

SOME LAVA SHOW CAVES OF HAWAII & ICELAND

- Greg Middleton

During 2000 I had the good fortune to explore lava tube caves in the Hawaiian islands (Middleton 2001) and Iceland (Middleton & Kiernan in press) – islands with similar geological origins and structures, if vastly different climates! Apart from investigating new, ‘wild’ caves, I took the opportunity to check out a few caves which have been developed for public viewing – even if only minimally! Lava caves have not tended to attract development and generally, where it has occurred it is fairly low-key.

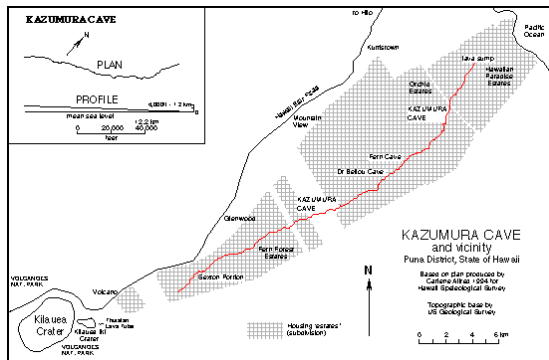


Fig. 1. Kazumura Cave and vicinity, Puna District, Hawaii - simplified from a plan in *NSS News*, November 1995.

Hawaii – the Big Island

The longest known lava tube cave is **Kazumura Cave**, south of Hilo on the eastern (wet) side of the Pacific Ocean island of Hawaii (Fig. 1). The cave is on the NE flanks of Kilauea Volcano and, despite being nowhere more than 25 m below the surface, has a vertical extent (depth?) of around 1,100 m – by far the greatest of any cave in the US. A major surveying push in 1995 linked together a number of known parts of the tube and pushed them to a total of 54 km (Halliday 1995); since then the length has been extended to around 60 km.

No part of Kazumura is reserved; in fact it has the misfortune to almost entirely underlie what are euphemistically called, in Hawaii, “vacation estates”. Although there must be a few thousand such parcels in this part of Hawaii, few have so far been built on, but in the long term it is likely that hundreds of homes will be built over this outstanding cave.

Mr and Mrs Shick built one such home, with the help of their son, Harry, on the “Fern Forest” subdivision near Glenwood. While installing their septic tank, the Shicks realised that there was a larger void below their house than they had bargained for. There is quite a large entrance within about 50 m of their house and Harry was soon exploring the cave. Although he had no prior caving experience, Harry quickly appreciated the potential and set about providing safe access to a few hundred

metres of the upper sections of Kazumura.

This part of the cave has a number of vertical lavafalls up to about 6 m in height that are the only obstacles to easy access along the passages. Rather than introduce costly and ugly industrial-type metal ladders or intrusive wooden structures, Harry devised his own. They comprise a piece of plastic industrial pipe about 100 mm (or “4 inches” as our US cousins so quaintly still express it) filled with steel reinforcing rods and concrete.

The rungs are pieces of steel bar pushed through holes in the pipe at appropriate intervals and set in the concrete. The base of each ladder is set in a small concrete block and the structure is tied to the wall with braces. The resulting ladders are easy to climb, minimally intrusive and should be able to be removed with minimal impact (Fig. 2). No safety features are provided but then, these are ‘adventure’ tours.

Having no scientific background, Harry has read a few books and is picking ideas up as he goes along. What he doesn’t have a proper explanation for he’s not reluctant to hypothesise about, resulting in some rather unorthodox explanations for the various features seen on his tours.



Fig. 2. One of Harry Shick’s ladders, upper section, Kazumura Cave.

Fig. 3. Entrance to Kaumana lava cave, Kaumana Caves County Park.



Apart from a wealth of flow-markings, benches, wall linings, multi-level passages, lavafalls and the usual range of lava speleothems, there are two highly unusual features seen on Harry's 'extended' tours. One is a large, round sunken pool of lava at the foot of a fall in the "Pit Room", the other is an intricate series of colourful (red/orange/yellow) lava 'fans'. These may have been formed as blasts of super-hot gasses tore through the passage remelting bits of shelves which remained from earlier higher lava levels.

Harry seems to adapt his tours to the interest levels of his clients: I got a private tour through perhaps 3 km of this great tube system in about 4 hours with Harry assisting me to try to take photos in the inky blackness – all for a very reasonable fee. He hasn't installed lights yet; you carry your own torch. As far as I know, Harry is so far the only commercial operator in Kazumura but if he's successful he won't be the last. With multiple owners, interactions between rival operators could easily turn nasty. The potential would appear to be there for 'cave wars' that could rival those in Kentucky early last century.

