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Union Internationale de Spéléologie (UIS) Commission on Volcanic Caves

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The Commission on Volcanic Caves
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regularly since December 22, 1993.
The Newsletter is available free of
charge to all members of the
commission, and to others who are
interested in Volcanic caves.



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MISSION STATEMENT

The UIS Commission on Volcanic Caves encourages exploration and scientific investigation of volcanic caves, and hosts the International Symposium on Vulcanospeleology about every two years



COVER PHOTO

Top:
ISV participants in
Dak Nong Vietnam.

Bottom:
The Nam Kar Volcano,
Dak Nong, Vietnam.

Photos by: Geopark Dak Nong

Editorial

Dear readers,

As 2022 just passed by, and Ed Waters decided to hand over his editorship of this Newsletter to the next generation, I just came along to give a helping hand for this first issue in 2023.

As in the beginning all layout was done by cut and paste probably in a program like wordperfect or just by scanning the original writing, in years after editors and co-editors managed to improve our Vulcano newslettter.

Several co-editors also gave a helping hand up to when Ed started in 2017 .

Ed did a great job to keep this digital newsletter going and keep us readers up to date with all what is happening in the world of “caves and Volcanoes “. Well done!!

It is my intention to give a helping hand to a new editor, Carlos Benedetto, later in the year. John Brush will assist us in editing correct English wording.

For now I look forward to start receiving material related to caves and volcanoes for the next issue.

As quality is an important issue, I prefer to receive a complete MS wordfile + the drawings and pictures attached separately in medium to high resolution. In that way I or we can guarantee a good quality and authors do not get disappointed.

Please feel free to contact us by email laurens.smets@home.nl , carlos_benedetto@fade.org.ar or just contact John Brush with any queries or offers for articles.



The editor at a fumarole in Lanzarote

President's Column



Hello everyone and a belated welcome to you for 2023.

Quite a lot has been happening within the Commission in recent months.

ISV20

Of course, the main event was the 20th International Symposium on Vulcanospeleology that was held in Dak Nong Province, Vietnam during November, 2022. And what an ISV it was! The organisers, principally staff of Dak Nong Province and the Dak Nong UNESCO Global Geopark, but also people from ExpTravel staged a truly spectacular, memorable, enjoyable and rewarding event.

The ISV was rewarding in the sense of what we observed, learnt and experienced. We gained insights into the local volcanic caves through the presentations and the field trips; we also increased our knowledge of volcanic terrains and caves in other parts of the world; we experienced windows into the local culture through talking to the locals, eating the fabulous meals, watching and listening to the performances by ethnic minority communities and visiting the museums and displays. Along the way, we also had quite a few laughs.

Many, many locals worked very hard to ensure the success of the ISV. Some of those involved were school teachers who acted as interpreters, translators, announcers and guides; there were IT and AV technicians who kept the technology rolling along; medical, first-aid, food safety officials to look after us; police and security people hovered in the background; students who constructed and staffed the displays around the forecourt of the provincial conference centre; minibuss drivers and, importantly, the strong team of outdoor adventure and caving guides from ExpTravel who took us to the caves, rigged the pitches and then, once we were in the caves let us wander, closely examine cave features and take photos at our own pace.

There were too many locals involved in the ISV for me to be able to acknowledge them all individually. However, there are four people I do wish to specifically mention. Most importantly, I acknowledge Ms Ton Thi Ngoc Hanh, Vice Chairwoman of Dak Nong Province and also Director of the Dak Nong UNESCO Global Geopark. Without her consent and ongoing support, the ISV would not have happened.

Ms Hahn made time to be present for periods during each day of the presentations in Gia Nghia City as well as during the evening social activities. Ms Hanh also made a special journey to Dray Sap to welcome participants to the gala banquet on the first night of the field trip. For many months I was in regular contact with Dr Tran Tan Van of the Vietnam Institute of Geosciences and Mineral Resources, who played a key role in the early days of organising the ISV. However, it is Mrs Tran Nhi Bach Van from the Dak Nong Government (and also a member of the Management Board of the Dak Nong Geopark Management Board) and Mr Ton Ngoc Bao, of ExpTravel and also an adviser to the Geopark who deserve our special thanks. They worked in close consultation with the Commission over many months to organise the ISV despite uncertainties resulting from the Covid-19 pandemic and deteriorating economic circumstances in many countries.

On behalf of all Commission members, I thank everyone in Vietnam who contributed to the success of ISV20.

You can read more about ISV20 elsewhere in this issue of the newsletter.

Comments on Cave Management

During ISV20, Dak Nong officials expressed interest in receiving comments from field trip participants on their observations and management suggestions to assist them in managing the new Dak Nong UNESCO Global Geopark. The Commission collated the individual comments and forwarded a consolidated document to Dak Nong on 20 January, 2023. The consolidated comments covered a range of cave and surface management issues and we suggested that they were considered along with the presentations on cave management given at ISV20 and also the UIS Guidelines for Cave and Karst Protection, noting that while the focus of the UIS Guidelines was on caves and surface issues in karst areas, many of the guidelines were equally applicable to volcanic caves.

Newsletter

I am very pleased that Laurens Smets (Netherlands) and Carlos Benedetto (Argentina) recently stepped forward and offered to take on the role of producing the Commission's newsletter. That this February issue has appeared now, is essentially because Laurens offered to do it. For future issues, Carlos will be the Editor, with Laurens assisting where he can. As the newsletter is produced in English, which is not the first language of either Laurens or Carlos, there may be occasions where they need additional assistance. This means authors should double check their contributions for possible grammar and spelling issues, and also be factually correct, as has always been the case. I will also be assisting with proof reading.

ISV20 Proceedings

The ISV Proceedings are very close to being finalised and digitally published.

ISV19 Proceedings

The ISV proceedings are now, finally, at a very advanced stage. I consider the document is essentially complete, with only minor finessing of layout, checking and proof reading now outstanding. Then it is all up to the ISV19 organisers.

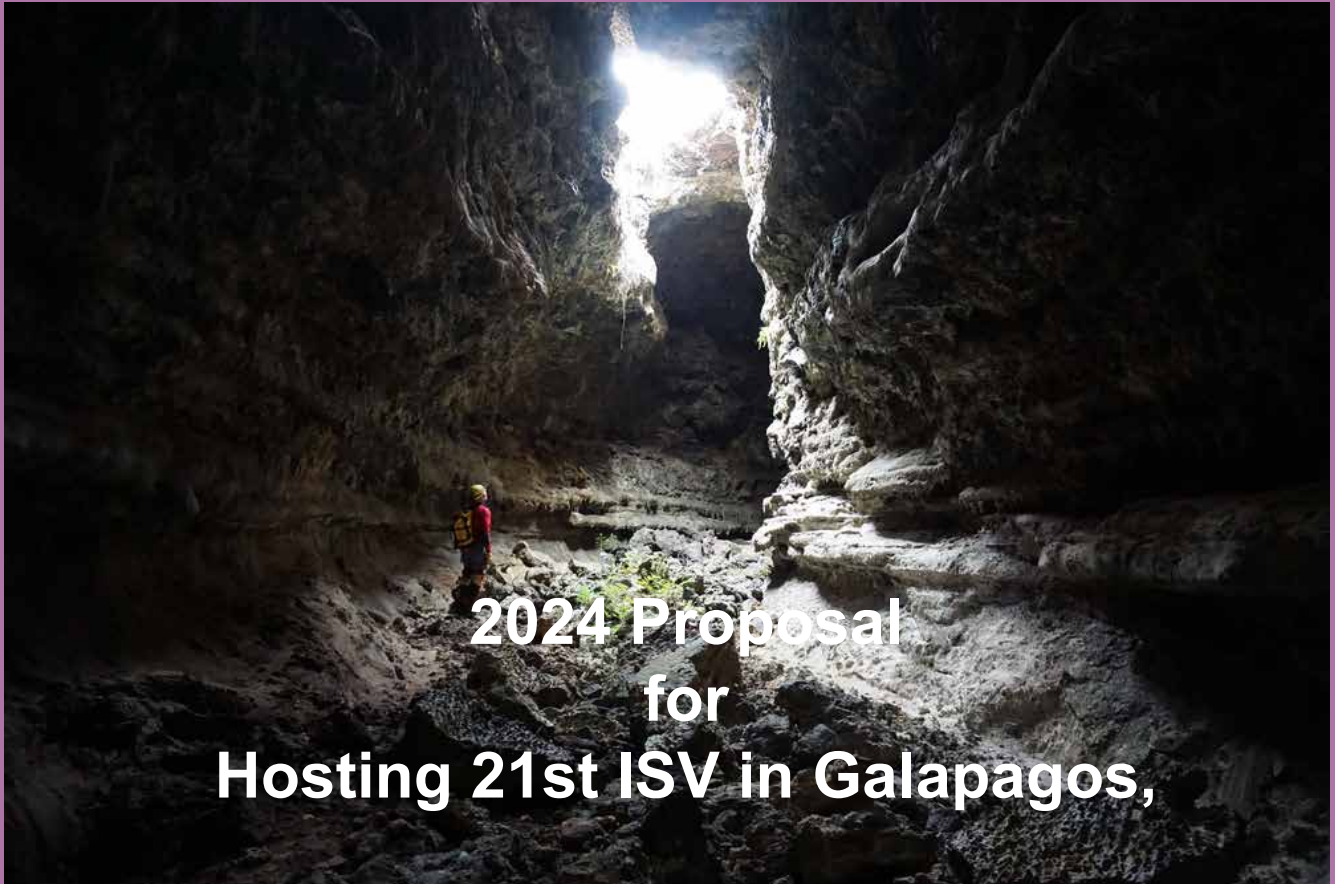
ISV21

Thank you everyone who offered comments over the last several months on the location and timing of the next ISV, due in 2024. Ultimately, there was only one firm offer and the Commission has now accepted it.

