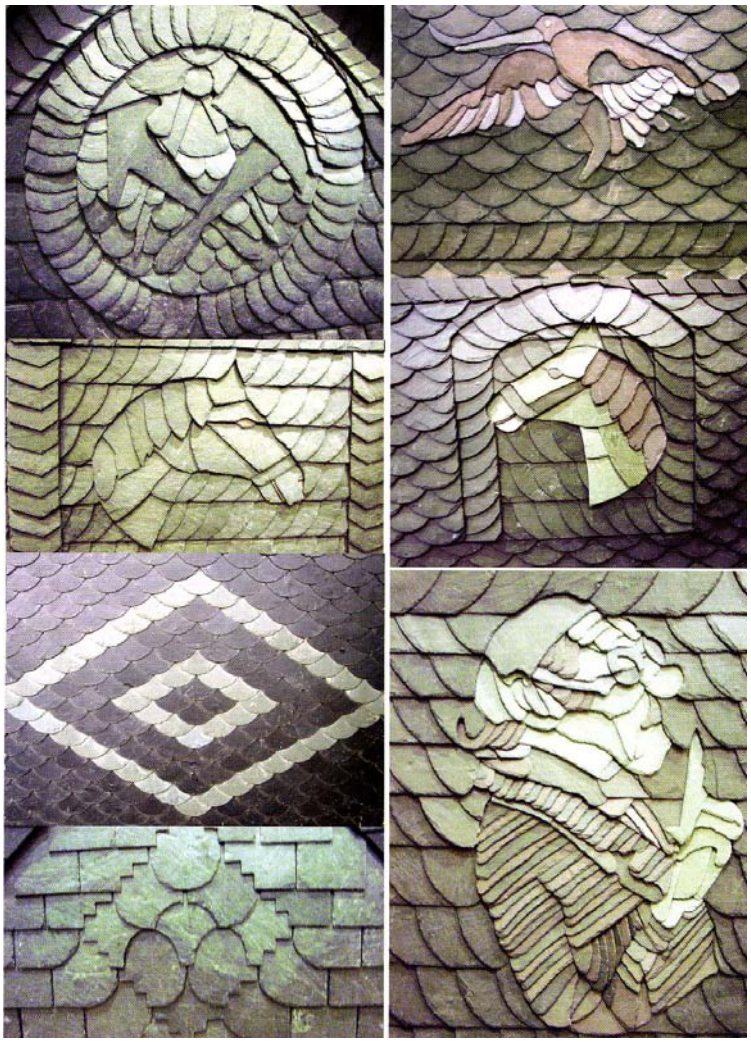

"BACK TO BASICS:
AN INVESTIGATION INTO PRESERVATION TRADES EDUCATION"

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HISP 711
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ABSTRACT

Title of Document: "BACK TO BASICS:
AN INVESTIGATION INTO
PRESERVATION TRADES EDUCATION"

Patrick Curtis Alley, Master of Historic Preservation, 2010

Directed By: Professor Donald Linebaugh, Historic Preservation Program

There is a growing shortage of workers trained in the preservation crafts (e.g. timber framing, masonry, plastering, etc.). This final project examines the state of the preservation trades education system in the United States, identifying ways in which a few educational programs are attempting to fill the void and detailing the opinions of select preservation education experts. The project goes on to describe the effect that the shortage has on our ability to successfully preserve historic buildings.

One reason for the lack of training is an inability of trades people to access training materials. The second half of this project takes the form of a manual for one trade group: slate roofing. The manual introduces issues of roofing within the context of historic preservation, details the six most important areas of competence in slate roofing, and suggests resources for further study.

“BACK TO BASICS:
AN INVESTIGATION INTO PRESERVATION TRADES EDUCATION”

By

Patrick Curtis Alley

Master Final Project submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Historic Preservation

2010

Advisory Committee:

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Dedication

To Amanda.

Thank you for your love and support during this

“short-term sacrifice for a long-term goal.”

Acknowledgements

Special thanks first to Professor Don Linebaugh – his tireless support of the Historic Preservation master's program, individual attention and interest for his students' work, and enthusiasm for the subject material have made my and my classmates' introduction to and studies of historic preservation fuller and more meaningful.

Thanks to Bob Ogle, Director of the Lamar Community College Construction Technology & Historic Preservation program, for sharing his knowledge of the ins and outs of the preservation trades education system. Also to Lisa Sasser, former president of the Preservation Trades Network, Dorothy Printup of the National Park Service Historic Preservation Training Center, and Rhonda Deeg of Historic Preservation Trades Technology program at Ivy Tech Community College.

Thanks also to Chuck Wagner and Lindsay Keiser of Wagner Roofing, Inc., for assisting with this project, and to Joseph Jenkins, author of The Slate Roof Bible, for both allowing me to use his illustrations, as well as for his enthusiastic support of the preservation of historic slate roofs.

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Introduction

> Technology has displaced the traditional building craftsmen as effectively as industry previously displaced the handcraftsmen who made the objects of domestic use and commerce. Not only has prefabricated and disposable construction destroyed the general need for such craftsmen, but artificial materials have replaced many of the natural materials used in earlier buildings whose properties are part of the craftsmen's lore. These ancient crafts are a significant part of our national cultural resources. Their continuation as a living tradition is essential to insure the authentic conservation of our early buildings.[1]
>
> -The Whitehill Report (1968)

In an ideal society, everyone contributes. There are bakers, tailors, firemen, teachers, etc. And there are builders; the men and women who construct and maintain the built environment. Such a society was the status quo for countless generations. There was continuity – the knowledge of one generation was passed down to the next as a matter of course. It is this continuity that we have to thank for our extant historic built environment; those structures are standing because people were trained how to build and maintain them. Without the people trained in the traditional trades (e.g. plastering, masonry, timber framing), we would lack not only basic shelter from the elements, but also the tangible architectural record that allows us to appreciate the scope of history and our place in it. On and on, this society continued.

Then something changed.

Sometime in the last century, there began a breakdown in that system of knowledge. Suddenly, the tried-and-true materials and methods of the past were eschewed in favor of more modern materials and methods; buildings began to be clad with metals and plastics, roofs were covered with asphalt, windows became less

[1] The Whitehill Report on Professional and Public Education for Historic Preservation. International Preservation Trades Network website. 12 May 2010. <http://www.iptw.org/whitehill-1.htm>

functional, etc. In a sense, modern buildings became more about what *could* be done as opposed to what had always been done. With this change in building style came a change in the skills considered to be necessary. There was a break in the chain of knowledge, and things, frankly, have never been the same since.

> Forty years ago most architects had been trained in the grammar of historic styles and in draughtsmanship, while many older carpenters and masons were still familiar with the traditional techniques of their crafts. Through changes in the curricula of architectural schools beginning in the 1930's, only an occasional architect of the present day has the interest in and knowledge of the past that were once a commonplace of the profession. With rapidly changing techniques in the building trades, inspired by new materials and pre-fabrication, the ability to repair (or where necessary reproduce) details in old buildings has become extremely uncommon. The larger public and private organizations engaged in historic preservation--of which the National Park Service and Colonial Williamsburg are conspicuous examples--have been forced to train and develop their own staffs of archaeologists, research historians, architects, and craftsmen. As these specialists are normally fully occupied with the work of their own organizations, the number of professional restorationists available for general work is very small indeed.[2]

As the years pass, and we drift farther and farther from the "old days," the gap in the social knowledge is only becoming wider and more apparent. Those of the oldest generation, who were among the last to receive traditional trades education as a common rite of passage, are a disappearing breed, and preservationists, architects, and craftspeople agree: there are not currently enough new workers being trained to replace them.[3]

This situation is both unprecedented and dangerous. As preservationists, we

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[2] The Whitehill Report on Professional and Public Education for Historic Preservation. International Preservation Trades Network website. 12 May 2010. <http://www.iptw.org/whitehill-1.htm>

[3] Krajewski, Grace and Moqtaderi, Nedda. Implementation strategy for incorporating preservation trades training into the Wilmington Job Corps Center . published Wilmington, Del. : Preservation Delaware, Inc., 2001. pp 1.

are keenly aware of the challenges inherent in keeping the built environment around for future generations. Now, to the list of preservation threats such as *urban renewal*, *sprawl*, and the ever-present effects of Mother Nature, we should add *declining trades knowledge* – because as the knowledge goes, the buildings are sure to follow.

All is not lost, however. There is a trades education system in the United States that is attempting to train tomorrow's skilled trades people. It is this system that forms the basis of this final project, which will be broken into two sections. The first section will explore the trades education system in some detail. Chapter one reviews different forms of preservation trades education, and concludes with the current trades education model - its inherent strengths and weaknesses, and experts' thoughts regarding its future. Discussion of trades education leads to greater detail of one trade in particular: traditional slate roofing. The second half of the project takes the form of a basic training manual for beginner slate roofers (aka "slaters"). The manual explains the importance of roofing and roofers to the historic preservation field, covers the top six areas of competence for slaters, and offers a list of materials that can be used for continued education.

Chapter 1 - Different Forms of Preservation Education
"Hands-off versus Hands-on"

Much of graduate level historic preservation education focuses on what could be termed the "paperwork side" of the historic preservation field; preservation law, policy making, building documentation, etc. Students in these programs typically do not spend much time inside actual historic buildings, much less physically work to preserve them. Instead, much of graduate level preservation education focuses on the techniques used by academics, policy makers, lawyers, and others professionals who work to protect cultural heritage across a broad spectrum rather than from the actual ravages of time. The tangible, hands-on work (e.g. repairing broken windows, repointing mortar, replacing rotten timbers, etc.) is generally outside of the realm of such programs. To me, and others, this begs the question: who will perform the work prescribed in the preservation policies that we "hands-off" preservationists enact, and how will these "hands-on" preservationists learn to do it?

We face a growing problem in the preservation field: a serious shortage of trades education programs in the United States (and abroad). While serious, this situation is not new; the condition was first acknowledged in the 1968 *Whitehill Report on Professional and Public Education for Historic Preservation*, which analyzed the state of preservation education in the country for the National Trust for Historic Preservation. The Trust commissioned the report, shortly after the passage of the National Historic Preservation Act (1966), to assess the needs of the preservation field and to make recommendations for its improvement. Even in 1968, it was clear that the shortage of trained preservation trades people would negatively impact a huge portion of the nation's building stock. It was also clear that there was no effective

program - then or now- for training and employing such workers. In order to address the problem, the Whitehill Report recommended the implementation of both graduate-level academic programs and trade school programs in order to address the overall shortage of trained preservationists. Furthermore, as the problem was perceived as being nationwide, the Report recommended that such programs be implemented on a nationwide scale.

