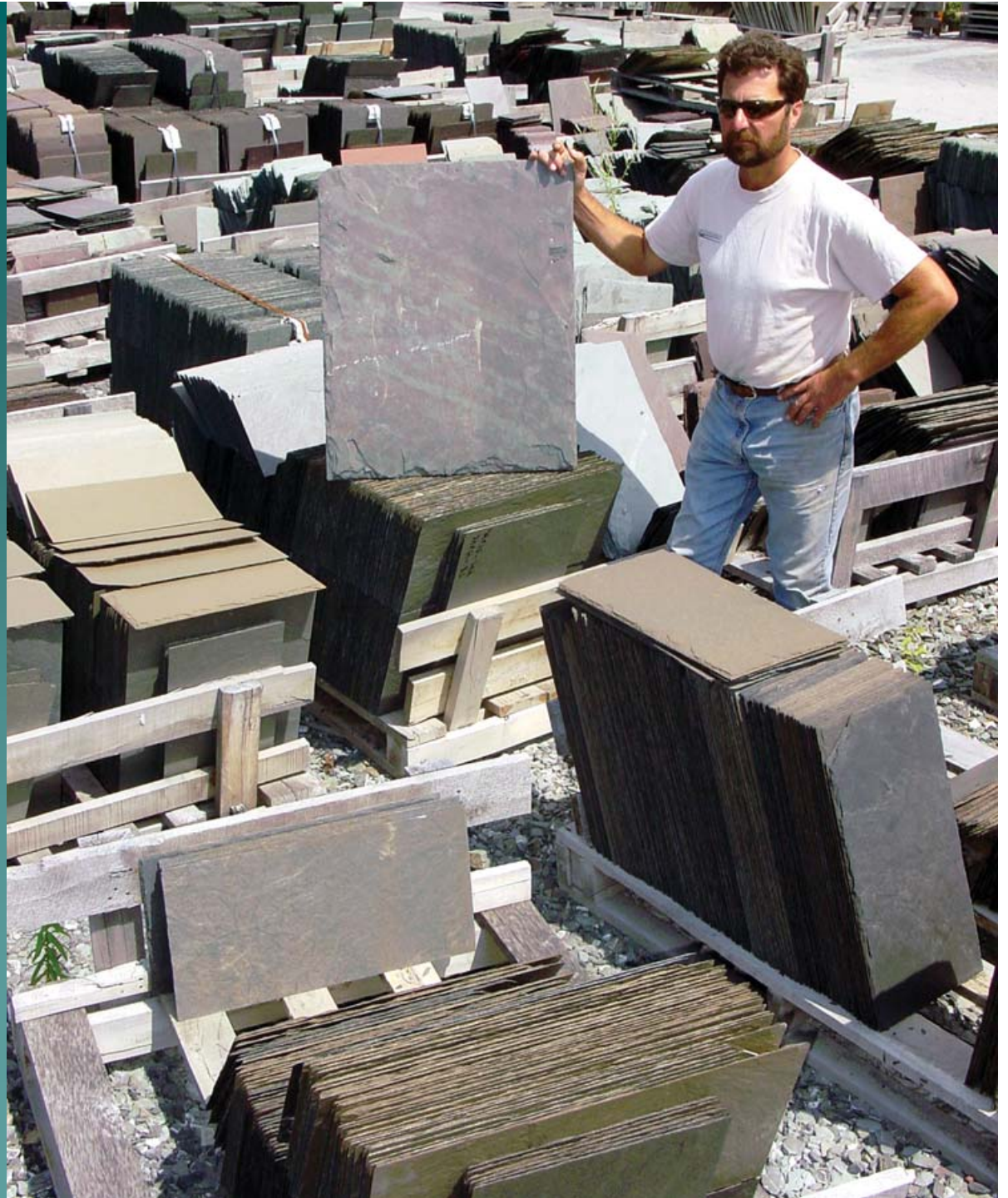
Nail holes
are then
punched
into the
slates
individually.



The finished shingles are then sorted, palletted and shipped.



New roofing slates of all sizes, thicknesses and colors are produced in the USA today (here at Taran Slate, VT).



Sources of new and used roofing
slates are listed on the web at

SLATEROOFCENTRAL.COM

or in the back of the Slate Roof
Bible, 2nd edition, which is available
at this conference. There will be a
book signing after this presentation.

The finished shingles are fastened to the roof deck with nails, preferably by experienced slaters.



In Europe,
slate roofs
were
originally
hung with
wooden
pegs on
split lath.



This is a very old UK pegged slate roof
(or what's left of it)



Slate are still installed on “battens” on many European roofs.



Batten style of slate roof in France.



USA: solid board roof decks under slate are patterned after the Scottish system.



It's not uncommon to find lath with wood shakes under slate.



Solid board roof decks provide the best system for slate roofs.



New bank building in Kansas, with kiln-dried yellow pine roof decking.



Yellow pine
roof decking
on the bank
tower prior to
slating.
Original plans
had called for
plywood.



Board decks with slate roofs are traditional, tried and proven systems.



This roofing system can easily be duplicated today.



Felt underlayment is not necessary on slate roofs.



Another 100 year old roof, on lath, with
no underlayment and no leaks



When this 120 year old cathedral roof was reslated, it was found to have no underlayment under the original slates.



A lath barn being reslated by adding 1x4s between the lath.



Felt underlayment keeps the rain out until the slate is installed.



It's the slate and the flashings that permanently keep the water out, not the underlayment



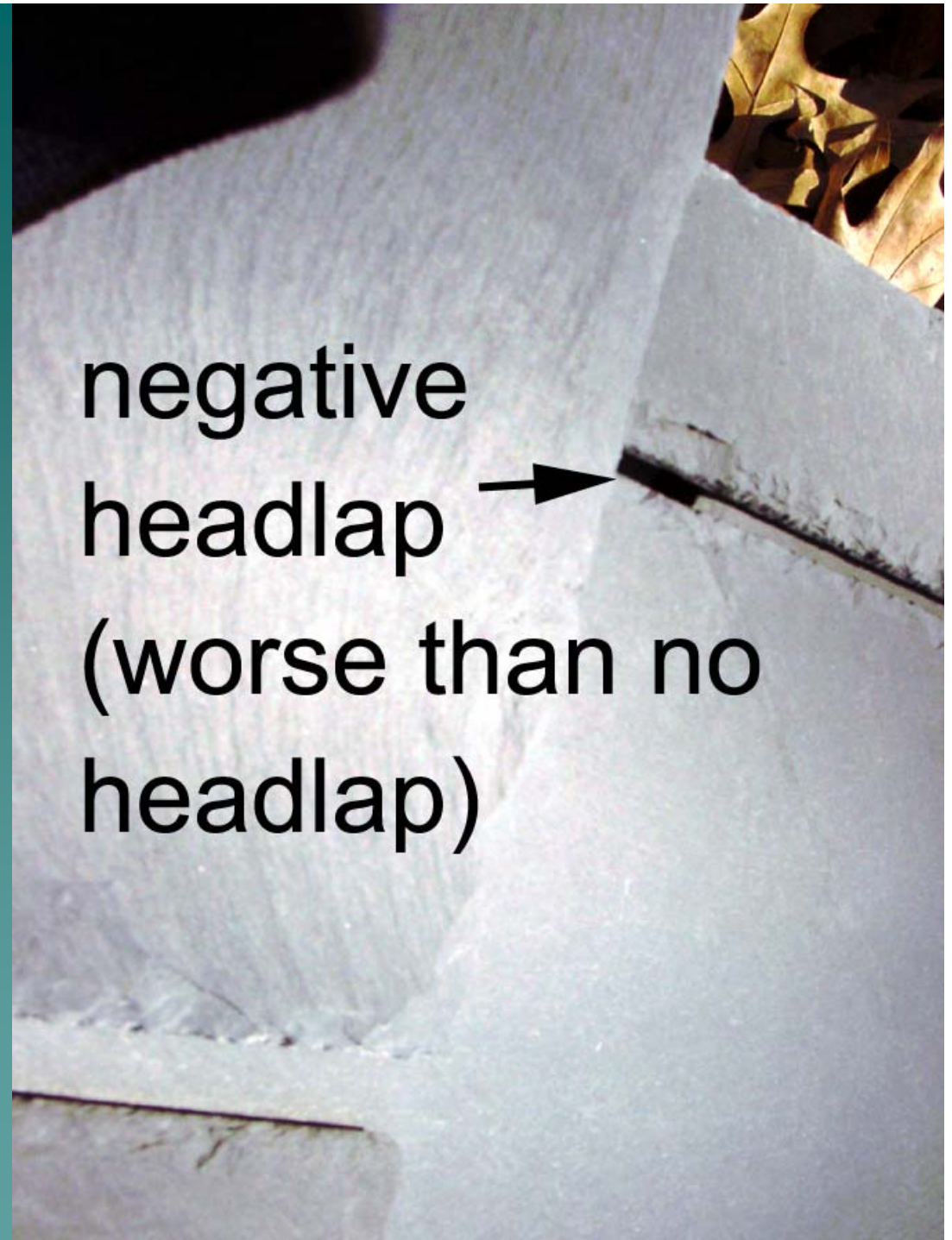
The 40' ladder is buried two feet deep (two rungs) in cow manure.