ISV21 will be held in the Galapagos Islands. It will be based in Puerto Ayora on Santa Cruz Island. Puerto Ayora is the largest town in the Galapagos and has good air access from the mainland, meeting facilities, plenty of hotels and restaurants and spectacular caves nearby. Field trips will include visits to several islands. Precise dates have not yet been fixed, but ISV21 is likely to be in the March-May period. Further details will be distributed as they become available.

I look forward to seeing you at ISV21 next year.

John Brush
President
UIS Commission on Volcanic Caves



**2024 Proposal
for
Hosting 21st ISV in Galapagos,**

2024 marks ten years since the last ISV event held in Galapagos. The archipelago made famous by Darwin continues to reveal its subterranean secrets as dedicated survey and science expeditions systematically explore the islands. In 2020 teams announced that the longest known lava tube in South America had been discovered and continues to be pushed by exploration teams. We propose visits to this cave system and other new discoveries as the backdrop for the UIS Commission on Volcanic Caves to meet, share presentations on local and global vulcanospeleological topics and explore the UNESCO World Heritage Centre and Biosphere Reserve for the 21st ISV in early 2024.

Organizers: Aaron Addison, Theo Toulkeridis, PhD.

When: March - May timeframe, 2024 (exact dates to be confirmed with UIS Commission on Volcanic Caves)

Location: Puerto. Ayora, Santa Cruz Island Galapagos, Ecuador

Proposed venue:

Auditorium located less than 200 meters from main hotel area in town with capacity for ~100 comfortable seating.



All pictures by Aaron Addison



Proposed Schedule:

Pre-conference trips

During the week prior to the main ISV event there will be opportunities for trips in original exploration and survey, geologic inventory, biology, and photography. Visits to the islands of Isabela, Floreana, and San Cristobal for visiting caves may be possible depending on sea conditions.

Expenses for pre-conference participation will be on your own (hotels at negotiated rates).

Notes:

1. All arrivals to Galapagos must transit through Ecuador mainland unless arriving by boat.
2. Hotel rates will be on your own at a ISV negotiated rate. Though room rates are unknown at this earliest stage, proposed dates have been chosen to be in off peak tourist season to minimize costs for lodging.
3. Though meals will be provided for several ISV activities, other meals will be on your own. Costs for meals can be reasonable for less than \$20/meal.
4. All COVID regulations for island visitation must be respected and followed. Currently there are no known restrictions, organizers will monitor regulation changes and communicate any updates to ISV community.

Day	Activities	Location	Main ISV 21 Proposed Schedule
Saturday	Early Arrivals\ Registration \ Pre conference photo-survey -exploration trips ending	Airport (Baltra), field	
Sunday	Local field trips \ main Arrivals day \ registration open	Around Pto. Ayora, airport (Baltra)	
Monday	Symposium opening and keynote presentation \ Afternoon presentations \ evening welcome reception	Pto. Ayora	
Tuesday	Symposium presentations \ closing of presentations and	Pto. Ayora	
Wednesday	Wild caving field trips (options for all skill levels)	In the field	
Thursday	Depart for Isabela	Early departure to Isabela, evening dinner on Isabela	
Friday	Visit sulfur fumaroles in caldera of Sierra Negra and caving opportunities, evening closing reception	In the field, Pto. Villamil	
Saturday	Additional caving field trips and early departures	In the field, airport	
Sunday	Field trips on your own \departures	Field \ airport	



The ISV20 Extension

A tribute to the International Symposium on Volcano speleology Vietnam

By Laurens Smets

(with assistance of: Lou Slangen and Rene Haemers)

From 21-26 November 2022 the ISV from the Commission on Volcanic Caves (UIS) took place in Dak Nong Vietnam.



An unforgettable happening, well organised including lots of shows all related to caves, the indigenous inhabitants and the environment.

Words fail to describe the enormous efforts the organisation put into this event to give us, the commission members, and another 100 dreds of Vietnamese invitees an unbelievable unforgettable remembrance on Vietnam. On the warmness and hospitality of the people, the endless energy to please others.



John Brush, the Commission Chairman, giving one of his speeches (Photo by Geoparque Dak Nong, 2022)

The ISV20 consisted of 4 ceremonials plus session days and 2 short- plus main trip days. These last days in the field where in fact we all came for. Taste and smell the lava caves on the other side of planet earth was the main objective for most participants.

It was on one of these last days we just coincidentally saw a lead going off in one of the longest lava caves in southeast Asia, a cave called C7.

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This cave was explored in 2014 by the NPO, the Volcano-speleological society of Japan. The length at that moment 1067m. caused by all the parallel galleries going off.

The cave starts in a breakdown with a shaft of 11m. into the dense vegetation. Downstream and upstream the lava flow, the galleries are walking size like tunnels.

Due to the rare fact that in heavy rain periods the galleries downstream turn into a riverbed and the water washes down towards tight squeezes, the cave becomes one big muddy system.



C7 entrance tunnel. (Photo by Dave Bunnell, 2022)

Branched section at the West side of C7 (Photo by Dave Bunnell, 2022)



Upstream into a damp west end of the cave we found on the first day of the field trips a small squeeze leading under the floor through a crawling bit into a nice chamber. Galleries leading off in all kinds of directions, looking like a good maze. In the east as well in the west ending in a boulderchoke.

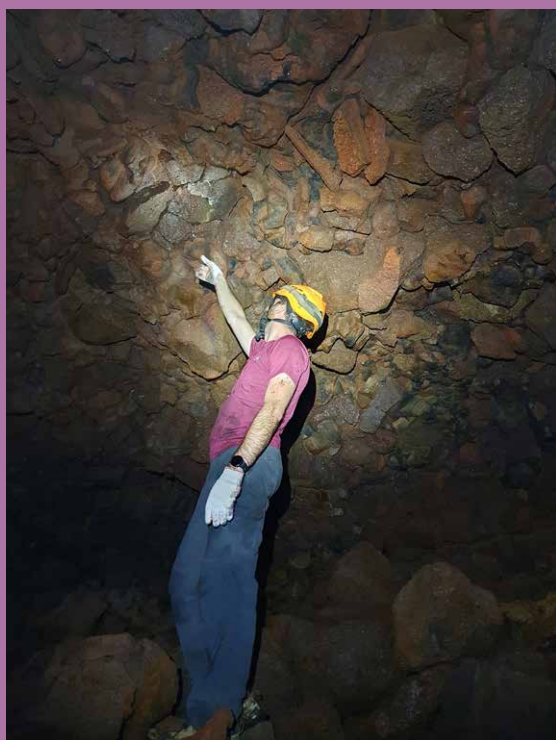
BUT the galleries, as new as they were, contained really very nice, rare features.



*a strange, melted feature in the extension ISV20
(Photo's by Laurens Smets, 2022)*



Rene Haemers at a water bucket extension



Rene Haemers looking at a conglomerate-like roof in the extension ISV20 (Photo .Smets, 2022)

Several minerals on walls and floor. All kind of colours, and last but not least: no mud!

In one gallery we found even a false floor containing 2 bridges. Several spiders could be found.

It appeared to be a maze of 4 parallel galleries of around 40m. long making the Extension ISV20 more than 199m. long.



Rene Haemers at a false floor

A true tribute to the organisers of the 20th International Symposium on Volcano speleology in Vietnam.

A present to them all making C7

with a length of 1266m. a strong leader as longest lava cave in South East Asia and now on spot 181 of longest in the world. What more PR can you have than this novelty for an Unesco Park in development like Dak Nong.

C7

**Krong No Volcanic Geopark, Xã Nam Dá
Commune, Krong No district, Dak Nong province,
Vietnam**

N12°30'28.8"; E107°54'41.6"/ 416m. asl

Length: 1266m.

