



PROPERTY OF **Vol. 16 #3**  
WINDY CITY GROTTO

# THE CASCADE CAVER



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March, 1977



THE CASCADE CAVER is published ten times a year by the Cascade Grotto of the National Speleological Society. Subscription rate is \$4.00 per year. Full grotto dues of \$6.00 includes a subscription to the quarterly Northwest Caving. All payments should be made to the grotto treasurer, Chuck Coughlin, 6433 S. 127th Pl., Seattle Washington 98178.

#### COMING EVENTS

The first weekend it doesn't rain: Trip to Tiger Mountain Talus Caves near Issaquah, with Don Holliday, after whom Don's Cave was named, as guide. Either Saturday or Sunday. Call Rod Crawford, 543-4486 late evenings.

March 21, Monday. Regular monthly meeting, our LAST at the old time and place, at least for a while. 8:00 PM at the Hallidays', 1117 36th Ave. E.

For this meeting, everyone is requested to bring their cave pack, containing everything they take into a cave. We will open them up, take a look at them, and make comparisons.

Sometime soon, maybe: North Chuckanut Talus Caves. Call Rod Crawford.

April 1-2. Paradise Glacier Cave with Annie Ruggles and company. Also this weekend will be woodcutting and mushroom gathering in the Eatonville area. Saturday night will be a potluck and slide show (remember, we want YOU to bring your slides!), at Annie's house. Two recent issues have contained maps showing the location of the house. For further details come to the meeting, or call Annie at (206) 832-6352.

April 1. DEADLINE for the April CASCADE CAVER.

April 18, Monday. Regular monthly meeting in Room 325 of the Seattle Public Library, central building, 4th and Madison. Room open from 7:00 PM, meeting comes to order at 7:30. More details in next issue.

April 23-24. Deadhorse and Dynamited caves, Mt. Adams area. Call Bob Brown, (206) 569-2724, or Annie Ruggles.

May 27-30, Memorial Day Weekend. Papoose Cave, Idaho. Call Bob Brown, or Curt Black, 564-0988 in Tacoma.

July 1-4, Independence Day Weekend. NWRA Convention, Memekay River area, Vancouver Island. See Bob Brown for details.

July 15-16. Oregon Grotto annual potluck at Trout Lake in the Mt. Adams area.

#### NEWS AND NOTES

The program for the April meeting will be a presentation on "Cave-saving Techniques" by Curt Black, originally scheduled for the March meeting.

\* \* \* \* \*

Jim Nieland reports that in addition to the Flashcube/Clearcut Cave system, reported in the Caver last year, there is another series of sinks, west of the road, in the clearcut immediately to the east, as yet unchecked.

\* \* \* \* \*

THE FEBRUARY MEETING was well attended by eighteen people. The grotto voted almost unanimously to apply for a meeting room in the Seattle Public Library, meetings there to begin in April, still on the third monday but at 7:30.

Ed Crawford showed some cave-entrance movies, Russ slides of his last Alabama trip.

\* \* \* \* \*

#### ADDRESS CHANGES THAT SHOULD HAVE BEEN PRINTED LONG AGO

Russ Turner                    Apt. 12, 1214 Harvey Rd., Auburn WA 98002  
Luurt and Jeanette Nieuwenhuis    7215 S. 196th, Kent WA 98031    852-4056

\* \* \* \* \*

Our cover: Secondary speleothems in a lava tube of the Mt. Suswa system, Kenya. From the Cave Exploration Group of E. Africa Bulletin V. 4, 1974.

FEATURE ARTICLE

Talus and Tectonic Caves in New England

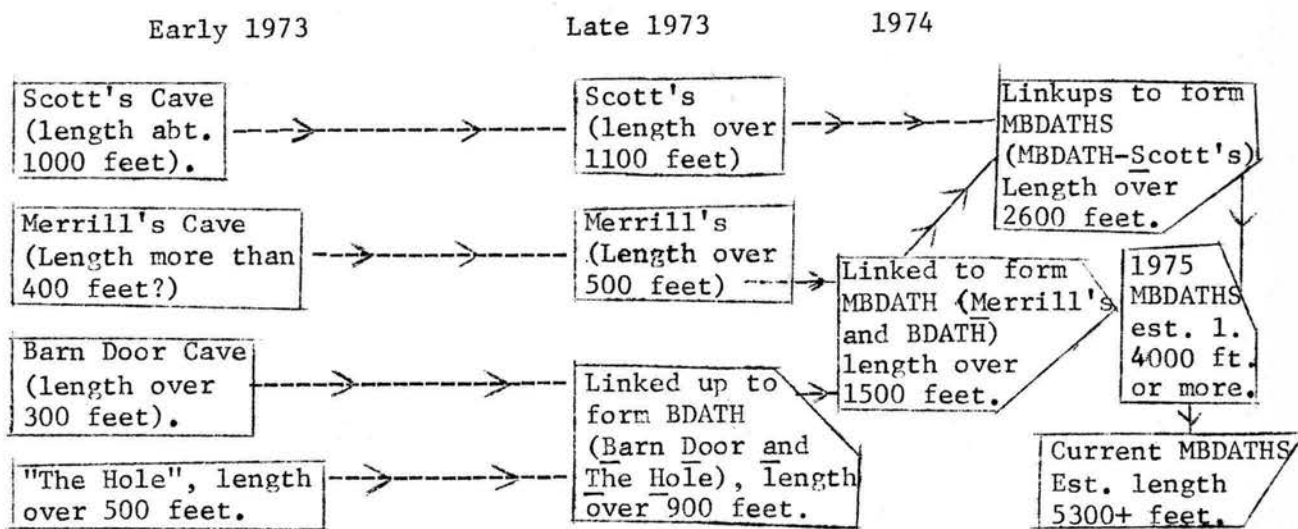
by Robert W. Carroll, Jr.  
Potsdam, N.Y.

