

Mapping of Harman Cave

by Ken Grimes

Collapse doline of Harman I Cave

The weekend of 15 - 16th November, 1997, was a most successful outing to *Harman Caves* [H-11 & H-12] at Byaduk, by the *Friends of Eccles and Napier*. 15 Friends (and friends of Friends!) turned up on the Saturday. We had enough experienced cave surveyors (mainly from VSA) to make up three survey teams, with the rest holding tapes and helping explore. We were also able to give some would-be surveyors hands-on experience.

These teams worked down the main cave — one team along each wall mapping the wall and floor detail, and one down the middle sketching a long profile of the roof and floor and cross-sections. We made numerous cross-links between the three lines to make sure they stayed in sync.

The surveying was done with compass, tape and clinometer. We knew that magnetic problems were likely because of the basaltic rock so we took fore and back bearings on each survey leg. This showed up major magnetic effects in several parts of the

cave, with discrepancies between the fore and back sight of as much as 29°. The computer smoothed all that out for me, but the map will only be useful as a guide to where things are (which was its main intention), not for precision engineering works. George Christie had a small, ultrasonic, distance measuring device which we tried out. It seemed to give reliable measurements of the roof height - and was smart enough to recognise when it was getting multiple reflections from irregular projections and would simply refuse to give a reading in those cases.

On the Sunday some of us continued the survey into *Harman II* [H-12], while others went on a tourist trip to the caves nearby. A week later Reto Zollinger and I returned to do some tidying up and surveyed two small surface caves (one of which Reto found that day).

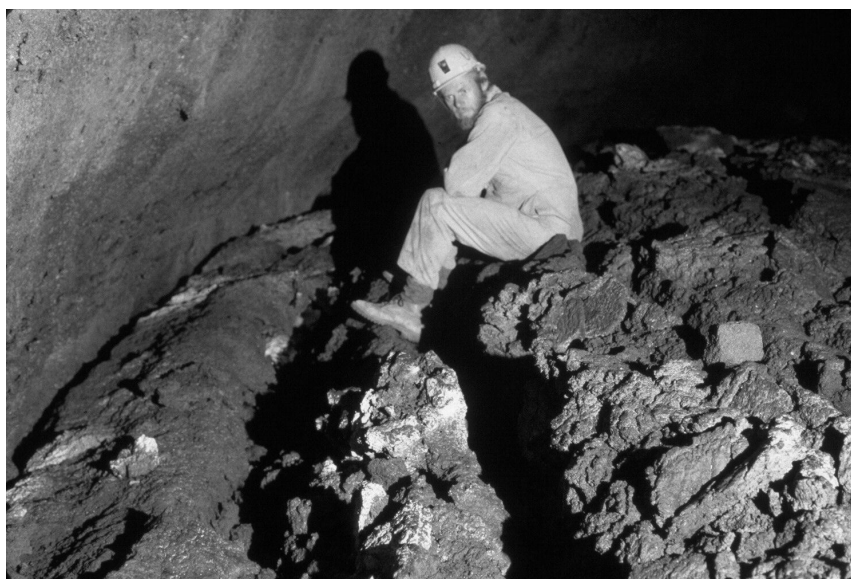
The final map is printed on an A3 sheet (VSA-318), but a reduced version is included here. My apologies for the resultant small lettering which

may be difficult to read. Total passage length in the system is 235m and the depth is about 22m below the surface.

The Caves

Harman I and *II* are two sections of a single large-diameter lava tube, separate by a large collapse doline and an area of rockpile passages. It is possible to travel between them while staying beneath the overhang of the big doline, so technically they are “one cave”. The caves are formed in a basaltic lava flow following the Harman Valley west from Mt. Napier, which probably erupted about 8,000 years ago. The tube would have originally been an open, deep, lava channel which eventually roofed over to form an underground tube. Later surface flows thickened up the roof, and some of these contain shallow caves (3H-90 & 91).

