A trip into Inchindown Caverns, Scotland

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The caverns at Inchindown are the largest underground space in Scotland. A chance remark to caving friends during a brief trip to the United Kingdom in October 2022 resulted in Marjorie Coggan and I being invited to participate on a trip into the immense caverns.

The caverns are a series of six huge parallel chambers connected by cross passages at each end. I would like to be able to report they are in limestone and were formed naturally. Unfortunately, I am unable to do so.

The caverns, more commonly known as the Inchindown oil storage tanks, lie deep inside a hill about six kilometres inland from Invergordon in northeast Scotland. This small town on the shores of Cromarty Firth was an important naval base during the First World War. At that time a large above-ground oil storage facility for refuelling naval vessels was considered safe from aerial attack. With the passage of time, that view evolved in line with advances in aircraft design and capability in the years following the First World War. With increasing political tensions in Europe during the 1930s, the British Government decided to construct a more secure storage facility in the Inchindown area.

The underground tanks and associated infrastructure were built between 1938 and 1941. They were connected to the above ground tanks and refuelling depot at Invergordon by two large steel pipes – one for filling the tanks and the other to refuel ships. Both pipes were heated to ensure the heavy furnace oil flowed freely.

We first learned of the tanks from a TV program a couple of months before we travelled to the UK. By chance, the subject came up during discussions with caving friends we stayed with at the beginning of our trip. We were asked "Do you want to go there?" "We know the man who has the key. I will give him a call, if you like". The good news was that the man with the key, Preston White, was planning to take his sister and several friends into the tanks in about a week's time, but no arrangements had yet been settled. We agreed to call him back after we had considered whether we had the time and would be within easy reach of Inchindown.

As it turned out, we were booked into a hotel just 100 miles from Invergordon and there just happened to be a day that suited both Preston's group and us. After we settled on the date, Preston told us what gear we would need. As we had not planned to do any caving, we were a bit lacking in the gear department. All we had was a couple of small but reasonably powerful hand torches that we always carry for possible emergencies. Fortunately, Preston said he could lend us helmets and "Wellies". However, we would need to obtain disposable overalls, gloves and headlights. Easy, we thought. But along the sparsely populated southwest coast of Scotland, hardware shops and supermarkets were few and far between and those that did exist were small and stocked a limited range of goods. To complicate matters, I decided a camera tripod was also essential. Camera shops? Well, Mr Google said there was one in Oban and, as we passed through two days before out trip, we managed to buy one without parting with too much money. The lights we purchased in a supermarket in Oban were barely adequate for a trip to Wee Jasper, let alone for vast oil-stained chambers.

On the day of the trip, we arranged an early breakfast at our hotel and made good time to the designated meeting point at a cafe just a couple of kilometres from the tanks. We then drove up into the forested hills. At the end of the road, all six of us (Preston, Kaye, Hazel, David and us) changed into Tyvek overalls, sorted out gumboots and adjusted helmets (*Figure 1*). I was asked if I could carry a bucket of sand, but the reason for this was not very forthcoming. We then walked a few hundred metres to a concrete tunnel portal nestled into the bush (*Figure 2*).

Figure 1: The party almost ready to depart for the Inchindown tanks (left).

Figure 2: Portal for the smaller access tunnel (right).

At the substantial steel entrance door just inside the portal, 'the man' produced 'the key' and cursed a break-in attempt that required making a few repairs and adjustments. Once inside, Preston gave us a briefing on do's and don'ts. The sand, he now advised, was to cover a line of oily footprints along the tunnel that led off into the darkness in front of us. Preston was obviously not very happy about the footprints in 'his' tunnel.

The access or service tunnel was about 1.5 m wide and 2 m high with vertical walls and an arched roof (*Figure 3*). It connected to one end of each of the oil storage tanks. It was concrete lined for the first couple of hundred metres, near where the first tank was located, but beyond that the tunnel was bare rock as excavated around 80 years ago. In the unlined section there were wooden pit props shoring up the roof in a couple of places where there appeared to be some roof instability (*Figure 4*).