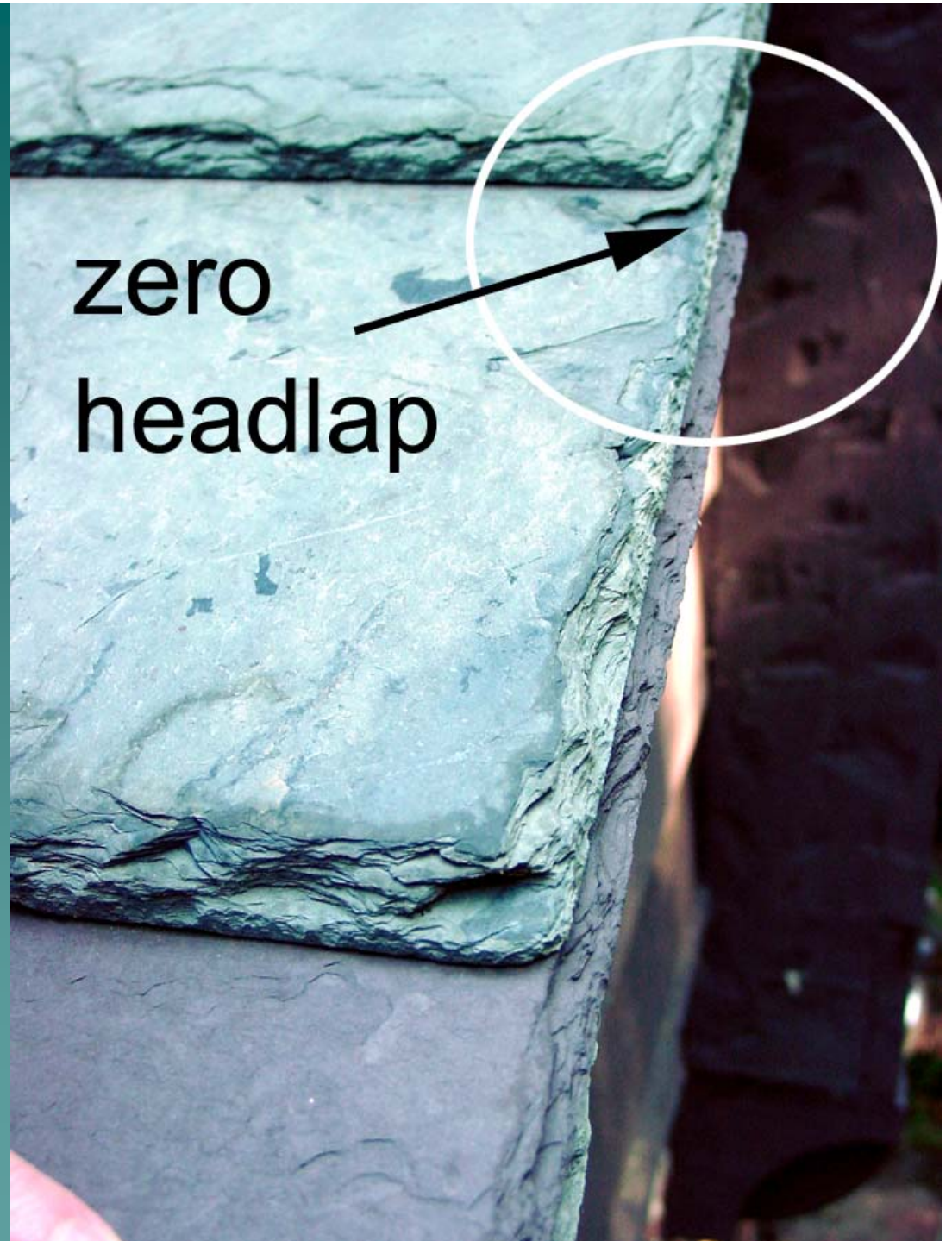
Proper HEADLAP is critical. This new slate roof at a university was installed incorrectly.



University roof
with areas of
negative
headlap. This
new slate roof
was incorrectly
installed and
will probably be
condemned.



Another case of zero headlap on an historic building. The entire roof was also installed incorrectly.



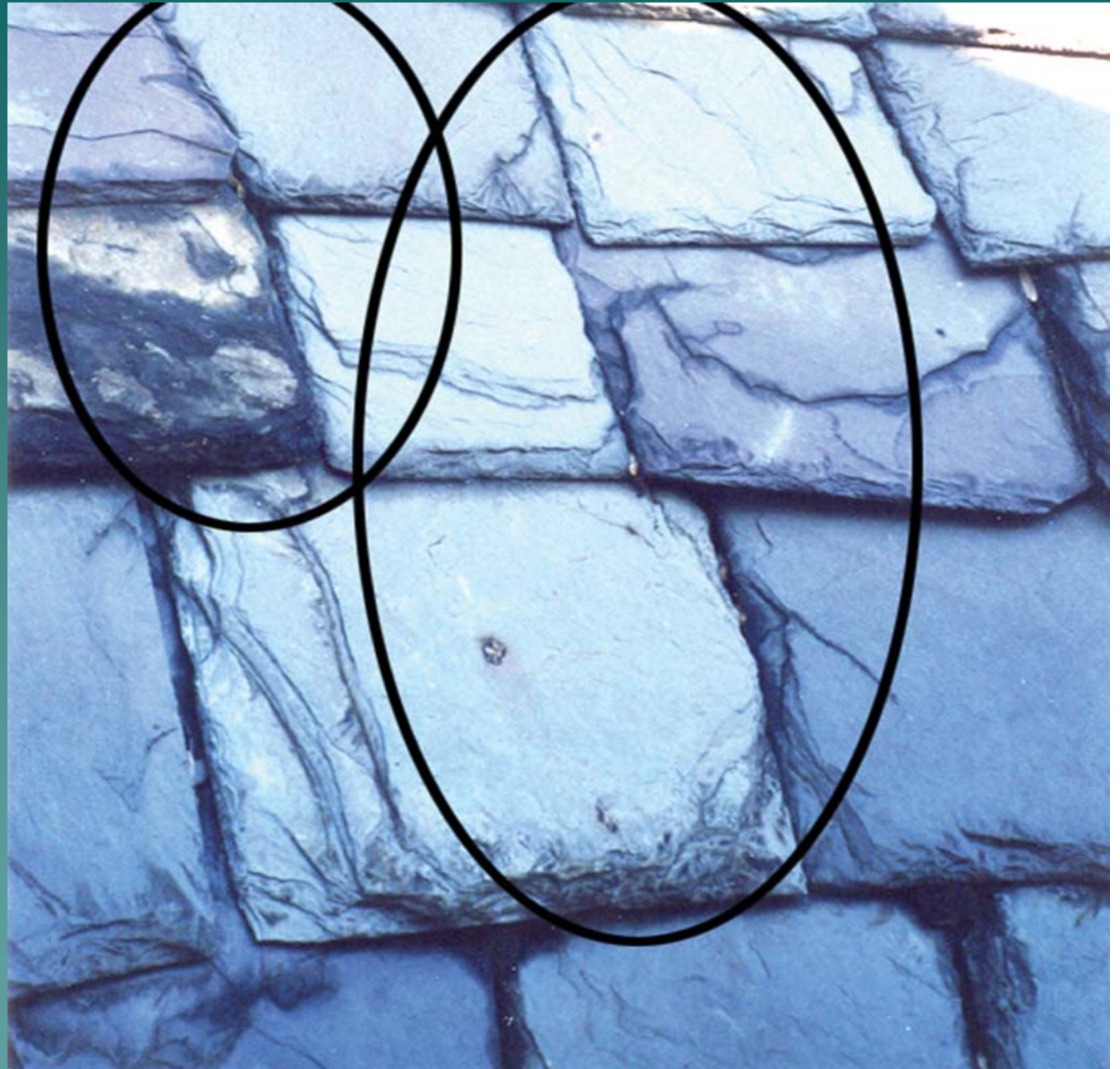
The entire graduated slate roof had to be removed and reslated.



It was done successfully, but at great expense.



Sielaps
are also
important.
These are
incorrect.



Slate is versatile and can be installed in many styles. This is a “ragged butt” style.



This ragged butt roof in Illinois was condemned, although nothing major was wrong with it.



A ragged butt slate roof in Pennsylvania.



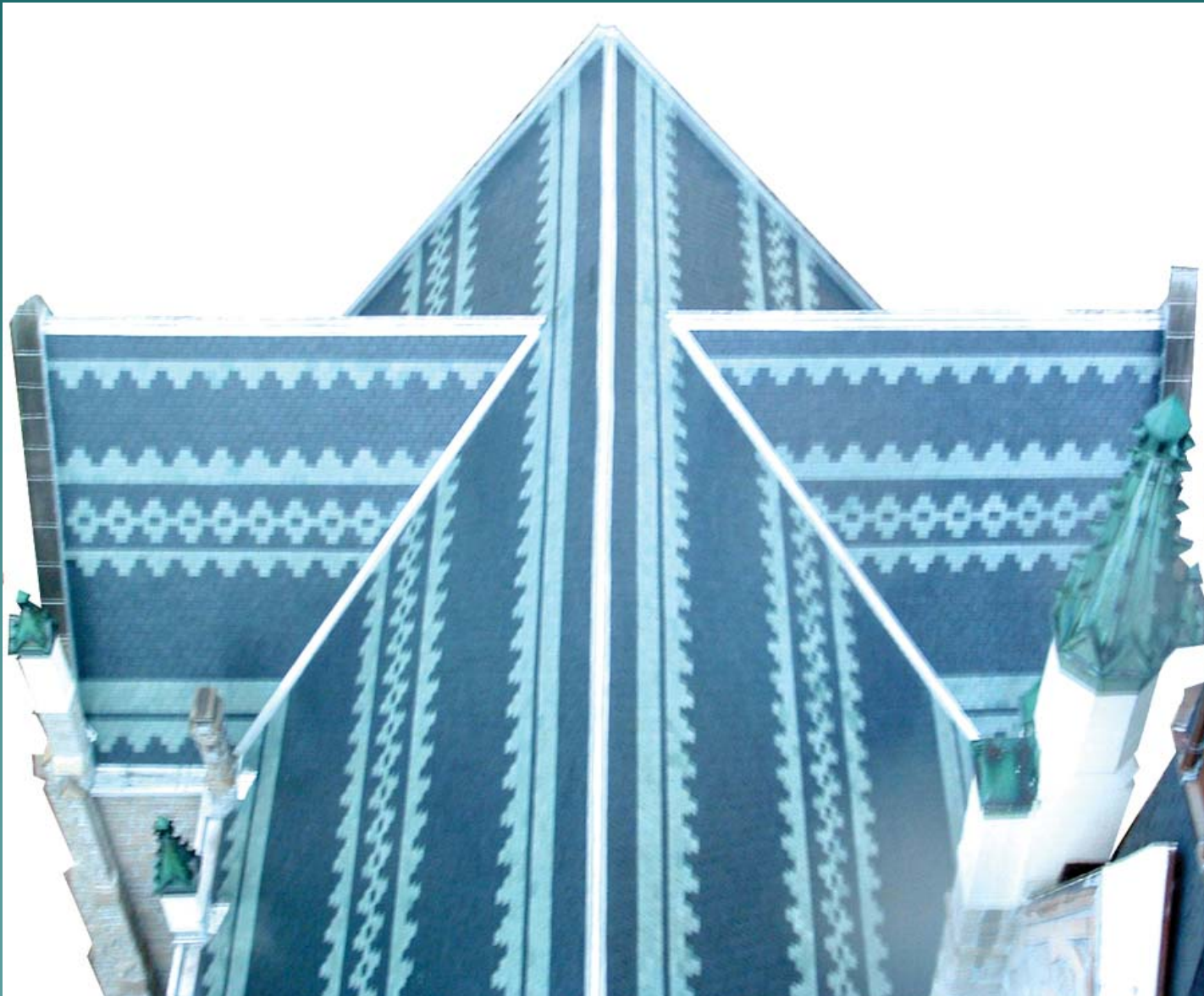
A
“staggered
butt”
slate roof style.



