

Chapter One

UNDERSTANDING SLATE ROOFS

Beneath the moss covering the roof of the rugged Saxon Chapel, erected during the eighth century, is a slate shingle roof in good condition after twelve centuries of exposure to the elements. H.O. Eisenberg



Allow me to make a humble suggestion. If you want to know how to build a roof that will last a century or even two, find a roof that's already that old and copy it.

There aren't too many types of roofs that can last that long. Ceramic tile, some metal roofs, and most stone roofs can all fit into the "century roof" category. Stone roofs are the subject of this book and, in particular, slate stone, although there are different types of stone roofs, as we will see later. "Slate roofs" can be very simple — composed of thin sheets of stone usually nailed to wooden boards which are themselves attached to roof rafters. If you use good slate, good nails, and then correctly fasten the slate shingles to a good roof deck, voilà! —you have a century roof!

Slate roofs have an abundance of advantages over other roof types. They're fireproof and watertight. They're made of natural materials. They have a track record that goes back at least five thousand years and spans the entire earth. They're beautiful, simple roofs made of rock on wood (and sometimes concrete) decks — ingenious, effective, and fabulously successful.

There are hundreds of thousands of older homes with original slate on their roofs, many a century old or older. For this reason, part of this book focuses on the history of the quarries and the people who created the roofs 100 years or more ago. If you have a slate roof circa late 1800s, then in this book you can find out how the roof was produced, where the quarries were located, and what life was like for the people who heaved the stone out of the ground.

Slate roofing in the United States has an odd history. The bottom fell out of the slate industry during World War II when the war took the men from the quarries. Slate production was deemed non-essential for wartime efforts, and artificial roofing crept into the market, pushing slate aside. What happened next was unfortunate. The "old-timers" who had

installed the millions of beautiful natural slate roofs in the United States eventually got old and died off. An entire generation or two of young men went off to college to become doctors or lawyers, ignoring the trades of their elders. Decades went by and only a tiny fraction of new slate roofs were installed in the 1950s, '60s and '70s compared to the peak period between 1880 and 1940.

In the latter part of the 20th century and into the early 2000s, natural slate roofing began an earnest resurgence. The National Slate Association, dead since 1926, formed anew in 2002. The Slate Roofing Contractors Association of North America, a national trade association, formed in 2003. As of this writing in 2016, slate quarries in the northeastern USA were organizing their own association.

The public has developed a renewed interest in natural quarried slate roofing. People are realizing that nothing beats slate. Its beauty and charm are inimitable. It is "the sheltering stone," fireproof, natural, and virtually inexhaustible. Although the

DECIDES TOO LATE TO REROOF WITH SLATE

\$75,000 FIREPLACE BLAZE

"York, Me., Oct. 1 (A. P.).—The home of John C. Breckenbridge, on the York River, burned tonight with \$75,000 loss. Sparks from the fireplace set fire to the roof."

—From clipping Boston Advertiser. Sent us by E. A. Bullard.

A few days later we learned that these people were considering reroofing with slate. Had actually wired Rising & Nelson Slate Company a few days before about it. Their home could have been saved had they considered earlier and put on slate, the sheltering stone, before they started up the first fire of the Fall in the fireplace. Buildings far away from community fire apparatus need protection of household fire extinguishers and slate roofs.

Capitalize such cases when you see them in the papers to hasten decisions of those in your city whose homes need to be reroofed to avoid such fire hazards.

W. L. Hassenplug, Philadelphia office, Rising & Nelson Slate Company, recalls a similar case in Maryland three years ago. A home was destroyed from sparks from fireplace chimney. It was rebuilt on original foundations, but first thing the owner insisted on was a slate roof.

From the Slate News Bulletin, May, 1926



old quarries leave big holes in the ground, these fill with water to become beautiful lakes. There is nothing toxic about the production of roofing slate — no poisonous chemicals leaching into the environment, no asbestos, no petrochemicals wafting into the air or leaking into the streams.