Over forty years later, it is clear that only half of the report's recommendations have been implemented. In 2007 there were forty-five graduate level preservation programs in the U.S., but only five trade programs. (see figure 1) Robert Ogle, a preservation education specialist, has written extensively on the subject. He writes:

> The Whitehill committee concluded that specialization in historic preservation education would be most effective at the graduate level in schools of architecture. This narrow view discounted any contribution to historic preservation professional development from other academic disciplines such as public history, geography, historic archaeology, and anthropology. Ironically, the elitist approach effectively created an insurmountable barrier to entry for those practicing in the historic building trades despite the findings.[4]

Elsewhere, Mr. Ogle contends that

> Historic preservation education is rapidly approaching a tipping point in terms of preparing graduates for current and future demands of the profession. Formal preservation education has turned a blind eye to the empirical evidence developing in the American market based economy that demands immediate rethinking of historic preservation curricular design and pedagogy. Demand for skilled craftsmen trained in the building arts and conservation sciences coupled with preservation project managers trained in law, finance, construction management, and business management working in partnership with designers and

[4] Ogle, Robert. "Historic Preservation Craft Education Leads the Way: The Colorado Story" http://www.iptw.org/rogle-ites07.htm.

planners has outstripped supply.[5]

What programs there are run the gamut between government-run programs (e.g. The National Park Service's Historic Preservation Training Center, which trains exhibit specialists who are capable of performing preservation work on NPS properties), private schools (e.g. The North Bennet Street School, a private school in Boston that teaches several crafts, including preservation carpentry, book binding, violin building and locksmithing), and periodic workshops (e.g. Bob Yapp's Belvedere School, which conducts individual training sessions on such topics as storm window construction). These programs, however, are only capable of training a handful of students at a time, while the number of historic structures is massive.

"Effects of the Shortage"

How, then, does this shortage of trained trades people actually impact the preservation field? Preservationists have standards for preservation work, namely the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, and these standards dictate how preservation, rehabilitation, restoration, and reconstruction work is to be completed. This work requires trained professionals to complete it. If such professionals are not available, two things can happen: 1) the work is not done, and the project suffers, or 2) the work is not done up to standard, and the project suffers. In either case, the delays caused by an extended search for a qualified professional, as well as higher cost of labor, has a detrimental effect. According to Lisa Sasser, former president of the Preservation Trades Network, result #2 is most common,

[5] Ogle, Robert. "PhD Abstract. 'Reconnecting the Head and Hand: The Crisis in Historic Preservation Education'" Email to the author. 19 Mar 2010

> There are probably many more instances of projects being completed by cutting corners and employing inappropriate or less skilled methods. Contracting officials, architects and project managers often lack the skills and knowledge to adequately evaluate the appropriateness of the work. Contracting procedures often lack measures to pre-qualify skilled contractors, and many highly skilled preservation trades people won't even bid on some types of government contracts because of excessive bonding requirements and paperwork.[6]

Take for example the preservation of a historic slate roof. As the roof ages, preservationists believe that the slate should be maintained, i.e., not replaced with common asphalt shingles. In order for the slate roof to be preserved, we need men and women who actually know how to perform proper work on slate roofs. However, trained slate roofers are becoming harder and harder to find. The shortage of trained professionals, therefore, results in either the installation of a faulty slate roof that will actually *harm* the building by leaking, or the installation of an inappropriate non-slate roof that will detract from the building's historic integrity.

[6] Sasser, Lisa. "Re: HP Trades Project." Email to the author. 19 Mar 2010.

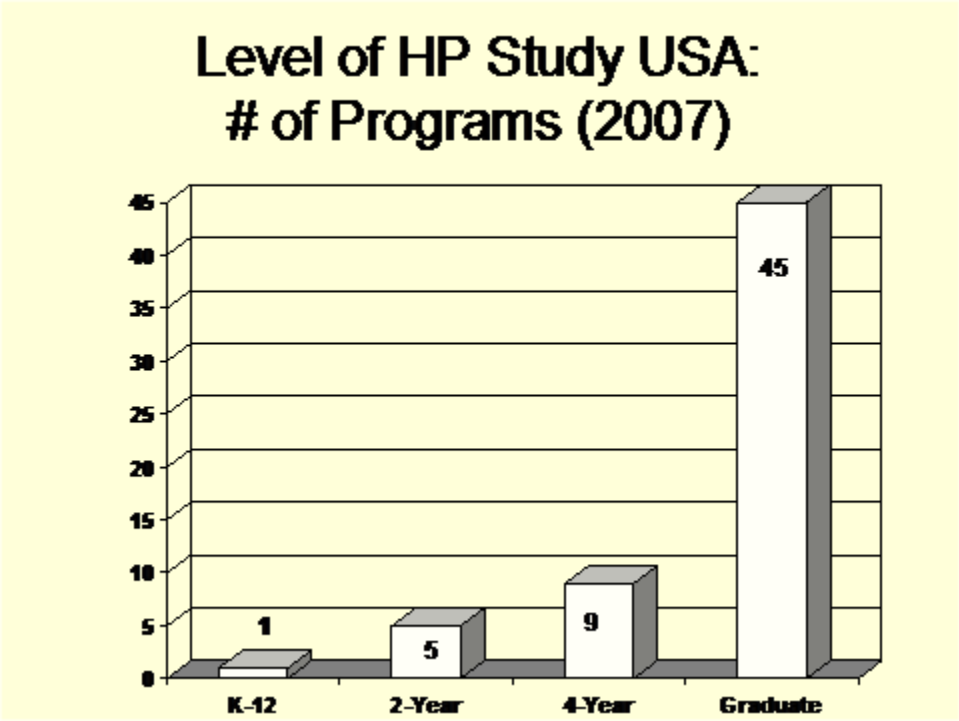

Fig. 1. Historic Preservation education programs in the U.S.
(Source: Ogle, Robert. "Historic Preservation Craft Education Leads the Way: The Colorado Story." < http://www.iptw.org/rogle-ites07.htm>)

Chapter 2: The Current Trades Education Model

> The best method of training a craftsman is the oldest method – apprenticeship – for the hand must be trained as well as the mind. In specialized work this means beginning the apprenticeship as an already qualified journeyman carpenter, and training for the special skills required for preservation and restoration work.[7]

It should be said that not all trades skills are learned at trade schools. Trades people who desire to become a master in one trade (e.g. timber framing) would typically be best-served through an on-the-job training program (i.e., an apprenticeship). Other programs, such as the National Park Service's Historic Preservation Training Center, train individuals to be "preservation specialists." According to Lisa Sasser, "[the HPTC program] usually covers basic proficiency in several trades applied to preservation projects plus a broad skill set for assessing and scoping preservation projects as well as project management."[8]

The difficulty of locating professional trades people is compounded by the fact that there are a number of difficulties in starting and maintaining a preservation trades program. In this chapter, the current challenges of trades schools, as well as their strengths, are reviewed.

"Types of Trade Programs, Their Pro's & Cons"

Trades education centers have a long list of challenges. To begin with, there is an unspoken (and sometimes spoken) bias against attending trade schools. Our society places a high priority on the attainment of a four-year college education that those who do not go to college are often seen as underachievers. According to Lisa Sasser,

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[7] The Whitehill Report on Professional and Public Education for Historic Preservation. International Preservation Trades Network website. 12 May 2010. < http://www.iptw.org/whitehill-1b.htm>
[8] Sasser, Lisa. "Re: HP Trades Project." Email to the author. 19 Mar 2010.

> A lot of students that would be highly motivated to go into [trades] programs never have an opportunity to hear about them from high school guidance counselors, etc. Families may actively discourage students from going into trades programs rather that (*sic*) following an academic course. Even students that are not on a college track are encouraged to seek out "high tech" vocational program tracks rather than traditional trades programs.[9]

This bias has two effects: fewer people go to trade schools than would otherwise go, and more people go to college than would otherwise prefer. Because of this, trades programs have a reduced number of applicants – and the applicants they do receive are often not the type that will make a life's work in the trades.

> The median age of students entering the North Bennet Street School preservation carpentry program is 40. A lot of anecdotal evidence suggests that many people who have a natural predilection for the trades feel pressure to pursue traditional career paths early on, and only return to their primary interest later in life.[10]

While not within the scope of this paper, the effect of these "would/should-be trades people" working in office cubicles is probably as detrimental to our society as it is dispiriting to contemplate. Suffice to say that the bias against pursuing a trades education is a crucial, underlying obstacle to improving the current situation.

In addition to the lack of available students is the lack of support from educational institutions. Historic Preservation programs at community colleges have often failed for one or both of the following two reasons: First, only one person is put in charge, often a preservation specialist with little experience in higher education. According to Robert Ogle, such directors often fail to understand the need for auxiliary funding sources; when the initial funding expires, the program is left

[9] Ibid.
[10] Sasser, Lisa. "Re: HP Trades Project." Email to the author. 19 Mar 2010.

unsupported and unsustainable. This lack of community investment implies that the connection between the product (i.e. trained trades professionals) and the community has not been made. This leads to the second reason for program failure: the school administration does not appreciate the value of historic preservation to the community. This is especially ironic, considering that the graduates of the community college program would likely go on to preserve the buildings in that same community. As Mr. Ogle has noted, "these programs are arguably the most tangible form of the community colleges' mission."[11]

"Ideas for Improvement"

Trades educators are learning from these mistakes, however. First, community colleges are not all alike. In some states, each community college is independent from the others in terms of programs offered. In other states, community colleges are part of a state-wide system, wherein the programs and curricula at one college are easily replicated at others in the same state. "While these ["state-wide"] schools tend to lack a certain 'community feel'", Mr. Ogle reports, "they can adapt easily to a good program."[12] Such is the case in Colorado, where Ogle has instituted a preservation trades program at Lamar Community College.[13] If the program does well at Lamar, it can be applied to the other community colleges around the state.

Ogle, and others, view community college programs as the solution to the current trades education deficit for several reasons. First is these schools' ubiquitous presence. While programs like the North Bennet Street School and the National Park

[11] Ogle, Robert. Personal INTERVIEW. 30 Mar. 2010
[12] Ogle, Robert. Personal INTERVIEW. 30 Mar. 2010
[13] Mr. Ogle has also started a preservation trades program at Colorado Mountain College. At CMC, funding is secured through a local property tax, as well as community investment. These programs train students not only in historic preservation, but also in a variety of business management skills.

Service Historic Preservation Training Center certainly produce very capable graduates, those schools' physical capabilities are limited – just two locations on the east coast. Community colleges, however, are already dispersed throughout all fifty states, which makes them well-suited to admit and train the large number of trades people that are needed. The second reason is their ability to offer classroom instruction, worksite training, and controlled skills training (i.e., workshop space where skills can be honed). The third reason community colleges are attractive is their accreditation status. While all community colleges are required to be licensed and accredited, many schools that specialize solely in trades education, such as the relatively new American College of the Building Arts, in Charleston, SC (the only four-year trades program in the country), are having a difficult time receiving accreditation. This deficiency means that students there are not eligible for federal student loans, which, in turn, limits the number and type of student who can attend. In addition, graduates of unaccredited programs may have difficulty convincing potential clients and employers of their capabilities.