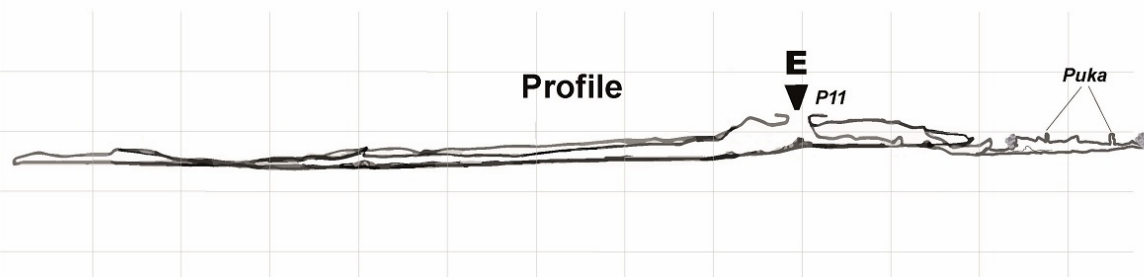
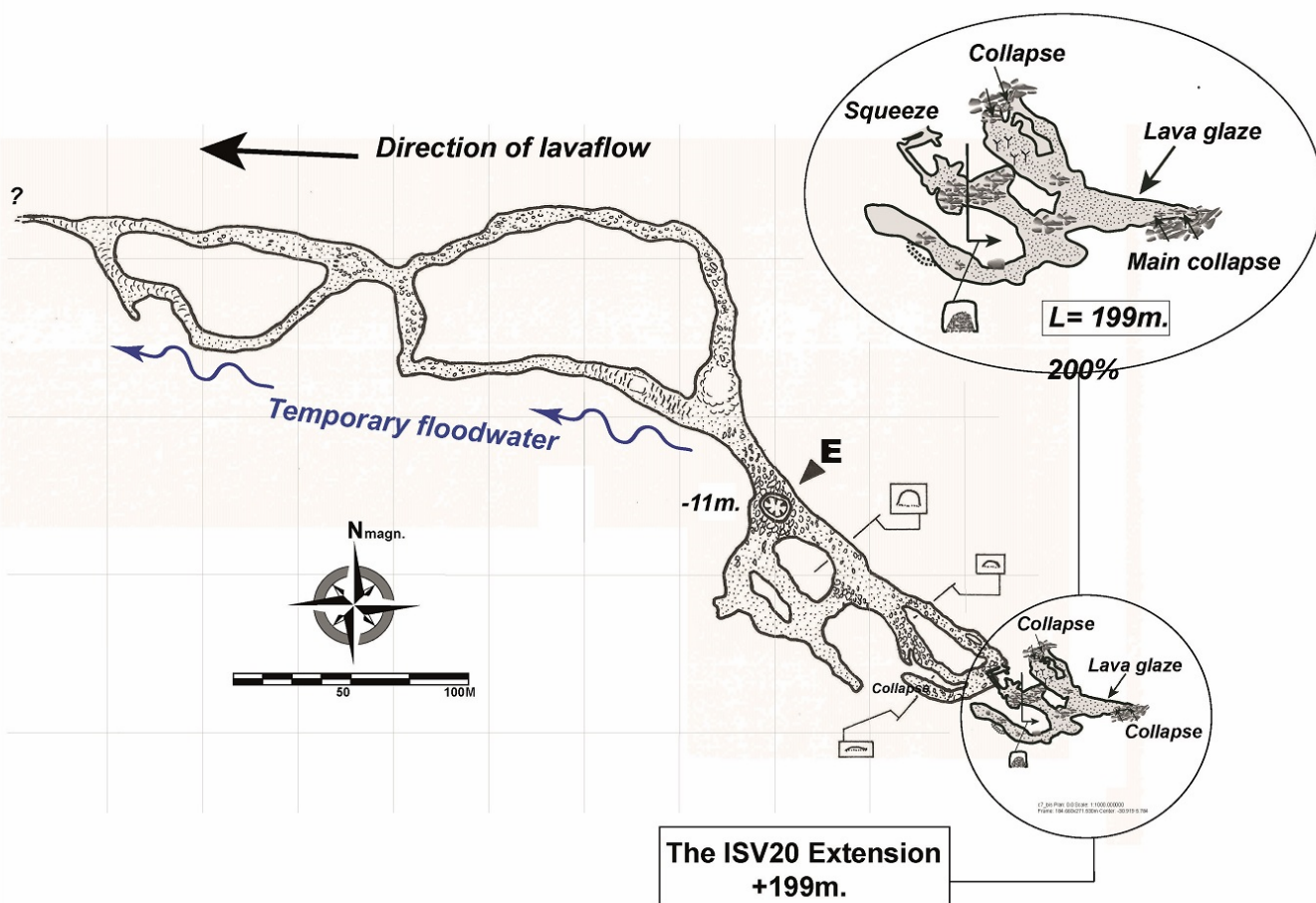
Simplified according to Honda et al.(2015)

First surveyed 2014 by NPO Volcano-Speleological Society of Japan

Original cartography: Yuriko Chikano & Hirohisa Kizaki

ISV20 Extension 2022 Surveyed by Laurens Smets & René Haemers

Drawing by L.M.J. Smets 12/2022



The Levantine Juba Depressions as Terrestrial Analogs for Planetary Pits

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(Publication with the permission of the primary Author)

Abstract

Geological depressions, such as pits, abound on the surface of Mars and other planetary bodies. Despite their ubiquity, the origin of many depressions remains poorly constrained, partially due to the current paucity of suitable terrestrial analogs. Here, we present a new terrestrial analog site with geological depressions that morphologically resemble Martian bowl-shaped pits. The analog site consists of tens of geological depressions (locally named “juba”), which occur within a Pleistocene basaltic plateau that overlies Meso-Cenozoic carbonates. This plateau is located at the northwestern margin of the Levantine volcanic field of Harrat Ash-Shaam along the Dead Sea Transform. We constrained plausible formation mechanisms for the terrestrial juba depressions by a combination of detailed field mapping and morphometric analyses of a 0.25 m/pixel LiDAR-based digital terrain model (DTM). We show that variable magnitudes of slope asymmetry between the north- and south-facing walls within the juba depressions together with different degrees of sediment infilling provide effective proxies for the geomorphic maturity of these landforms, which in turn indicates asynchronous formation of the juba depressions after the Pleistocene emplacement of the Harrat Ash-Shaam basalts in the study area. Our findings preclude phreatomagmatic explosions as the juba depression formation mechanism, indicating instead that these pits formed by collapse into missing subsurface volume. We more broadly propose that the morphometric analyses developed in this study can be extended to constrain the formation mechanisms of similar pit features on Mars and other planetary bodies.

THE “JUBOT” DEPRESSIONS AS TERRESTRIAL ANALOGS FOR PLANETARY PITS.

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A paper presented at the 50th Lunar and Planetary Science Conference in March 2019.

Included in this Newsletter with the permission of the primary Author.

Introduction: The nature of many geological depressions on the surface of Mars and other planetary bodies remains poorly constrained partially due to the paucity of terrestrial analogs. A better understanding of possible formation mechanisms for martian depressions may provide valuable information about subsurface stratigraphy and Mars' climatic and hydrological history. Here, we explored the formation mechanisms for terrestrial geologic depressions that occur within a stratigraphy analogous to martian terrains and the possibility that some of the martian depressions may have been formed by collapse into subsurface voids.

We focus on a series of terrestrial depressions in the northwest margins of the Levantine volcanic field of Harrat Ash-Shaam. These depressions are locally named “jubot” (singular “juba”) and morphologically resemble martian bowl-shaped pit craters [1]. The jubot occur on a moderately sloping Pleistocene basaltic plateau, which is underlain by Mesozoic to Cenozoic sedimentary rocks. The underlying sedimentary units record past tectonic stress fields, and are comprised mostly of carbonates, which are regionally known to be susceptible to karst. Several depressions, morphologically similar to the jubot, occur on carbonate rocks that outcrop near the jubot [2]. This stratigraphy bears similarities to many locations on the surface of Mars, where volume changing geochemical processes could induce surface collapse.

We tested two previously suggested formation mechanisms for the terrestrial jubot:

- i) explosion by volcanic gas eruption.
- ii) collapse into subsurface karstic or

Methods: We mapped stratigraphy and measured fracture orientation at the jubot sites. Surface morphology was characterized with a 0.25 m/pixel digital elevation model (DEM) (from 8 pts/m² airborne LiDAR) covering 35 km² (Fig. 1b) and a cm-scale ground-based LiDAR scan of a bell-shaped pit (Bell Juba) with an interior hidden from aerial view (Fig. 2). Orthophotos and digital surface models (DSM) from drone imagery were acquired for selected sites (Fig. 1a and 2).

Morphometric Analysis: Most basaltic jubot are of similar scale except one juba, known as the Big Ju-ba, with a volume that is at least an order of magnitude larger than all others. The limestone depressions are within the scale of the majority of the jubot by every measured geometric aspect (Fig. 3). The depth to diameter ratio (d/D) of martian pit craters ranges between 0.08 and 1.99 [1]. Existing analogs for martian pits, pit craters in Hawaii's east and southwest rift zones, cover only a part of this d/D range (between 0.17 and 1.7) [3], whereas the d/D range of morphologically mature jubot is 0.06 to 0.31 (neglecting a bell-shaped cave, which has an anomalous geometry). Thus, in certain aspects, the jubot are an analog for martian pits with d/D in the lower part of the range (Fig. 3). The bell-shaped cave, known as the Bell Juba, has d/D within the range of martian type 1 (bell shaped caverns) atypical pit craters [4].

Jubot with wider sediment-filled bottoms tend to display greater asymmetry between their north and south wall slopes. Each of these two independent measures implies that the jubot vary in geomorphological maturity, suggesting different timing of collapse, or even different timing of subsurface void formation that triggered the collapse (Fig. 4).

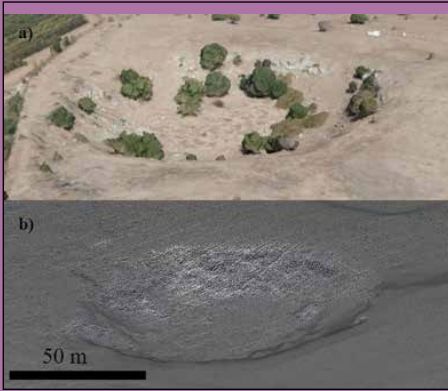


Figure 1: A typical bowl-shaped juba. a) DSM from drone photo-grammetry. b) DEM from airborne LiDAR.



Figure 2: DSM of the Bell Juba and its surface (credit: Iyad Swaed).

The jubot form linear clusters and have weakly elongated shapes in plan view. Individual jubot elongation trends peak in the directions north and east-northeast, and are either quasi-parallel or perpendicular to the azimuthal trend of the cluster to which the individual jubot belong. Similar trends can be seen in the surrounding geologic structures, like cinder cone lines and Dead Sea Transform-associated faults. To test the hypothesis of jubot formation by collapse into subsurface voids we looked for morphologies consistent with a collapse origin. We detected:

- i) Outer quasi-concentric stairs (slump scars?).
- ii) Subsided surroundings that may predate or postdate the main collapse.
- iii) Wall and floor stairs and inner depressions of secondary/gradual collapse.

To test formation by explosion, we looked for the remnants of elevated topography around the rims of the depressions. No elevated rim morphology was found for any depression, at all scales resolvable in the DEM. Conclusions: The basaltic, limestone and bell-shaped depressions are all surface expressions of the same

formation mechanism. The varied morphological maturity of the jubot implies different formation times. Their spatial distribution, elongation axis and cluster azimuthal trends suggest a response to past and present stress fields.

We reject the explosion hypothesis due to the lack of elevated rims, and conclude that the jubot formed by surface collapse into subsurface voids. The origin of the voids, karstic or volcano-tectonic, cannot be discerned with the existing data, and we are currently investigating these two possibilities with a combination of detailed field mapping and tomographic methods. The jubot provide a special opportunity to develop the linkage between subsurface processes and their surface morphological expression. Application of the insights gained in this study to martian depressions may yield valuable information on the subsurface and history of Mars.

References:

[1] Wyrick D. et al. (2004) JGR, 109, E06005.
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 [3] Okubo, C. H. and Martel, S. J. (1998) Vol. Geotherm. R., 86, 1-18
 [4] Cushing, G. E. et al. (2015) N. J. Geophys. Res. Planets. 120, 1023–1043.