Yet, even today, people are removing perfectly good slate roofs simply because they think they're "old," or because they need a minor repair. The hand-split stone shingles are ripped off and thrown into a dumpster, then replaced with cheap, temporary materials destined to clog a landfill sooner rather than later. A lot of this is due to pressure from predatory or misinformed roofing contractors, who are the principal bane of existing slate roofs. Yes, the death, destruction and ruin of many a good slate roof can be traced directly back to a roofing contractor. Why would a roofer who makes his money stapling shingles to plywood want to repair or restore a stone roof when he can easily talk the owner into destroying it instead? Many shingle roofers don't know how to repair genuine slate roofs, even though it's not difficult for any competent roofer to do.

The *installation* of new slate roofs requires skill

and knowledge that is not commonly held by standard shingle roofers. Nevertheless, there is an abundance of helpful information now available online, including instructional videos, books (like this one), magazines such as *Traditional Roofing*, and organizations such as the Slate Roofing Contractors Association. There are also training programs for installing new slate roofs. In other words, there is no excuse for a roofer to be incorrectly installing a natural slate roof today.

Many readers of the first two editions of this book were able to use the information to install their own roofs. An inexperienced home owner who takes the time to educate himself or herself (and yes, ladies also work on slate roofs) can do a better installation job than someone who thinks he knows what he's doing with slate when in fact he does not.

With one foot in the past and one in the present, the reader will learn all about older slate roofs, including how to identify them, repair them, and restore them, and all about new ones and how to install and maintain them.

Evidence of slate roofs is found in ancient prehistoric archeological digs such as the Ness of



▲ Photographed by the author in 2010, this roof, covered with Vermont purple slates with a Vermont unfading green inscription, was 159 years old at the time and still quite functional. You just can't beat a good slate roof for beauty, utility, or even cost when the entire life span of the roof is taken into consideration.

◀ Town hall, Old Town, Prague, Czech Republic, German-style slating.



▲ At the time of this writing, this Vermont roof, at 155 years of age, had miraculously managed to escape being ripped off and destroyed, probably because there was a date inscribed on it. If someone takes care of the roof, it may very well last as long as the house.

Brodgar on the Orkney archipelago off the northern coast of Scotland, dating back 5,000 years. The Romans used slate for roofing a thousand years ago. Some of the earliest Europeans to develop a proficiency in slate quarrying and roofing were the inhabitants of Wales, where slate roofs date back hundreds of years, at least. Slate roofs are common in Europe, where they're valued enough that some are still in good repair after several centuries. It is against cultural tradition to replace a slate roof with an asphalt roof in many countries, and the people there are adamant enough about it that they have passed laws preventing the replacement of stone roofs with cheap substitutes.

At the time of this writing, the author has personally worked on about 1,500 slate roofs over a 47-year period, starting at age 16 in 1968 and continuing at age 64 in 2016. He has climbed on well over a thousand slate roofs, torn them apart and put them back together, examined them, assessed them, removed and recycled them, repaired, restored and installed them. Their average age was about 100 years, not counting the new ones.

Every now and then I see a slate roof where one side of the roof has been replaced with asphalt or

fiberglass shingles. Picture this if you can: you're standing on the ridge of the roof, and to one side of the ridge you see a slate roof, the other side a shingle roof. The asphalt shingles are curling up and falling apart, worn thin, brittle and leaking. The slate roof, already 90 years old, looks solid and almost exactly the same as it did when the shingle roof was installed 20 years ago. You wonder why the home owner ever took the slate off the one side in the first place. Now look into the future: the decrepit shingle roof will soon be replaced and the slate roof will, once again, be left alone. In another 20 years the same scene will repeat itself. Then again. Then again. Each time, the shingle roof will need to be completely replaced — the old shingles will be hauled to a landfill, if there is any landfill space left by then, and the home owner will needlessly fork out more money to roofing contractors.