Within the past three years, marble caves (which, despite a decade of determined effort, have "stalled out" at around 2000 feet in Vermont and 1600 feet in the Adirondacks) in the Northeast have been "leapfrogged" by a new generation of talus and fault caves over ten times as large as the best Northeast specimens known a decade ago. At least two of these systems may rank among the world's largest talus caves, which brings up a good question: does anyone have definitive statistics on the world record talus and fault caves known at present?

The three systems of interest are as follows.

**MBDATHS:** The result of numerous explorations by Boston Grotto cavers and myself of a huge "semi-coherent" granite talus slope, this Grafton County (N.H.) system is tentatively rated at 5300+ feet (grade-5 surveys could drag on into the 1980's), has 100 entrances, 200+ intersections, some very formidable mazework, ice that finally melts in October, and "impurity" speleothems up to 1 1/2 inches thick. This monstrosity sprawls over three acres and has an estimated 140 feet of relief. A map appears on the next page. Whether any other New England cave will ever equal it (or even half of it) is doubtful at this time.

As for MBDATHS, the evolution of that strange name can be best illustrated by the historical diagram below:



**TSOD:** Three years ago, no known Adirondack anorthosite talus cave had even 200 feet of passage, but my recent investigations in Essex County (High Beaks area) have changed that in a very dramatic way. A series of impressive boulder ramparts has yielded a documented 4900 + feet of continuous passage in one system, plus two nearby 700-footers. TSOD (for "touchy sword of Damocles", one of its more notorious loose-rock configurations), has a horizontal "spread" of 400 by 180 feet, 100 entrances, 200+ intersections, enough unexplored passage to make it a "miler" next fall, underground streams, a boulder seven stories high, small "nodule" speleothems, and a possible "biennial" glacière. To reach it requires a 4 1/2 mile walk each way.

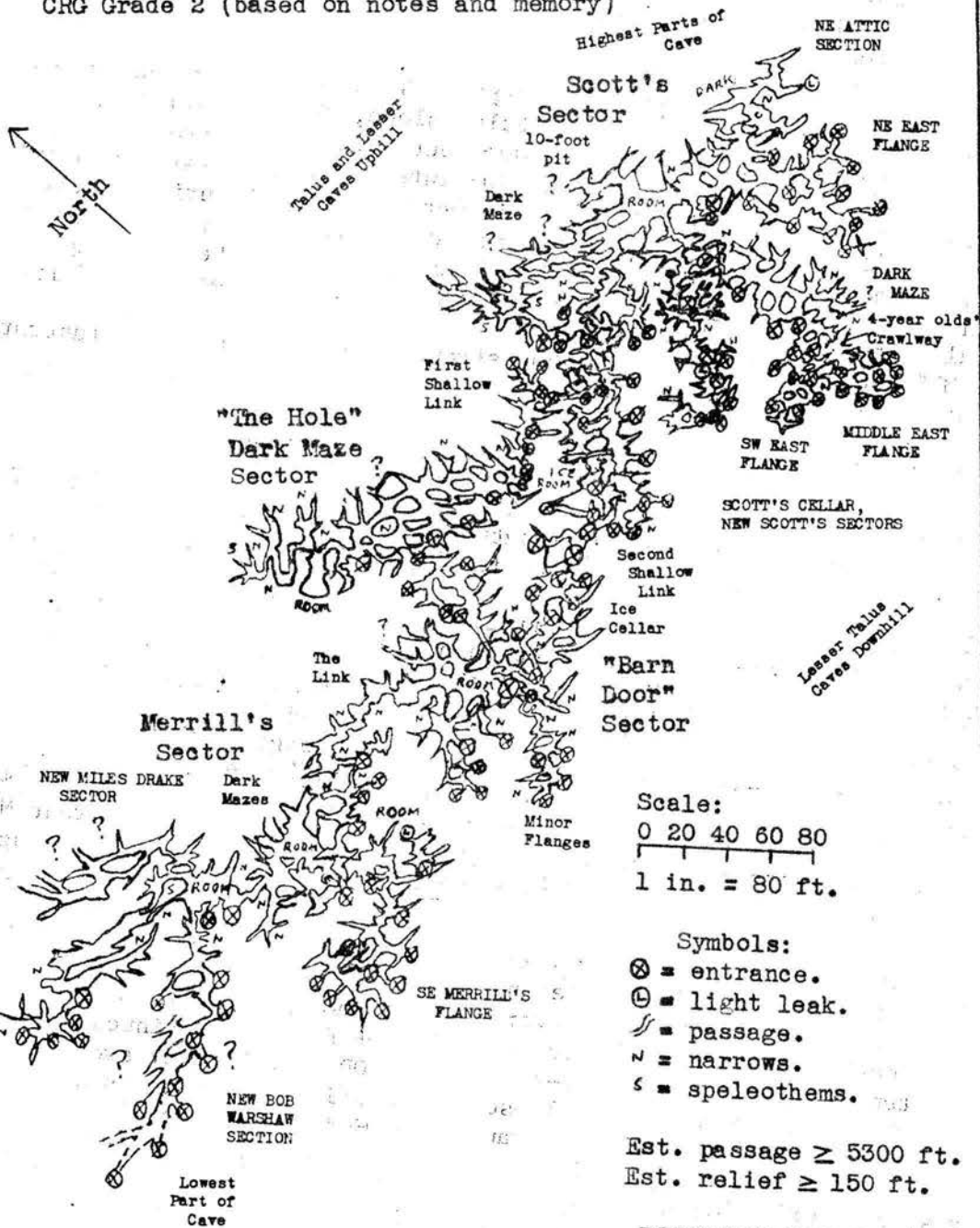
HORIZONTAL LAYOUT OF MBDATHS TALUS NETWORK

GRAFTON COUNTY, N.H.