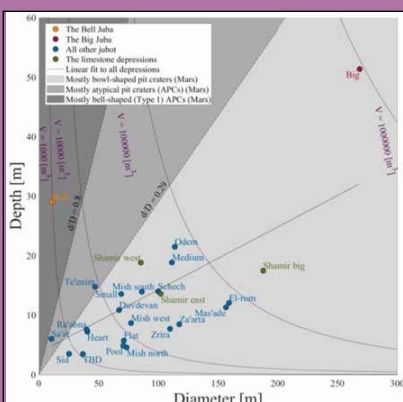


Figure 3. Jubot depth vs. diameter. d/D ranges of martian pit craters are colored in gray. The purple lines are contours of equal volume of a cone with a given depth and diameter.

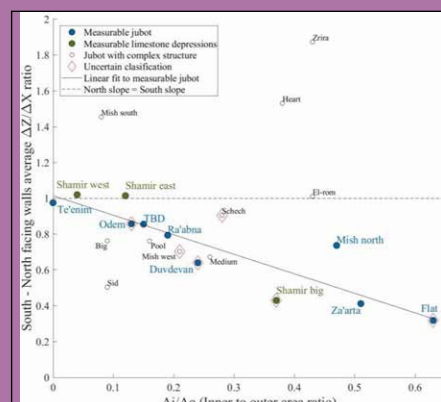


Figure 4. Ratio between average slopes of south- and north-facing jubot walls, vs. the ratio between jubot floor and rim surface area (Ai/Ao). Empty circles are disturbed jubot.

The 20th ISV (International Symposium on Vulcanospeleology)- Dak Nong Province, Vietnam November 2022

By Dave Bunnell

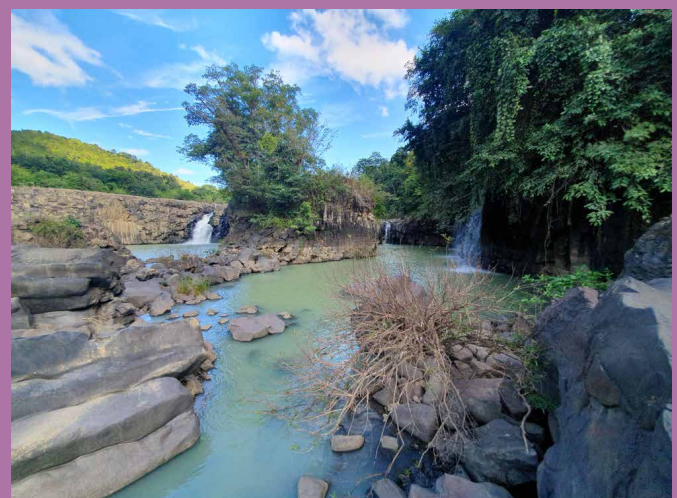
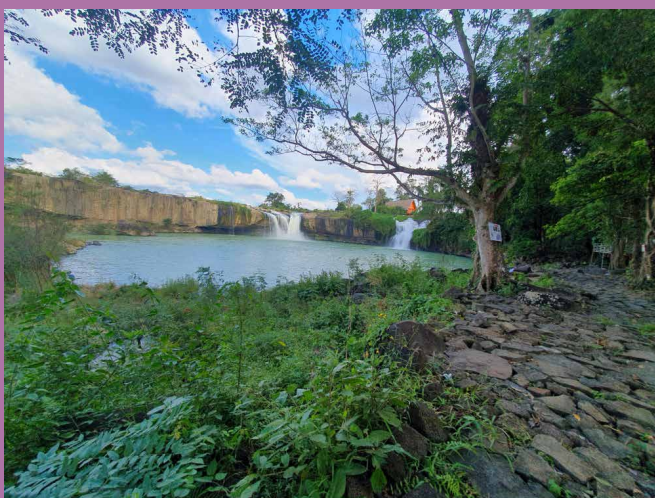


Dave Bunnell preparing for a caving trip.
Photo by Dak Nong Geopark

For a selection of more pictures of Dave Bunnell you can visit:
<https://davebunnellunderearthimages.zenfolio.com/p125079497>

Cavers who follow international caving events are largely familiar with the UIS Congresses that occur every four years, the most recent being in France this past summer. The UIS has various commissions and the only other one that also has regular symposia meetings is the one for Vulcanospeleology. The group has a bi-annual newsletter and meetings every two years in places that have lava tubes to visit. Two have been held in the USA recently, in Lava Beds California (CA) and in Hawai'i. The most recent one I'd attended was in the Galapagos in 2014. My first was in Hawai'i in 1991, organized by Dr. Bill Halliday and was the first of my many trips to the lava tubes there.

Southeast Asia, though, is not a place one thinks of as having lava tubes, and thus the idea of an ISV in Vietnam seemed intriguing. The venue was the Dak Nong UNESCO Global Geopark in southern Vietnam, a recently designated UNESCO Global Geopark that includes several volcanoes and some scenic waterfalls that tumble over basalt cliffs as well as caves.



Photos by Laurens Smets

There are some 50 lava tubes known in the Geopark, all thought to have originated from flows of the Nam B'Lang Volcano some 780,000 years ago. The lava field occupies a large area of about 400 km². The caves are found on all



Location map of the caves in the Krong No volcanic field (“Map courtesy of Torsten Kohn (Rehfeld, Germany), published in volume 74 of the Berliner Höhlenkundliche Berichte (2018© ”). With permission of M. Laumanns

sides of the volcano with some over 10 km away.

They are in several distinct groupings and are identified not by name but by letter-number combinations:

A, B, C, P, or T with a sequence number. These are mostly not extensive caves, the longest being just a bit over a kilometer in length. Known as C7, this is considered the longest lava tube in the park and in Southeast Asia as well. Another cave, P8, is considered the deepest such lava tube, with a freefall drop of 26 meters to enter.

Altogether there is a bit over 10km of cave mapped in the park. Most all the caves had been explored and mapped by expeditions organized by the Vietnamese National Museum of Nature starting in 2007. The first real mapping got under way in 2014 with teams of Japanese cavers and in 2018 an international team headed by Michael Laumanns and also involving the Vietnam Institute of Geosciences and Mineral Resources (VIGMR), completed surveys of most of the other known caves.

I was at first hesitant to go, as the images of the caves didn’t look very photogenic compared to the Hawaiian caves I’ve been exploring for many years. And it was a fairly pricey conference, even on top of the expensive airfare. However thanks to John Brush, chairman of the Volcanic commission, the Geopark became aware that a “famous” cave photographer was considering attending and offered to facilitate part of our trip so that we could stay a bit longer to take photos after the scheduled field trips.

ISV meeting

Most international participants came through Ho Chi Minh City (formerly Saigon), and the Geopark organized a couple small transports to ferry people to the park headquarters in Gia Nghia, about a 5 hour drive away. We based here for 3 nights in a fancy hotel called the Lodge Resort Hotel, which had pleasant rooms, breakfast, landscaped grounds, and a small atrium. For some reason they had decided to keep a rooster in that cage just outside our rooms, unfortunately one of those circadian-challenged types that crows all night long. Were I writing a hotel review this would certainly cost them a couple stars, but other than that it was a great base for our stay in the biggest city in the province.



Photos by Laurens Smets and Dak Nong Geopark

As caving conferences go, this one was stellar. Buffet lunches, coffee breaks with snacks during the day, and followed each evening with more extensive buffet meals and entertainment provided by indigenous groups that highlighted their music, song, and dance. All manner of unique instruments were in use. The first night we were also introduced to the practice of sharing a large keg of fermented rice liquor with three long straws for a trio of guests to imbibe simultaneously.



John Brush gives his welcome speech



Representatives from the Commission on Volcanic Caves and UNESCO with Vice Chairwoman of Dak Nong Province.

As these conferences go it did not attract many international visitors, maybe 18-20. The largest contingent was Australian (6), some from Japan and Korea, a few from Europe (Netherlands, Spain and Germany), two of us from the US, and another American / Australian residing in Laos. With so few of us, by the end of the first few days we all knew each other by name. But to expand the event and make it more noteworthy, a parallel conference on geoparks organised by Dak Nong provincial government officials was held in conjunction. Many of those participants had positions in Geoparks in other countries in the Asian region. There were also a cadre of six or more media folks who were covering the event, much of it focused on our small group, and some of the included photos were provided by them.

Symposia

The first morning kicked off with an opening ceremony with speeches by provincial leaders, UNESCO and Geopark officials, and three keynote addresses. After our first buffet lunch was the first of 3 paper sessions devoted to geology/geomorphology/volcanic processes/cave exploration and documentation. There was also a print exhibition of "volcanic caves and volcanic wonders" with several dozen prints. At the park's request I had earlier provided some images which they printed for this, about a dozen including Hawaiian caves, Icelandic Caves and volcanic features, Lava Beds CA, and one from the Galapagos. There were also many from the caves in the park. Some groups of English teachers were on hand to give some information about them to the non-Viet speakers. We had lunch one day with a group of them and were surprised to find out that learning English was mandatory in Vietnamese schools starting in the earliest grades.

Almost all the attendees, including me, gave a presentation, with many also provided by Vietnamese attendees discussing the formation of the caves in the park, and various management concerns.



*Alice Buhrich, from Australia
Photo by Dak Nong Geopark*



*Min Huh, from Korea
Photo by Dak Nong Geopark*



*Tran Tan Van, from VIGMR/ MONRE
Vietnam
Photo by Dak Nong Geopark*

UIS Commission on Volcanic Caves Newsletter No.80

Day 2 was a full day of talks divided into two sessions: Human uses of caves/ biology/ volcanic processes/geology/cave management and protection. Some were attending the symposia remotely, and also giving talks, such as Pat Seiser, who spoke on Management of volcanic caves in US national parks, and Stephan Kempe from Germany who spoke about his theories of lava tube development. He has some interesting ideas based on observations from Hawaiian tubes, and thinks rather than lava tubes they should be called pyroducts. He has published his observations in, among other places, the Hawaiian Speleological Survey (HSS) newsletter.