The slate side, if left alone, and repaired occasionally as needed, will smugly sit there, stone quiet, stoically oblivious to the vagaries and vicissitudes of humans. It will continue to do what it's supposed to be doing: protecting the dwelling and sheltering the people who live there. And it will do so with a level of aesthetics and a richness of history that a fiber-



▲ The 1862 roof located in western Vermont has a VT unfading green slate inscription on a VT purple slate roof — thinly split stone nailed to a one inch thick board roof deck — a roofing system easily replicable today.

glass shingle couldn't begin to compare to. The folly of replacing such a roof with a cheap substitute becomes clearly evident when one roof displays both roofing materials at the same time, and their performance can be seen and compared side by side.

A common reason why people feel they need to remove their slate roofs is because "*We can't find anyone to repair our roof.*" If they do find someone, they run the risk of hiring a contractor who wants to overcharge for the repairs. Many contractors don't specialize in slate, or even roofing, and when they're not building decks or installing bathrooms, they'll "repair" your roof. Many of the contractors I've met who repair slate roofs do it improperly. And because they're not equipped and experienced to work on high, steep roofs, they charge an exorbitant fee, knowing that if you pay them enough, they'll do the work for you. So if a property owner can find someone to repair the slate roof, and if she can afford him, then she may still have to pay to *have the job done wrong!* Which means she'll have to pay again to eventually have the job done right, and redoing someone else's lousy work is always harder than doing the work right in the first place. This makes for a frustrating situation for owners of slate roofs,

and it's one reason this book was originally written.

I recently met a contractor who advertised himself as a specialist in slate roof repair. He told me he goes through about 15,000 pieces of slate every year doing roof repairs. Then he proudly informed me with a grin, "*I face-nail every one of them.*" What roof owners don't know is that every face-nailed slate (nailed through the exposed face of the slate so that the nail head remains exposed) is an improperly installed slate, one that will leak, and one that has been ruined by the roofer who punctured it. So here's a guy whose roofing company face-nails fifteen thousand slates every year. Every single one of those ruined slates will have to be taken off and replaced someday by someone else. Before they're replaced, though, they'll probably leak. This roofer got paid good money to slowly destroy slate roofs. (He's now out of business.)

If you don't want to repair your roof yourself, but you do want to hire a competent contractor, make sure the contractor you hire is either experienced with slate or has read this book *before* he's set foot on your roof! Get online (SlateRoofers.org) and look at the Slate Roofing Contractors Association contractor list. If your contractor tells you he already knows