Mixed colors and sizes, staggered
butt slate roof in Pennsylvania.



Slate can be installed in patterns and designs.



It's easy to create a landmark roof with slate.



A landmark barn in Vermont.



Another landmark barn in Vermont.



Owner-designed pattern, salvaged slate.



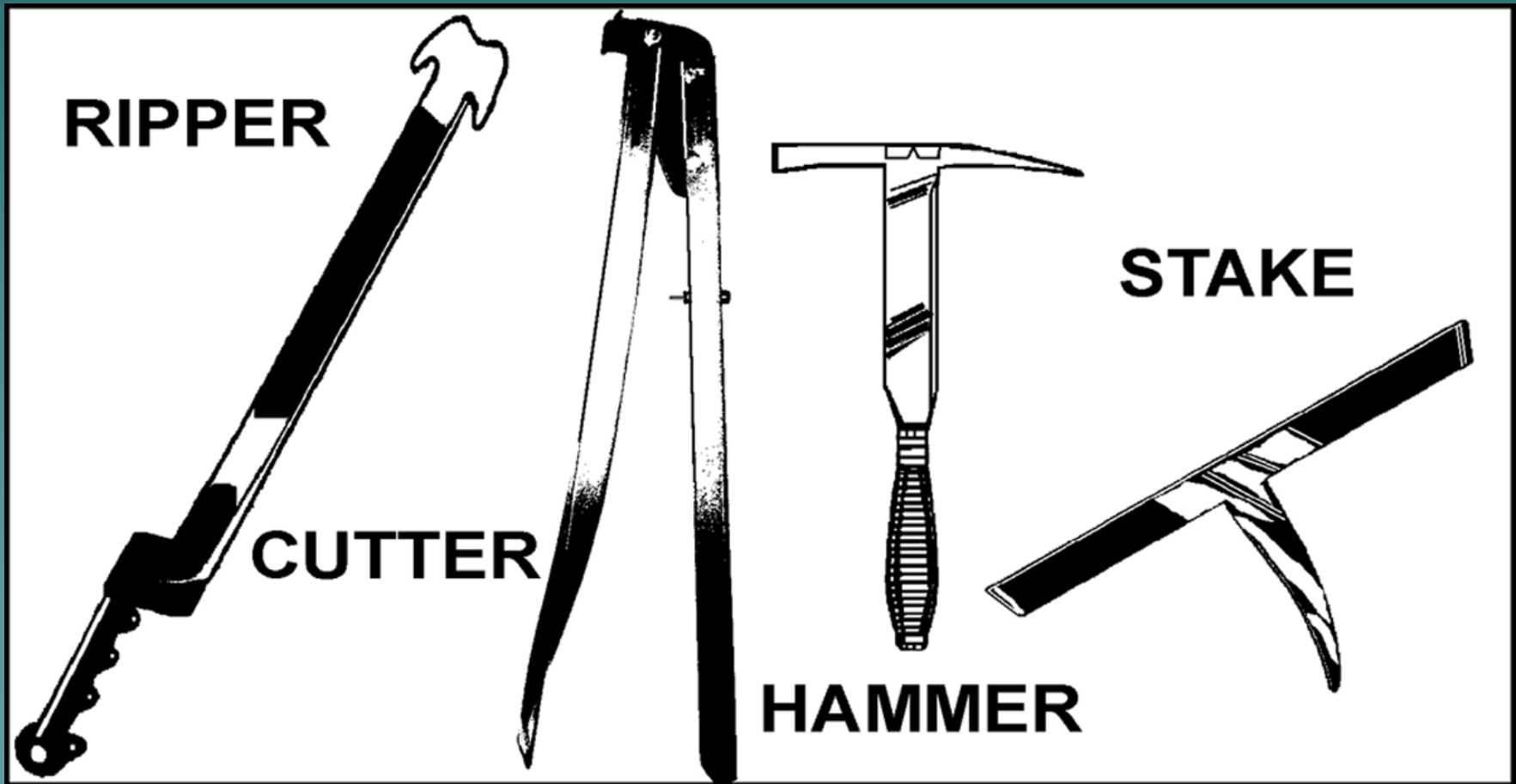
Other side of garage.