Field trips

On the afternoon of the second day, we had a visit to the Gong house of the Ma people, which had some displays of local instruments, especially gongs of various sizes and demonstrations of weaving, which Elizabeth tried, much to the interest of our media entourage. We also sampled some local Jackfruit, one of the biggest fruits I know of that grows on a tree, and about the size of a watermelon.



Photos by Dak Nong Geopark

After the final day of papers, session 3 in the morning, we loaded up for a couple hour's drive up north to the town of Dak Nong, which was to be our base for four nights while we visited the caves. That evening was the mother of all buffets, huge spreads of food, nicely labeled with their Vietnamese names. My favorites were the deep fried spring rolls and the rice pancakes filled with sausage. Entertainment was again provided by some of the ethnic subgroups who reside in the area, with song and dance. Groups of women danced through a moving pole challenge**, where 5 pairs of women on each side moved long poles back and forth along the ground in time with music, and those who could follow it with their feet could advance through as the poles were moved. If you messed up your feet could get scrunched by the pole! They had a contest of sorts for us foreigners, which Elizabeth did quite well in with her dance background and she was declared the winner. She was awarded a hand embroidered cap which one of the ladies took off her own head and placed on her.

Caving at last

Two days were allowed for those who signed up for caving field trips. There were several groups, mainly those wanting to do the two vertical caves offered and those who wanted only horizontal caves. I had signed the two of us up for the vertical caves, one for each day. I think some other smaller caves were to be included but we ran out of time.

The first cave we visited was the deep one, apparently the deepest lava tube in SE Asia. With the catchy name of P8, this one has a 26 meter, mostly freefall drop. For the visit the conference people had hired a special "ropes" team,



Entrance of P8. Photo by Dave Bunnell

who had rigged the cave an elaborate setup that allowed for either normal SRT or lowering and hauling people out. We hadn't brought our vertical gear but they had loaner sets, which included the sketchiest looking footloops I've seen, but I suppose they were strong enough. They seemed surprised that this old guy (me) wanted to climb out on my own since I could be pulled out but hey, not my style. The small opening immediately belled out into a large chamber, perhaps the largest I've seen in a lava tube. Cool roots spread out all over the walls on the top 5-10 metres providing some exotic looking transition from the surface. At the bottom, very large passage headed off in each direction. There was lots of break down, so not much in the way of intact flow features,

but there were quite a few calcite deposits of small stalagmites. And on the floors, there was lots of wet guano that you could sink into up to a foot in places. I began my photography immediately as I had jumped to the first place in line, so I could set up and get Akira Miyazaki in his bright blue suit in my photos. At the bottom, I corralled various people in our group of a dozen or so to help out. At least one of them was a prestigious professor of geology from Hanoi University that had sponsored the earliest studies of the caves.



*L + R: Cave P8.
Middle: Cave C7
Photos by
Dave Bunnell*

Caving Day 2

Next day we had another vertical cave with a catchy name, the C7. This was said to be the longest lava tube in SE Asia at a bit over a kilometer in length. The rope team was on hand again with ropes and a ladder this time, which had been supplied by the Australians. Elizabeth and I opted for that for the 10 meter drop, though I rapelled in. This drop was into a huge entrance puka lined with abundant mosses and ferns, which covered the floor and a bit beyond the dripline. As in the last cave there weren't a lot of floor or flow features, so the main thing of interest was the sheer size of the passage. In the end I couldn't get many photos, as once we got away from the entrance, the passage became quite foggy and pretty much ruined the attempted photos.



Entrance of C7 cave. Photo by Dave Bunnell

But we explored the full cave and more, in the case of a Dutch caver (Laurens) who went through a short crawlway that ended up opening up! Laurens and Rene actually returned the next day and surveyed another couple hundred meters, which caused great excitement for the park's publicity folks. Apparently there were still promising leads left when they called it a day.

The next two days of caving were add-ons, photo trips to repay the park for covering our conference costs. On these two days we basically visited the large horizontal caves that the other groups had been visiting while we explored the vertical caves. Several of these proved to be the most photogenic ones we saw.



Entrance of P8. Photo by Dave Bunnell



Entrance of C7 cave. Photo by Dave Bunnell



Entrance of C7
Photo: Dave Bunnell



Entrance of C7 cave
Photo: Dak Nong Geopark



Entrance series of C4
Photo: Dave Bunnell

Horizontal caving day 1

We hit several caves in the "C" series; C1, a short cave with handline climb down a strangler fig in the entrance, with the objective of getting sunbeam shots, which were better than expected. It was also one of the few caves where I found intact flow lines in the walls.

C3 and 4 are considered two separate caves though really a single cave with a broad collapse puka. Together they are a bit over 900m in length. C3 had some classic tube passage with intact gutters and a huge passage separated by a large pillar into two passages. The C4 section had some nice jungly entrances with numerous strangler figs that made it more challenging to cross the puka that one had to cross to continue. In one passage a thick root segment traveled probably 15 metres down the side of a passage before never reaching water.

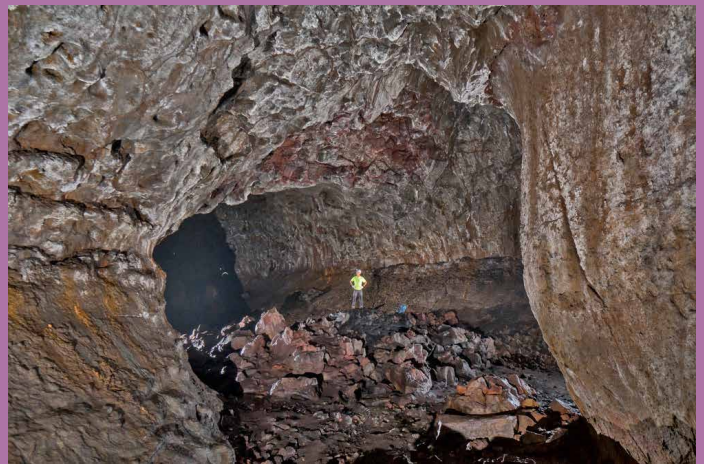
Finally there was the 6.1 cave, another beautiful puka entrance with mosses, plants with immense body-sized leaves, and a huge gate across a side passage. The gate was to protect an archaeological site, where human bones and various prehistoric tools were found by the Hanoi-based Vietnam National Museum of Nature.



Entrance of C1. Left: Lou Slangen showering in sunbeams
Photos by Dave Bunnell

Horizontal cave day 2

Our fourth and final day of caving focused on another segmented cave, the C8+C9 caves, together almost 900 m in length. C9 has a gorgeous entrance with long hanging ferns as its highlight. C8 is arguably the nicest and most photogenic of the caves. It has probably the largest passages I've seen in a lava tube, and several lush, verdant entrances. One of these displayed a spectacular sunbeam, which because of its large width was split into about 7 separate beams. There also seemed to be quite a few bats flying about in this one, but I never got a close look at any of them. In between visiting the two caves, our hosts for the day had built a fire, roasted a couple chickens, and whipped up a tasty soup. It was embellished with various greens they had picked from the nearby area.



Top: C8 cave Down: entrance from C9 cave . Photos by Dave Bunnell



I should note that, for the most part, the park has not yet really pushed for a lot of tourist caving. I think these horizontal caves are the only ones open and guides are required to visit them. Indeed, they had contracted with one of the tour companies to run both the IVS excursions as well as our smaller photo

group for the subsequent days. After our visit, John Brush, chair of the Volcanic Caves Commission, gathered comments from several of us regarding proposed management of the caves, which the park staff had asked for. My comments focused on protecting the beautiful vegetation in some of the cave entrances and pukas by making an established trail through each, and also to figure out what times of year are best to avoid visitation to protect the bats found in C8 and P8.

***I never found out what they called this dance form but it is similar to what is called Tinikling or Singkil in the Phillipines*

Acknowledgments

I'd like to thank the Geopark staff, and especially Mrs Tran Nhi Bach Van, who was the park's coordinator for the ISV, for hosting such a well-organized and memorable event, and John Brush, President of the Volcanic Caves Commission, for his work with park and government officials to ensure the event's success.

Finally, I commend the efforts of the two Vietnamese cavers that organized and guided our trips in the caves: Ton Ngoc Bao ("Bao") and Phan Duy Linh, who were most congenial and so very helpful with the photography. Bao also did the presentations program and collected abstracts and papers in the weeks leading up to the ISV.



Dr. Tran Tan Van leading a field trip
Photo Dak Nong Geopark



ISV20 participants at the end of the closing ceremony
Photo by Dak Nong Geopark



The Dray Sap Waterfalls
Photos by Dave Bunnell

Roberto Conti

Introduction

By John Brush

Roberto Conti, a highly-regarded member of the Commission, passed away in Milan, Italy on 23 July 2022, following post-operative complications. He underwent major surgery in June 2022 and was in fine spirits in the days following the operation and he told me he was recovering well. Unfortunately, complications soon emerged and Roberto remained in hospital for several weeks as his condition fluctuated. His wife, Olga Lucherini, said Roberto remained positive and put up a valiant fight, but ultimately lost the battle.

Roberto was a very warm, intelligent and caring person who was passionate about many things including good food, wine and coffee, Italian - and especially Milanese - history and culture, the outdoors and of course, caves. He is survived by Olga and their daughter Fatima and also by his wonderful mother, who Marjorie and I had the pleasure of meeting and having lunch with at her home in 2019.

I first met Roberto in 2017 at the International Congress of Speleology in Australia and he quickly became a good friend. Marjorie and I enjoyed hiking with Roberto in the Italian Alps and we also did a memorable day trip with him and his good friend Sandro Ghidelli in the Mt Grigna karst area above Lake Como.



Roberto and Sandro Ghidelli in the Mt Grigna karst.



