

Kinstone Chapel: Cordwood, Stone and Thatch

by Kristine Beck

Atop a ridge overlooking the Mississippi River, on 4th generation family farmland, a permaculture school has been established called Kinstone. Kinstone is a working permaculture site with a megalithic focus. On this 30-acre bluff-top farmland, there are many gardens, food forest plantations and natural buildings as well as a large stone circle, megalithic dolmen, many standing stones, a dry-stack stone sculpture and a 7-circuit classical labyrinth. Amidst all of this is a lovely cordwood chapel with a bright copper spire. The Kinstone Chapel is the heart of Kinstone. The chapel building is a 12' x 12' hexagonal cordwood structure with a thatched roof and walls that are full of story and magic.



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It is a place for personal solitude and quiet time and can be rented for weddings, reunions, celebrations, etc. The two handmade wooden doors weigh 260 pounds apiece. There are over 1,000 bundles of reeds in the thatched roof; mostly harvested just 10 miles down the road in the Mississippi River backwaters. Over 450 bottles create a design in the walls entirely based on the beauty of the earth; inspired by St. Francis of Assisi in his mystical poem, ***"The Canticle of Brother Sun and Sister Moon"***. Some highlights include the sun, moon, flowers, birds, a tree, a dragonfly, fireflies, a river, mighty winds, clouds, fire, starry night skies, the Eternal Flame and a

rogue doorknob into the unknown. A special wood carving graces the doorway showing Native American motifs from tribes that wandered this land before the first of the 4 generations of my family settled here. The specially designed and crafted stained glass windows are elegantly simple allowing in plenty of sunlight but not distracting the eye. Hear now the story of this wonder from concept to construction.



Post and beam frame with
stone stem wall in progress.

Inspiration

There is a place in Pennsylvania called Columcille Megalith Park. It is the life work of a man named William Cohea Jr., now 87 years young. I have fallen in love with the place and the man. There is a beautiful hexagonal stone chapel with a slate roof at Columcille. It was hand-constructed by dedicated friends working together over a season. This is the inspiration for the size and shape of the chapel at Kinstone as well as the approach to building it. The idea of cordwood and thatch originated with my good friend and seasoned permaculture designer, Wayne Weiseman. Using natural materials is an important practice that I have been learning more about since 2010 when we started out creating Kinstone using Permaculture principles. The selection of cordwood, stone and thatch has conspired to create a structure full of wonder. Over 110 people helped build this chapel, and each one's spirit permeates it still.

Planning

The story of building this chapel starts with planning. Natural materials were important. We chose cordwood because of its well-known suitability in our Wisconsin climate and because we LOVE how it looks! We decided to build a 2' stem wall out of some type of Wisconsin stone. We eventually obtained a dark blue "hornblende gneiss" from Krukowski Stone in Mosinee, WI. Further, we decided to use local thatch for the roof. This roofing material is proven in many areas of the world; we thought we would give it a try here in Wisconsin and document our results. With plenty of *Phragmites australis* water reeds in the nearby backwaters of the Mississippi River, we thought this would be doable. It was quite an undertaking, as harvesting enough thatch took two winters to complete! The DNR is very willing to allow harvesting of this reed, even in parks and wildlife refuge areas, as they consider it to be invasive.

Knowing that I would want to use bottle ends, we all started saving glass bottles, jars, vases and even bowls of all shapes and colors. As for the cordwood itself, we did not have wood onsite that we could cut, prepare and dry in time for our planned project start, so we took advice from Richard Flatau and called on Rapid River Rustic in Michigan to see what they had. We were able to place an order for several cords of very dry northern white cedar cordwood, 12 cedar posts (each 12' x 8" x 8"), 13 red pine pole logs (each 24' long and 8"-12" in diameter) for the rafters, and several unique, center-rot cedar logs that we would use to inspire creativity in the cordwood walls. Once we had decided upon materials, we worked on plans for the frame. An architect rendered the initial design and drawings of the chapel. We would use post and beam framing for 16" thick walls and set it up with a steeply pitched roof to support the use of thatch in our snowy

region. It was originally supposed to have a twist to the walls, but last minute plans made it simply straight hexagonal lines. This change was determined only after the concrete floating slab was poured for the floor and the corner posts were cut with angles to support the original design. You can still see the effect of this change, as the walls are only 13" thick in some areas and 16" in others. This made for careful cutting to ensure we had the correct length cordwood available for each worker. In hindsight, simpler is always better, so plan yours right, from the get-go!