AS OF SEPTEMBER 15, 1976

Drawn by Robert W. Carroll, Jr.

CRG Grade 2 (based on notes and memory)



EXPLORED IN 1970-76 BY:  
 Miles E. Drake  
 Bob Warsaw  
 David Allured  
 Vi Schweiker  
 Robert W. Carroll, Jr.  
 and others.

Est. passage  $\geq$  5300 ft.  
 Est. relief  $\geq$  150 ft.

**WARNING:** Parts of map are not too accurate, especially about three dimensional maze sections and western Merrill's sector. Map is more intended as indicator of lead density than as specific guide.

Adapted from Northeastern Caver,  
 Nov.-Dec. 1976, p. 134.

Eagle Cave: Efforts by Boston and ADK Grotto cavers at this spectacular Hamilton County tectonic cave have raised its passage to 1800+ feet, relief to the order of 150 feet. Some reports indicate it is second only to North Carolina's Bat Cave among tectonic systems in the East. The mountain looks like a Richter 10+ cataclysm one time hit it (120-foot high gneiss ledges pulled apart and toppled, etc.), and the sequence of rooms suggests that torsional downward forces pulled the mountain apart from within. Unique "scalestone" speleothems range up to 6 inches in length. Ice at the lowest levels retains 5-foot thicknesses through October and sustains nonmelting frost at least through October 11.

While there remains the possibility of other discoveries elsewhere, the three systems I have mentioned will likely dominate the statistics for New England and the Adirondacks for a number of years. My current guess is that, with only one apparently-good unexplored section, the MBDATHS system will "stall out" at around 5500 feet. Eagle Cave has three unpushed leads of uncertain potential, but I would not bet on any ultimate length of over 2000 feet as of now. TSOD is anyone's guess. This cave has seen some "diesel engine sized" openings pinch out completely 35 feet in--and "hide-rippers" open up into new sections with hundreds of yards of passage. I have a hunch that we will be getting it near or over the 2-kilometre mark a year from now.

From what information I have, anorthosite exposures of the type that TSOD is in are very uncommon on the Earth's surface. The possibility that TSOD has set a world record for that type of rock should be investigated (maybe our colleagues in parts of Labrador and the Soviet Union might have a few anorthosite surprises of their own!).

The factors that determine talus cave extent are not as simple as one would suppose. The higher the source cliff, the better--unless the rock is too brittle. I know of several 1000-foot granite cliffs in N. H. and Maine, with barn-sized boulders at the bottom, but with the rock so finely splintered under the top boulder layer that the caves are very mediocre. One of the 1000-foot Maine cliffs didn't even have a 60-footer below it! Anorthosite is extremely variable in structure, some of it very crumbly, but the stuff that TSOD is made out of has such an interlocking crystal structure that a 70-foot diameter chunk can drop 1000 feet off a cliff, get "roughed up" by the Ice Age, and still be in reasonably good shape.

The distribution of talus cave sizes is extremely uneven; the second largest N. H. cave is but a tenth the size of MBDATHS. The second through fifth largest New England caves are all marble (the fifth "ties" with a 900-foot fault cave)--and put together do not have the combined passage of MBDATHS!

Still another possibility is that large talus caves are very abundant--but these systems are not very popular in the caving community. Quite a few cavers in the Northeast "wouldn't touch one with a 10-foot pole"! Hopefully, such things as MBDATHS and TSOD (which each have more passage than some popular limestone caves in the Northeast) will change this attitude in the years ahead.

In any event, we know what the world's largest and deepest limestone caves, lava tubes [not quite--ed.], clay "tubes", ice/firn caves, and quartzite-resolution caves are, but data on tectonic/fault and talus systems is a bit elusive. This situation needs to be corrected, and I am certain that the caving community would be interested in finding out what the "world's worst rockpile maze" is, even if they don't want to visit it personally.

For now, MBDATHS sounds like an "unofficial temporary record" for talus caves--and a potential "catalyst" for the uncovering of far larger systems in the West and elsewhere that would far "outdistance" anything the Northeast

could produce. The West apparently has vast amounts of broken granite waiting to be probed into further. The "Catch-22" phrases are "intactness of second talus layer", "complexity", and "patience and persistence". In some places, "rattlers", "bears", and "ice blockages" should be added to the list. Even a crude mapping effort probably wouldn't net more than 600 to 1200 feet a day; a talus "miler" could take on the order of a week's work, and a ten-miler (if such a thing exists) would be akin to a Flint Ridge-type effort!

Two items of advice should be passed on to the "rockpile cavers" in your region: (1) make use of intermediate entrances in "linkup" efforts, and (2) be on the lookout for "impurity" speleothems (even granite can form "coral" a half inch thick or flowstone an inch thick!). I also note that linear cliffs in passes seem to have better talus caves than cirque or rock-slide boulder fields, and the most fascinating talus caves have underground streams.

Hopefully, the information I have given will be of value to any future evaluation of the Earth's inventory of major talus and fault systems.