Roberto hiking in the Italian Alps

Roberto was a passionate and enthusiastic member of the UIS Commission on Volcanic Caves and was a strong supporter of the International Symposi-ums on Vulcanospeleology (ISVs). His first was the 4th ISV, which was held at Catania in Italy in 1983. While he always maintained his interest in volcanic caves, his principal caving focus for many years was karst in Italy. After a long association with the Commission, Roberto formally joined in 2017 and again became an active participant in its activities, including the ISV at Lava Beds in California in 2018 and the ISV in Catania in 2021.

In fact, Roberto, and also Olga, worked very hard behind the scenes to help organise the Catania ISV and ensure its success.

In 2019, Roberto agreed to take on the newly-established role of the Commission's membership officer. He quickly formalised the Commission's membership list and set up and continued to manage the online membership application process.

In view of Roberto's substantial efforts in furthering the objectives of the Commission, I thought it would be appropriate in noting his passing to mention more of his caving background. However, as I was not familiar with his wider contributions to speleology, I asked Olga for some help. Olga compiled the following notes after consulting with Sandro Ghidelli and sent them to me late last year.



At Heppe Chimney in the Lava Beds National Monument, California.



Roberto at the entrance of a small lava cave, Lava Beds National Monument, California.

Roberto Conti's speleo life

By Olga Lucherini

Roberto's first cave

At age seven, Roberto and his four year old brother Renato went with their dad to visit the Grotte di Toirano, about 200km from their home in Milan. Even at that tender age, Roberto was highly impressed by the size of the halls and the speleothems.

The emerging speleo

On a bulletin board at the University of Milan, where he was studying Mathematics, Roberto saw an announcement that the Gruppo Grotte Milano (GGM) was looking for new members. Roberto immediately signed up for a range of activities and took the beginners' course.

Several years later he left the GGM and together with a small group of friends, founded the Gruppo Grotte Busto Arsizio (GGBA) in the nearby town of Busto Arsizio. There he helped to draft the statute of the group and served the group in many positions over the years.

Roberto's activities

In the seventies and early eighties Roberto and the GGBA devoted a lot of time and energy to the exploration of numerous caves in the Varese area. Around 1975, the aqueducts of two small towns in the Varese area were temporarily polluted and the local authorities turned to two speleologists, Paolo Amedeo and Ranieri Piazza, to find out what the causes were. The two of them asked GGBA to collaborate, given their knowledge of the area. The outcome of this substantial work was published in 1978 with the title *"Karst and Hydrogeological Hypogean Phenomena of the Monte San Martino – Colonna-Monte Rossel complex in Valcuvia (VA)*.

Over time Roberto acquired a considerable knowledge of geology, even though his degree was in Mathematics with a specialization in Computer Science.

He studied the Karst of the Triassic Rocks of Val Brembilla (BG) (*Proceedings of the XIII Conference of Lombard Speleology - Varese November 1988*) and, in the following years, the Karst of Monte Comana-Brienno (CO), the Karst of the Artavaggio and Monte Campelli (LC).

In 1981 Roberto participated in his first International Congress of Speleology, at Bowling Green in Kentucky (USA). He was enthusiastic about meeting speleologists from all over the world so he could exchange information, find out about new caves, new studies on karst and about new approaches to the subterranean world. He was very curious and the International Congresses were an inspiring window to the world for him.



The perfect caver's lunch in Italy. Nothing but the essentials: bread, cheese, salami, red wine and a nearby cave

At the International Congress in Kerrville in Texas (USA) in 2009, he was invited to be part of the Commission that would evaluate the pictures exhibited at the Print Salon. This was yet another challenge and he took it very seriously. He read about the evaluation of pictures, then applied himself very carefully to the

observation of each picture on exhibition and was finally very happy to discover that his evaluation and the reasoning behind it matched the evaluation of the other judges.

In 1983, Roberto participated in the IV International Symposium on Vulcano-speleology in Catania where he met some UIS Commission members for the

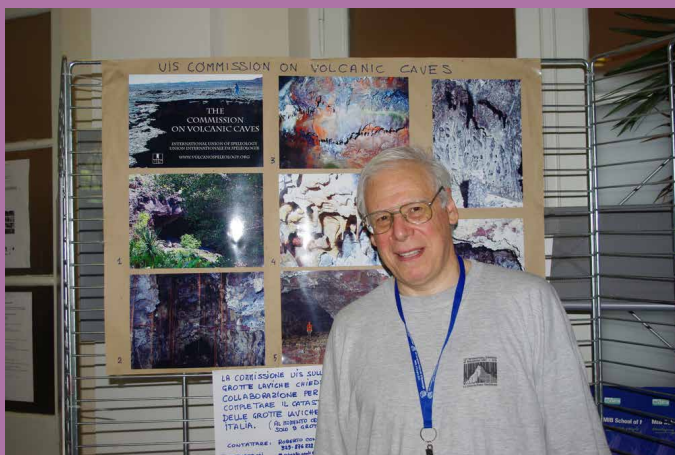
first time and from then on, he kept in touch with Bill Halliday, who was the President of the Commission at the time. That relationship led to Roberto attending the IX International Congress of Speleology in Barcelona (Spain) in 1986 and also participating in a post-Congress excursion to the Canary Islands. On Tenerife, Roberto was among the participants who climbed to the crater of Teide volcano and later visited some of the most important caves on the island.

For a few years after that Roberto, focused on karst areas in the Lombardia region and collaborated in the exploration of the Pizzala cave, a small cave near Como that was discovered by the GGBA group.

From 2009, Roberto devoted more time to volcanic caves. As noted above, he attended the XV International Congress on Speleology in Texas in 2009 and participated in the post-congress excursion to the Big Island of Hawaii where he visited many caves, including Kula Kai Caverns, which is part of the huge Kipuka Kanohina system, the second longest known volcanic cave system.

In 2011, by advice of the UIS Commission, Roberto set up a poster at the Italian National Congress in Trieste, to emphasize the need to create an official register of volcanic caves in Italy.

In 2017 Roberto took part in the International Congress of Speleology in Sydney (Australia) and visited the volcanic caves at Undara in the far north of Queensland. At the UIS Commission meeting during the Congress, Roberto offered to assist the Commission and was later appointed as the Membership officer. He also volunteered to find out whether it would be possible to organize the next International Symposium on Vulcanospeleology in Italy. In 2018, after a few refusals, Roberto received a proposal to host the next Symposium by the Gruppo Grotte Catania and he went to the XVIII International Symposium at Lava Beds in California to propose the candidature.



Roberto with his poster on volcanic caves at the Italian National Speleo Congress in 2011.



Roberto in California presenting the case for ISV19 to be held at Catania in Sicily.

As soon as the Catania offer was accepted, Roberto commenced work on organization of the Symposium and it was officially announced in Italy in 2019, at the Speleological meeting at Casola Valsenio.

The XIX International Symposium on Vulcanospeleology was originally scheduled to be held in Catania in 2020, but was postponed for 12 months because of travel restrictions and uncertainties resulting from Corona-19 pandemic. When the Symposium took place in 2021, Corona restrictions remained in effect in many countries, which limited participation. However, there were 21 participants on the premises and 18 more participating online. The Symposium was successful both for the level of the scientific work that was presented and for the hospitality of the Catania group who organized significant excursions, excellent food and fun. During the Commission meeting in Catania, Roberto's position as Membership Officer was renewed for two years and he also became a trusted adviser within the Commission to assist the local organizers of the 20th International Symposium in Dak-Nong Province of Vietnam, which was held in November 2022.



Roberto Chairing a session at ISV19 in Catania.

Roberto was happy with the outcome of the Catania Symposium and I am happy too that he could count on good memories of his last international appearance.

To the end Roberto was active and never let go. Together with his friend Sandro, he presented a paper on the geology of Mt. Cich at the Annual Speleo Meeting of Lombardia at Ormea (Italy) at the beginning of June 2022 and he had made plans to attend the XVIII International Congress in France in July 2022.



Roberto with former Commission Chair, Jan Paul Van der Pas on the slopes of Mt Etna, ISV19

The “Berliner Höhlenkundliche Berichte” (BHB), published by the Speleo Club Berlin, is the only comprehensive and continuously published monographic series of caving expeditions and speleological country compilations. ISSN 1617-8572.

All details at: <https://www.speleo-berlin.de/en/publikationen.php>

All of our volumes provide detailed location maps and a comprehensive collection of cave data, descriptions and surveys. Several of our publications cover areas featuring volcanic caves - such as Rwanda, Mt. Suswa (Kenya), and southern Vietnam. Volume 74 is dedicated to the Dak Nong Geopark, host of the 20th International Symposium on Volcanospeleology in November 2022.



Volume 23 Michael Laumanns, Silvia Schmassmann & Hans Schmassmann-Adrian: **The Caves of Rwanda / Les Grottes du Rwanda. 2nd / 2^{ème} edition.** 173 pages, many surveys and maps; Berlin 2007. - There is no other comparable source of information on the inventory of lava caves of Rwanda.

Volume 31 David Checkley (Ed.): **Mt. Suswa Cave Survey. A project to map and review the tourism potential of Mt. Suswa's principal cave group (Kenya).** 50 pages, full colour; Berlin 2008. - A thorough assessment of the tourist potential of Mt. Suswa's lava tube caves.

Volume 56 Michael Laumanns: **Karst and Caves of South Vietnam. Part 2: Provinces of Dong Nai, Lam Dong and Quang Tri.** 49 pp., colour photo tables, area maps and many surveys; Berlin 2014. - 53 lava caves from Dong Nai, another important lava cave area in southern Vietnam.

Volume 74 Michael Laumanns (Editor): **Karst and Caves of South Vietnam. Part 3: The Caves of Krong No Volcanic Geopark (Dak Nong province).** 70 pp., colour photo tables, many maps & surveys; Berlin 2018. - This is the comprehensive compilation which helped our Vietnamese friends to successfully achieve UNESCO Geopark status.