Synchronicity

Once we had a plan, we needed to determine its exact placement on the land. There have been many interesting coincidences as Kinstone has been built. The chapel itself was sited based on the idea that triple threes continue to spontaneously appear in our layout. We placed the chapel 333 feet from the Labyrinth and almost the same distance from the Stone Circle, creating a nearly equilateral triangle. My friend and neighbor excavated the chapel spot creating a nice flat circle of level gravel from which to start. A local concrete company poured the floating slab with a 16" portion around the edge, poured 16" thick (to support the 16" cordwood walls) and the interior portion is 4" thick. The contractor's term for this type of slab is a turned-edge, frost protected, shallow foundation or FPSF.

Materials

The cordwood, posts and rafters were delivered in one big load. At the same time, we also received our local sawdust and sand. We set aside the pallets of cordwood and other materials and covered them with tarps to protect against the weather. We would purchase Portland cement and Hydrated Lime on a "just-in-time" basis to ensure it was fresh. We hired a local contractor to erect the post and beam frame and raise the 12 red pine pole rafters to form the steep roof. The top called for a collar tie (also called a ring tie) to hold all the rafters together. This had to be custom made. A local metal worker did the job, but was unable to bend the required $\frac{3}{4}$ " steel, so he bent three $\frac{1}{4}$ " steel plates and welded them together to form the ring. In addition to the collar tie the architectural plans called for a tension ring to be installed where the rafters meet the top plate of the building frame. This was also custom-fashioned by the same craftsman and made for a beautiful floating ring, centered between the peak of the roof and the floor with spokes going out to the 6 corner rafters. The final touch to the roof structure was the cedar purlins placed to support the attachment of the planned thatch material.



Collar tie and tension ring in harmony.

Stem Wall and Thatch

As soon as the frame was erected, we began the stem wall. Jarad Barkeim, our own stonemason, natural builder and permaculture designer, did the stonework. Laying the stones took longer than expected due to the fact that this particular stone is very heavy (relative to other stone we are familiar with) and does not lend itself to shaping well with hammers and chisels. However, the

end result is strikingly beautiful! Just about the time the stem wall was dry students arrived for our Natural Building Workshop. It began with learning how to thatch. Deanne Bednar, of The Strawbale Studio, taught us some thatching basics and we practiced the craft with bundles of reeds harvested earlier in the year. As you will see, we did not thatch the chapel ourselves, but later engaged an authentic Irish thatcher to do the job in a way we felt would last a lifetime.

Cordwood Construction

All of the effort so far was just in preparation for setting the cordwood infill! In 104°F July heat, Richard and Becky Flatau laid the first mortar beads and log ends in the Kinstone Chapel (and, coincidentally, 18 months later they put in the last ones, too) as they taught our students during the first Natural Building Workshop ever held at Kinstone. This was the first of four cordwood workshops we held specifically to work on the chapel. We also held many volunteer work days and weekends that brought folks from all over to assist. All told, about 110 people worked on this chapel over the time period June 2012 through October 2013, when we declared the cordwood finished. Workers instilled a piece of themselves into the wall by using their individual creativity to place logs and bottles into the grand design. Even now folks will come back and point out what portion they worked on and what they tried to convey in their own way.



The wall gets started with the first mortar beads.

The cordwood walls themselves have their own story; I have written more details about that in another article entitled “Kinstone Chapel: Signs and Symbols”. (That article can be found on the www.cordwoodconstruction.org and www.kinstonecircle.com websites). As I thought about this structure being a chapel, I felt it needed a theme, design or focus. During the first workshop in July 2012, we had a massive bottle-end making session where we all learned how to make bottle ends for use in the walls. In essence, the bottle ends are just like log ends when they are laid in



Glass placed in possible design options.

the wall, except they allow light to pass through. The resulting “stained glass effect” is stunning. One student, Kaitlyn O’Connor, took the liberty of laying out bottle ends on the Kinstone porch in ways that evoked certain natural phenomenon – like rivers, trees or the sun. This struck a chord with me and reminded me of Saint Francis of Assisi and his 12th century poem of praise to God for the things of the earth: *The Canticle of Brother Sun and Sister Moon*. This was the beginning of a process of designing the main elements of this poem into the walls of the chapel.

On *day one* of learning cordwood (and perhaps every day thereafter!), we challenged our teachers. The first course of mortar and log ends was progressing nicely until one group decided to place some large river rocks into the walls instead of cordwood. “It is the beginning of the river,” they argued. Richard and Becky scratched their heads and thought about it a bit and then gave the go-ahead to do it, with a caveat that they had not tried this before. The stones were stacked a few high, inside and outside, to represent the edge of a river. Blue and green bottle ends were laid out in a meandering line from this rocky beginning to represent water. This line of bottles goes across two walls of the chapel and now represents “Sister Water” in the poem, but is also placed to mimic the Mississippi River just a mile as the crow flies beyond those same walls.



“Sister Water” starts with some river rocks.



The river flows below, the wind above.

Being our first cordwooding experience, we immediately found that just placing random cordwood log ends would be much faster than placing cordwood, bottle ends and stones to evoke a particular design. At this point, we realized that this effort would take much longer than originally expected, but oh, would it be worth it!