Lastly, graduates of preservation trades programs still face the challenge of establishing their credentials. Most trades people, such as auto mechanics, receive some sort of standardized third-party certification, e.g., ASE (Automotive Service Excellence) Certification. Receiving such certification (essentially being vouched-for by the accrediting body) allows employers and clients to trust that the trades person is a trained professional. Currently, there is no such certification for preservation trades people, which means there is no way for potential employers/clients to differentiate between trained professionals and untrained charlatans.

In summary, the current preservation education model, made up of both public and private programs, is failing to produce a sufficient number of trained trades people. A combination of anti-trades bias, insufficient funding, and lack of support (i.e., accreditation, community involvement, and post-training certification) is hindering present attempts to solve the situation. The sheer enormity of the trades deficiency is a problem in itself; one that requires a similarly enormous solution.

> Practical means for providing careers in [preservation trades] work need to be found through the joint efforts of government and private initiative. These objectives cannot be accomplished on a limited basis no matter how dedicated such projects might be, for the need is so urgent and so general in scope that it must be recognized as a national responsibility, requiring national leadership, direction, standards, and continuity .[14]

Coupled with the current economic crisis, which has resulted in a vast amount of unemployed workers, preservation can equal more jobs, as well.

> [Presenting the idea of a preservation trades program to high school career counselors] may be a good first approach, since it is in their best interest to create opportunities for students to be more employable. Exposure to preservation trades means students could be hired into both new and preservation construction fields.[15]

The community college system in America, nearly 1,200-strong at last count[16], is clearly a viable resource.

But what will be taught in these new programs, and how will it relate to the

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[14] The Whitehill Report on Professional and Public Education for Historic Preservation. International Preservation Trades Network website. 12 May 2010. <http://www.iptw.org/whitehill-1b.htm>

[15] 'Introducing Preservation Trades to High School Students' A fast, easy, and low-cost approach for high school instructors, preservation trades practitioners and preservation organizations to introduce preservation trades in technical high schools. Produced by the National Center for Preservation Technology and Training and the Michigan Historic Preservation Network.

<http://www.michigan.gov/documents/hal/MHPN_Preservation_Trades_Education_261301_7.pdf>

[16] American Association of Community Colleges website. 12 May 2010. <http://www.aacc.nche.edu/AboutCC/history/Pages/ccmap.aspx>

field of historic preservation? To better explore the topic of curriculum, I selected a subset of the trades – slate roofing – for closer study. By doing this, the connection between preservation and craft becomes even clearer.

Chapter 3: Traditional Slate Roofing

While studying the operation of Wagner Roofing, a local roofing firm, it became clear: our present society is not an environment in which trade skills can be passed down from master to student as they had in past times. Master craftsmen have their hands full just getting their day-to-day work completed, they are not available to teach others full-time. This is a result of both the large amount of historic roof work and the ever-decreasing number of master craftsmen.

The president of Wagner Roofing is diligent about inviting trade specialists to come to the company headquarters to perform training workshops when possible, but such events must be balanced with fact that Wagner's employees are being paid to roof, not attend classes.

That is where this guide attempts to help. By communicating with master slate roof craftsmen (aka "slaters") and trades education experts, I have established some basic "areas of competence" (i.e., basics skills that must be mastered to become an accomplished slater). I then linked these areas to the basic tenets of historic preservation, and presented them to the roofers in an accessible way. In addition to these skills, I have also compiled a list of resources for roofers interested in pursuing more in the way of preservation training. My hope is that students can use the guide to gain a basic understanding of good techniques before actually undertaking slate work. That way, their time at a job site can be spent honing these budding skills, rather than starting from scratch. The additional resource section will also help by bringing the many varied publications together into one document. These resources include other manuals, books, and pamphlets – even You Tube videos – that will

broaden students' appreciation of both proper slate roofing and proper historic preservation.

A Short Guide for Beginner Slaters

> As well meaning as the design team on a historic preservation project may be, there is often little technical understanding of slate roofing. Restoration contractors, too, may be at a loss for practical information and proper technique when working with slate.[17]

"Why Slate Roofs?"

Slate roofs have been used in America since colonial times, and were especially popular beginning in the mid-nineteenth century.[18] Slate roofs are said to be the most long-lasting types of roof in the world, easily lasting over 100 years.[19] This longevity is thanks mostly to the durability of slate – it is rock, after all – but they also require good installation and upkeep in order to realize their maximum potential. That's where you come in.

Chances are, you already know a thing or two about roofing. In fact, you may be a professional roofer. That's a good start – a lot of the basics of slate roofs will come naturally to you. The purpose of this manual is to put you on the right track to becoming a master "slater." It won't teach you everything, but it will point out the most important skills you need to master; that way, you can pay special attention to them when you're on the job site with a teacher.

This manual was put together for a few reasons. First, because people need to know what they're doing before they try to work with slate; otherwise, they could end

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[17] Stearns, Brian; Stearns, Alan; Meyer, John. The Slate Book: How to Design, Specify, Install, and Repair a Slate Roof rev. by Ken Follett, APT Bulletin: The Journal of Preservation Technology XXX-2/3-99, p. 78

[18] McKee, Harley. Slate Roofing, APT Bulletin: The Journal of Preservation Technology II-1/2-70, pp. 77-83

[19] Stearns, Brian C. "Evaluating Whether to Repair or Replace a Slate Roof." pp IV-41 Slaton, Deborah and Fisher III, Charles. The roofing handbook for historic buildings / editors, . published Washington, D.C. : Historic Preservation Education Foundation and the National Park Service, 1999.

up doing more harm than good. It's becoming apparent that, as the old-timers retire from the industry, they aren't being replaced by people with similar knowledge. Slate roofs, in particular, seem to be foreign even to many professional roofers. There's a gap of knowledge, in other words, between the masters and the students. What's more, the masters who are still working are too busy with their own workload to actually give one-on-one instructions to a rookie or novice. This manual is designed to teach some of those basic skills, as well as point you to where there are more learning materials available.

"Historic Preservation: What is it? Why do it?"

> A weather-tight roof is basic in the preservation of a structure, regardless of its age, size, or design. In the system that allows a building to work as a shelter, the roof sheds the rain, shades from the sun, and buffers the weather. … During some periods in the history of architecture, the roof imparts much of the architectural character. It defines the style and contributes to the building's aesthetics. … But no matter how decorative the patterning or how compelling the form, the roof is a highly vulnerable element of a shelter that will inevitably fail. A poor roof will permit the accelerated deterioration of historic building materials-- masonry, wood, plaster, paint--and will cause general disintegration of the basic structure. [20]

Of particular importance in this manual is how slate roofing – all roofing, really – relates to the field of historic preservation. The basic idea behind historic preservation is that things from earlier generations (buildings, monuments, objects, sites, etc.) are important to present generations and should be kept around for future ones. Without these relics from the past, it's difficult for a community to have a good

[20] Sweetser, Sarah. Preservation Brief #4 - Roofing for historic buildings / . published [Washington, D.C. : U.S. Dept. of the Interior], Heritage Conservation and Recreation Service, Office of Archeology and Historic Preservation, Technical Preservation Services, 1979. 13 May 2010. <http://www.nps.gov/hps/tps/briefs/brief04.htm#Significance of the Roof>

sense of itself – where it came from, what kinds of people have lived in it, what makes it different from other places. Communities that preserve their historic buildings and landmarks enjoy a richer social environment. Preservation is also more economically and environmentally sound than demolishing and rebuilding. Examples of historic preservation are all around; here is a couple:

Bostwick Estate (Fig. 2)

One of only four buildings in Prince George's County, Maryland built before the Revolutionary War, Bostwick Estate (c. 1746) has played an important role in the history not only of the Town of Bladensburg (it was the home of a local merchant and town founder), but also of the United States (it played a role in the War of 1812 and was home to the first Secretary of the Navy). By studying the construction of historic buildings like Bostwick, historians learn more about how homes were constructed in years past, as well as how architectural styles have changed throughout the years.

Hyattsville Historic District (Fig. 3)

Buildings don't have to be extremely old or grand in order to be considered worth preserving. For example, many of the homes of Hyattsville, MD – such as these bungalows – are being preserved so that the character of the neighborhood remains intact. These are the homes of normal, blue-collar workers. The houses' simple, yet attractive, historic appearances tell us about the people who built and lived in them. Preserving the houses is a way of preserving the memory of those people and maintaining the community.

The main way to preserve the character is to avoid making drastic changes to the houses' exterior walls and roofs. Preserving these places isn't always easy,

though. In fact, sometimes it seems that Mother Nature herself is trying to tear things down, and one of her favorite tools of destruction is, you guessed it: water.

Water, while being a necessity of life, is also a key agent in destruction. It makes metal rust, bricks crumble, paint peel, plaster dissolve, wood rot, and stone crack. Really, there isn't any part of a building that *isn't* susceptible to water damage. That's what makes good roofs (and good roofers) one of the most important parts of the historic preservation team. You and your roofs are the first and most important line of defense against the so-called "ravages of time."

Fig. 2. Photograph of Bostwick Mansion, Bladensburg, MD. Photograph by author.

Fig. 3 Photograph of houses in Hyattsville Historic District, Hyattsville, MD. Photograph by author.

"The Importance of Style"

> "Slate roofing, especially decorative slate roofing, appeared in almost every late nineteenth century pattern book, usually with little or no explanation, as it had become a standard roofing material."[21]

While weathering and decay are the most obvious reasons roofs are important in historic preservation, there are other reasons, as well. Part of what makes a historic building different from more modern ones is, of course, its appearance. Old buildings look, well, *old*. This difference has taken generations to occur. Think about it - when the colonists first arrived in America, they liked and built certain styles of architecture. The people after them tweaked the style to fit their tastes. The third generation tweaked it some more, and so on. Now, 300 years later, the current American generation is left with examples of all these different styles, each of which is unique.

What is an "architectural style"? It's a combination of building elements; window shapes, building material, number of floors, and – yes – roof type, to name a few. Certain architectural styles typically have certain roof styles that go with them. So what are the styles, and why does it matter?

You probably already know the basic roof types, such as hip, gable, gambrel, flat, shed and mansard. (see fig. 4) Each of these styles of roof is commonly paired with a certain style of building. For example, a Mansard roof is usually found on a "French 2nd Empire" style building (see fig. 5). This architectural style is said to have

[21] Pierpoint, Robert N. Slate Roofing, APT Bulletin: The Journal of Preservation TechnologyXIX-2-87, pp. 15

been created by the French during their second rise to power in Europe, and was popular from the mid- to late-1800s.