Importance of the cave biota for the protection of lava tubes of North-Patagonia

Importancia de la biota cavernícola para la protección de los tubos lávicos de Nor-Patagonia

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Summary

The discovery of a singular relictual cave-dwelling arachnid in the “Cueva Doña Otilia”, meant the discovery of a new species, a new genus and the creation of a new family of the order Opiliones (Acosta, 2019). This discovery highlights the importance of biospeleological studies and the environmental protection of lava tubes in arid areas of Argentina.

The cave biota has always intrigued naturalists. There are underground ecosystems, for example caves and aquifers, which are highly significant from a biological point of view, among other aspects, due to the relict nature and high degree of endemism of their species.

The study of organisms adapted to live in subterranean environments is usually difficult in the sense that their classification requires exhaustive analysis. This is due, in part, to the fact that these species present very particular structural, physiological and ethological characteristics due to being subject to an adaptive convergent evolution (eg absence of eyes and pigmentation).

The possibility of incorporating new technologies for the genetic study of cave-dwelling organisms today expands the possibilities of reconstructing the complex genealogies of their lineages and their adaptations to these extreme habitats. All these analyzes provide biological evidence for paleoclimatic, paleoecological and paleogeographic reconstructions of the region.

In Argentina there are cavities of basaltic origin, such as the Cueva del Tigre - Mendoza and the Cueva Salamanca-Neuquén, with interesting biological records of vertebrate and invertebrate fauna. Comprehensive studies are required to determine if it is about organisms that enter cavities occasionally or accidentally or corresponds to fauna that, for historical-ecological reasons, is limited to caves.

Worldwide, based on the biospeleological study, the environmental protection of cavities, aquifers and surrounding areas has been achieved. In other words, the identification and monitoring of all the biotic components of the caves is an initial and essential step before defining the degree of protection and use of the caves by man. In Argentina we cite the example of a lava tube from an arid zone, the “Cueva Doña Otilia”, an interesting ecosystem where native plant roots have been found to enter from the roof of the cavity. Apparently the entry of these roots and the high internal humidity favor the development of a complex subterranean biotic community. A new cave-dwelling species of arachnid has been described in this cave. It is *Otilioleptes marcelae*

*Speleothems and roots in Doña Otilia cave. Large roots can be observed hanging on the ceiling and the walls.
Photos by Marcela Peralta.*



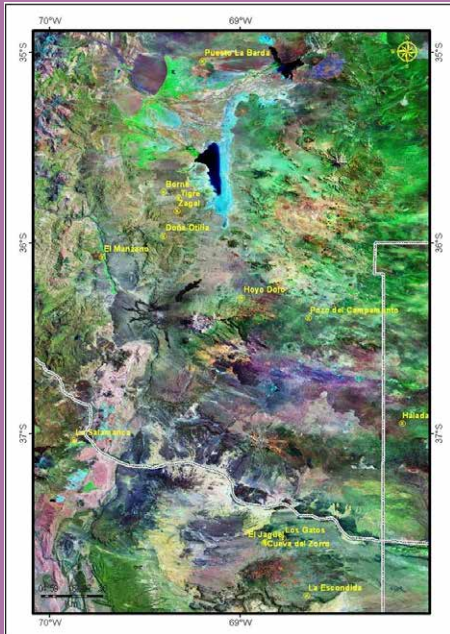
Acosta 2019, a harvestman that turns out to be a representative of a new genus and a new family of Gonyleptoidea, hitherto unknown (Acosta, 2019) (see UIS Commission on Volcanic Caves Newsletter No.77).

Its discovery has been a novelty for the systematics and biogeography of harvestmen and has been one of the foundations for which the Private Natural Area “Cueva Doña Otilia” has been created. This finding has shown that it is essential to continue with explorations and biological studies in other lava tube systems in the region, since they may be the exclusive habitat of many other relict and endemic plant, animal and microorganism species, unknown today which form a valuable part of our natural heritage.

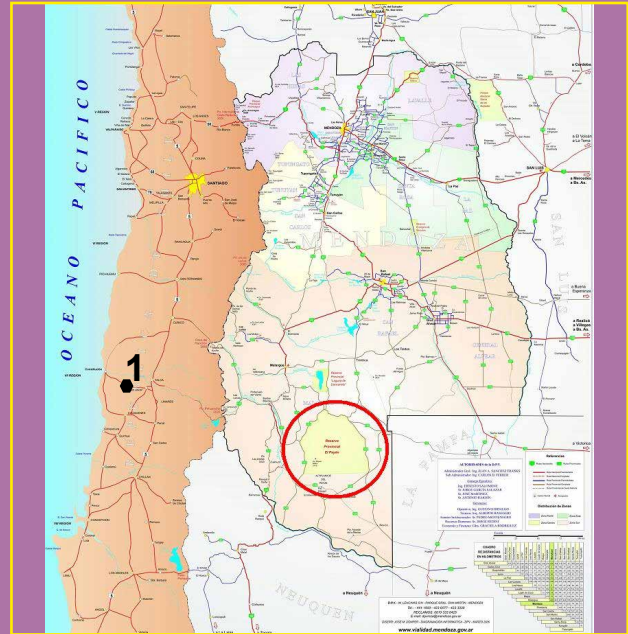
The volcanic district of Payunia, in which the Doña Otilia Cave is located, extends in the south of Mendoza, the north of the Neuquén province and the west of La Pampa province, and has approximately 800 retroarc volcanoes already inactive and many of them have formed extensive flows of pahoehoe lavas.

The signing of an agreement between the FAdE and the owners of the land to convert this cavern into a private reserve was the motivation for the deputy Emanuel Fugazzotto to present a bill for the provincial government to support the creation of this natural reserve within the framework of Law 5978 on Natural Caves.

- Acosta, L. 2019. A relictual troglomorphic harvestman discovered in a volcanic cave of western Argentina: *Otilioleptes marcelae*, new genus, new species, and *Otilioleptidae*, new family (Arachnida, Opiliones, Gonyleptoidea). PLoS One. 2019 Oct 23;14(10):e0223828. doi:10.1371/journal.pone0223828. eCollection 2019



Payunia Surface regional



Location of Doña Otilia cave in the Payunia region (Mendoza Province, Argentina). The site is indicated as (1). Figure uploaded from Turismo Nacional de Argentina.



The protected area



Blattaria in Doña Otilia



Fig 1. *Otilioleptes marcelae* gen. nov., sp. nov. Paratype male (FML-OPIL 00218), dorsal view. Photo: Abel Pérez-González. <https://doi.org/10.1371/journal.pone.0223828.g001>

Importancia de la biota cavernícola para la protección de los tubos lávicos de Nor-Patagonia

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(2) Federación Argentina de Espeleología-FAeE- E-mail: carlos_benedetto@fade.org.ar

Resumen

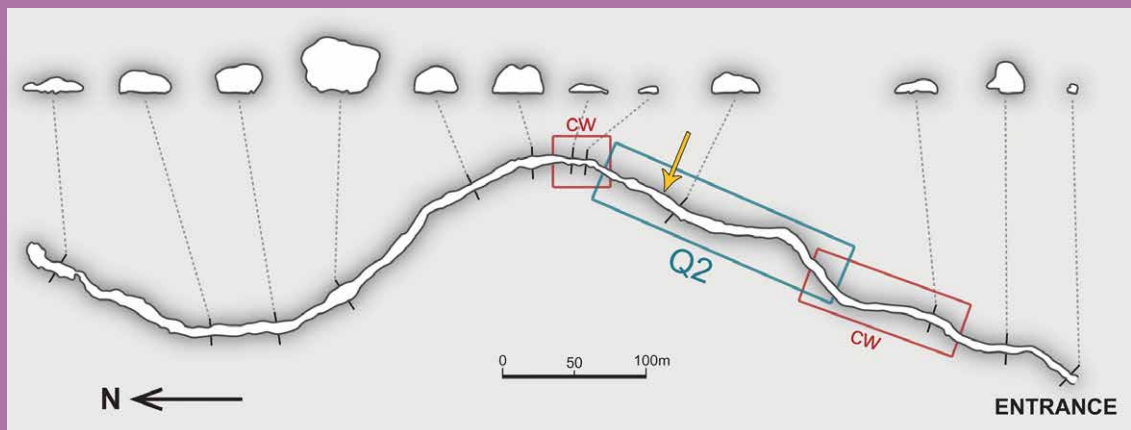
El hallazgo de un arácnido cavernícola relictual, muy particular, en la Cueva Doña Otilia, significó el descubrimiento de una nueva especie, un nuevo género y la creación de una nueva familia de opiliones (Acosta, 2019). Este descubrimiento pone en evidencia la importancia de los estudios bioespeleológicos y la protección ambiental de los tubos lávicos de las zonas áridas de Argentina.

La biota cavernícola siempre ha intrigado a los naturalistas. Existen ecosistemas subterráneos, por ejemplo cavernas y acuíferos, que son altamente significativos desde el punto de vista biológico, entre otros aspectos, por el carácter relictual y alto grado de endemismo de sus especies.

El estudio de los organismos adaptados a vivir en los ambientes subterráneos, suele ser dificultoso en el sentido que su clasificación requiere de exhaustivos análisis. Esto se debe, en parte, a que estas especies presentan caracteres estructurales, fisiológicos y etológicos muy particulares por estar sujetos a una evolución convergente adaptativa (ej. ausencia de ojos y pigmentación).

La posibilidad de incorporar nuevas tecnologías para el estudio genético de los organismos cavernícolas amplía hoy las posibilidades de reconstruir las complejas genealogías de sus linajes y sus adaptaciones a estos hábitats extremos. Todos estos análisis aportan evidencias biológicas a las reconstrucciones paleoclimáticas, paleoecológicas y paleogeográficas de la región.

En Argentina existen cavidades de origen basáltico, como la Cueva del Tigre-Mendoza y la Cueva Salamanca-Neuquén, con interesantes registros biológicos de fauna de vertebrados e invertebrados. Se requieren estudios exhaustivos para determinar si se trata de organismos que ingresan a las cavidades en forma ocasional o accidental o corresponde a fauna que, por razones histórico-ecológicas, quedó circunscrita exclusivamente a las cavernas.