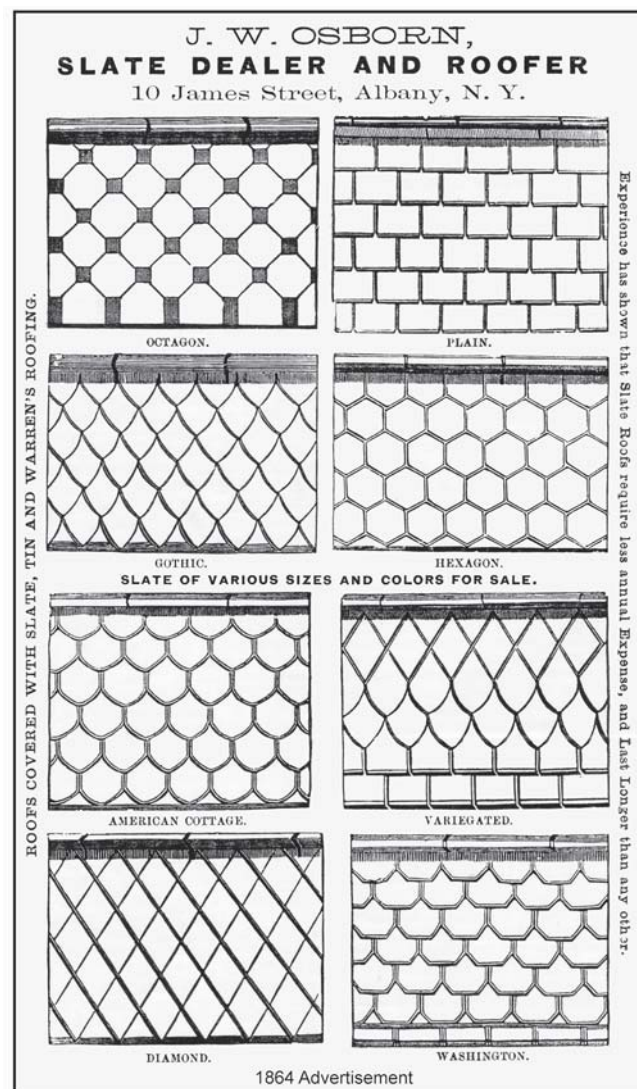


everything there is to know about repairing or installing slate roofs, then ask him a few questions to see whether he's telling the truth. Ask him where your slates came from and how long they'll last; ask him to explain how he replaces a single slate; ask to see his slate cutter, slate hammer, slate ripper and ladder hooks. You may know a lot more about your slate roof than he does by the time you've read through this book, and if the guy is an imposter, you'll know that, too!

There are numerous reasons why slate roofs should be installed and preserved. One is *longevity*. Another is *aesthetics*. In this plastic world, a hand-crafted stone roof is a symbol of durability, of quality and craftsmanship. As slate roofs become older, they could eventually be considered *antique* roofs, or vintage roofs. They're rich in history. Imagine the human effort and struggle that enabled people to bring literally tons of massive stones up from hundreds of feet underground, out of the pitch blackness of mines and tunnels, then split it into shingles by hand, and do it all in the horse and buggy days before electricity was available. People will pay a lot of money for antique furniture, yet they may discard at whim a perfectly useful, antique stone roof worth much, much more. Why?

Let's not overlook the fact that the purpose of a roof is protection. Stone roofs are *fireproof* and withstand the elements like no other roof. If you live under a properly maintained stone roof, then you know exactly what I mean. Roofing slates are wind resistant and, in most cases, hail just bounces off of them. There's no feeling like the feeling of security you get when the wind is howling and torrential rain or sleet or ice is beating down upon the earth and pummeling your house, and a stone roof stands guard overhead, deflecting mother nature's blows. Living under a stone roof can be like living in a cave. It's almost a primal experience and with a little imagination, we can see why such a roofing material appeals to us instinctively. There is no shelter quite as secure from the harsh elements as a cave, and any roof made of pure rock comes close to providing the same level of protection as the earth itself.

On the other hand, old slate roofs that have truly worn out cannot be restored. Some softer slate types can flake, crumble and fall apart sometime between



55 and 125 years of age. If the roof slate is otherwise hard, the roof can usually be restored and may still last for generations, even if it's already a century old. If the slate is old and soft, it may still last for years but will need to be replaced before long. Of course, any worn-out slate roof should be replaced with new or recycled roofing slate.

Unquestionably, historic slate roofs can have an air of mystery about them. The men who installed them have long since died, and the old roofs (in the United States in particular) have been virtually ignored by almost everyone since. The origins of these old roofs and their remaining longevity and value are difficult to determine for laypeople and professionals alike.

As the author of this book, I set out on a quest

◀ Opposite page: This beautiful, mixed-Vermont, graduated slate roof in Ohio was condemned by roofing contractors because of minor hail damage, a common occurrence. Few roof types have such beauty and grandeur.