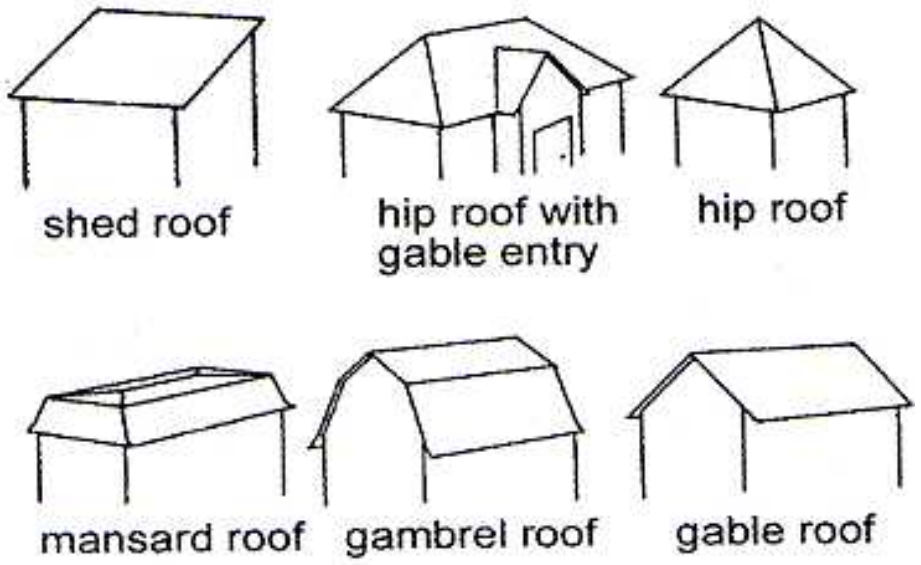

Fig. 4 Drawings of various roof types (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 118).

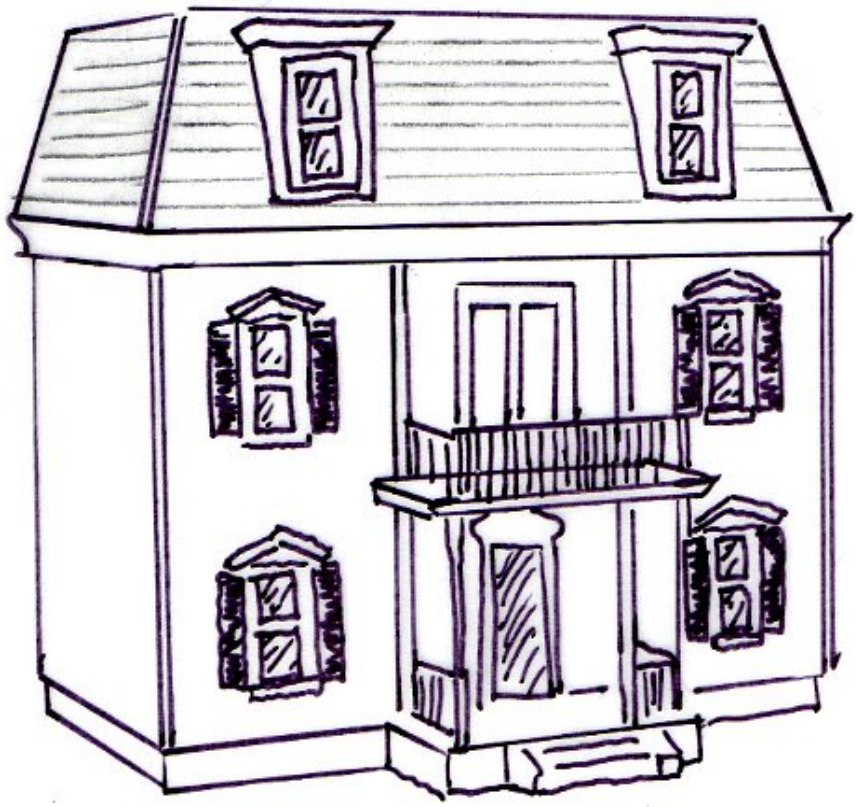

Fig. 5a Drawing of a building of the French 2nd Empire architectural style. Drawing by Author.

In fact, the roof is considered to be so important to the overall architectural style that if the same building were to have a different type of roof, it would probably not be considered a French 2nd Empire building anymore (see fig 6). The changed building would no longer make the same visual or historical sense, so it couldn't teach people about how fashion and styles have changed throughout time.

Besides roof type, there's also the matter of roofing material. By now you've probably seen just about every material out there – slate, tile, asphalt, wood, metal. What's the difference between materials? In fact, there are many. First, some architectural styles come with certain roof materials, such as "Spanish Colonial Revival" buildings, which typically use clay tiles. Then, there's the matter of longevity – how long the material will perform. Asphalt shingles typically last twenty years, metal roofs last at least fifty, and slate can last well over 100 years. There's cost, which ties-in to longevity (asphalt shingles cost less than slate, but will have to be replaced more often). And there's the matter of appearance – how the material looks on the building.

This is a good time to bring in some of the rules for governing historic preservation work. A list of standards and guidelines for preservation work is published by the Secretary of the Interior (typically referred to as the "Secretary's Standards"), and include sections on preservation, restoration, rehabilitation, and reconstruction. Think of the Standards as the basic principles of historic preservation; they explain what the overall goal of preservation is. The guidelines give more details about how to actually achieve the goals of the Standards be describing which kind of work is recommended and which is not.

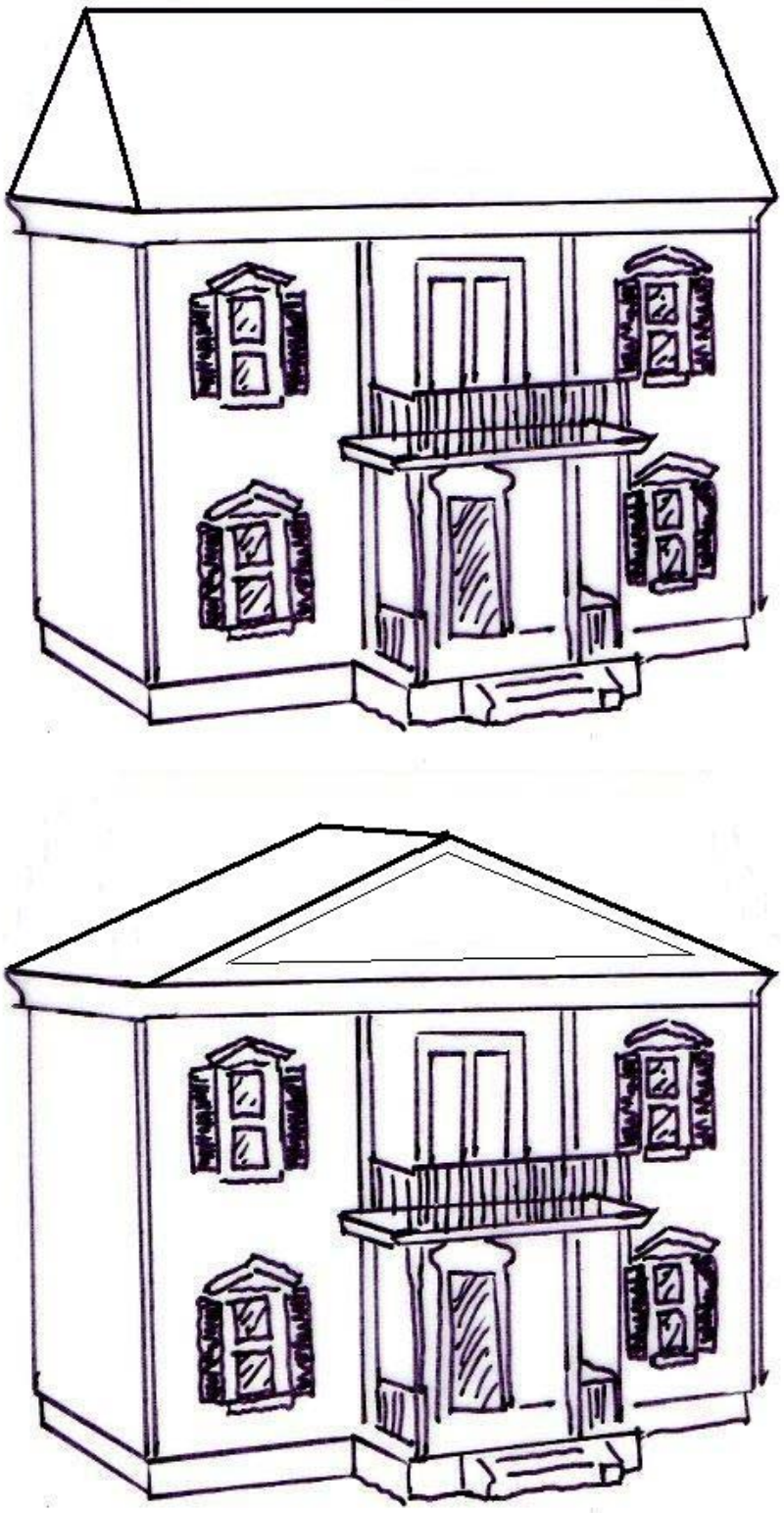

Fig. 5b Drawings of building from Fig. 5 exhibiting a side-gable (above), and a front-gable roof (below). Drawing by author.

“How to Treat Historic Buildings”

Preservation

“Preservation” means to stop a building from continuing to deteriorate. This is the least invasive of the four types of treatment. Only basic maintenance is performed, such as painting the walls or repairing the roof. For example, the barn on the Bostwick Estate (fig. 2), is being “preserved.” It is still in use as a barn (i.e. it hasn’t been turned into an office, or an apartment), and no work is being done to make it appear like new.

Restoration

“Restoration” means to return a building to a specific time period, such as how it originally appeared, or how it appeared at an important moment. For example, say a two-story house was built in 1900 and had a slate roof. In 1960, the owners added a third story and replaced the roof with asphalt shingles. In order to “restore” the house to its original appearance, the third story would have to be removed, and a slate roof put back on. Riversdale Mansion, shown below, has been restored to its original appearance.

Rehabilitation

“Rehabilitation” means to make a building suitable for a new, modern use. Some people think of this as “remodeling.” In rehabilitations, it’s important to try hard to make the old building work for the new use. Avoid making drastic changes in style, materials, etc. For example, this historic building in Charleston, SC, has been rehabilitated for use as an Urban Outfitters retail location. Its appearance remains historic, but its use is modern.

Reconstruction

"Reconstruction" means to rebuild something from new materials. This usually implies that the original structure is gone, but plans and/or pictures of it remain, which allow builders to produce a faithful replica. The image below shows a reconstruction of the chapel building at Historic St. Mary's City, MD. The original chapel was built in 1667 and destroyed centuries ago. The reconstructed chapel was built based on descriptions of the original, using authentic building materials and techniques.

The Secretary of the Interiors's Standards for the Treatment of Historic Buildings can be found at http://www.nps.gov/history/hps/tps/standguide/

Fig. 6 Photograph of Barn on Bostwick Estate. Photograph by author.

Fig. 7 Photograph of Riversdale Mansion, Riverdale, MD. Photograph by author.

Fig. 8 Photograph of Urban Outfitters store portico in Charleston, SC. Photograph by Author.