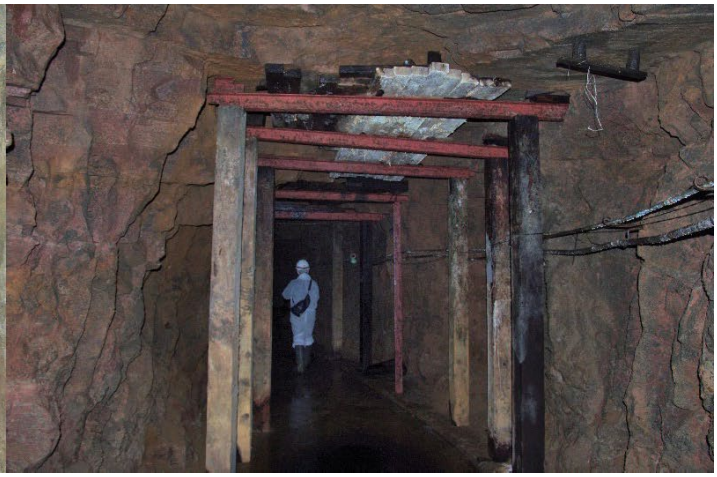

Figure 3: In the concrete-lined section of the small access tunnel (left)

Figure 4: Rock walls and wooden pit props in the more distant parts of the smaller access tunnel (right)

As we walked along the tunnel, Preston gave a running commentary on the history and use of the of the Inchindown facility. He said there was a second and larger access tunnel connecting to the other end of each of the storage tanks, which we would visit later. He said the tanks were used through Second World War and while the surface facility at Invergordon was bombed once, in 1941, the damage sustained was minor. Apparently, a bomb passed right though one tank and set fire to an adjacent one. Fortunately, there was no major explosion and the fire did not spread to other tanks. The location and purpose of the Inchindown facility was a tightly held secret for many years and, as best as local historians can tell, it fell into disuse in the 1960s but was reactivated during the Falklands war in 1982, at which time the storage was filled to capacity. After the Falklands war, the tanks were decommissioned. In 1998, plans to upgrade the facility for NATO use were considered, but later abandoned and the site was decommissioned in 2002. In 2006, the tanks were thoroughly cleaned to make them safe for public entry. Around this time, the facility was sold to a private owner, the Bannerman Company of Tain.

The first public tours were offered in 2009 and were booked out in less than two hours. These early tours were organised by Forestry Commission Scotland, which manages the forest on the slopes above the tanks. Several public tours were also organised by the Royal Commission on Ancient and Historic Monuments. Later, in consultation with the Bannerman family, Preston came to be the tour organiser and holder of the keys (there is one for each access tunnel). Preston conducted regular tours for several years, but these have now ceased and he runs just an occasional trip.

At the first passage junction, we turned into a short side passage. It ended at a concrete wall that had four protruding pipes, each about 50 cm in diameter. The original cover plates on the pipes had been removed so it was possible to peer a couple of metres through the pipe to see the interior of Tank 1. It was, we discovered, also the access point into the tank. All the other tanks had a similar setup. However, to make access into Tank 1 easier, one of the pipes had a concave-shaped bench attached to it (*Figure 5*) and there was a low-profile trolley matching the curvature of the bench that could be pushed into the pipe.

With the aid of a hook on the end of a long steel rod, the trolley was used to push everyone through the pipe to a matching bench inside the tank (*Figure 6*). Most of us had to lie face down on the trolley and fold in our shoulders to fit through.

Figure 5: Preston with the custom-made bench at the access point to Tank 1 (left).

Figure 6: Emerging into Tank 1 on the low-profile trolley (right).