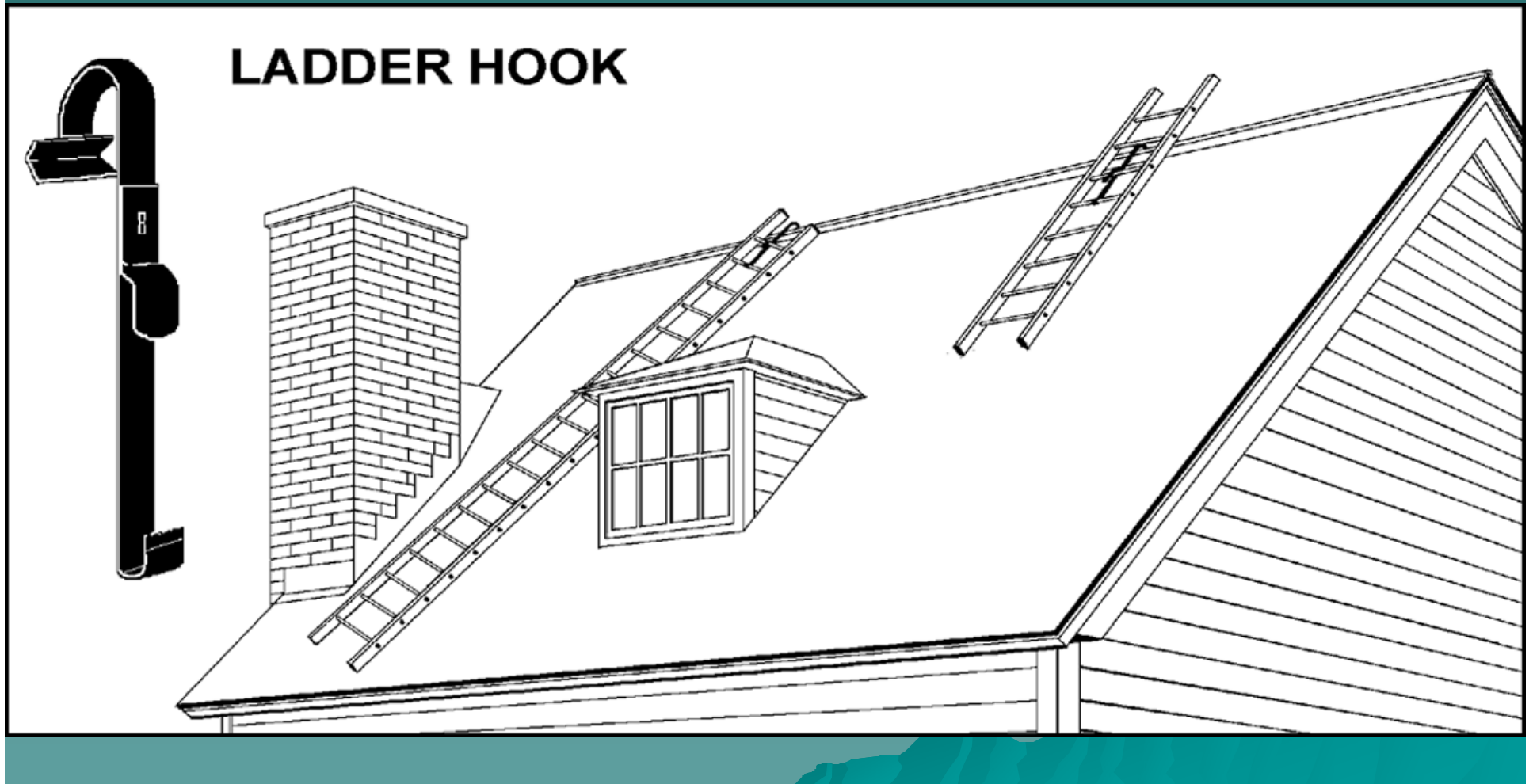
Repair and Restoration of Slate Roofs



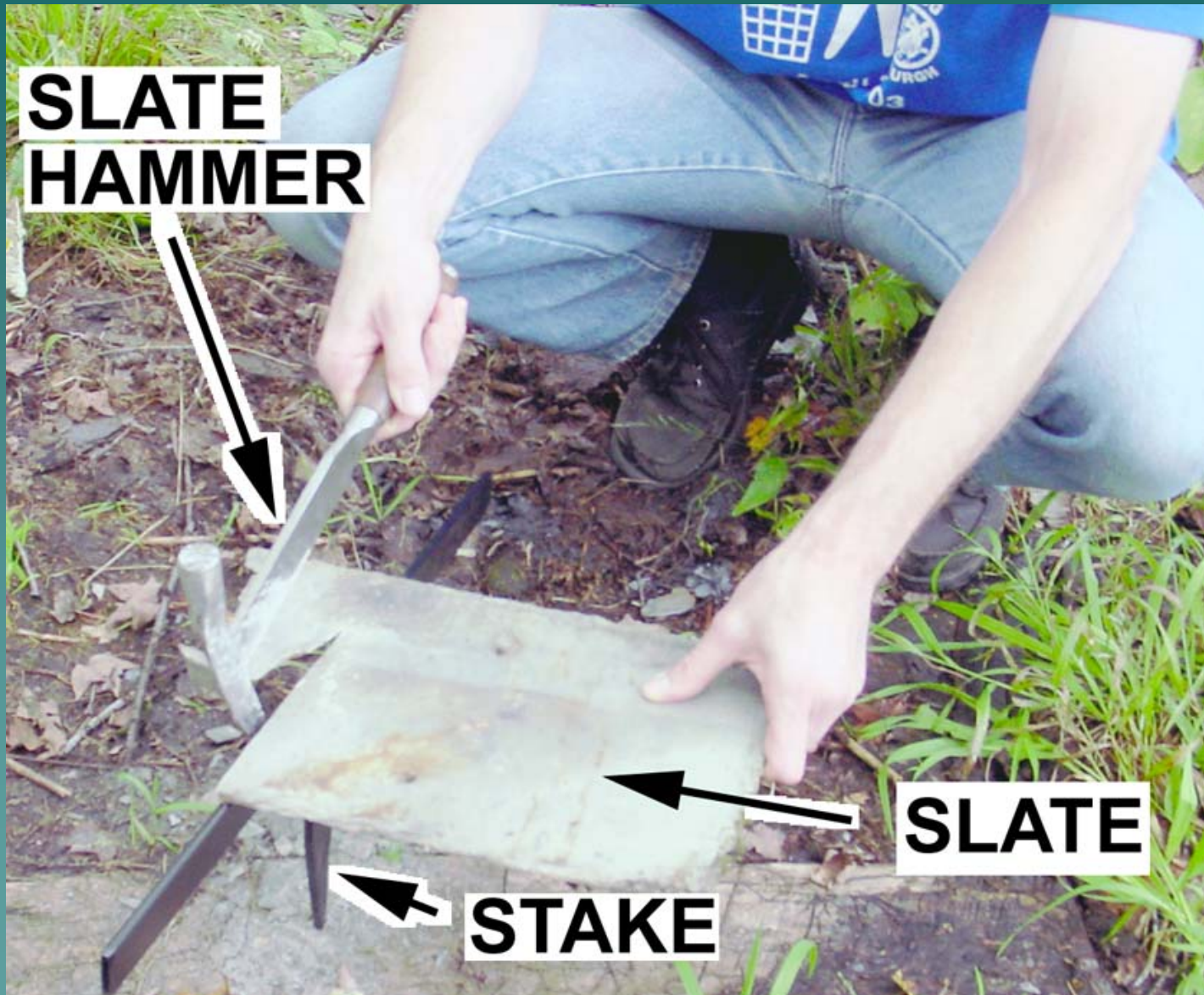
Proper tools are required:



Hook ladders allow access to the roof without walking on the slates.



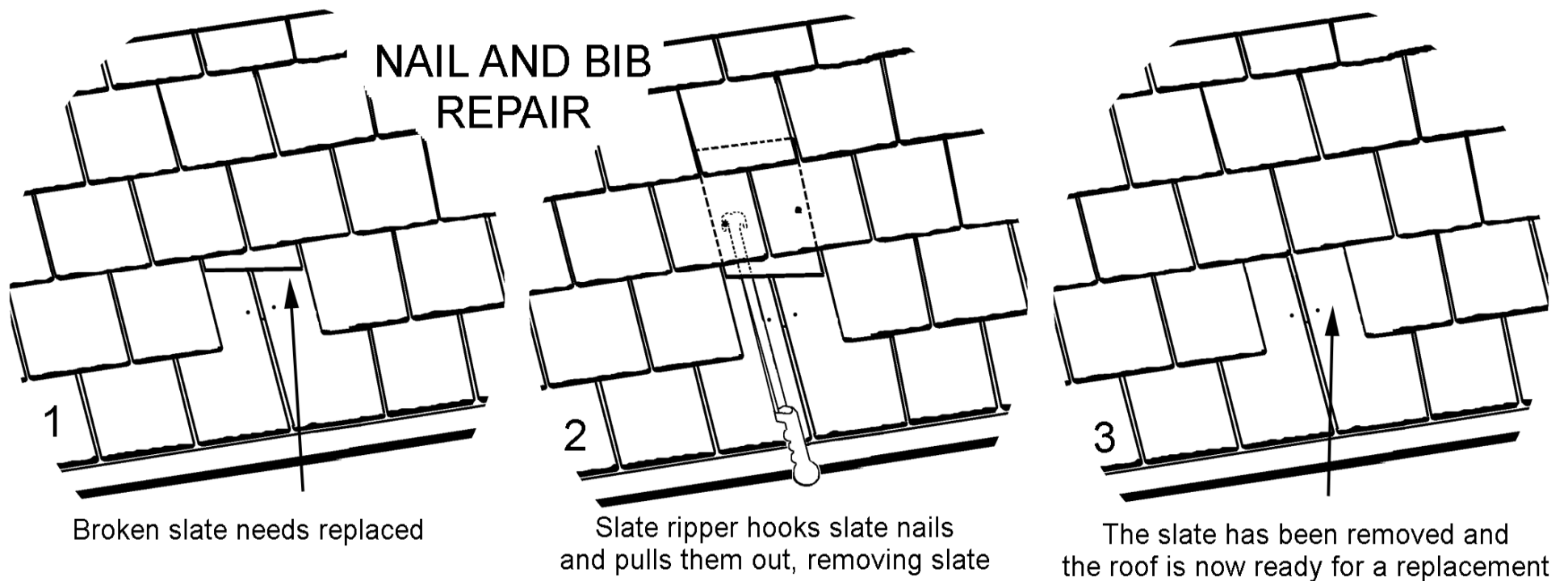
Slates can be cut with a hammer and a stake.



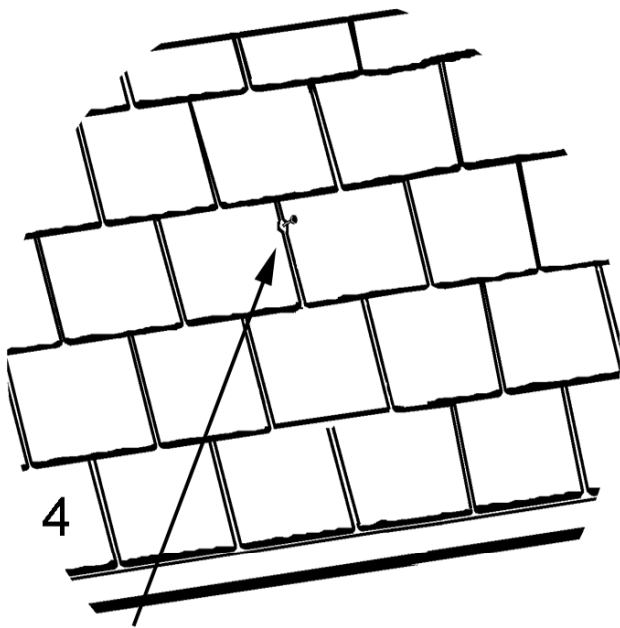
Missing slates are easy to repair.



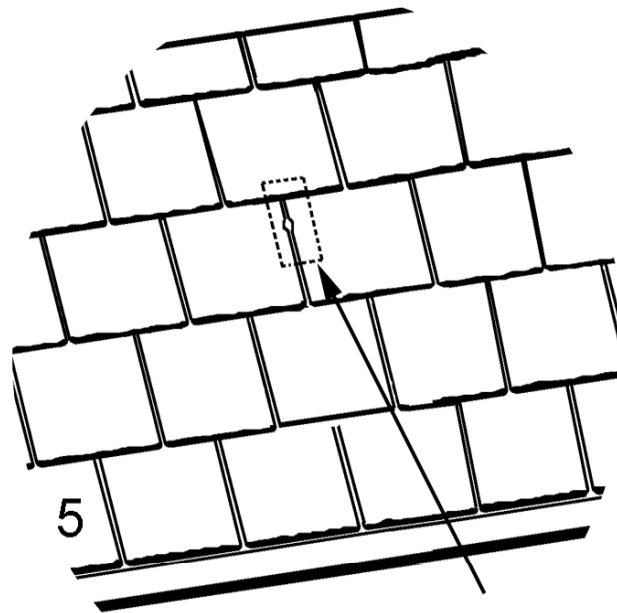
Any individual slate can be removed and replaced.



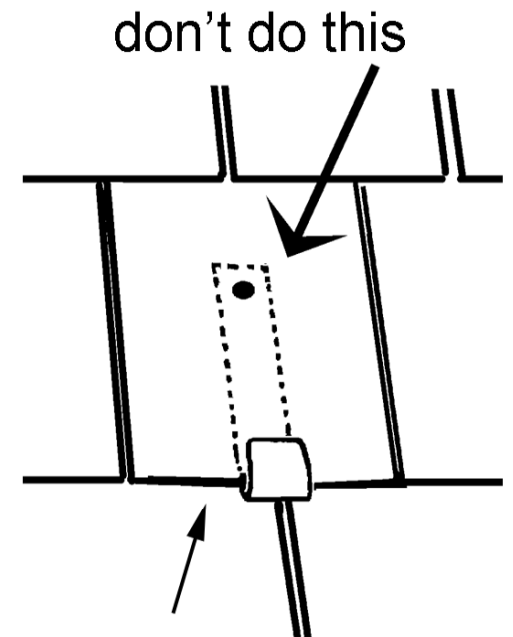
The nail and bib repair is common and acceptable. Exposed strap hangers are not acceptable.