Fig. 9 Photograph of reconstructed chapel building, Historic Saint Mary's City, MD. Photograph by author.

"Observation and Documentation"

> Roofing materials are one of the most ephemeral elements of our structures. We can often rely on physical evidence to determine the nature of the original covering of a building – traces, nailing pattern, etc., but rarely do we find the actual materials.[22]

As a roofer, you are often working in areas of a building that few other people ever see. This means that you have both the privilege and responsibility of telling the rest of us what you find up there. A building's materials and construction techniques can be very important to people who want to learn about its history. For this reason, try to record what you find while working. As a rule, you should never remove any parts of a building unless absolutely necessary; after all, the more parts of a building that are removed, the less building there is left to preserve. However, when you do have to remove materials, there are several ways of recording samples: taking notes about the locations where you found samples of nails, wood, etc.; making sketches of the conditions you found; and taking photographs of objects before they are removed. The important thing to keep in mind is that seemingly unimportant things, like old nails and wood, may actually provide important information. Some examples of interesting things are:

"Types of nails"

Because nails have been made differently throughout history, you can tell when something was built based on what type of nail was used. (see fig. 10) For example, if you find a hand wrought nail, you know that the building was built before 1800, at a time when blacksmiths made each nail by hand.

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[22] Dalibard, Jacques and Nelson, Lee. Early Roofing Materials , APT Bulletin: The Journal of Preservation Technology II-1/2-70, pp. 18-76

“Types of wood”

Most wood you’ll come across on the roof will be from the roof deck. Most modern roofs use plywood for decking, but older roofs usually have solid planks of oak or pine. Pay attention to how the planks are laid (such as, are there gaps between them?) and how long and wide they typically are. Also pay attention to the saw marks. Just as nail types can give clues to a building’s age, so can the saw marks found on the sides of wood. There are three main types: pit sawn, band sawn, and circular sawn. (see fig. 11) Pit sawn wood was cut by two men using a large saw; one standing in a pit below the wood, and the other standing above it. This technique was used until the mid-1800s, when mills using circular saws (and later band saws) became prominent.

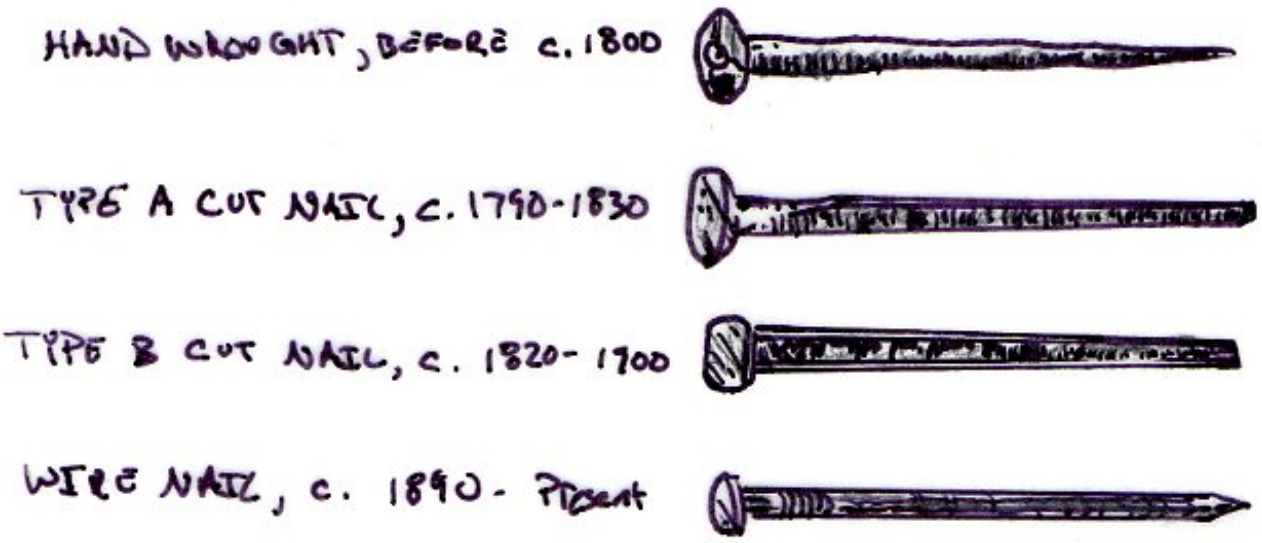

Fig. 10 Drawing of various nail types. Drawing by author.

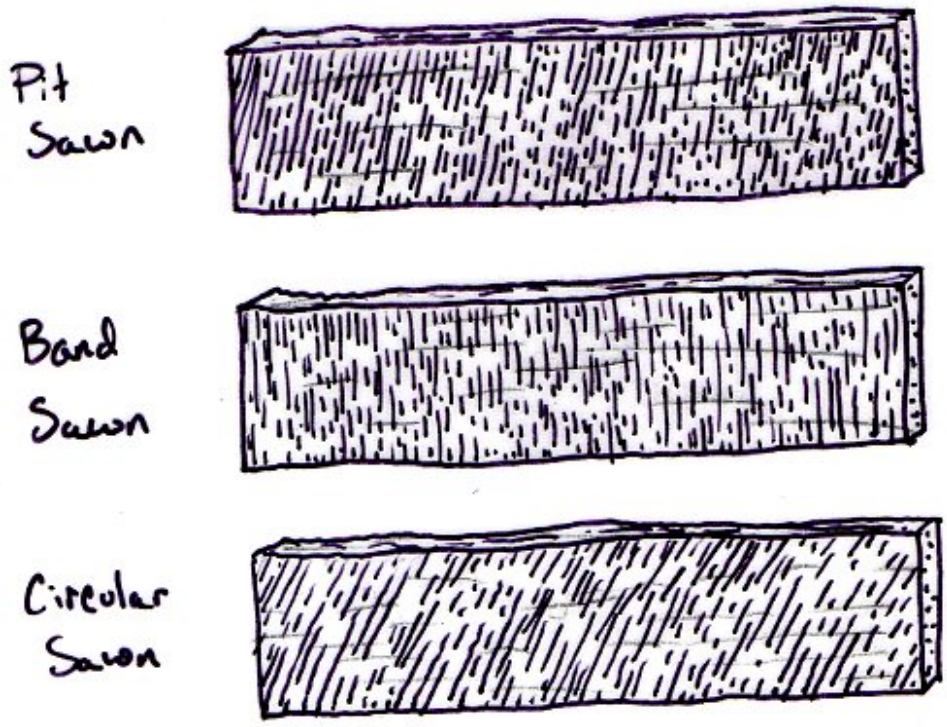

Fig. 11 Drawing of various saw marks on wood. Drawing by author.

"Materials"

If you need to replace materials, such as a broken slate or a piece of rotted wood, be sure to record (in writing and/or with a photo) what it is and where it came from. Why? Because that information may be important to have. For example, if a historian was trying to determine when an addition was added to a building, he may be able to tell simply by studying the broken pieces of slate and wood that you removed during your work. So, save samples of those materials and keep them with the building.

Replacement materials are extremely important to preservationists. We've already been over how a roof is an important part of a building's appearance. This also applies to the materials used in preservation work. All changes, even seemingly minor ones, affect how a building appears. Replacing old windows with new ones, for example, is a big problem for preservationists because the new windows don't fit in with the rest of the building; they take away from its historic feeling, or "integrity." The same applies to roofs. If a black slate roof is replaced with black asphalt shingles, the building no longer remains fully intact in the historic sense.

In most cases, the decision regarding what materials are used won't be up to you – it will have been decided by the building owners, preservation commission, state historic preservation office, etc. – but it's still important to do everything you can to replicate the original roof. In slate roofing, this means using the same type and size of slates, and the same laying pattern as was original to the building.

"Slate Type"

> Generally, the slates of Maine, Virginia, and the Peach Bottom district of York County, Pennsylvania are deep blue-black in color. Those of

> Virginia have a distinctive lustrous appearance as well due to their high mica content. The slates of Lehigh and Northampton Counties, Pennsylvania, are grayish-black in color. Green, red, purple, and mottled slates derive from the New York-Vermont district. The slate producing region of New York, which centers around Granville and Middle Granville, is particularly important because it contains one of the few commercial deposits of red slate in the world.[23]

Because slate is a geological product, it varies in appearance and quality depending on where it was quarried - some slates are purple or green; some have "ribbons" (stripe marks); some fade over time and others do not. Slate is graded as an S1, S2, or S3 material. S1, the highest quality, is expected to last 75 – 100+ years.[24] Unlike other stone types, such as granite, marble and sandstone, slate is relatively easy to match.[25] Matching replacement slates with the originals is important in order to ensure that the new slates look and wear like the historic ones. (see fig. 12a and 12b)

"Roofing patterns"

In addition to using the same kind of slates as was original to the building, it's also important to lay the new slate in the same pattern in order to preserve the appearance of the original roof. (see Fig 13) If a building has a complicated slating pattern, replacing part or all of it with a simple pattern will make the building look different,

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[23] Levine, Jeffrey. Preservation Brief #29 - The repair, replacement, and maintenance of historic slate roofs [electronic resource] / . published Washington, D.C. : Technical Preservation Services, National Park Service, U.S. Dept. of the Interior, [1992] 13 May 2010. <http://www.nps.gov/hps/TPS/briefs/brief29.htm>

[24] Stearns, Brian C. "Evaluating Whether to Repair or Replace a Slate Roof." pp IV-41 Slaton, Deborah and Fisher III, Charles. The roofing handbook for historic buildings / editors, . published Washington, D.C. : Historic Preservation Education Foundation and the National Park Service, 1999.

[25] Marshall, Phillip. Polychromatic Roofing Slate of Vermont and New York , APT Bulletin: The Journal of Preservation Technology XI-3-79, pp. 77-87

and vice versa. Using the same size, shape, color, and pattern is important because it preserves the historic character of the building as a whole.

Fig. 12a Photo of different types and colors of American roof slates. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 28).

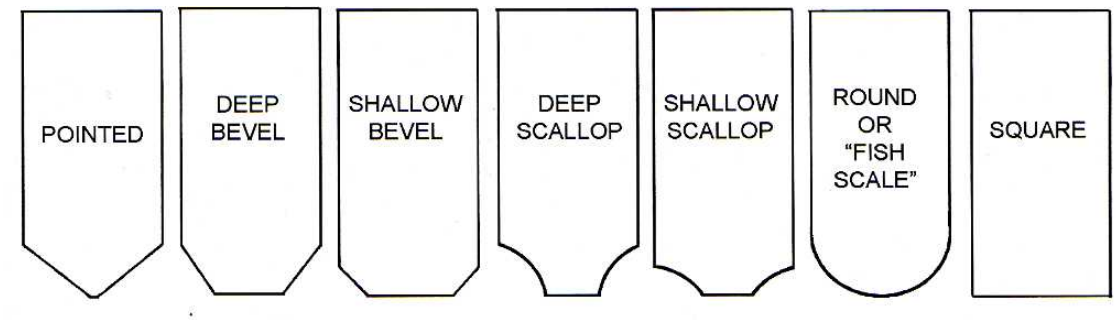

Fig. 12b. Drawing of different types of slate shapes. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 165).

