HEALD WELL

STOCK WELL

ST.MARY'S WELL

'To secure a meaningful and lasting future for all three of Clitheroe's Ancient former Public Town Wells'

The Ancient Wells of Clitheroe: A Geologist View

This paper was produced by a Professional Geologist and former Ribble Valey Councillor to address a misleading statement made in a RVBC Community Service Committee Meeting that *"the Town Wells could be sat on top of limestones caverns".*

The town of Clitheroe contains three ancient wells; Stock Well, in the castle grounds, St Mary's Well on Well Terrace and Town or Heild Well, on Wellgate (

Figure 1). Records show the Grade II listed wells (British Listed Buildings) have been in existence since at least the 16th Century, and that the Borough was responsible for their maintenance as a water supply up to the creation of the Clitheroe Water Works company in the 1850's. It should be noted that the creation of the water

works was at least partially in response to a Cholera outbreak that ravaged Clitheroe around 1849. This would also match the start of the town's expansion with the arrival of the railway in 1850.

Figure 1 Location of the ancient wells. ©Crown copy right June 2015. All rights reserved (Ordnance Survey Maps)

To date, research has not uncovered any evidence to suggest the wells have vertical shafts, therefore suggesting that they are simply the collection of natural spring water in a stone lined basin. That these springs are called wells is not unusual in this area. Where a reservoir is at the site of a spring, it is usually described as a well (Earp *et al*, 1961). Examples of other such 'wells' in the area include the (famous) Ebbing and Flowing Well on Buck Haw Brow and Wollaper Well on Waddington Fell to name two.

Archives show that Stock Well was sealed in the 1880s after two small children "narrowly escaped drowning". This may explain why the well has no longer contains a stone basin, and why it has been levelled with the surrounding area. The well is currently owned by Ribble Valley Borough Council (RVBC) and abuts, but is not completely surrounded by, the castle playing fields.

Pictures of the wells can be viewed in the following article written by the Lancashire post *Clitheroe's Town Wells*.

Why it is very unlikely* that the wells are sitting on top of "caverns":

*As an engineer I am loath to use the word impossible.

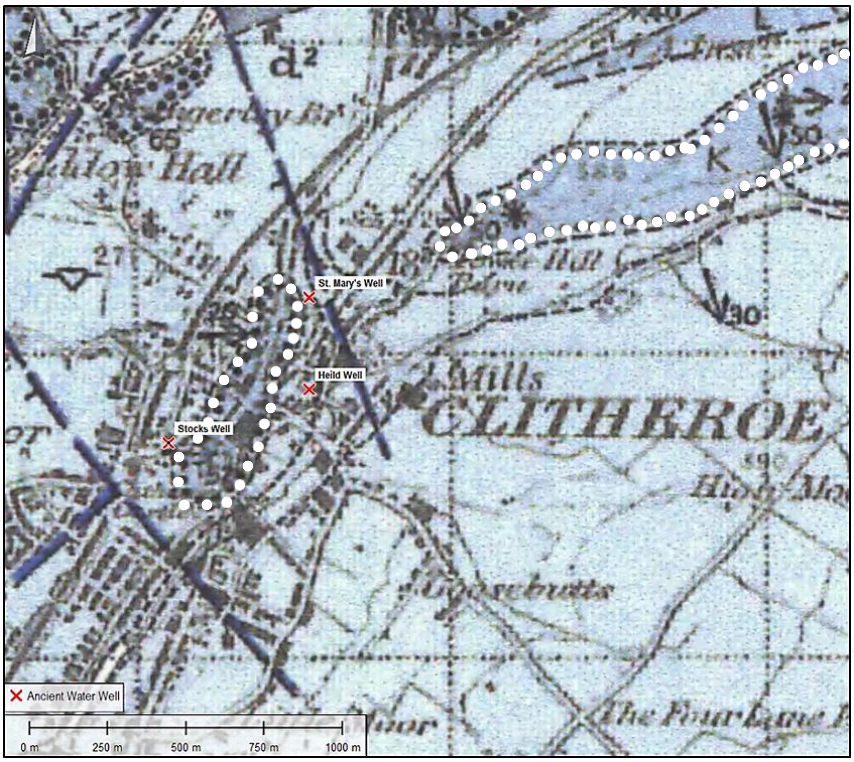
1. Clitheroe town centre is quite densely built-up. In the 1000 years of its existence I can find no evidence that any building has fallen into a sink-hole. All three wells have or have had substantial buildings very close to them with no reports of finding caves when digging their foundations. Stock Well is within 5m of Trinity Methodist Church, a not inconsiderable structure.
2. The catchment areas for each of these springs is relatively small suggesting a low flow-rate of water through the wells. This is also shown by the small size of the out-let drains still visible at Town and St Mary's Wells.
3. Neither the Clitheroe Limestone or any of the Waulsortian mud-mounds around Clitheroe contain caves.
4. The wells have been capped for 140 years, yet show no sign of collapse.
5. Today very little of the rainfall that falls on Clitheroe town centre can enter the underlying rock due to the road and house drainage systems increasing surface runoff and reducing infiltration into the ground.