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### Athabaska Glacier Caves

by Bill Halliday

In the Canadian Caver #5, the following item appeared:

"The Athabasca Ice Cave at the snout of the Athabaska Glacier is reported to be almost completely collapsed, so it seemed fairly safe to publish the survey for it this issue (surveyed November 1969--WRH). The cave has been known for a long time. It is wholly in dead glacial ice, and comprises a meandering passage, which during summer acts as a resurgence for a subglacial stream; access is, however, possible in winter. The most spectacular features of the caves are the huge scallops developed on the ceiling and wall due to ablation by the inward air flow. These contrast nicely with the smaller scallops cut by water flowing outward at the base of the passage."

This cave and an "ice tunnel several hundred feet long" also are mentioned and pictured repeatedly in "Probing the Athabaska Glacier", a 32-page booklet by Richard E. Kucera, sold widely in the Canadian Rockies.

On September 2, 1976, however, I found the entire part of the glacier containing these features melted away. They seem to have been in a moraine-covered lobe of the glacier, somewhat like the one from which the main stream emerges from the Saskatchewan Glacier, but from the description, they differed markedly and it is regrettable that no glaciopedologist had an opportunity to study the Athabaska Glacier Cave before its demise.

Some small sole cavities are present beneath the snout of the main part of this glacier now, and a tectonic cavity perhaps 50 feet long, toward the east end. Lacking permission to enter caves in Jasper National Park I did not check them out, but none looks extensive.

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## TRIP REPORT SECTION

### Snowless Cascade Caving--in February

by Rod Crawford

Clyde Senger and I went south two days before the Speleo-Educational Seminar, in order to take advantage of the remarkable weather and do some mid-winter bat-checking and caving in the Mt. St. Helens lava tubes. We arrived at our campsite on Swift Creek Reservoir after dark the evening of Thursday, the 17th. In contrast to the 20° weather last November, the temperature must have been in the forties.

Bright (though not especially early) on the morning of February 18, we drove on up the lava flow to park near Spider Cave. There was not a flake of snow to be seen anywhere below the upper slopes of Mt. St. Helens; even the flanks of the mountain were bare. There was not a cloud in the sky and the temperature felt like a day in early May. Contrast this with the usual snowy winter when one has to park down by the reservoir and hike in on the snowmobile trails.

Our brief visit to Spider Cave yielded a count of thirty-one bats (Plecotus townsendi), six with bands. Evidently the population is still recovering, which is nice to know. Temperature above the constriction was 2.2°C., 2.9° below it. Many harvestmen were in the room below the entrance drop.

Incidentally, since we have hopes that the hibernating bat population in Spider Cave will recover still further in future years, please don't jeopardize it by visiting the cave unnecessarily in the winter.

We next visited the lower entrance of Gremlin Cave, finding three bats in this and nearby holes. We saw hundreds of pink ribbons marking trails crisscrossing the area every which way, and incidentally marking all of the cave entrances. I assumed they were for the planned post-Seminar caving trip in the area, but as it turned out they weren't. No doubt they have been removed by now.

Several years ago, Clyde had been to Utterstrom's Caves (which I tried to find, unsuccessfully, last July), and he thought he might be able to relocate them now. So, we set off on a hike through trackless hills and clearcuts, and, sure enough, went right to them.

Utterstrom's Caves, for those who didn't see the article on them in the August '75 issue, are a series of six small named caves on a high, steeply-sloping part of the lava flow. Once in the area, the caves are most easily located with reference to the enormous sinkhole entrance of Breakdown Cave, the lowest cave in the system. We did not enter Breakdown Cave, but found the others extremely interesting despite their small size.

Moss Cave, the next uptube, is the first lava tube I have seen with its entrance in the face of a non-erosional cliff (this cliff is evidently a feature of the original lava flow). The southern exposure of the entrance supports a luxuriant growth of moss throughout the spacious grotto just within. Many moth wings on the floor indicate summer use by bats.

Railroad Track Cave deserves its name, containing in its 90-foot length a trench-in-tube not much inferior to that in Prince Albert Cave, though smaller. There were many roots and debris had entered through a skylight. Gnats and pika and slug droppings were noted.

Arch Cave, one of the largest in the system, has two entrances at one side of a shallow half-sink. The smaller, arched one, contained a pika's haystack. We were stopped by two vertical drops just inside. Nearby Surprise Cave was just as large and easy to explore. We found one bat there and some fascinating tube-in-tube structures, unlike any others I have ever seen.

The uppermost named cave in the system, a relatively small one, is Lava

Spring Cave, named for the appearance of the upper end. Interestingly enough, there is a similar appearing feature at the lower end of the cave.

A seventh, very small cave, which I have not seen mentioned in any caving publication, was located 150-200' upslope from Lava Spring Cave. It was evidently known to the pink flagger, however.

After hiking back to the car, we attempted to scout out an easily repeatable route to these caves (which the one we took definitely is not; there are half a dozen ways to go wrong on it). We amazed ourselves by finding one almost right away. In future, no Cascade Grotto member need ever have any problem finding Utterstrom's Caves if the appropriate directions are acquired before the trip.

Note on the NSS Western Speleo-Educational Seminar  
February 19-20

Yr editor is in a position to report that the 1977 Seminar was a resounding success. You should be sorry you missed it. There were talks on every conceivable topic—and some inconceivable, like "Spelunking Sasquatches and the Hollow Earth Theories" given by a certain well-known Northwest speleo-author. The Larsons, as usual, provided sleeping bag space for transients, and, what is more, Jo fixed a batch of very good pancakes for the horde of hungry houseguests all three mornings. The grotto and the region did well on the financial side: I sold \$16 worth of Caver subscriptions and back issues at the sales counter, as well as over \$100 worth of the new regional patches and several dollars' worth of back issues of Northwest Caving.