Fig. 13 Photographs of various patterns of laying slate. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 160).

“Six Areas of Competence”

So, let’s get to the main part of this manual – the top six areas of competence. This list of skills was put together after talking with several master slaters. They are: Proper Headlap; Starter Course; Cutting slates; Nailing; Materials; and Repairs.

Proper Headlap

“Headlap” is the distance, in inches, a slate is overlapped by the slate *two* courses above it (i.e., not the slate directly on top of it). Headlap should generally be at least 2”, but varies depending on the slope of the roof and the location of the courses (i.e. the slate courses at the bottom of the roof require more headlap than the courses near the ridge). (see fig. 14 and 15). Proper headlap ensures that water will not leak between the bottoms and tops of slates.

Starter Course

The starter course is placed on top of the cant strip. The cant strip ensures that the bottom course sits at the same angle (i.e. “cant”) as the other slates on the roof. The slates that comprise the starter course should be laid face-down (i.e. the beveled edge facing down toward the roof deck), overhanging the bottom edge of the roof by 1.5” and the side edges of the roof by 1”. (see fig. 16)

Cutting Slates

When using a slate cutter, position the slate as high up on the cutter as possible (i.e. into the crotch of the two blades). After each cut, reposition the slate into the crotch. Remember that the side of the slate facing *down* on the cutter will be the side that faces *up* towards the weather, because that is the side that will show the

beveled edge. (see fig. 17) When using a slate stake and hammer, only remove a couple inches at a time to avoid cracking the slate. (see fig. 18)

Nailing

When putting nail holes in a slate, strike your hammer tip against the *back* of the slate; this will cause the hole on the front of the slate to have a wide divot into which the nail head can fit. (see fig. 19)

When nailing slates, be sure to nail only deep enough that the nail head rests in the divot. (see fig. 20) Nail too deeply and the bottom of the slate will "rock" (rise up off the plane of the roof) (see fig. 21), and may also crack the slates underneath. Nail too shallow (i.e. letting the nail head rest above the hole in the slate), and the nail head will rub against the slates installed above it, causing holes to appear. (fig. 21)

Materials

Roof Decking

Whenever possible, roof decking should be made of solid wood planks, not plywood, OSB, or other inferior material. (see fig. 22) This is for three reasons: inferior materials 1) will not last as long as the slates, requiring the roof to be removed in order to replace the decking, 2) may not be able to support the combined weight of slate and snow, and 3) make leaks harder to detect by allowing water infiltration to spread over larger parts of the roof instead of leaking directly into the attic. Leaked water frequently travels along the roof deck and rafters before actually being detected on a ceiling.[26] Such leaks can cause large areas of plywood to

[26] Koziol, Richard and Stockbridge, Jerry. Detecting Water Leaks in Slate and Clay-Tile Roofs, APT Bulletin: The Journal of Preservation TechnologyXIX-2-87, pp. 6-9

delaminate and require replacement, whereas wood planks can more easily be removed in small portions.

Nails

Nails for attaching slates to the deck should be either copper, hot-dipped galvanized, or stainless steel. Never use electro-plated galvanized nails. Nail length should be 2x the thickness of the slate plus 1”. Nails used to attach the decking to the rafters, while not at as much risk of rusting, should be similarly long-lasting.

Slates

Slates are classified as either S1, S2, or S3. S1 slates are the most durable, lasting over 75 years, while S3 slates are the least durable and may last only 20-40 years. When replacing individual slates, always match the original slates’ size, shape, and color.

Repairs

Repairing a broken slate requires three things: a new slate, a slate ripper, and a nail & bib (or a slate hook). Never use a strap hanger to secure a replacement slate, as it will eventually fail. (see fig. 23). When working on a slate roof, avoid stepping directly on the slates, as you could crack them, causing leaks. It is better to walk on ladders or roof jacks, instead.

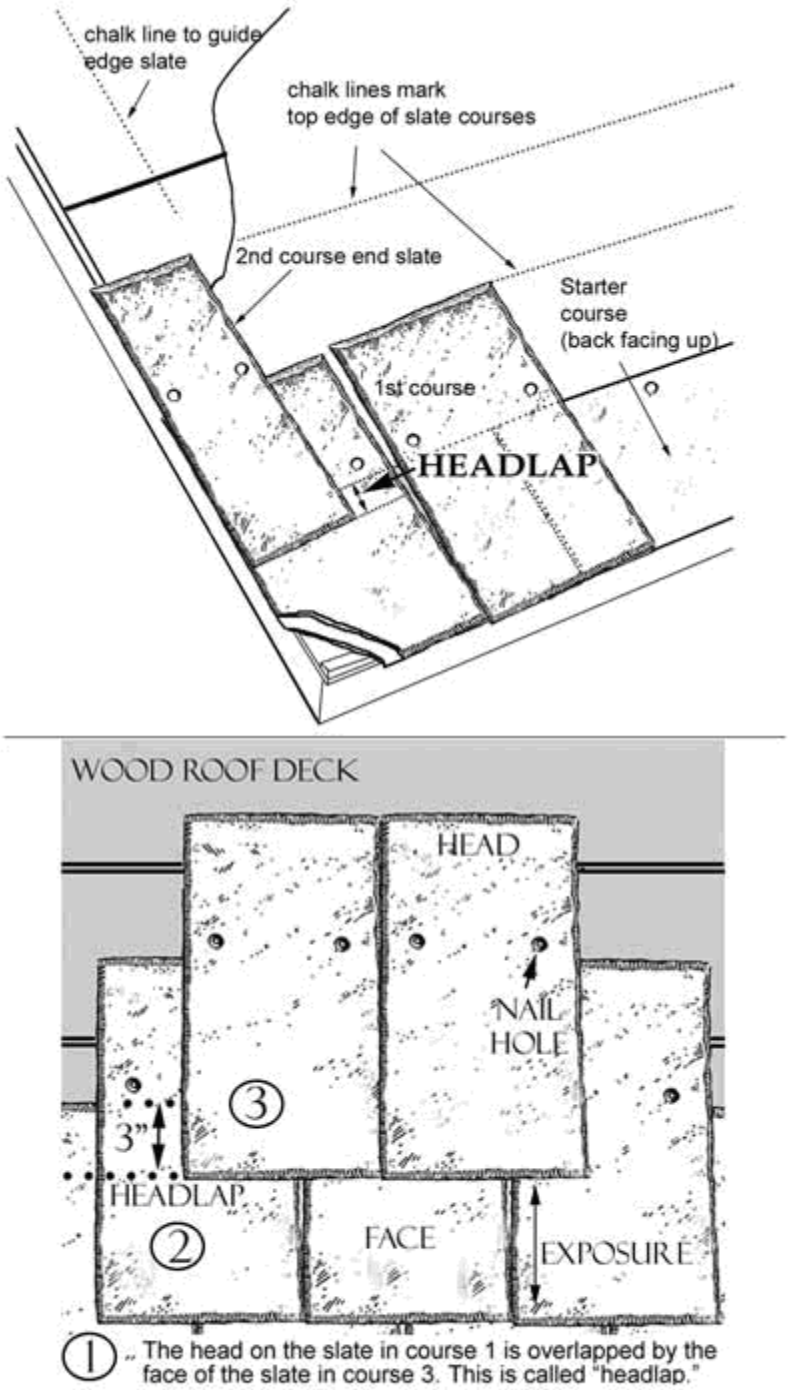

Fig. 14 Drawings showing proper headlap. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 158, 149).

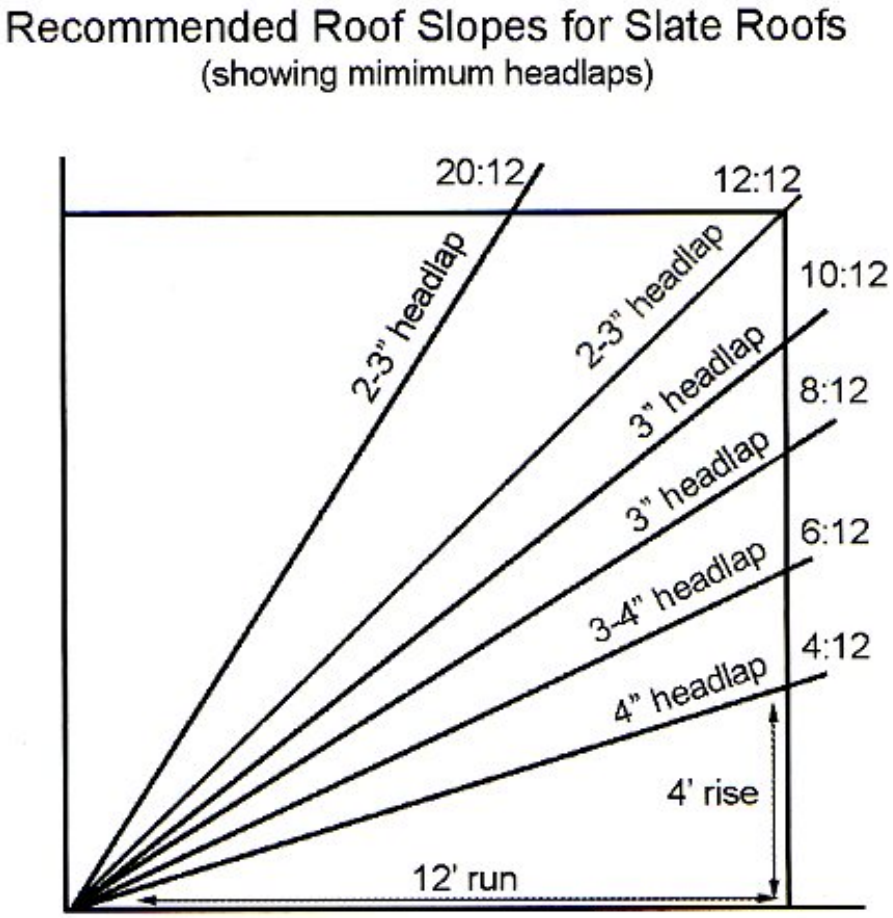

Fig 15 Diagram showing relationship between roof slope and recommended headlap. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 153).

