

# The Kielder Wave Chamber

In 1997 when I was wandering the British Isles researching “*Dry Stone Walling*” I stumbled across a strange structure in Kielder forest, a 4m tall corbelled dry stone building housing a camera obscura, built as part of Visual Arts UK 1996 in the North of England, the same project that was the genesis of Goldsworthy’s “*Sheepfolds*”. It was an overcast day so I couldn’t fathom how it worked, but I later discovered it was a ‘wave chamber’, a ‘periscope’ in the roof incorporates a lens and mirror, angled at the reservoir the rippling surface of the water is projected on to the floor of the chamber (at least if its not too overcast) and is quite atmospheric as the chamber is situated on a rocky outcrop literally on the lake edge and “the walls echo the wave sounds and the floor appears to become liquid”.<sup>1</sup>



Kielder wave chamber © Chris Drury  
“*Silent Spaces*” Thames & Hudson 2004 .

The structure was designed by Chris Drury, a landscape architect, and built by Don Golden and his son from nearby Bellingham. All the stone came from walls within the plantation, and had to be hand loaded onto a barge and transported to the site often in poor conditions. In fact when I spoke to Don his most vivid memories seemed to centre on the weather, which he described as “quite hairy” at times, it was very windy, the lake waters were frequently rough and waves often broke right over them. Dry stone.....

Chris had decided on a dry stone structure because all things considered the construction is

relatively quick and easy, and corbelled buildings are “*the oldest known to man where wood beams are not used*”, and the beehive shape is essentially very strong. He had intended to have a more curved top (Don says it was essentially described as a dry stone igloo), although the periscope had to be high enough and able to point own at the water so it couldn’t be entirely rounded, as he subsequently designed for a “cloud chamber” (i.e. one that essentially looks straight up) at the Eden Project Cornwall (which you can see below and in various stages of construction at [http://greenmuseum.org/content/work\\_index/img\\_id-319\\_\\_prev\\_size-0\\_\\_artist\\_id-29\\_\\_work\\_id-76.html](http://greenmuseum.org/content/work_index/img_id-319__prev_size-0__artist_id-29__work_id-76.html)). Don had never built a corbelled structure before, how many of us have? He explains that it was stepped in gradually, with the shape largely dictated by the size and shape of the stone and hence it’s pointy nature. This said structurally it is probably more pointed than was necessary - as noted in “*Stonechat 21*” the amount you can overlap the last few courses is probably a little counterintuitive.

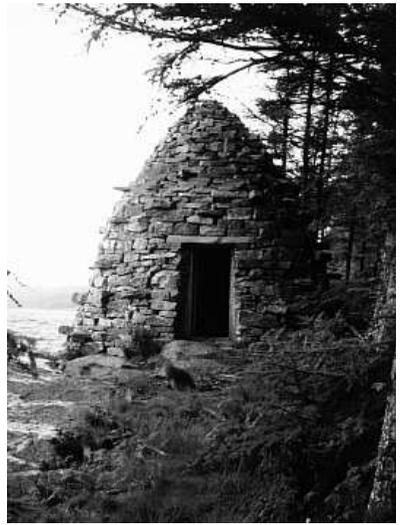


Temporary jetty and foundations © Chris Drury  
“*Silent Spaces*” Thames & Hudson 2004 . p116

The original structure had a large number of throughstones, projecting at regular intervals throughout. Not only did these give it strength Chris explained they “*allow you to climb the building as you go – so you don’t need external scaffolding. You see it on practically all of this sort of building throughout the world*”. An interesting take on these projecting stones which although widespread are not necessarily endemic and usually attributed to helping hold a turf cover rather than facilitating building. I wonder what a risk assessment would say. Chris notes that with the Eden project “*The foreman ... was asked to do a risk assessment, so he had 3 sleepless nights and then never did one – too risky*” in all respects. The cloud chamber there is built from Delabole slate far more suitable than the Kielder stone which has

*"regular through stones and everything packed tight with small stones so nothing moves. Once it is capped off, the building is as safe as houses, until that moment it is precarious".*

Technically Chris felt there was little to it, whilst no-one involved had done it before the principles were sound, it was well planned and beyond that it was just learning on the job. Don says it was all built by eye, they just scraped off the bedrock, drew a circle and off they went. Typical waller. Chris re-iterates that there were no technical problems, just sheer hard work – *"the wallers had the easy job, myself and a volunteer had the job of getting the stone to them, which was exhausting but a brilliant challenge!"*. Typical architect, typical labourer! All this said I definitely got the impression Chris felt it looked too pointy compared to his original design. The 'problems' with the shape seem to have been overcome at Eden with the use of a metal framework/cradle sort of wigwam frame like (you can find images buried near



Kielder wave Chamber with projecting stones  
© Sean adcock



Eden project "Cloud Chamber", 15 feet high and wide  
c/w workforce. © Chris Drury

the bottom of the page [http://www.eden-project.co.uk/latest\\_happenings16.htm](http://www.eden-project.co.uk/latest_happenings16.htm)).

Chris wasn't sure whether or not it was all going to work until, as he explains in his book *"Silent Spaces"* *"the point we put the door on and it the inside went dark. At that moment the afternoon sun was hitting the water just where the mirror was angled. Inside it was as if a thousand silver coins were dancing across the floor"*<sup>2</sup>

Health and safety might not have reared its ugly head during the building process it has subsequently. The projecting throughs

have been cut off to prevent children clambering over the surface and to my mind has removed some of its outward appeal. It is still a rough, rustic structure. It's lack of formality I think works, helping it to fit into its surroundings.

Chris has gone onto building several more obscure in various mediums, plenty of scope for future articles. When I spoke to him for this article he was just off to the dolomites *"to make a small oratory type dry stone hut which will turn an image of the adjacent mountain upside down inside. But it will be touch and go because limestone is not ideal, and the wallers are an unknown quantity. The outside is rectangular but the roof inside will be conical, like Kielder."* Another of his camera obscura, is at the North Carolina Museum of Art. Built in 2003 this "Cloud Chamber for the trees and Sky" combines stone logs and turf in what I think is a particularly striking structure.

*If you would like to find out more about Chris and his work have a look at*

<http://www.chrisdrury.co.uk/home.htm>, if you'd like to know more about the history of camera obscura, and how they work, you could do worse than having a look at [http://www.absoluteastronomy.com/topics/Camera\\_obscura](http://www.absoluteastronomy.com/topics/Camera_obscura)

Thanks to Chris Drury and Don Golden for their comments.

**Sean Adcock**



## REFERENCES

<sup>1</sup><http://www.visitkielder.com/site/things-to-do/art-and-architecture/art-and-architecture-list>.  
Extracted 23.04.10

<sup>2</sup>Chris Drury– “Silent Spaces” (revised edition) Thames and Hudson 2004 p.117



North Carolina Cloud chamber, by kind permission © Kathy Koch  
<http://www.flickr.com/photos/kathykochevar/3282204282/>