After the sessions on Saturday night there was pizza, followed by a fine caver party at the Larsons', complete with various entertainments; singing, slides, my attempting to chase a spider out of Ro Deveraux' boot (which finally came out of its own accord and proved to be a Hololena nedra), and topped off by a rousing pillow fight. As before related, at this party I got the correct tune for "The Wild Caver" from Pip Whitfield, who brought that song to the Northwest from its original home in England.

The seminar was intended to finish with a caving trip on Monday, which yr reporter did not attend. No doubt it, too, was successful.



See article on pages 26-27.....



VULCANOSPELEOLOGICAL ABSTRACTS

Wood, C., 1976. Caves in rocks of volcanic origin. Pp. 127-150 in: Ford, T. D., and C. H. D. Cullingford, 1976. The Science of Speleology. Academic Press, London, 593 + :iv pp.

This general account is not bad on the whole, but suffers from being somewhat out of date.

It is intended as a summary of information on all caves in volcanic rocks--including, in addition to lava tubes, cavities beneath pressure ridges; cavities beneath spatter cones; blister caves; vent caves; fissure caves in volcanic rock; and caves in bedded tuffs and agglomerate. However, all but 2 1/2 pages of the account is devoted to lava tubes.

There is an interesting page on the geographical distribution of lava tubes, containing the cryptic and undocumented statement that "some of the longest lava tube caves in the world are found in Korea"; this led yr editor to look into the matter, resulting in the following abstract. The longest lava tube known to the author was Cueva Del Viento, Canary Islands, with a 7.9 km and a 2.1 km segment; evidently he had not heard of Kazumura.

The section on vulcanospeleogenesis suffers most from anachronism. It concentrates mainly on the laminar-flow theories of Ollier and of Greely, and also implies that lava tubes might be non-destructively modified by subsequent eruptions.

The bibliography is useful but evidently far from thorough. (RLC)

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Ueno, Shun-Ichi, Sok Kyu Pae, and Fumihiro Nagao, 1966. Results of the speleological survey in South Korea, 1966. I. General account, with brief descriptions of the caves visited. Bulletin of the National Science Museum, Tokyo, 9 (4): 465-499, 8 plates, 3 foldout maps.

This is the first of a series of reports by a team of Japanese scientists and cavers who made a thorough biological study and survey of 23 caves and 49 wells in South Korea in 1966, the former including two lava tubes. These are described, with maps, and two other lava tubes are mentioned which the team was not allowed to visit.

Pp. 465-6: "...a number of lava caves are developed on the Island of Cheju-do. This volcanic island lies about 80 km off the southwestern corner of the Korean Peninsula and is about 1,860 square kilometres in area. The highest point is Mt. Halla-san, which rises 1,950 m above sea-level. Large caves are found mainly on the northern side, and two of them [not visited], Keumnyeong-sa-gul Cave and Manjang-gul Cave are well known in the country. Both the caves are situated at the northeastern part of the island, and the latter is said to attain a length of about 6 km."

Pp. 489-492:

"Handeul-kunyeong Cave

"Location: Keumreung-ri, Hanlim-eub, Is. Cheju-do. Latitude: 33°22'14" N; longitude: 126°13'56" E.

Quadrangle: Biyangdo (1:50,000) Altitude: 35 m.

Date: August 12, 1965 (preliminary exploration); May 2, 1966.

"This long cave is situated near the northwestern coast of the Island of Cheju-do and about 1.6 km to the south of the village of Keumreung-ri. It has two entrances 25 m apart, one natural and the other artificial, both opening on a hillock that rises on a sloping grassland. The cave consists mostly of a single loop passage, of which the long axis runs northwest. The loop is broken at the southern loop by a collapse, on either side of which

open the two entrances.

"The artificial opening, the western, is a 1.5 m vertical drop, which leads into a small entrance room 13 m wide and 20 m long through a steep slope covered with breakdown. A tortuous passage, 3-5 m wide and 2-3 m high, continues from the western end of this room, trends west-northwest for 145 m, and then swings north for about 50 m to expand into a breakdown room 20 m wide and 35 m long. Beyond the room, the passage runs north for 70 m, then swings west-northwest for 150 m, and finally turns northwest for 140 m farther to a fork. The cave slowly declines towards the back and contains two large piles of breakdown near the fork. Most of the floor is, however, composed of bare lava and is damp throughout.

"The fork itself is floored with extensive breakdown. A sinuous passage to the left extends west for about 80 m and eventually becomes too low to penetrate. The main passage continues to the right as a winding gallery 4-6 m wide and 2-3 m high. It trends east-southeast for 50 m, bends southeast for 135 m, then turns east for 200 m, and finally swings southeast again for 220 m further to a tight crawl 1.5 m wide and 0.5 m high. This section of the cave slants slowly upwards from northwest to southeast and is very simple in structure, although there are two expansions at the southeastern part. The tight crawlway opens into an elongate room more than 15 m in width, which extends southwest and west for about 90 m and directly leads to the side of the room, and a bit of guano is found on the pile of fallen rocks. The natural entrance is very wide, opening at the bottom of the collapse sink. A tight crawl is said to lead through a pile of loose breakdown and to connect the southwestern corner of the eastern entrance with the southern side of the western. It is, however, very difficult and dangerous to penetrate into the breakdown, since many of the rocks are so loose that they may easily be dislodged.