The Geology of Clitheroe Town Centre

Clitheroe town centre extends across a small hill with two summits. The southern, higher summit lies beneath Clitheroe Castle, whilst the northern summit sits below St Mary's Church (

Figure 1). This hill is a direct result of the underlying Carboniferous geology (These mud-mounds were laid down in the early Carboniferous approximately 345 million years ago when Britain sat close to the equator.

).



The hill upon which Clitheroe town centre sits is commonly known as a reef knoll, **but is more correctly a Waulsortian mud-mound**. Waulsort is the town in Belgium where this type of structure was first identified and studied. These mud-mounds were laid down in the early Carboniferous approximately 345 million years ago when Britain sat close to the equator. They consist of micrite (lime mud) grey/white poorly bedded limestone, formed from microscopic organisms (down to bacteria size) with virtually no fossils contained within the mound, though as can be seen at Salthill, their surface could be colonised by Crinoids, a plant-like marine animal. There is a very good example of a crinoid bed as you enter Salthill quarry from the southern end. These mud-mounds were laid down in the early

Carboniferous approximately 345 million years ago when Britain sat close to the equator.

Figure 2 Geological Map of Clitheroe (© Crown Copyright 1960). Light blue; Clitheroe Limestone Formation, Dark blue; Clitheroe Limestone reef knoll, Dark blue lines; faults

These mud-mounds were laid down in the early Carboniferous approximately 345 million years ago when Britain sat close to the equator. They consist of micrite (lime mud) grey/white poorly bedded limestone, formed from microscopic organisms (down to bacteria size) with virtually no fossils contained within the mound, though as can be seen at Salthill, their surface could be colonised by Crinoids, a plant-like marine animal. There is a very good example of a crinoid bed as you enter Salthill quarry from the southern end.

The rock in the mounds, is “pure” limestone and has very low micro-porosity which makes it a good building material, hence the reason why Salthill, Coplow and Bellman quarries were originally dug. Salthill Quarry is a good example of a Waulsortian mudmound, a visit with a guidebook is recommended. The quarries were the primary sources of building material in Clitheroe up to around 1870, when the local builders started using sandstone for the boom in building for mill worker houses. This is seen today in the many dressed sandstone terraces that sprang up outside the immediate town centre.

The Waulsortian reef mounds were formed on the sea-bed, on top of and eventually within, the formation now known as the Clitheroe Limestone. The British Geological Survey description of this formation is “Predominantly pale grey and commonly coarsely crinoidal, packstones, wackestones and subordinate grainstones and mudstones with Waulsortian mud-mound reef limestones present at two levels”. In other words, less uniform than the mud-mounds. That the mounds are still in place when the surrounding Clitheroe Limestone has long since eroded, shows that the mud-mound limestone is harder than the rock that was deposited on and around them. The Clitheroe Limestone overlies the more stratified Chatburn Limestone that can be seen in the cement work’s quarry.

How the rainfall, which falls on mud-mound reached the springs, prior to the drains being installed, is open it debate. It was stated earlier that the limestone in the mud mounds was of low porosity, obviously for water to flow through it, it must have some permeability and porosity. This could have been induced much later when the area west of Pendle Hill was lifted and a syncline formed. Imagine Clitheroe buried beneath a mountain that arched above it from the Pendle ridge to Waddington Fell. This induced folds and fractures that are very visible in Salthill quarry and the cutting below the Downham Road outside Chatburn. Water entering a fissure high on the mound will only be able to pass down through the boundary of the mud-mound and interbedded Clitheroe Limestone before meeting an impermeable layer of this rock and then be forced out to the surface as a spring. Alternatively, the water flowed over the steep side of the mound and entered the clay soils at the base of the slope. Again, once the water reached a point that it could not move downwards in the rock or clay and a spring was formed.

On studying and BGS’s 1:25000 map (also available online) the wells or springs are on the Clitheroe Limestone and just a few metres below the boundary with the mud-mound. Of course the geological mapping always comes with some uncertainty when the rock is overlain with boulder clay.