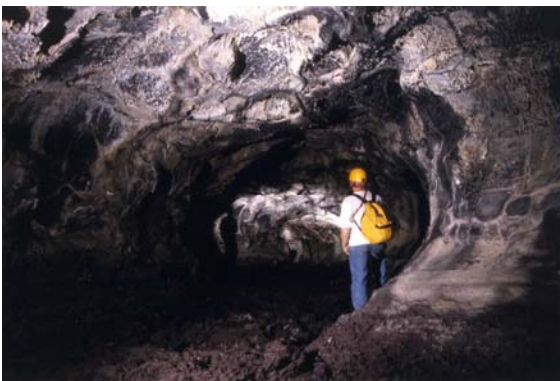


Fig. 4. Spacious passage in Kula Kai Caverns, Ocean View, Hawaii.

Also not far from Hilo, on the Saddle Road to Waimea, is the Kaumana Caves County Park. This is a small park containing a quite impressive entrance to **Kaumana Cave** – a lava tube cave some 2.2 km long on the NE slopes of Mauna Loa. The County has provided a simple fence around the large collapse entrance and a concrete staircase to provide access to the cave (Fig. 3) – beyond that visitors are left to their own devices. The cave has a few interesting features - the most unusual (for a lava tube) being its tendency to carry a stream after heavy rain. During my visit on 19 July I had the good fortune to witness waterfalls spraying out of a large crack in the wall about 4 m above the floor; on another visit on 2 August these were dry.



Fig. 5. Large collapse in Surtshellir, with snow persisting from previous winter.

The cave is fairly 'robust' (there are few stalactites in evidence) and probably doesn't suffer greatly from unsupervised visits. While there was remarkably little litter in the sections most heavily visited near the entrance, other pukas in the mauka (upflow, or 'towards the mountains') part of the cave have been used for years for the dumping of household garbage. The local County and the Hawaii Grotto of the NSS, spurred on by Bill Halliday, are now in the process of cleaning up the garbage dumps.

A brief mention should be made here of probably the most visited lava tube in the world – and one of the least interesting – **Thurstan Lava Tube** or **Nahuku**, immediately to the east of Kilauea Iki Crater in the Hawaii Volcanoes National Park. I first visited it in 1981 and it didn't inspire me to go looking for more lava tubes. It is a bare tube with no discernable flow features, no lava speleothems and no obvious life. A line of lights down one wall illuminates it. At the rear of the cave a previously gated-off section said to be 334 metres long has now been opened. A sign

states "You are invited to explore this undeveloped section of the lava tube where natural features have not been disturbed. You will need a flashlight. Tread lightly on these fragile resources. Do not disturb roots or geological features."



Fig. 6. Ice formations in Surtshellir lava tube cave, Hallmundarhraun.

On the dry side of the island, south of the heavily developed Kona Coast, is another subdivision, "Ocean View Estates", with quite a different cave system from Kazumura, and quite different operators. Rick Elhard and Rose Herrera, cavers from mainland USA, have purchased land at Ocean View and are developing the underlying **Kula Kai Caverns** [I couldn't help wondering how hard it was to resist spelling 'caverns' with a 'k']. They have built a highly imaginative home above the caves and welcome cavers who are prepared to contribute to the surveying effort which has been continuing in the area for a few years now. They have provided lighting through a significant section of the main cave and are progressively improving pathways, etc. This is a true labour of love and one can't help wondering if they will ever recoup their outlays.

One big advantage which these lava tubes have is that in many parts they are relatively light in colour, making illumination much easier than in the black rock passages of which most lava caves are comprised. The Kula Kai system is also atypical for lava tubes in being multi-branched so that there is a complex interconnected set of passages, not just one simple tube (Fig. 4). At Ocean View, as at Kazumura, there is the problem of the ubiquitous "estates", resulting in caves having multiple owners and already there are disputes over who has the right to go where underground, although it appears that over 95% of the lots are not yet occupied. If

property rights don't cause too many problems, Kula Kai should have a great future; few caves can have more sympathetic stewards.

Yet a cloud currently hangs over most caves in the State of Hawaii. Efforts to achieve a cave protection law (see <http://www.state.hi.us/dlnr/hpd/reports/sac/esrpt.htm>) are in danger of being hijacked by an extreme group that seeks to expand proposed restrictions on access to burial caves to take in all caves. The key provisions, recently put before the State Senate read:

(a) Access to a cave or cave entrance shall be limited to the native family associated with the cave, the caretaker designated by the native family, or the native group designated by the associated native family.

(b) Except as provided in subsection (a), access or entry to or into a cave or cave entrance, exploration of a cave area, close proximity to a cave, or cave area discovery, inadvertent or otherwise, is prohibited for any purpose, commercial or otherwise.

A violation of any provision of this chapter shall be punishable by a fine of not less than \$10,000 and not more than \$250,000 per violation.

Such a law would provide a fine of at least A\$20,000 for even going near a cave! – even if you had no knowledge the cave was there!! Of course caves should be protected, and customary practices and sacred sites respected, but there have to be ways of effectively achieving this short of the extreme measures proposed above.