"In short, the cave is a long monotonous tunnel with several breakdown rooms. It attains the total length of about 1,400 m, but is scanty of organic material and extremely poor in the fauna. Only seven species of animals were obtained, and the majority of them was trogloneous. However, the cave harbors a white polydesmid diplopod (Epanerchodus), which may be a trogloneous species. Materials obtained: Araneida, Diplopoda, Coleoptera, Chiroptera.

#### "Seong-gul Cave

"Location: Sinchang-ri, Han'gyeong-myeon, Is. Cheju-do. Latitude: 33°20' 07" N; longitude: 126°11'10" E.

Quadrangle: Biyangdo (1:50,000).

Altitude: 20 m.

Date: May 1, 1966. Materials obtained: Pseudoscorpions, Opiliones [harvestmen], Araneida [spiders], Diplopoda [millipeds], Chilopoda [centipeds], Collembola [springtails], Orthoptera [crickets et al.], Coleoptera [beetles], Saliencia [frogs & toads].

"Seong-gul Cave is developed under farm-houses and cultivated fields of the village of Sinchang-ri. Its location is about 5.8 km to the southwest of Handeul-kunyeong Cave and close to the western coast of the island. The main entrance, opening among farm-houses, is a vertical collapse sink 5 m in diameter and 4 m deep, which drops directly into the trunk gallery of the cave. A flight of concrete steps has been constructed at the northern side of the entrance pit.

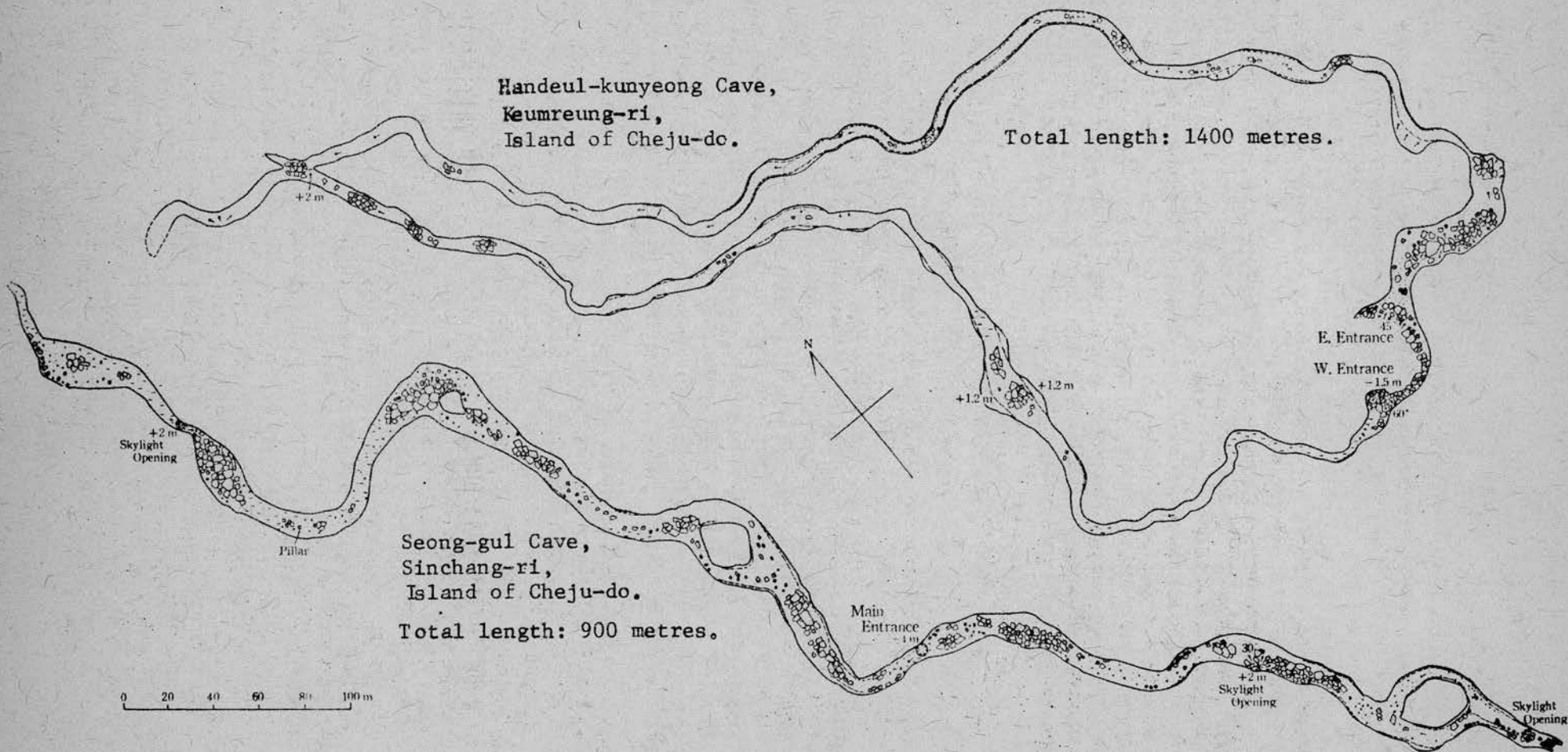
"To the left, the cave heads east at the beginning but soon swings southeast, and generally extends in the latter direction for about 370 m, though having a bend to the east about one-third way from the entrance. The gallery is 1.5-3 m high and averages 10 m wide. It branches into two passageways

Maps of two lava tubes  
on the northwest side  
of Cheju-do Island,  
South Korea

Surveyed May 1-2, 1966  
by Hidenori Toyama and Kuniaki Saito,  
Speleological Society of Japan

Handeul-kunyeong Cave,  
Keumreung-ri,  
Island of Cheju-do.