Replacement slate is slid into place and fastened with a nail in the slot



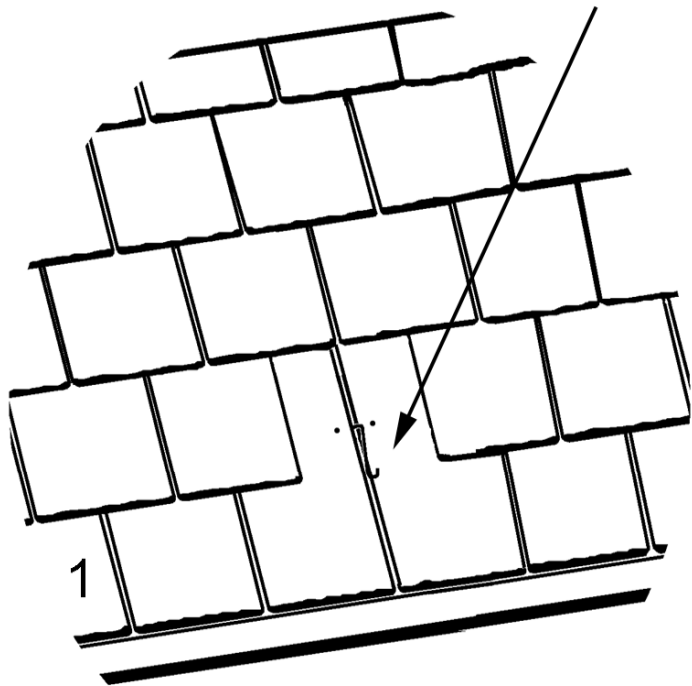
The roofing nail is tapped down and a bib flashing is slid under the slate but over the nail head



The above strap technique is undesirable for two basic reasons: it looks bad and the straps are easily bent open by sliding ice and snow

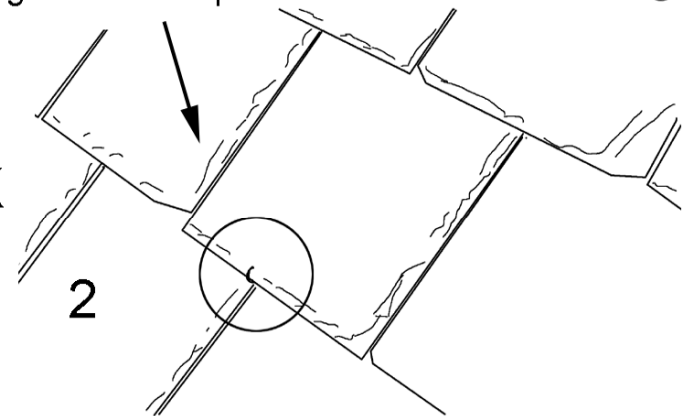
Slate hook repairs are also acceptable.

Alternatively, a copper or stainless steel slate hook can be nailed into place after the old broken slate has been removed

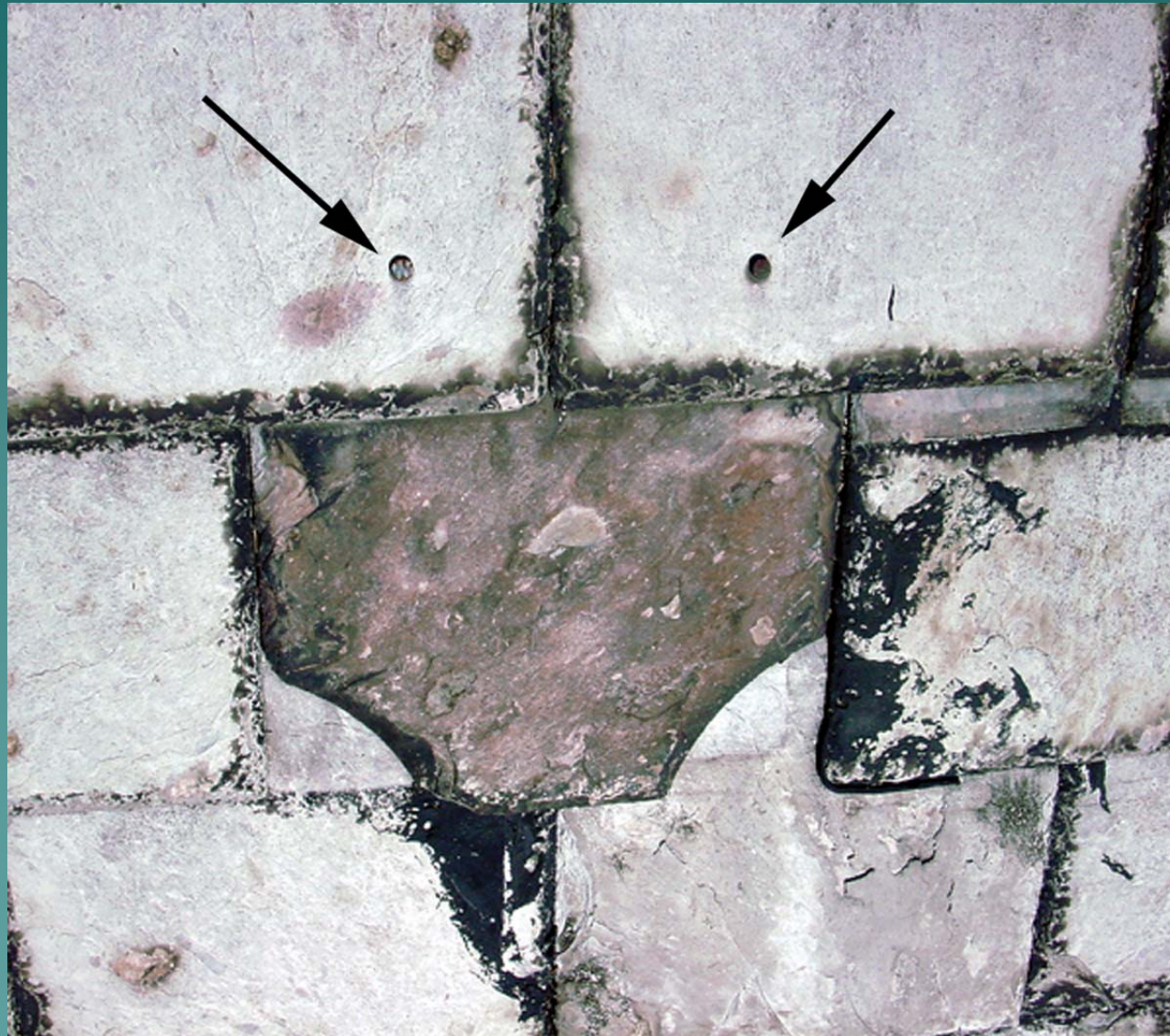


The replacement slate is then slid in place where it is permanently held by the slate hook. The hook can be pushed down between the underlying slates, if needed, in order to make more room for sliding the slate in place.

SLATE HOOK REPAIR



Bad repairs are a plague.



A hidden nail creates a hidden leak.



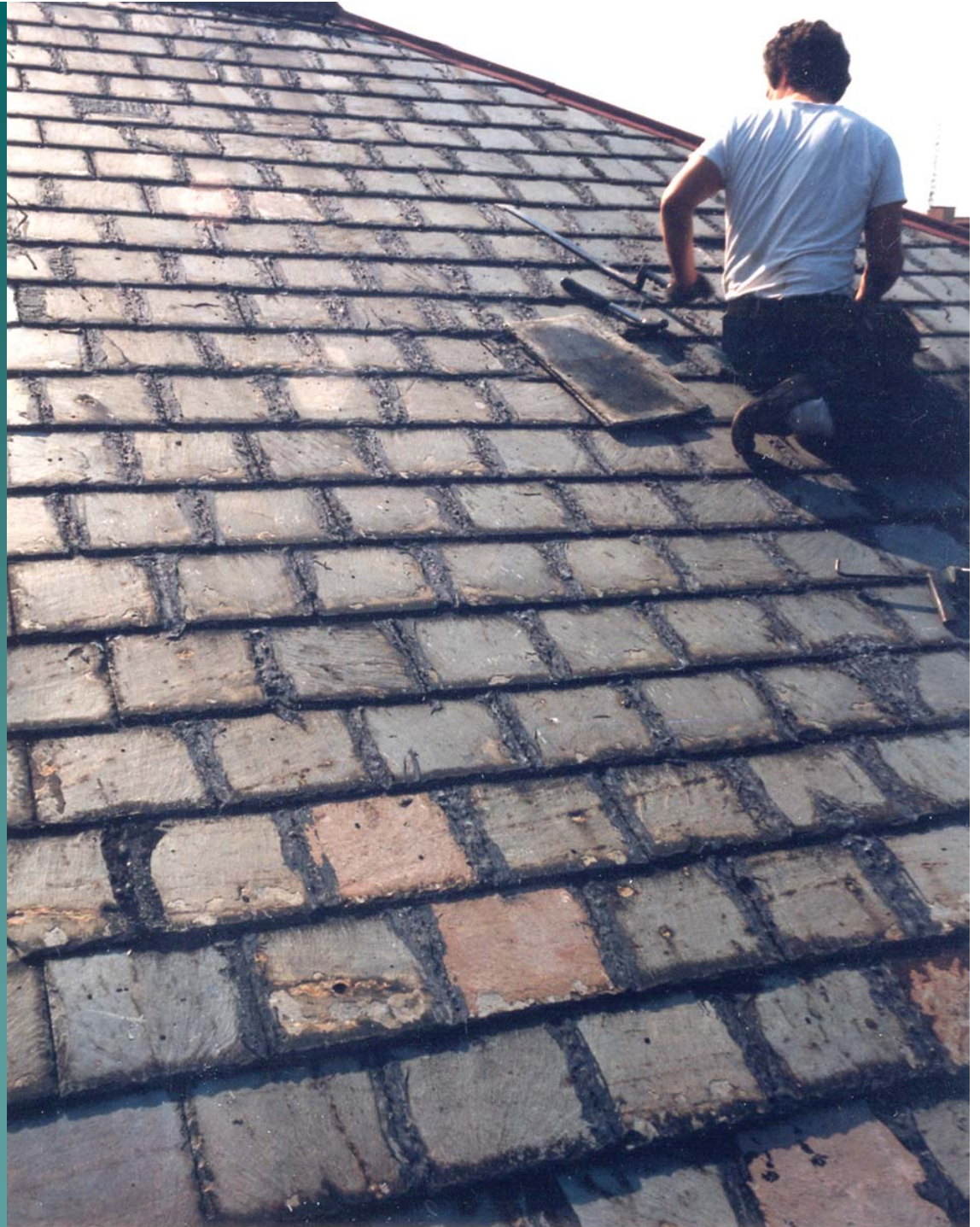
Nail without
a bib flashing
will leak.