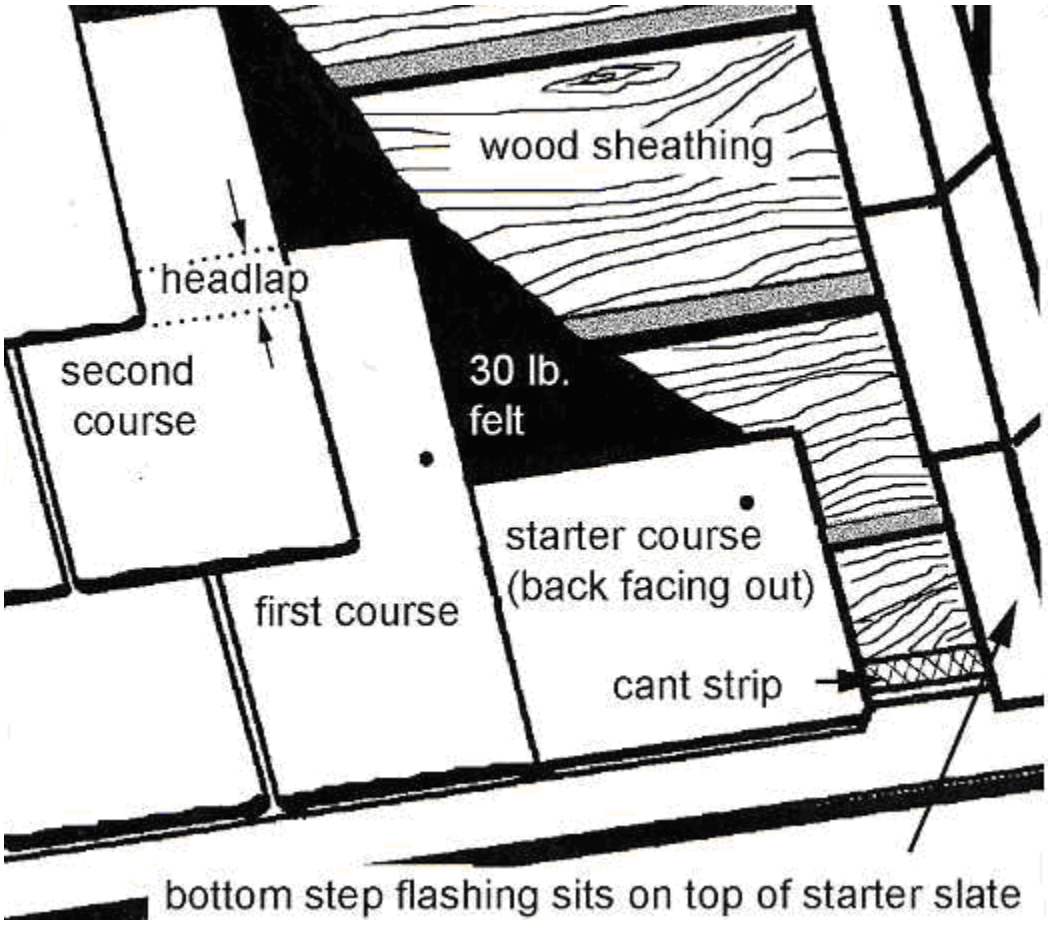

Fig. 16a. Drawing of installation of cant strip and starter course. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 212).

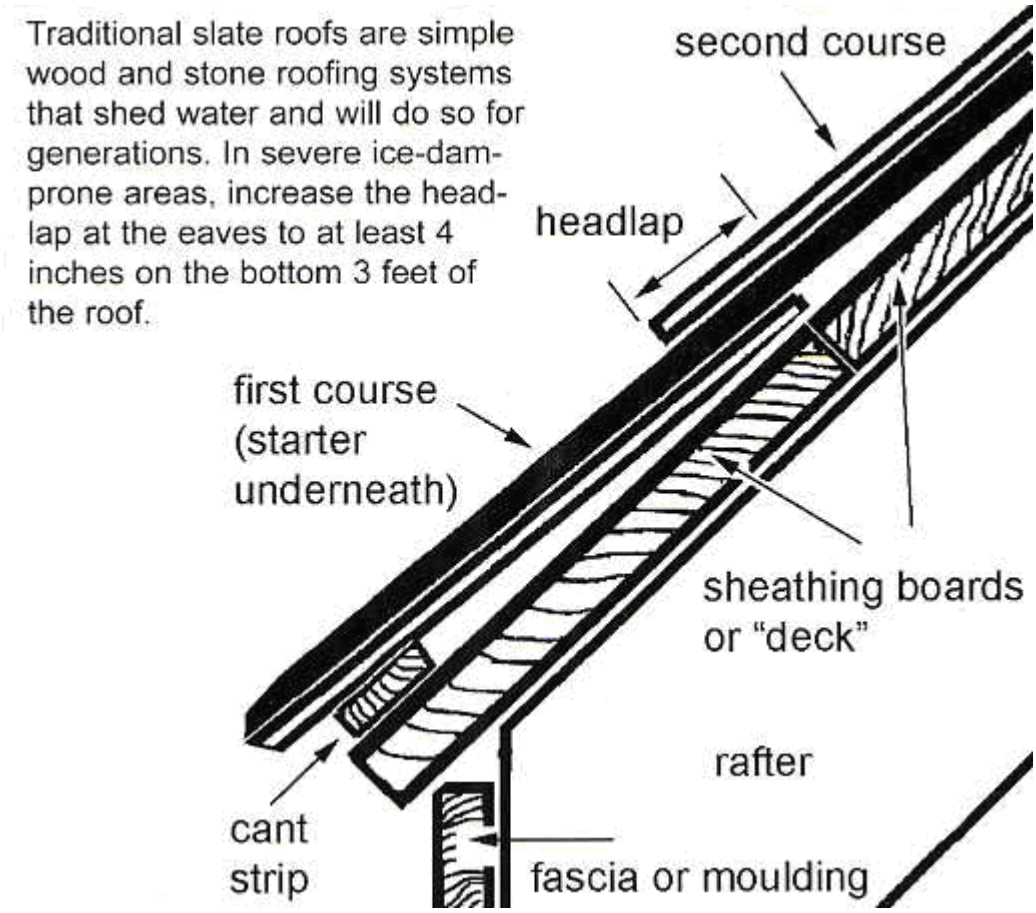

Fig. 16b. Drawing of side-view of cant strip and first courses. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 212).

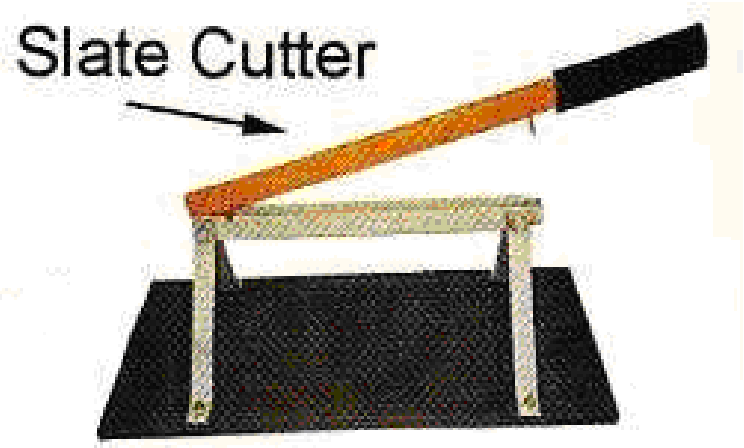

Fig. 17 Photograph of a slate cutter. Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 132).

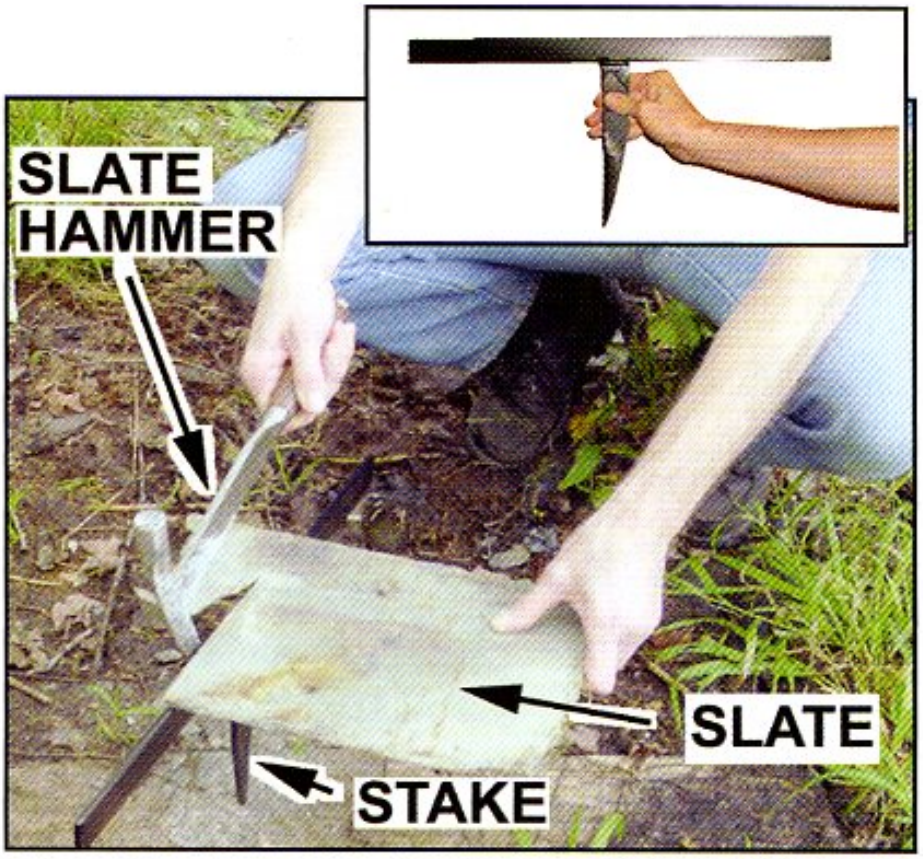

Fig. 18 Photograph of use of a slate stake and hammer. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 133).

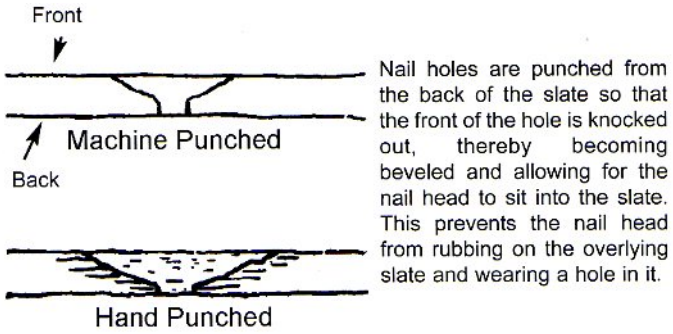

Fig. 19 Drawing of machine- and hand-punched nail holes. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 149).