Total length: 1400 metres.



at about 220 m, which rejoin after a distance of about 40 m and form an oval loop. Beyond this section, the cave extends straight to terminate at a breakdown. There is a skylight opening in the right-hand roof 155 m inside the main entrance. Breakdown is extensive in the vicinities of this skylight opening and the main entrance, but the floor is largely of bare lava in other places. Near the innermost is found another small skylight hole in the roof, which casts a dim light over the talus cone below.

To the right of the main entrance, the cave heads west for 30 m, then bends at a right angle and extends north for 65 m to a fork. Hubs of fallen rocks pile up in the northward section, where the gallery expands in both width and height. The two forks rejoin after 45 m of separation and form a loop passage. Beyond this point, the cave continues for 130 m in a north-northwesterly direction as a curved passage with occasional breakdown, which expands towards the back and divides into a second loop near the northern end. An enormous pile of huge fallen rocks is met with at the northwestern side of the loop, from where a muddy gallery extends west-southwest for 40 m, then swings 115° over a distance of 70 m and runs north, as a breakdown room, for 45 m farther to a second entrance, a skylight opening which has been blocked up with stones thrown in from the outside. Towards this opening, the cave rapidly contracts to a passage 3 m wide and 1-1.5 m high, but opens out again, after a short distance, into a wider passage which continues north and northwest for about 100 m to a terminal silt fill. The last 30 m is a low crawlway 4-6 m wide.

"The cave is long and sinuous, attaining nearly 900 m in its total length, but the general trend of its extension is from southeast to northwest. It is developed just below the surface and is roofed with a very thin layer of lava. Many of the rocks in the ceiling are poised in precarious positions, and active breakdown is taking place from time to time. The floor is damp throughout and fairly rich in organic material. True cave animals are, however, extremely scarce just like the case of Handeul-kunyeong Cave, although many trogloneous forms were found mainly in the vicinity of the main entrance and the skylight openings."

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#### THE BIOLOGIST'S CHAMBER looks at SPELUNKING SHEEP

For reasons (if any) best known to themselves, sheep, both wild and domestic, often enter caves. Examples of this are not hard to find close to home. Caves of Washington reports use of Fowler's Cave on Orcas Island by domestic sheep (Ovis aries), as indicated by wool caught on the ceiling. The Saddle Butte lava tube system in southeastern Oregon was used extensively by sheep and shepherds during pioneer days. Probably any cave in sheep grazing country with a sufficiently large entrance is entered by sheep occasionally. Wild sheep (Washington's only species is the Mountain Sheep, Ovis canadensis) certainly use the entrance areas of caves and rockshelters for shelter at times, but there are apparently few records of their entering the further reaches of longer caves. The following article, which I quote in part, gives a report of an interesting instance of such behavior recently discovered in Canada--The Editor.

#### MORTALITY OF DALL'S SHEEP WITHIN A CAVE

by George W. Scotter and Norman M. Simmons, Canadian Wildlife Service

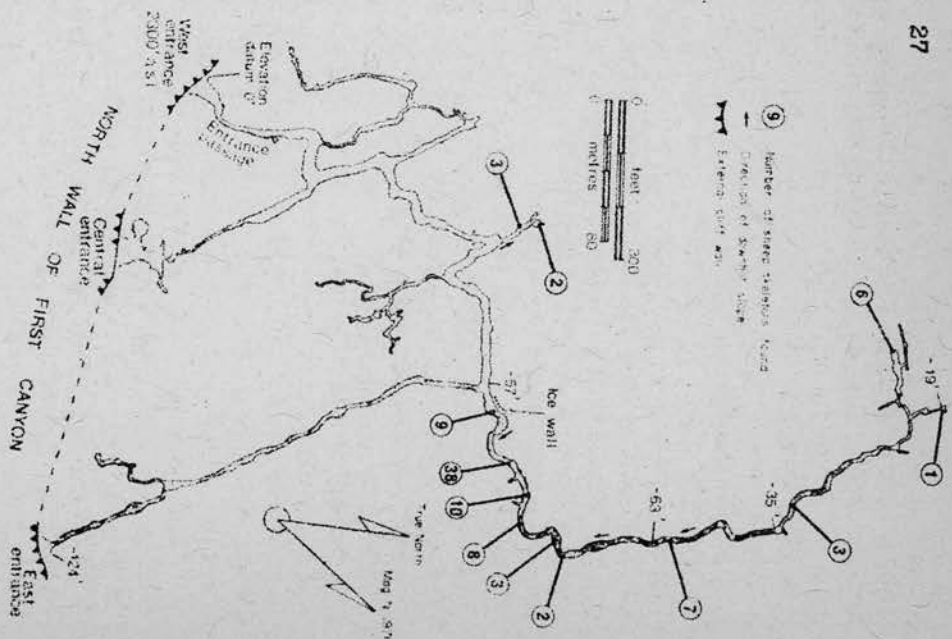
On 19 September 1971, the senior author visited a cave at the mouth of First Canyon on the South Nahanni River in Nahanni National Park, Northwest Territories. Examination of the cave revealed the remains of 93 Dall's Sheep,

(*Ovis dalli*) at 12 different locations, all of which were located beyond daylight. (Fig. 1). No similar occurrence has been noted in the Rocky Mountains of Alberta or in other northern areas with sheep populations, nor in any of the other 300 caves explored in the area up to this time.