Topografy 838m. Plan view map of Doña Otilia cave. Transverse sections of the passage are displayed at the same scale. . Redrawn from a 1973 survey made by C.A.E. (Centro Argentino de Espeleología). <https://doi.org/10.1371/journal.pone.0223828.g010>

A nivel mundial, en base al estudio bioespeleológico, se ha logrado la protección ambiental de cavidades, acuíferos y zonas aledañas. Es decir que la identificación y monitoreo de todos los componentes bióticos de las cavernas es un paso inicial e imprescindible antes de definir el grado de protección y uso de las cavernas por parte del hombre. En Argentina citamos el ejemplo de un tubo lávico de una zona árida, la „Cueva Doña Otilia“, un interesante ecosistema donde se ha constatado el ingreso desde el techo de la cavidad, de raíces de plantas nativas. Aparentemente el ingreso de estas raíces y la alta humedad interna favorecen el desarrollo de una compleja comunidad biótica subterránea. En esta cueva se ha descrito una nueva especie cavernícola de arácnido. Se trata de *Otilioleptes marcelae* Acosta 2019, un opilión que resulta ser representante de un género y una



Left: Dr Acosta at the entrance of the cave



Right: Together with Mladen Garassic


familia de Gonyleptoidea hasta entonces, desconocidos (Acosta, 2019) (ver UIS Commission on Volcanic Caves Newsletter No.77).

Su descubrimiento ha sido una novedad para la sistemática y biogeografía de los opiliones y ha sido uno de los fundamentos por los cuales se ha creado el Area Natural Privada que abarca la „Cueva Doña Otilia“. Este hallazgo ha puesto en evidencia que es imprescindible continuar con las exploraciones y estudios biológicos en otros sistemas de tubos lávicos en la región pues pueden ser el hábitat exclusivo de muchas otras especies de plantas, animales y microorganismos, relictuales y endémicos, hoy desconocidos, que forman una parte valiosa de nuestro patrimonio natural.

El distrito volcánico de Payunia, en el que se encuentra la Cueva Doña Otilia, se extiende en el sur de Mendoza, el norte de la provincia de Neuquén y el Oeste de la provincia de La Pampa y cuenta con aproximadamente 800 volcanes de retroarco ya inactivos, muchos de los cuales han formado extensos flujos de lavas pahoehoe.

La firma de un convenio entre la FAdE y los propietarios del campo para convertir a esta caverna en reserva privada, motivó a que el diputado provincial Emanuel Fugazzotto presentara un proyecto de ley para promover que el Gobierno respalde esa decisión en el marco de la Ley 5978 de Cavidades Naturales.

- Acosta, L. 2019. *A relictual troglomorfic harvestman discovered in a volcanic cave of western Argentina: Otilioleptes marcelae, new genus, new species, and Otilioleptidae, new family (Arachnida, Opiliones, Gonyleptoidea).* PLoS One. 2019 Oct 23;14(10):e0223828. doi:10.1371/journal.pone0223828. eCollection 2019


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FUNDAMENTOS


El desmanejo que existe en las áreas protegidas mendocinas se puede observar con sólo tener en cuenta que no hay planes de manejo. Basta entrar a la Payunia o Llancanelo para poder disfrutar de cada vez más numerosas torres de petróleo que fauna autóctona. Para el caso de Las Brujas, se produjo su reapertura al turismo, pero sólo en el sector menos turístico de la cavidad, y es posible que esa restricción no se esté cumpliendo en los hechos.

Es por ello que la FAdE gestionó, en el caso de Doña Otilia, la creación de una reserva privada.

El convenio respectivo fue firmado entre la FAdE y el Dr. Sergio Rostagno, y puede verse escaneado en <http://fade.smartnec.com/images/prod/KTZVim1cJYj3kB5YiYFI3TDLzWaP.pdf>, en la sección Payunia de "Proyectos" de www.fade.org.ar, donde hay otras publicaciones científicas que respaldan la iniciativa

La Dra. Marcela Peralta, investigadora de la Fundación Miguel Lillo, Tucumán, y Miembro Honoraria de la FAdE, quedó a cargo de este gran proyecto:

Allí se exponía la tremenda importancia de haberse descubierto una nueva familia de arácnidos, clasificada por el Dr. Luis Acosta (UN de Córdoba) como *Otilioleptes marcelae*, en homenaje a su descubridora, la Dra. Peralta, quien esta



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A partir de este descubrimiento, la Cueva Doña Otilia se convierte en algo así como La Meca de las investigaciones de la biodiversidad en los ambientes cavernarios de la Argentina, en tanto la aparición de una nueva "familia" de arácnidos es de trascendencia por lo menos sudamericana.

De hecho, hasta 1986 la bibliografía mundial establecía que nunca iba a encontrarse fauna cavernícola en Patagonia, pero ello fue desmentido ese mismo año cuando el grupo GEA (entonces presidido por el autor de estas líneas) descubrió un arácnido y a partir de allí apareció toda una comunidad cavernícola en el Sistema Cavernario de Cuchillo Cura, Neuquén. Hasta el momento ese era EL lugar bioespeleológico por excelencia, pero dado que la única asociación argentina de espeleología que tiene biólogos especializados en su staff y equipo de asesores es la FAdE, las investigaciones de biodiversidad en Cuchillo Curá están paralizadas desde la Primera Expedición Argentino-Brasileña de Espeleología 1991, organizada por el I.N.A.E., un grupo que hoy es columna vertebral de la Federación. En aquella ocasión los especialistas brasileños identificaron un nuevo género de coleópteros, el *Ptomafagus picunche*, cuyos parientes más cercanos están en el Amazonas.

La fauna de cavernas de la Argentina, como se sabe, se encuentra generalmente en zonas áridas. Pero en la humedad de nuestras cavernas han sobrevivido y evolucionado, y siguen dando sorpresas, ahora en Mendoza.

De manera que esta vez, y dado que tenemos un "estado privatista" (un oxímoron si los hay) o sea un gobierno provincial que apoya al sector privado más que al público, los espeleólogos decidieron cambiar de estrategia, y así fue que la FAdE firmó el susodicho convenio linkado al principio de esta nota y empezó a pedir que Doña Otilia fuera reconocida como "reserva privada". Los pedidos fueron cursados a la Asociación Amigos de los Parques Nacionales, a la Fundación Vida Silvestre y a la Comisión de Recursos Naturales de la Cámara de Diputados de la Nación.


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Por razones obvias, y tal como reza el convenio posteo en www.fade.org.ar antes referenciado, en Doña Otilia no se permitirá el ingreso de turistas ni curiosos, sino sólo investigadores, docentes y alumnos de la Escuela Argentina de Espeleología. O sea que, además de laboratorio natural, Doña Otilia será una caverna-escuela. De hecho, se está organizando una campaña junto a los flamantes 20 nuevos miembros que incorporó la FAdE este año y se está redactando un proyecto de investigación y formación de largo aliento.

El primer apoyo vino de la Asociación Amigos de los Parques Nacionales (AAPN). Quizás por estar a cargo de alguien que transitó por el mundo de la espeleología, la primera respuesta positiva provino de la AAPN, el Prof. Norberto Ovando, homónimo de un conocido docente de Malargüe, y del Guardaparques Adalberto Damián Álvarez, quienes comunicaron a la FAdE, que otorga a Doña Otilia la Categoría Internacional III por parte de la World Commission on Protected Areas (WCPA), del Geoheritage Specialist Group (GSG) y de la International Union for Conservation of Nature (IUCN), todo lo cual fue comunicado también a la Cámara de Diputados de la Nación y al dueño del campo. En estos días se comunicará también a Don Martín Zagal, puestero de La Batra que ha custodiado la caverna durante décadas.

Según la UICN, Categoría III significa **"III. Monumento o característica natural: áreas establecidas para proteger un monumento natural concreto, que puede ser una formación terrestre, una montaña submarina, una caverna submarina, un rasgo geológico como una cueva o incluso un elemento vivo como una arboleda antigua."** Más información sobre el sistema de reservas privadas según la UICN en www.fade.org.ar.


Por todo ello es que solicitamos a esta honorable cámara su apoyo para la creación de esta nueva reserva natural protegida bajo el marco legal de la ley 5978.


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PROYECTO DE LEY
EL SENADO Y CAMARA DE DIPUTADOS DE LA PROVINCIA DE MENDOZA,
SANCIONAN CON FUERZA DE
LEY:

ARTICULO 1: Crease la Reserva Natural Cueva Doña Otilia (coordenadas geográficas boca de acceso 35° 57' 46.2" LO, 69° 24' 03" LS) en el marco de la Ley 5978 de la Provincia de Mendoza, a fin de preservar dicha cueva para fines de investigación y fines científicos, otorgando protección jurídica ante cualquier avance privado o público.

ARTICULO 2: De forma


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Nombre del Proyecto	EMF-I-reserva natural
Tipo de Proyecto	Ley
Autor	Diputado Emanuel Fugazzotto
Coautores	
Bloque	Partido Verde
Tema	Creación de la Reserva Natural Cueva Doña Otilia en el marco de la ley 5978
Nº de Expediente	
Fojas	
Fecha de Presentación	



A photo of Bill Halliday (in wheelchair) with well-known American cave identity Gordon Smith

Bill Halliday

Several times a year, members enquire about Bill Halliday, the Commission's Foundation Chairman and/ or President (Bill used both titles over time). In recent years, Bill has ceased responding to emails, or even reading them, largely due to failing eyesight. So communicating with him is not easy.

Last year, well-known American cave identity Gordon Smith caught up with Bill in the care home where Bill now lives. Gordon is a show caves owner (now down to an interest in just one, I think) and a retired caver who was a caving companion of Bill's in the 1950s and 1960s. Gordon reports that Bill was in fine form and had the attached photo taken of them together (Bill is on the left).

Gordon gave the photo to Greg Middleton at the UIS Congress in France.