Fig. 7. Entrance to Vifgelmir (steel stairway on right), Iceland's premier show cave.

Iceland – Land of ice and fire

Also in 2000, I participated in the Laki 2000 Expedition, during which we searched for caves in the enormous lava fields which resulted from 1783-85 'Skaftár fires' volcanic

eruptions which were the biggest in recorded history. We found some interesting caves (Middleton & Kiernan in press) but there are, as yet, no show caves in the Skaftareldhraun. The latter part of the trip focussed on the better known Hallmundarhraun lava fields where we sought to detect entranceless tubes by various geophysical means (Wood et al. 2001). Much of this work was carried out over the well-known **Surtshellir** and **Stepháshellir** which might qualify as show caves, at least of the 'adventure' variety. There are no facilities or developments of any kind (save the occasional signpost) but local tourist operators certainly offer tours of these caves. Apart from their very large size (entrances over 10 m high are not uncommon - Fig 5), a special feature of these caves are their ice 'rinks' and ice formations (Fig. 6). In places there are frozen pools which extend across the full width of the cave and masses of ice 'stalagmites' which survive right through 'summer'. In some of the pukas compacted snow even survives right through the year.

South of Surtshellir, on the property known as Fljótstunga, is Iceland's premier show cave, **Vifgelmir**. This is open to visitors for a fee – though because we were colleagues of Soggi Jónsson (of the Icelandic Speleological Society) and had come all the way from Tasmania, we were admitted gratis by the owners Bjorni Jöhanssen and Kristin Halldórsdóttir. (I have reliable reports of people being charged a great deal – and only being admitted to the first 150 m!

In 2000 a Dutch caver reported the full trip was prohibitively expensive.) A fine new steel stairway provides access down into the entrance puka (Fig. 7), then you scramble down over the boulders, under the arch roof to the impressive entrance. After the initial large entrance chamber the cave narrows and the first ice is encountered. A rope ladder with wooden rungs provides safe passage down an icefall which is barely a metre to a narrowing, ice-floored passage which leads to a gate (Fig. 8).

This steel mesh gate was installed by ISS in 1991 to control access to the cave which is said to have the largest volume of any Icelandic cave – 148,000 cu.m (Hróarsson and Jónsson 1992). Beyond, the floor continues as solid ice (Fig. 9) and there are many impressive stalagmites rising from it. After a couple of hundred metres the ice stops but there are numerous lava speleothems, including mini-forests of shiny grey lava stalagmites, in the rest of the cave's 1,585 metres.

Iceland isn't big on national parks and, although it's now under discussion, has not nominated any world heritage areas. So far as I'm aware, none of the major lava caves is in a reserve of any kind – perhaps a case of not appreciating things that, to the locals, are commonplace. One great advantage of Iceland, and particularly Husafel where one can obtain accommodation on the southern edge of the Hallmundarhraun, is the presence of hot springs which make great places to relax after a cold day's caving. The worst thing about the place is that alcohol is (almost) prohibitively expensive!



Fig. 8. Gate in ice passage, Vifgelmir

THE CAVES:

HAWAII

Kazumura Cave. Harry Shick conducts a range of tours. He can be contacted c/- General Delivery, HEAAU, HI 96749-9999 or at 1 (808) 967-7208. He asks people to phone and make advance bookings. He'll take up to 6 people on a tour and he'll provide hand torches. For 'serious cavers' he offers his "Maze Tour" which requires that you bring a climbing harness and rope.

Kaumana Cave. In Kaumana Caves County Park, on the western edge of the City of Hilo, this cave is maintained by Hawaii County Dept. of Parks & Recreation. Entry is unrestricted; visitors provide their own lights.

Thurstan Lava Tube or **Nahuku.** An illuminated but self-guided lava tube cave in Hawaii Volcanoes National Park. Quite probably the most visited lava tube there is – and among the least interesting. Not surprisingly access is free. Not a cave to go out of your way to see.

Kula Kai Caverns. Rick Elhard and Rose Herrera offer tours of their caves in Ocean View Estates, in the far south of the Big Island, by appointment. Very interesting lava tubes – excellent lighting. Rick & Rose can be contacted on 1 (808) 929-7539 or by e-mail at: caver@kulakaicaverns.com

ICELAND

Surtshellir and **Stephánshellir** are two large lava tube caves in the Hallmundarhraun (lava field), NE of Reykjavík. Husafell is the nearest tourist centre where tourist operators could no doubt be contacted who would run trips to the caves. There are no ‘improvements’.

Vifgelmir. Bjorni Jóhannsen conducts tours of this cave on his property, Fljótstunga, near Husafel; reportedly the tours are expensive, but this is an outstanding lava tube with many lava speleothems and ice formations. The tours are BYO lights.

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