The cave, located at 61°17'N, 124°06'W and 700 metres elevation, is part of the central limestone beds of the Nahanni formation. The cave has about 1900 m of passageways and three entrances, but only the west entrance is easily accessible to man. Silt or ice over silt, with a thickness of over 10 m in some places, underlies the cave floor. The cave openings are from 2 to 12 m high and 2 to 8 m wide.

Sheep remains from the cave were classified according to age and sex. Age determinations were based on teeth, horn core and sheath development, and on closure of the basicranium or long bone epiphyses. [Continued below].

Fig. 1. Map of cave showing location of Dall's sheep remains. →



Sex determinations were based on horn conformation. A total of 92 sheep (33 males, 43 females, and 16 unsexed) were examined. Eleven of the males were juveniles (0 to 3 years of age), four were 3 to 5 years of age, seven were older than 5 years, and 11 could only be classified as adults. Of the 43 females, six were juveniles, 10 were 3 to 5 years of age, two were in excess of 5 years of age, and 25 could only be classified as adults. Of the 16 unsexed sheep, 11 were juveniles and five were adults. At least six mature ram skulls had been removed by visitors before our count was taken; therefore, the cave contained the remains of at least 98 animals in 1971. Doubtless an undetermined number of remains went uncounted under ice or silt.

The stratigraphic position of the sheep remains was generally on top of silt or other deposits except for those partly covered by ice. Other skeletons were located on or within rock falls. A few of the skeletons were relatively undisturbed, but most had been scattered by other animals such as *Neotoma cinerea* and *Erethizon dorsatum* which now live in the cave.

One unique feature of this cave was a steep ice wall, about 2 m in height, located approximately 275 m from the west entrance. Due to the lack of rough edges, ascent of the ice wall would be difficult for Dall's sheep, particularly if an animal attempted to jump to the top of the ledge from a downward slope in total darkness. Therefore, the ice wall combined with darkness might have accounted for the deaths of many sheep; once down in the cave the animals might not have been able to climb out. The remains of several animals were partly incorporated in ice below the wall. Five sheep were found between the west cave entrance and the ice wall in a side passage off the main cave. These animals simply might have become lost.

Hair, horn, and cartilage were removed from one animal and subjected to C<sup>14</sup> datings by the Geological Survey of Canada. The corrected ages were as follows: hair, 2400 ± 160 years B.P. (GSC-1649); horn, 2440 ± 80 years B.P. (GSC-1757); cartilage, 2370 ± 150 years B.P. (GSC-1774).

It is doubtful that such an array of sheep would naturally congregate in a cave at one time. During seven years of research on Dall's sheep in the Mackenzie Mountains, we have never observed more than 55 sheep in one group. The alternative explanation, that small groups entered the cave during several cold periods, is not consistent with the sex and age class data. For example, rams do not usually associate with females and young during the winter, and the presence of lambs only a few months old at death indicates that all deaths were not during winter months. Separate entries by individuals or small groups over several seasons during many years seems to be a more plausible interpretation.

It is not unusual to find evidence of sheep, goats (*Oreamnos americanus*), or other large mammals at the entrances of caves in western Canada, but droppings and other signs of their presence are generally not found beyond the reach of daylight. At the present time there is evidence that Dall's sheep are still using the area near the west entrance of the cave. Geist (Mountain sheep: a study in behavior and evolution, 1971) noted that sheep seek shelter in caves at night during extremely cold weather. Geist (personal communication) also observed Stone's sheep (*O. dalli stonci*) making extensive use of a cave from January through late March; however, from late March onward they used it less frequently.

CASCADE GROTTO STORE  
Bill Capron, Keeper: Phone 784-8497.  
Price List, October 1976

ANNOUNCING A

Cave Packs	\$1.50
Carbide	50 ¢/lb.
Judson kneepads, pair	4.50
Helmets	*
Chin straps	.85
Premier Carbide Lamps	8.75
Lamp Brackets	1.00
Lamp felts	2/15 ¢
Lamp tips	.20
Lamp flints	3/25 ¢
Lamp gaskets	.10
MSA Nickel-Iron Headlamps	*
Gibbs ascenders (spring)	8.50
Gibbs (quick release)	10.50
Bonaiti D Carabiners	2.50
Bonaiti Locking D	3.25
Cascade Grotto Patches	1.50
Cascade Grotto Decals	.25
NSS Decals	.20

\*Contact keeper for information.

Quantities are limited in some cases.  
If you want any caving-related equipment not listed here, please ask for it. The store is here to serve you, so take advantage of it.

NEW  
MEETING  
PLACE!

To wit, Room 325 of the Seattle Public Library, Central (downtown) building, located at 4th & Madison.

As resolved at the last meeting, the Grotto requested and was granted the privilege of meeting in the library. We are currently scheduled to hold our April 18, May 16, June 20, and perhaps subsequent meetings there. The March 21 meeting, however, will be held at the Hallidays'.

We have scheduled the room for 7:00 to 9:30, with the understanding that the meeting will begin at 7:30 and from 9:30 to 10:00 we will be in the process of leaving. More info. next month.

THE CASCADE CAVER  
207 Hub (FK-10) Box 98  
University of Washington  
Seattle WA 98195

Take  
Nothing  
But  
Pictures  
Leave  
Nothing  
But  
Footprints

DON'T FORGET--THE MEETING IS THIS MONDAY!  
And don't forget to bring your cave pack!!