OLD ROOFING MATERIAL IS FILLING UP LANDFILL SPACE

When old roofing is removed from buildings, it's usually trucked to landfills. Non-biodegradable, petrochemical roofing made of asphalt and fiberglass typically lasts about 20 years on a roof, then is discarded. Roofs such as these that are guaranteed by the manufacturer to *fail* in two decades are guaranteed to clog landfills year after year. According to the U.S. EPA, roof installation generates an estimated 7 to 10 million tons of shingle tear-off waste and installation scrap in the USA every year. More than 60 manufacturing plants across the U.S. generate another 750,000 to 1 million tons of manufacturing shingle scrap. The reroofing waste stream is composed of 85 to 90% tear-off waste shingles. Environmental concern is only one reason to have a stone roof, but it's an important one.

determined to clear up some of this confusion. I located the original sources of various old American roof slates and visited the quarry sites, which range from Georgia, up the eastern seaboard of the U.S. through Virginia, Maryland, Pennsylvania, Vermont, New Jersey, New York, Maine and elsewhere. Old roofs at each quarry site were examined to determine their conditions after a century or more of wear, in order to help ascertain the longevity of the slates from each region. Museums and libraries were searched for historical information in order to understand the conditions and techniques involved in producing the slates still gracing older homes and buildings today. Personal interviews with quarry workers, roofers (there are many excellent ones, by the way), architects, home owners and other history buffs, along with a multitude of photos, added to the investigation.

Not content only with information about *American* slate, the author journeyed to northern Quebec and on to the far eastern reaches of Newfoundland, Canada, then across the Atlantic Ocean to Ireland, Northern Ireland, Wales, Scotland, England, France, Germany, Spain, Italy, Poland, the Czech Republic, Slovakia, Holland, Switzerland, Greece, Estonia, Sweden, Russia, Norway, Austria, Hungary, and even China, looking at slate roofs, hiking through slate quarries, descending into slate mines, and gathering information from slate distributors, slate roofing masters, slate geologists, and anyone else who had something to say about stone roofs.

The information gathered during these voyages, combined with decades of on-the-job experience and observation, have led to the creation of this third edition book. I will be the first to admit that there are many different opinions about slate roofs, many ways to install them, numerous ways to repair, restore, appraise, assess and evaluate them — some quite sound, but others quite mistaken.

There is a trend in some corners of the U. S.

roofing community these days to largely abandon traditional roofing styles, methods, and materials in exchange for those that are convenient, expeditious and cheap. You may find that a gross lack of understanding about slate roofs can be firmly entrenched at the highest levels of the roofing trades, with misinformation running rampant. Not only roofers, but also some architects, engineers and other design professionals can be notoriously bad sources of information. Luckily, slate roof systems are simple, and when their simplicity is understood and respected, these roofs are also unbelievably successful.

High-quality roofing slate is still manufactured in the United States and is readily available to purchase. It is also now being imported into the USA from Spain, China, Brazil, Argentina, India, and elsewhere. New slate roofs are in demand across the United States and throughout the world. Whether you're selling slate or buying it, purchasing a building with a slate roof or maintaining one, installing, restoring or appraising such roofs for insurance purposes, you have found the right book.

S. S. GILL,



THE ORIGINAL

SLATE ROOFER

OF

BUTLER COUNTY, PENN'A.



LEAVE ORDERS AT

WICK HOUSE,

228 and 230 MAIN ST., BUTLER, PA.

Votivkirche, Vienna, Austria, with newly installed slate roof (Chinese green slate and Spanish black slate, all hooked into place).





◀ Opposite page, top: Slate workers, late 1800s.

◀ Opposite page, bottom: This unique and beautiful roof was on an expensive home that had minor hail damage. The roof was condemned in its entirety by several different roofing contractors, all of whom incorrectly said it had to be completely replaced. The smart owner instead had it repaired and thereby preserved the charm and character of his home.

▼ The photo on this page shows only a small portion of a massive 1882 roof in good condition that had been condemned in its entirety by roofing contractors due to minor and repairable wind damage.





HAULING UP
the "MAKINGS"
of an ENTIRE
ROOF or TWO

This block weighing about five (5) tons, contains enough slate to roof an entire house.

It is one of the reasons for the good quality and low price of "Pennsylvania

Slate Institute Standard" slate. Few quarries, aside from those members of the Pennsylvania

Slate Institute, have the quality of rock or cleavage to make possible the handling of such enormous blocks.