Strap hangers are a mistake.



Surface tar
(roof cement
or “mastic”) is
a mistake.



Most leaks in slate roofs
are caused by

- 1) faulty slates**
- 2) faulty flashings**
- 3) bad repairs**

In many cases these can be repaired
or restored. Some can not.

Slates have limited longevities. Those that are worn out cannot be restored.



This is the front of the same slate.



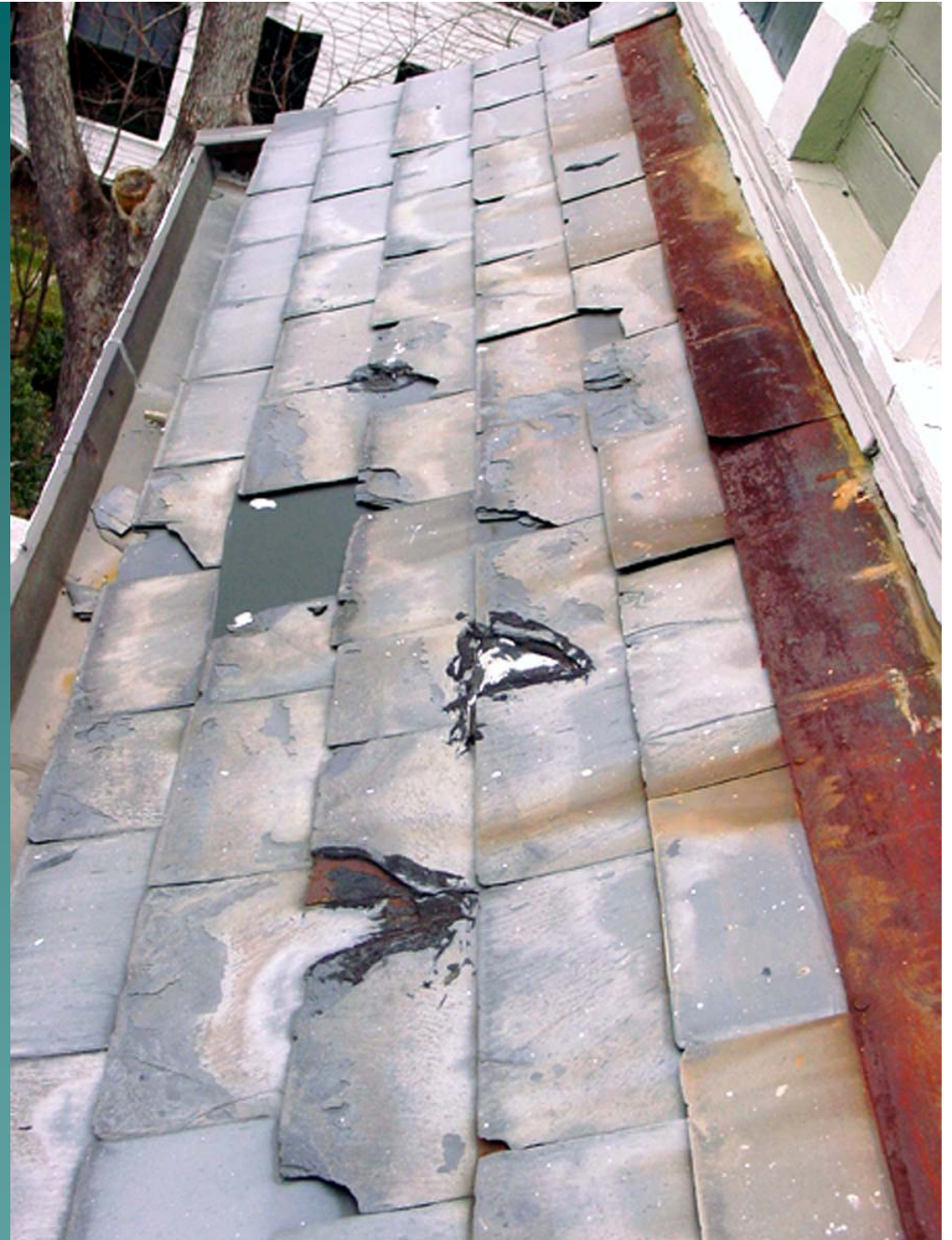
This roof is beyond repair.



Old soft slates
will crumble
and fall apart.
These roofs
can't be
restored.



Another
example of
slates in
disrepair and
beyond hope.



This roof is still good, although it had been wrongly condemned.



A smooth surface indicates a good slate and a good roof, no matter how old.



Weathering VT slate can last
150 years or longer.



Chapman (PA) slate may last 125 years. VT unfading green may last 200 years.



A graduated mixed Vermont slate roof is highly restorable.



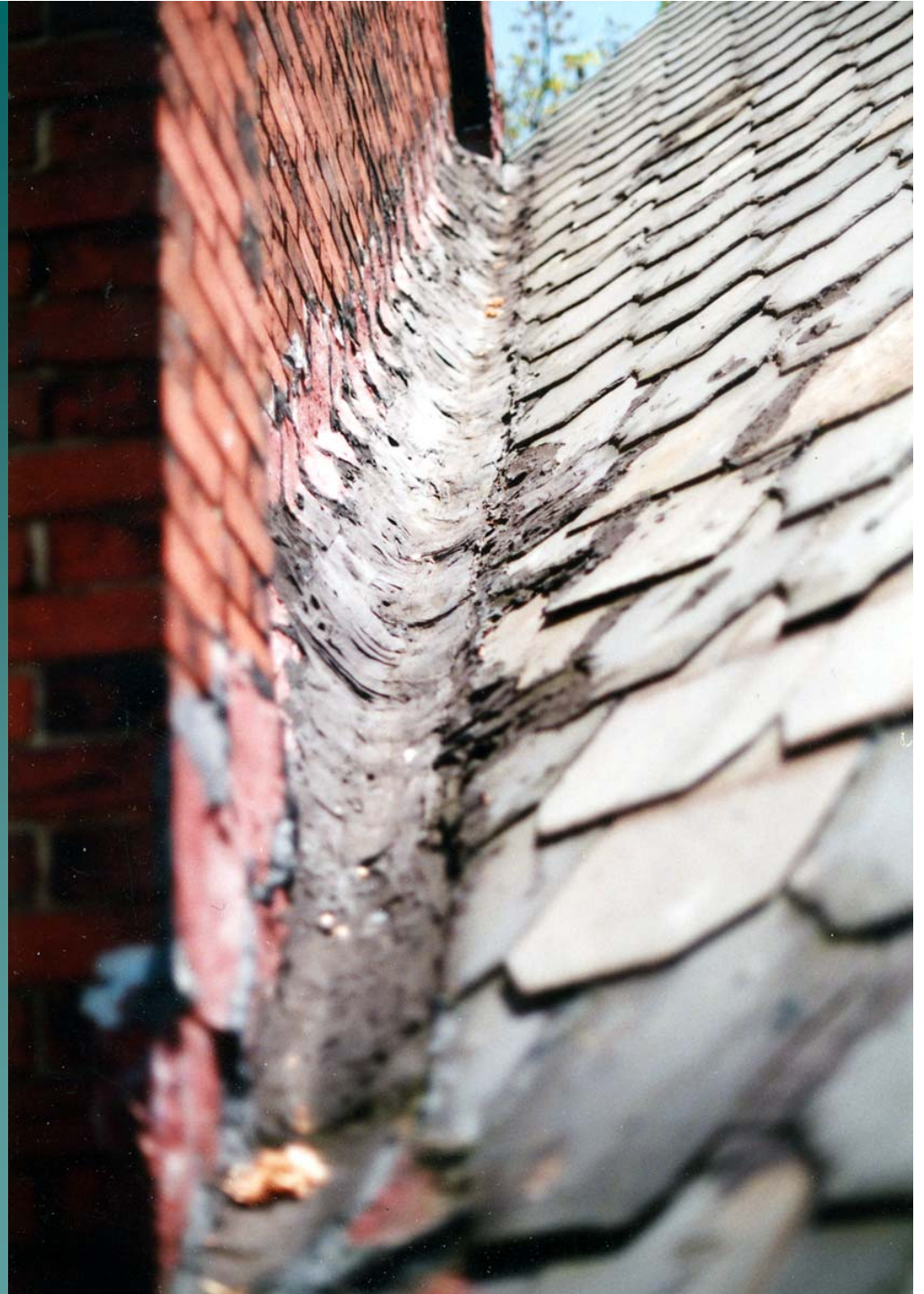
VT green and purple slate roofs are excellent and restorable.