The main lava tube is typically 10-15m wide and 5-10m high and the end of the *Harman I* section is about 100m west of the entrance. Much of the original character of the tube has



Pahoehoe lava ridges at end of *Harman I*

Photo: Ken Grimes

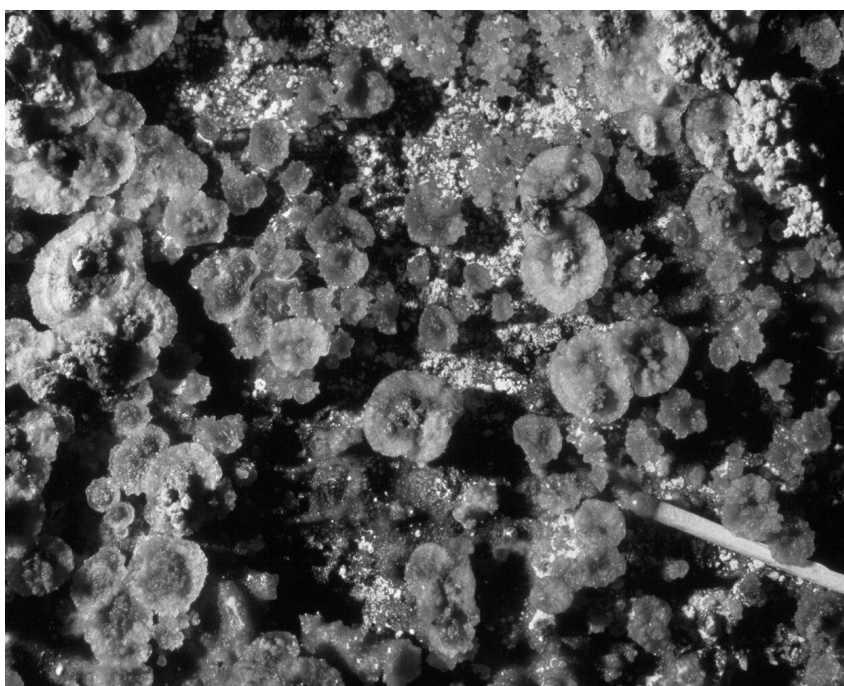
been destroyed by extensive collapse, and the connection between the two caves is through a mess of rockpile. However, in places original features are preserved such as pahoehoe lava floors, wall linings (including some peel-backs), lava tide-marks, spatter coatings and lava drips. The far end of *Harman I* has a broad up-domed lava floor with large ropy ridges at the edge (photo) and plates of lava separated by deep cracks. The walls here have many close-spaced horizontal lines that seem to be old water levels, though there is no historic record of a lake within the cave. George Christie had his “rock-melter” floodlight, which let us see that the ceiling in this area has mottled patterns of yellow-brown mud vermiculations over the black rock which would be the result of shrinkage of a thin mud coating — possibly also a relict of an old lake?. In one place there are some unusual mineral growths which have not yet been identified. These have mushroom-like forms, with a short stem, then spreading out sideways as a thin transparent cap up to 1cm across.

In *Harman II* the lava floor is at a significantly higher level to that of *Harman I*, but drops suddenly at a “lava wall”, suggesting that there may have been a lava fall, or, more likely, a “false floor” that partly collapsed. The

the tube roofed over, and continued to overflow and build up the walls before finally roofing over at a higher level. It may be that it never roofed entirely as false floors of lava often indicate cooling of the lava surface beneath an open roof hole. In that case the surface lava lobes that contain the shallow caves (H-90 & 91) could have been fed by overflows from this open roof hole. All rather speculative, but it makes an interesting story.

The two dolines have a dense vegetation of bracken (and other ferns), raspberry and nettles, together with some bushes. Ferns and mosses extend into the caves for at least 25m in the twilight zones of the large entrances. Some light reaches right to the end of *Harmans I*, though not enough to see by. Bones have been reported in the low-level rockpile section on the north side of the main H-11 entrance.

The far (eastern) end of the H-12D doline has an overhang which only extends in about 6 metres. There is a lava shelf on the north side, but most of this area is breakdown surfaces of little interest.