Sketching the Bottle-End Design

I made a sketch on graph paper of each section of wall. Onto these lines I tried my best to layout the bottle-end designs in a way that would help us with placement of logs and bottles. This process was constantly in flux and it was a good thing we had lots of erasers and pencils. My main job was to sit, stand and walk around with this design in hand, critically reviewing each new layer of cordwood, ensuring that all groups working on the various walls were aware of what was coming next. When someone got close to a section requiring a “flower”, then I handed out appropriate bottle ends for that feature. When the “river” was coming to a break due to the window, I directed where to start on the other side. When we reached the “skies”, I was there to direct where the “wind” would blow and where the “stars” would glow.

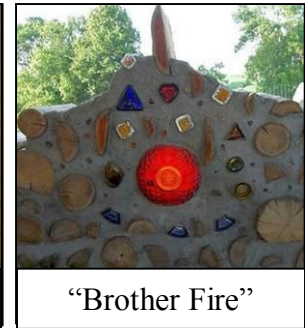


This proud group finished the first wall!

At one point, when trying to determine how to create a “fire” from bottle ends, one of our students, Mike Fanslau, asked for permission to design the fire and put it in the wall. Permission granted! He took the bottle ends that I had planned (blue, red, amber, orange and clear) and arranged them around this fabulous Depression Era red glass fruit bowl that belonged to my grandmother. We had a difficult time making the bowl into a bottle end, but we finally made it happen using aluminum flashing, reflective tape and a lot of hands and patient finesse. The opposite end of this bottle end is a modern, clear, cut glass fruit bowl stolen from my kitchen cupboard. Mike added some touches of his own to the fire that are totally unique. Using liquid nail glue, he took tumbled glass beads and fixed them to clear bottle ends making an ember-like effect. Further, he hollowed out a quarter inch of the ends of some thin, flame-like logs, filled them with the “embers” to create another texture to the overall fire. He spent hours working at this and getting it mortared into the wall. We had to tear him away to come for meals, but he finally finished it before the course ended. This wall (and Mike) are now dubbed “Brother Fire.”



Working on the Fire Wall.



“Brother Fire”



The sequence: Mortar, insulation, log end, repeat.

Cordwood Construction

Working diligently to follow **best practices** at Kinstone, this is how we teach the cordwood technique.

1. Use dry, peeled wood (cedar)
2. Use a slow-setting mortar mix
 - 3 masons sand
 - 2 soaked softwood sawdust
 - 1 Portland cement
 - 1 hydrated lime (type S)
3. Lay 3-4" mortar beads
4. Insulate center cavity with a dry sawdust and lime mixture
5. Tuck point with spoon/knife/brush
6. Keep mortar protected from the drying effects of the sun & wind
7. Tarp walls tightly for 7 days for proper set and cure R & R Flatau

Rams Horns and Hollow Logs

We were lucky to have several center-rot logs granted to us by Rapid River Rustic. These were cut into 16-inch lengths, debarked and the center rot was cleaned out by hand, chisel or chainsaw. Some we were able to keep whole, while others had splits or curls that resulted in half-sections of a hollow log – becoming



A hollow log “eddy” in the river.

what are known as “rams horn.” These were some magnificent pieces that were added in special places in the walls. One entirely hollow log end was used to make an “eddy” in the river. We placed two smaller pieces of cordwood, forming a wave pattern, in the middle of the hollow log, stabilizing them with recycled denim insulation. Once set the way we wanted, we mortared the ends and set a stone in the middle. This truly unique piece helps the “river” just roll along.



Heart of amethyst.

Another center rot log turned out to be a near perfect heart. Feeling compelled to dress up this heart a little bit, I ran to my crystal collection to find a special stone to place in the center. I found a beautiful celestite geode and a chunk of amethyst that felt just right. Using denim insulation to stuff the middle of the log and then mortaring the two ends, we placed these two crystals in the wet mortar, one on the inside and one on the outside. It was intentionally placed in the “Night Wall” amongst the 160 blue and white bottles and “Sister Moon” (a crescent moon stained glass window) that represent the night sky. Just as the Kinstone Chapel is the heart of Kinstone, so this piece became the “heart of the night”.

Entrance of Distinction

The final wall we worked on was the doorway and it is the most ornate of them all. A whole row of our curly “rams horns” lines the top of the doorway wall. The arched doors and doorjamb were custom-made for this chapel. We had to leave a post between the two doors to support the frame and the cordwood. You can see this post on the outside; on the inside, the space between the two doors is filled with a carving of Native American symbols in a rich, deep, black walnut. A bow of rectangular cordwood pieces (each one shaped specifically for this) goes up over the doors, mimicking their arch. Above that is a bright arch of clear bottles with beautiful shapes and facets. Throughout the area above the doors, we have used the tiniest of log ends. I have taken to calling them “cordwood confetti.” Richard Flatau lamented that at this stage, the final wall is one where the owner/builder just wants to “get it done” and puts in the largest log ends to fill space. But no, not me! I was adamant that each piece was slivered down to just a teensy-weensy fleck. I was certain that this cordwood confetti would leave us with a sense of celebration and an uplifting feeling as we enter or exit. Indeed it has.