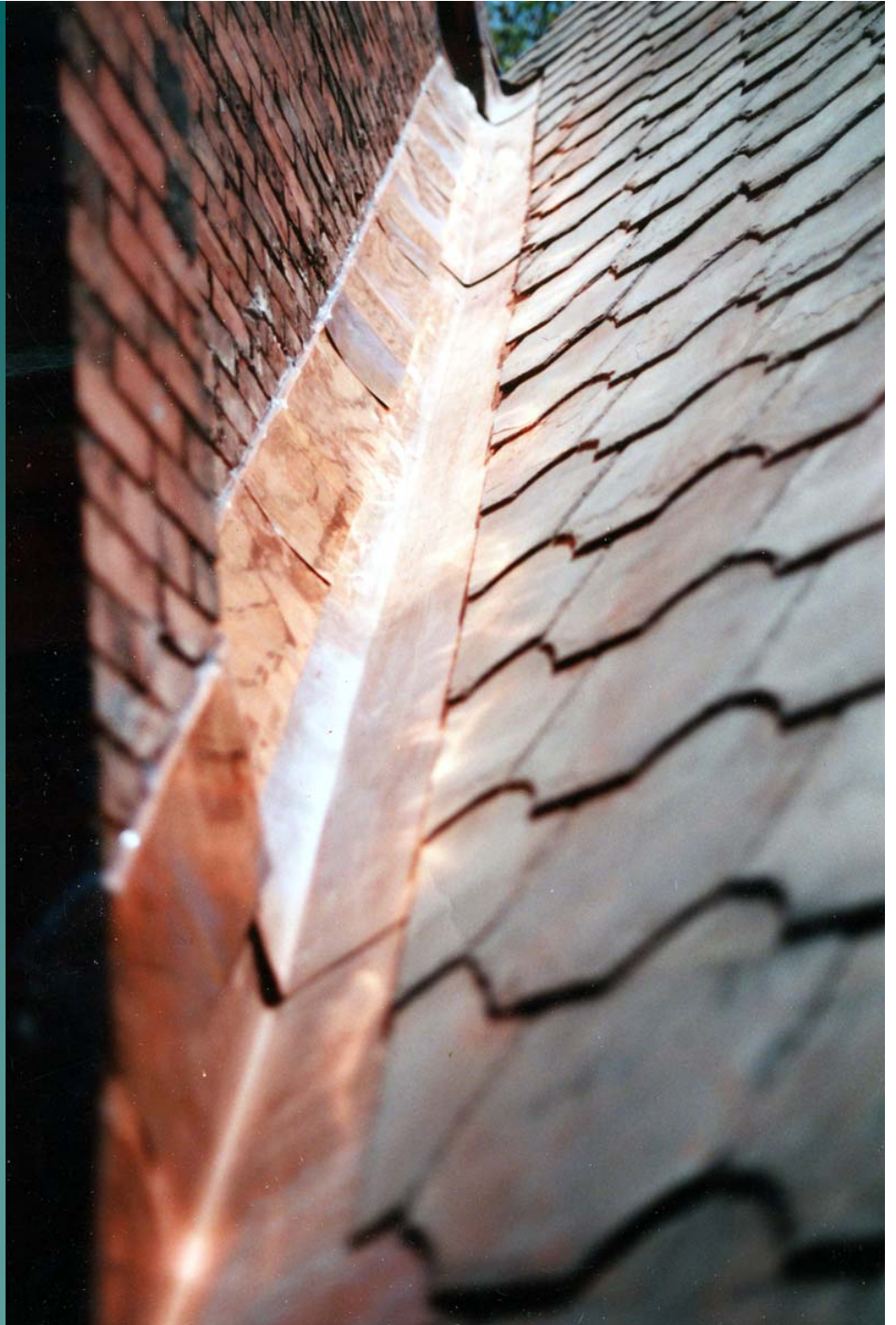
There is a
“how to identify your slate roof”
page on the web at

slateroofcentral.com

This is a “soft”
PA slate at 104
years of age,
still restorable.



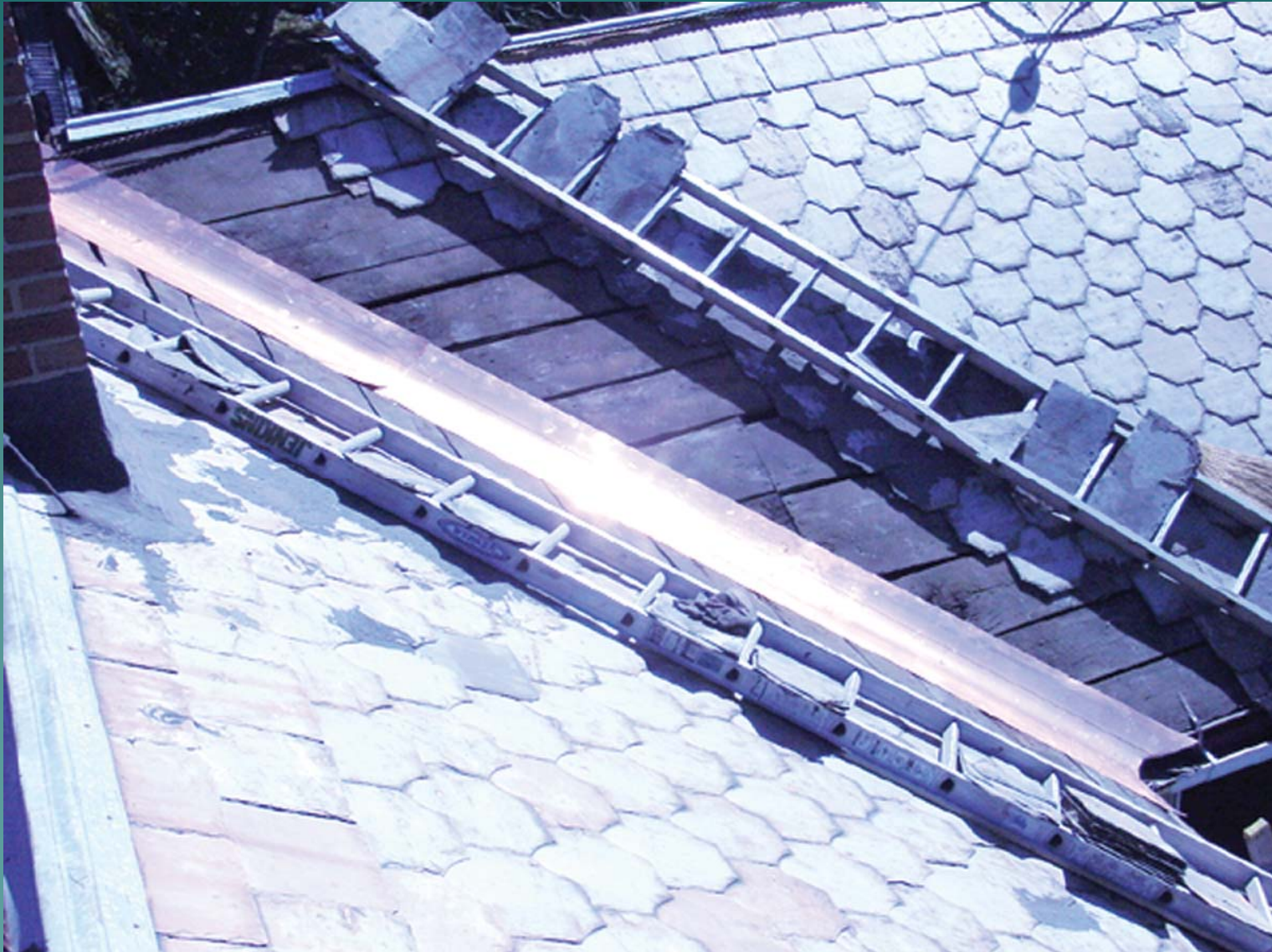
This is routine
work for a
slate roof
restoration
professional.



Sea green roof heavily damaged by roofing contractors.



All flashing and tarred slates are removed and new flashing installed.



This is routine restoration work on a century-old residence.



Typical
“Neanderthal”
roof work.



Same chimney
after
restoration
work.



VT unfading green slate roof in good condition but with severe leakage.



The leakage was caused by poor workmanship.



Severe leakage on a church – does the slate roof need replaced?



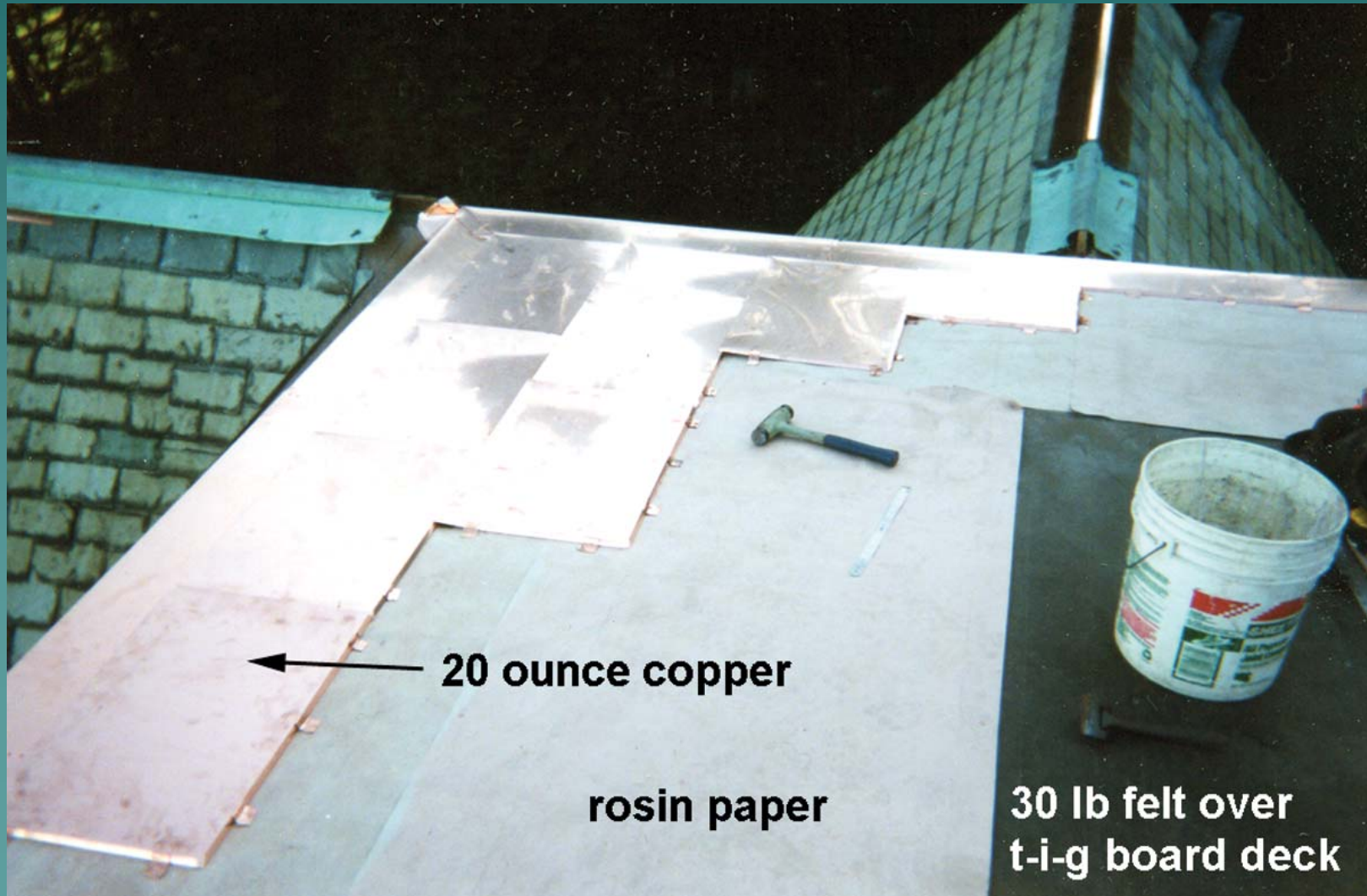
No. The leakage was not in the slate roof but in an adjoining low slope built-up roof.