Five of the storage tanks are of identical size; 237 m long, 9 m wide and 14 m high. They are lined with concrete 45cm thick, have a vaulted ceiling and are spaced 15 m apart. They originally had metal racking about half a metre above the floor to support heating pipes, but this has all been dismantled and is stacked along the walls (*Figure 7*). We were told this was to facilitate the cleaning work in 2006.

The floor has a central raised concrete ridge running the length of the tank and there were regularly spaced lateral ridges running out towards the side walls. Despite the cleaning, it is filthy inside the tanks. The walls were streaked with a thick, black, tarry layer. And there was a layer of oily mud on the floor. It seems oil is continuing to seep out of the concrete walls. Surprisingly, there was only a faint smell of oil.

Figure 7: Interior of Tank 1, one of five identical tanks, each 237m long

To reduce the amount of oil we picked up, Preston suggested we refrained from touching the walls and other surfaces. He insisted that as we wandered around, we did so only on the raised ridges, which were still relatively clean. It now became apparent why Preston was so sensitive about the oily footprints along the access passage. Had there been unauthorised access, or was it a careless visitor, we wondered?

Preston switched on a couple of portable floodlights and together with our headlights, we walked to the far end of the tank to look at the oil filling and draining apparatus. When oil was removed from the tanks, it was skimmed off near the surface, where it was warmest and therefore most fluid. This was achieved by means of a swivel joint in the pipe where it entered the tank at floor level and there was a manually operated pulley system, operated from outside the tank, to raise or lower the end of the pipe.

Preston came well equipped to demonstrate the amazing acoustics in the tank. He produced several items capable of making loud noises and we tried to count how long the echoes lasted. The general consensus was at least several seconds. This was far short of the (world) record in 2014 when an acoustics engineer armed with a gun and sophisticated recording equipment claimed the sound of a shot reverberated around the cavern for 112 seconds.

Before we left the tank, we tried taking a few chamber shots, of the photographic type, and while the new tripod worked well, our rudimentary lighting made the task difficult.

Before we left the smaller access tunnel, we walked to the end to visit the sixth and innermost tank. This tank is only two-thirds of the length of the others, but it has the same height and width. We did not go in but peered in through the uncapped service pipes. We could see that the metal racks and heating pipes were still fully in place. It was suggested to us that this indicates the tank was never used and therefore did not need to be cleaned. However, photos available on-line clear show an oily tide mark around the vaulted ceiling.

After we returned to the surface, we walked to the portal of the second and larger access tunnel (*Figure 8*). Here there were also signs of forced entry and in fact, some of Preston's hidden security features had been damaged, most likely by a thin cutting disc attached to a portable angle grinder. We spent some time making rudimentary repairs and discussing how to make the gate more resistant to any future angle grinder attacks.

Figure 8: Portal for the main access tunnel (below)

Figure 9: Typical view along the main access tunnel (right)

The main access tunnel (*Figure 9*) is about 2.5 m wide and has large oil pipes embedded in the concrete floor. All the valves to control the flow of oil were operated manually, as was the winching arrangement for raising and lowering the fuel supply pipes inside the tanks, as noted above (*Figure 10*).

Figure 10: Hand operated valve and winching equipment for controlling oil flow from the tank (left)

Back on the surface, we had a quick look at the electrical supply substation and switching building for the facility. The camouflage pattern on the exterior was remarkably intact. However, the interior had been severely vandalised. All of the switching equipment was smashed and the wiring had been torn out, presumably to salvage the copper. According to Preston, the interior and its contents were almost intact until a few years ago.

While it could be argued our visit to the oil tanks was only tenuously connected to caves and karst, it became apparent through the day that many of the management issues faced by Preston are very similar to those regularly encountered by cave managers: unauthorised access, forced entry, angle grinder attack, interior damage, vandalism, graffiti and mud tracking.

Acknowledgments: We are very grateful to Preston and his sister and their friends for inviting us to participate on their trip. We also thank the Bannerman family of Tain for granting access to their underground property. It was a memorable and highly enjoyable trip.