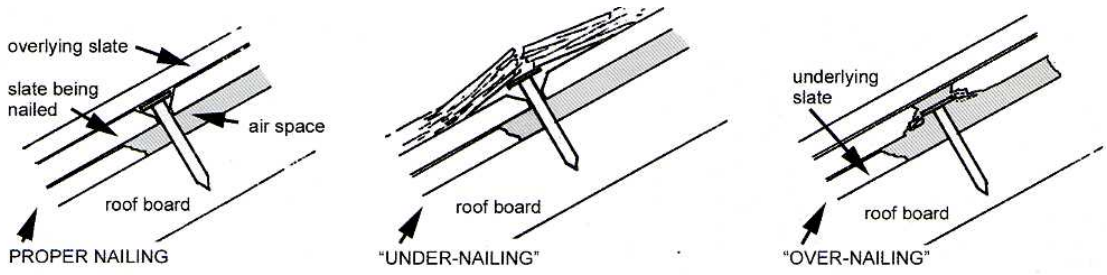

Fig. 20 Drawing of proper nail position. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 63).

Fig 21 Photo showing results of nailing tops of slates too tightly. Photograph by author.

Fig. 22 Photo of a solid wood plank roof deck. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 144).

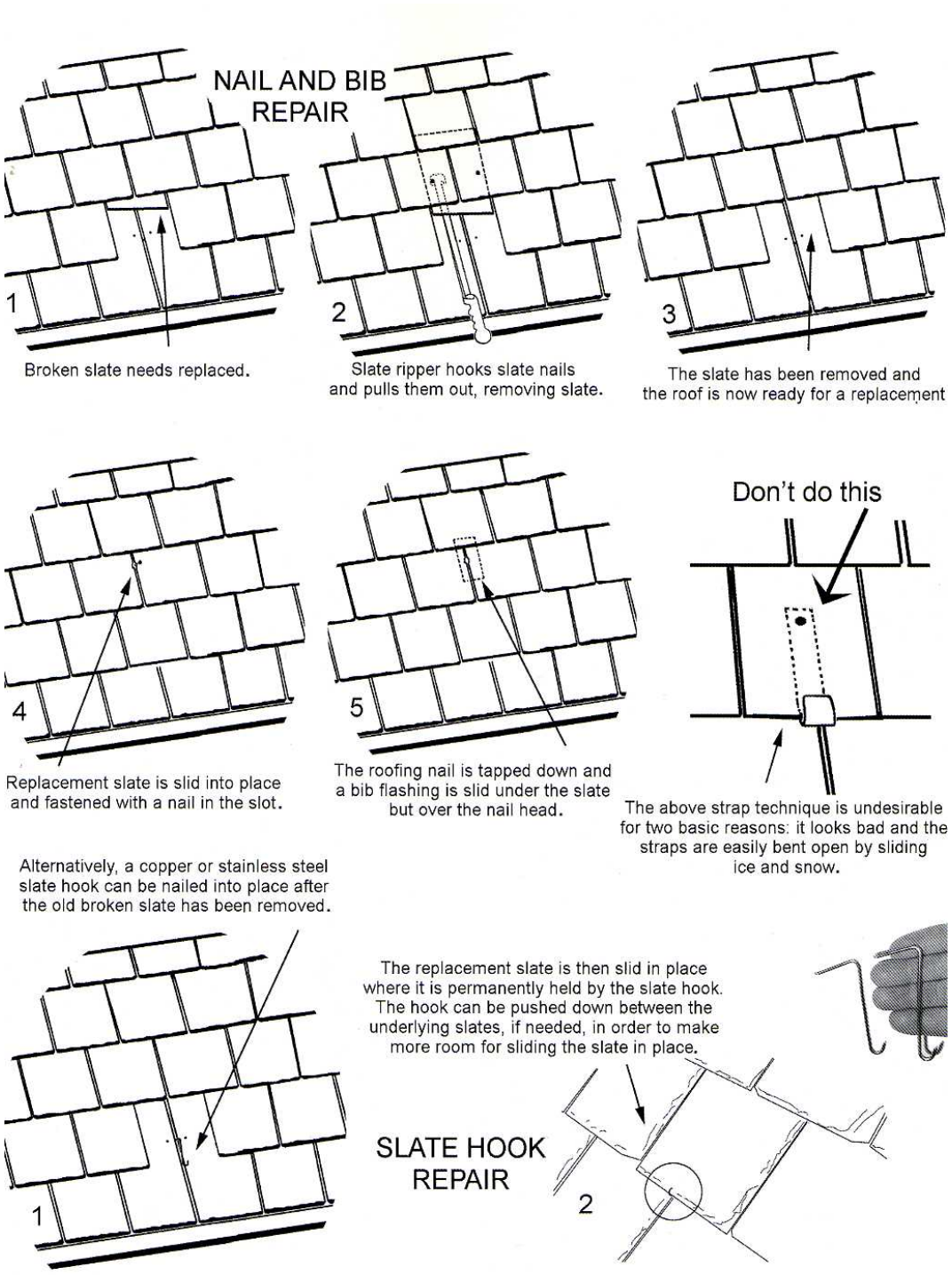

Fig. 23 Drawing of proper slate repair technique. (Used with permission. Source: Jenkins, /The Slate Roof Bible/, p. 215).

“Manual Conclusion”

The purpose of this guide was to teach you to some basic, proper techniques for laying and maintaining a slate roof, as well as to introduce you to the field of historic preservation and how roofing applies to it.

Historic preservation is about more than just saving old buildings. It’s about preserving cultures, sustaining ways of living, and honoring the memory of both those came before us and those who will come after us. As a roofer, you are part of a long tradition of craftsmen and women who have made it their lives’ work to give others a dry place to call home. The skills that you possess were passed down from roofer to roofer, and it’s up to you to learn them to the best of your ability and pass them down to younger generations; to *preserve* that knowledge.

You are also an important part of the preservation “team.” As I said before, you are responsible for maintaining one of the most important parts of a building. Please take that responsibility seriously and proudly! Doing your best to protect today’s buildings will help ensure that they are there for your children and grandchildren tomorrow.

Resources

The tips in this guide are meant to help roofers get started with good slate roofing techniques. If you would like to learn more about slate roofing, historic preservation techniques for roofs, or trades education, here are some additional sources that may provide assistance:

Slate Roofing

Slate roofing technique videos.
http://www.youtube.com/results?search_query=slate+roofing&aq=f
These are great videos made by Joseph Jenkins, the author of The Slate Roof Bible, that illustrate all of the top six skills I described, as well as several others.

Koziol, Richard and Stockbridge, Jerry. Detecting Water Leaks in Slate and Clay-Tile Roofs, APT Bulletin: The Journal of Preservation TechnologyXIX-2-87, pp. 6-9

Marshall, Phillip. Polychromatic Roofing Slate of Vermont and New York , APT Bulletin: The Journal of Preservation Technology XI-3-79, pp. 77-87

Levine, Jeffrey. Preservation Brief #29 - The repair, replacement, and maintenance of historic slate roofs [electronic resource] / . published Washington, D.C. : Technical Preservation Services, National Park Service, U.S. Dept. of the Interior, [1992]

Stearns, Brian; Stearns, Alan; Meyer, John. The Slate Book: How to Design, Specify, Install, and Repair a Slate Roof rev. by Ken Follett, APT Bulletin: The Journal of Preservation Technology XXX-2/3-99, p. 78

Jenkins, Joseph. The Slate Roof Bible : Everything you wanted to know about slate roofs including how to keep them alive for centuries / . published Grove City, PA : Jenkins Pub. ; White River Junction, VT : Distributed by Chelsea Green Pub., c1997.

McKee, Harley. Slate Roofing, APT Bulletin: The Journal of Preservation Technology II-1/2-70, pp. 77-83

Pierpont, Robert. Slate Roofing , APT Bulletin: The Journal of Preservation Technology XIX-2-87, pp. 10-23

Historic Preservation Involving Roofs

Judd, Henry. Before Restoration Starts APT Bulletin: The Journal of Preservation Technology III-1-71, pp. 30-37

Dalibard, Jacques and Nelson, Lee. Early Roofing Materials , APT Bulletin: The Journal of Preservation Technology II-1/2-70, pp. 18-76; and III-1-71, p. 10

Friedman, Donald. Historical building construction : design, materials, and technology 1st ed. published New York : W.W. Norton, c1995.

Shakelton, Phillip. Item on Roofing in the Nineteenth Century APT Bulletin: The Journal of Preservation Technology VI-3-74, p. 148

Forsyth, Michael. Materials & skills for historic building conservation . published Oxford, UK ; Malden, MA : Blackwell Pub., 2008.

Sweetser, Sarah. Preservation Brief #4 - Roofing for historic buildings / . published [Washington, D.C. : U.S. Dept. of the Interior], Heritage Conservation and Recreation Service, Office of Archeology and Historic Preservation, Technical Preservation Services, 1979.

McKinnon, Hunt. The many roofs of Monticello : a case study / ; with assistance from Maurice Johnson and Russell Palmer, and William L. Beiswanger. published Raleigh, N.C. : College of Design, North Carolina State University, 2006.

Slaton, Deborah and Fisher III, Charles.The roofing handbook for historic buildings / editors, . published Washington, D.C. : Historic Preservation Education Foundation and the National Park Service, 1999.

Trades Education

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Conclusion

Studying the current state of the preservation trades education system should be an eye-opener not only for ardent preservationists, but for the average citizen as well. The effects of the problem may not be seen in our society's most revered buildings – there are enough artisan craftspeople for those – but rather in the rest (the majority) of our aging building stock; our homes, municipal buildings, places of worship, etc. The term "preservation trades" belies the fact that trades knowledge is necessary for all buildings, not just those high-style examples typically associated with the preservation field.

In order to address the enormity of the problem, trades education and work needs to become a large sector of American society once again; as large – or larger – than the now-traditional four-year college education. A nationwide system of preservation education, ideally within the existing community college system, is necessary in order to train a sufficient number of the next generations of trades people.

Graduate level historic preservation programs should be part of the solution. Increased exposure to the trades would help to educate tomorrow's academic preservationists on the importance of the tradesmen and women who implement preservation policies. Such awareness would ideally lead to greater study and understanding of the connection between strong trades training programs and sustainable community preservation.

Those who graduate from graduate level historic preservation programs need to help, too. Adjusting current policies in order to mandate an increase in the number

of trained preservation craftspeople included in government-supported preservation work (i.e., work on historic governmental properties, properties impacted by government actions, and preservation tax credit projects) would be one way to start. By adding to the Standards and/or the criteria for preservation tax credits a requirement that a certain amount of contracts be steered toward certified preservation craftspeople – mush as is already done for women- and minority-owned businesses - the current problem would begin to be addressed in a top-down fashion. Naturally, this would require the institution of a certification system. Government-run centers, such as the National Center for Preservation Technology and Training and the National Park Service Historic Preservation Training Center could be involved in devising either a skills assessment exam and/or a training curriculum.

My conclusion, really, is that trades education is about more than just historic preservation. As I began in this paper, an ideal society sustains itself through the transference of important knowledge. Without trades knowledge, our society will lose not only its trades heritage, but also, eventually, the tangible products of that heritage; our cherished buildings. Especially now, when we are becoming more and more aware of the economic, social, and environmental need for preservation, the importance of trades knowledge must once again be recognized.

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