Leaking low-slope areas can be re-roofed with soldered seam metal.



In this case, 20 ounce copper is being used.



The pans are soldered together to create a durable roof.



Ford's Theater: Another roof about to be condemned for a leak on an adjacent roof.



This slate roof was also condemned.



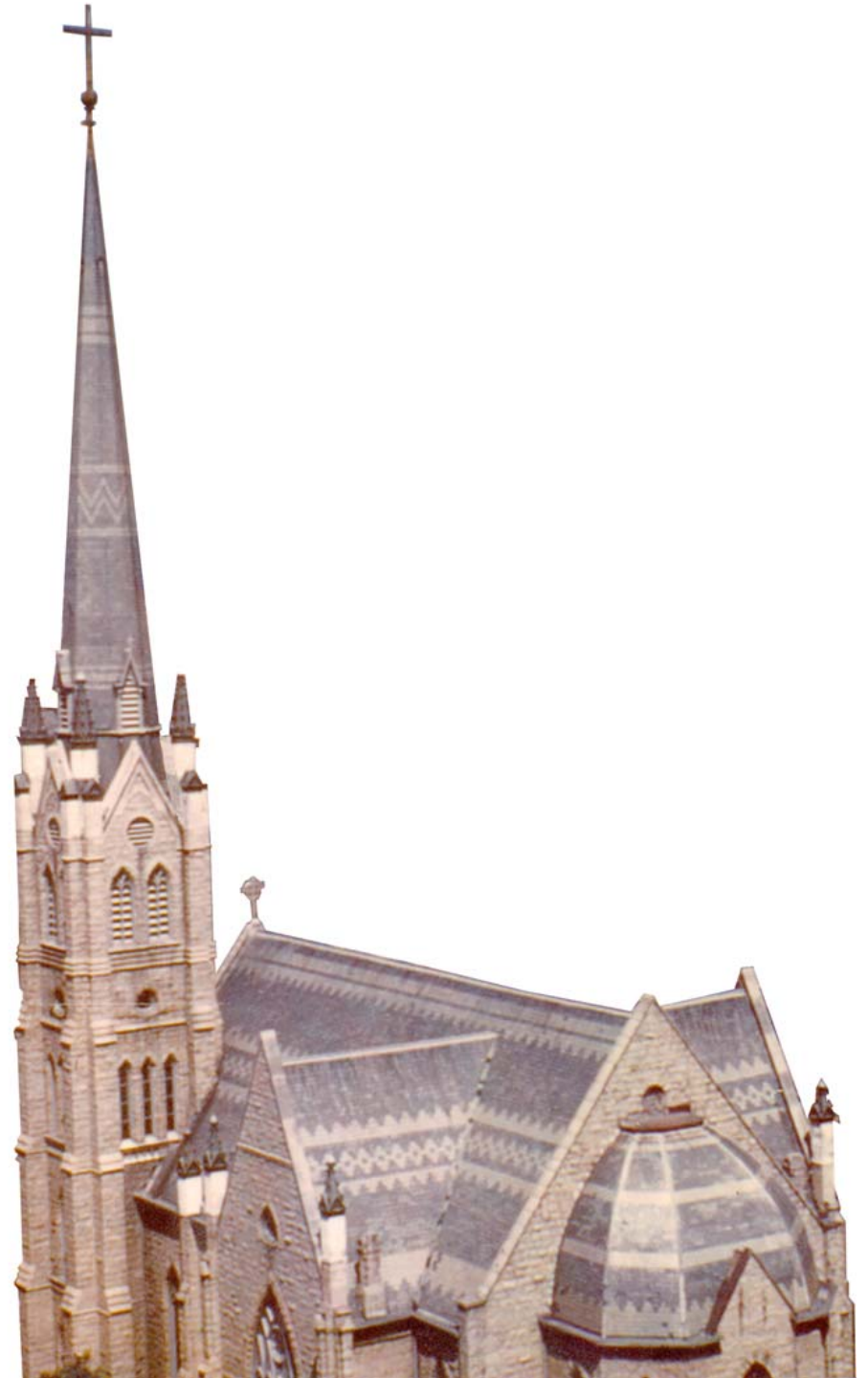
However, the minimal ice damage was covered by insurance.



Our consulting services help identify and solve slate roof problems.



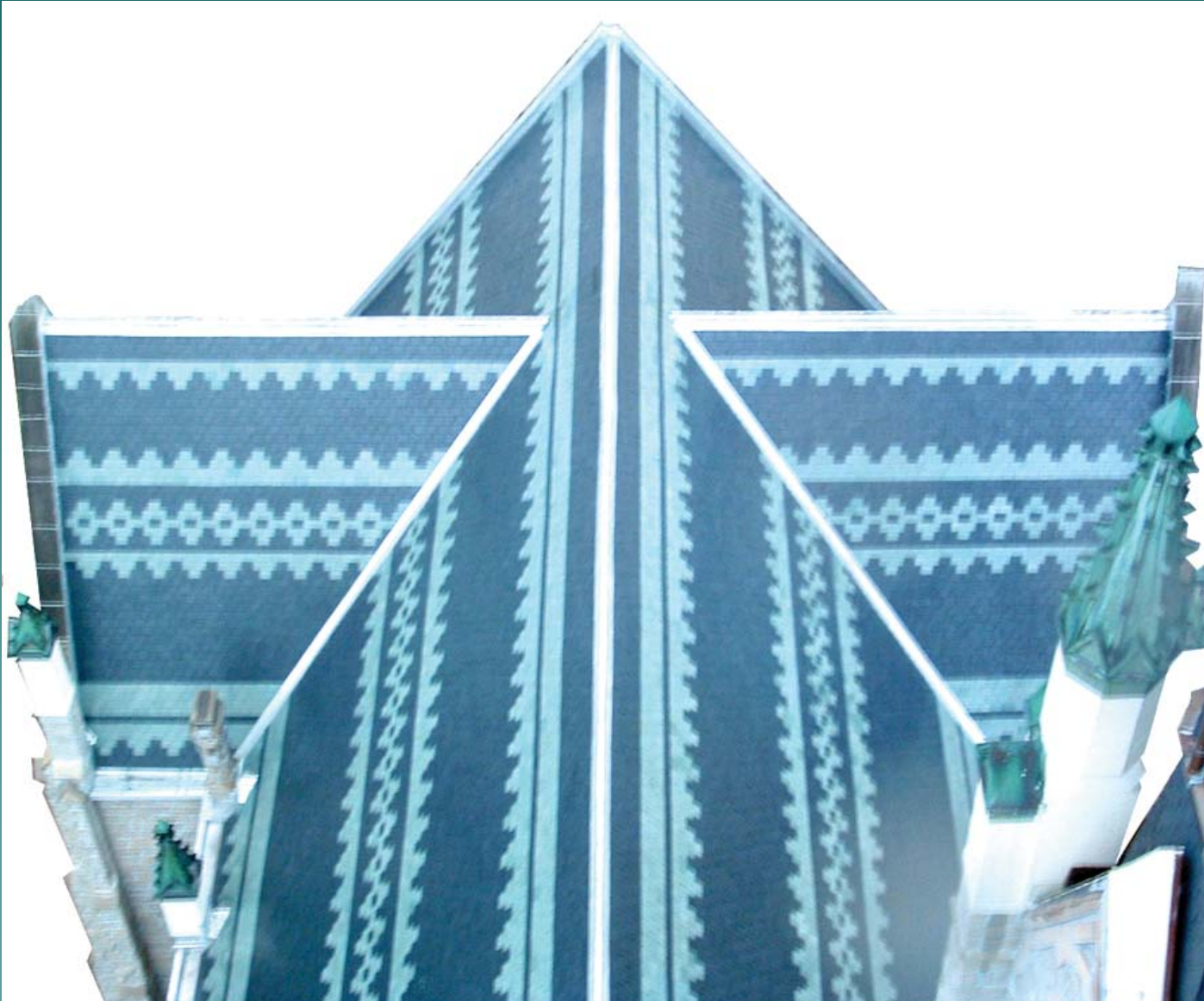
This cathedral
roof could not
be restored
without total
replacement.



The black slates had worn out, although the green slates were still good after 120 years.



New slates and stainless steel flashings have added 150 years to this building.



For More Information:

- ◆ slateroofcentral.com
- ◆ traditionalroofing.com
- ◆ josephjenkins.com
- ◆ **The Slate Roof Bible** (available here at this conference, or at slateroofcentral.com)
- ◆ Call us toll free at 866-641-7141