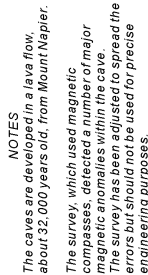
Mushroom-like mineral growths in *Harman I*

Photo: Ken Grimes

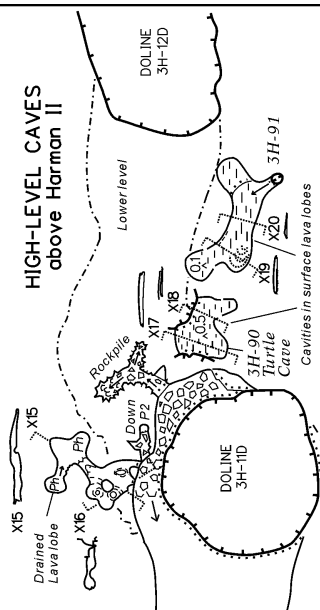
Harman II Cave, 3H-12



PROFILE and SECTIONS



HIGH-LEVEL CAVES



Harman Cave (3H-11, 12), Byaduk

ASF Grade 53A survey by Friends of Eccles & Napier, Nov-Dec 1997.
Survey teams led by: K. Grimes, J. Matthews, S. Matthews, S. White, and
R. Zollinger. Assisted by G. Christie, D. Cameron, J. Grimes, Y. Ingeme,
J. Johnson, J. K., & S. Maas, P. Rankin & N. White.

Compiled by K. Grimes, December 1997.



KGG 6-1998.

Roof height (m)
Line of section, tics indicate view direction.

10

In addition to the main large tube there is one area of low crawlway of the “drained lava-lobe” type exposed in the wall of the H-11D doline (see inset to the main map). This is classed as part of H-11 as it lies within the overhang that contains the main cave, but is of separate origin and of a quite different character. It comprises a set of small interconnected low chambers with ropy lava floor and solid lava walls and roof. The roof and walls have a hackly surface of secondary cave-coral deposits superimposed on lava bursts and drips. The floor has several small lava mounds, one of which shows evidence of having been pushed up from below as a tumulus. This cave would have formed later than the main tube, by draining of the core of a small lava flow that was originally above the roof of the big tube. Collapse of the main doline has intersected it.

The two shallow surface caves have been given numbers H-90 & 91 (see inset to the map). These are both irregular low chambers with dusty floors developed by the draining of thin surface lava lobes. H-90 has been

known for some time; I have called it *Turtle Cave* because it is rather like an empty turtle shell — a hollow area within a domed lava surface. It has some nice lava drips on the ceiling. This is a good cave for kids, but check for snakes first. H-91 was found by Reto Zollinger during our final tidy-up survey; the entrance was obscured by bushes. This is a low mud-floored crawlway, with some pahoehoe surfaces, that heads towards H-90. There were a few lava drips and small lava-bursts.

Management issues

The survey was made to assist in management of the cave and there was some discussion of management during the visit, and also during a later visit with the ranger, Geoff Sharrock.

Points raised included:

- There has been some damage to ferns etc in the twilight zone. A marked trail might help to concentrate traffic to a localised path.
- There is pressure from local tourism interests to increase

visitation to the area, and to this cave in particular. If this happens it might be necessary to add things like steps, a viewing platform, marked trails etc etc. This needs to be planned carefully, and only done progressively as the need arises.

- The rubble floor is potentially dangerous for inexperienced visitors — the boulders are slippery and there are large gaps hidden in the shadows. The black basalt rock swallows up light, so strong lights are required. Additional warning signs and some sort of visitor education is needed.
- Visitors should be kept completely away from certain sensitive or dangerous areas, such as the unusual mineral growths. Marked trails may be the least intrusive method.

I guess the next job will be to help the Department of Natural Resources and Environment work out a detailed management plan, and perhaps to produce a leaflet similar to the one we did for *Tunnel Cave* [H-9].