Hand-made Amish doors & glass.

Odds and Ends From Around the World

One of the more unusual things we did here is place many, many small stones in the walls. Every large mortar joint was a target. I have loved and gathered stones since I was a child. Further, as I have travelled the world, I have picked up more. Nearly all of those stones have found a home in the walls of the Kinstone Chapel. With stones from Scotland, Ireland, England, Sweden, Iceland, Greece, Malta, Switzerland, Argentina (from the summit of Mt. Aconcagua, no less), Machu Picchu, New Zealand, and many from places in the USA (including Columcille) this chapel truly

Kinstone Chapel

has an international flavor. Besides stones, we have other items in the walls: beach glass from Fort Bragg, northern California redwood, clay from the center of Kinstone Circle, dust from Chimayo, New Mexico, special chestnut log ends from a tree my father loved that died shortly after he did in 1994, a candy dish from my children's great grandmother, a door knob from my childhood home, many unique tequila bottles from my own collection of specialty tequilas, flakes of granite from the Kinstone Circle megaliths, a tangerine quartz crystal, a bottle end full of marbles from my mother's collection, a copper butterfly, 28 clear quartz crystals, a conch shell, celestite, amethyst and more! Visitors are fascinated by the variety of such odds and ends that are hidden in plain sight throughout the walls.

Reeds, Cattails and an Irish Thatcher

For two winters, Jarad Barkeim worked diligently (often with family, friends, and volunteers) to harvest over 900 bundles of reeds from the backwaters of the Mississippi River. Using small sickle knives the first year and a brush cutter the second year, the reeds were cut and bundled. Each bundle was 10' to 13' tall and tied off at 28" in circumference. We stockpiled the reed in a shed on my family farm. While we were completing the cordwood walls of the chapel, we all got the pleasure of witnessing a master thatcher at work. William Cahill, of Roofthatch.com, an Irishman from Galway (now living in Cincinnati) was engaged to thatch the roof. William worked for three weeks, placing row upon row of bundled reeds and carefully layering them in neat order. Despite our planning, our 900 reed bundles were still not enough! William himself brought an additional 150 bundles he collected in Cape May, New Jersey. When he reached the chapel peak, he needed some fresh, green cattails. So, together we gathered those from the marshes in the area and these made the final ring of thatch around the peak. We topped it all off with a copper roof cap with a spire pointing to the heavens. The shiny copper cap, custom made by a local metal shop, is expected to earn a lovely patina as time and weather work their magic on it.

An Invitation

The Kinstone Chapel is so much more than just a cordwood building with a cool thatched roof. It holds within it all the heart and spirit of those that have come together to create it. Over 110 souls have left their lasting imprint! This energy, both grounding and uplifting, is felt throughout Kinstone. It embodies what Kinstone is all about. Visitors feel it and become part of it, bringing their own energy to add to the mix. Come feel it for yourself!

Cordwood, Stone and Thatch



Jarad sports his Kinstone "uniform".



Thatching with bundles of local reed.



Happy smiles of fun and friendship.



Thin slabs of cedar became grass, bottles are flowers, a dragonfly flutters and a tree bears fruit.

Kinstone Kinship --Richard and Becky Flatau

The process of building the Kinstone Chapel and the feeling of becoming kin was a significant moment in our lives. The atmosphere, the camaraderie, the feeling of soul-affirming work on a project of significance was overwhelmingly satisfying. Kinstone is a special place with wonderful people. "Big Rich" (overseer) and Clare (chef) told us when we first arrived, "Don't worry, you will get pulled into the vortex" and a positive vortex it became; while walking the labyrinth, passing through the stone circle, sitting by the reflecting pool, eating Mona's cob-oven pizza, and making merry around a campfire. All the while, the project was teaching us, in Wayne Weiseman permaculture-style, to observe and take note of all the natural phenomena. It is hard to define when an epiphany happens, and this one was gradual, but we feel that our work and play at Kinstone has been a defining era in our lives. Our gratitude could not be greater.

Editors Note by Richard & Becky Flatau: One of the special challenges during the construction of the Kinstone Chapel was to simultaneously teach our students the proper cordwood techniques while arranging the symbols into the chapel walls; all the while endeavoring to keep the project moving forward. It became a balancing act to adjust and adapt as the walls took shape. We have fond memories of the people and how they took ownership of "their" wall section.

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