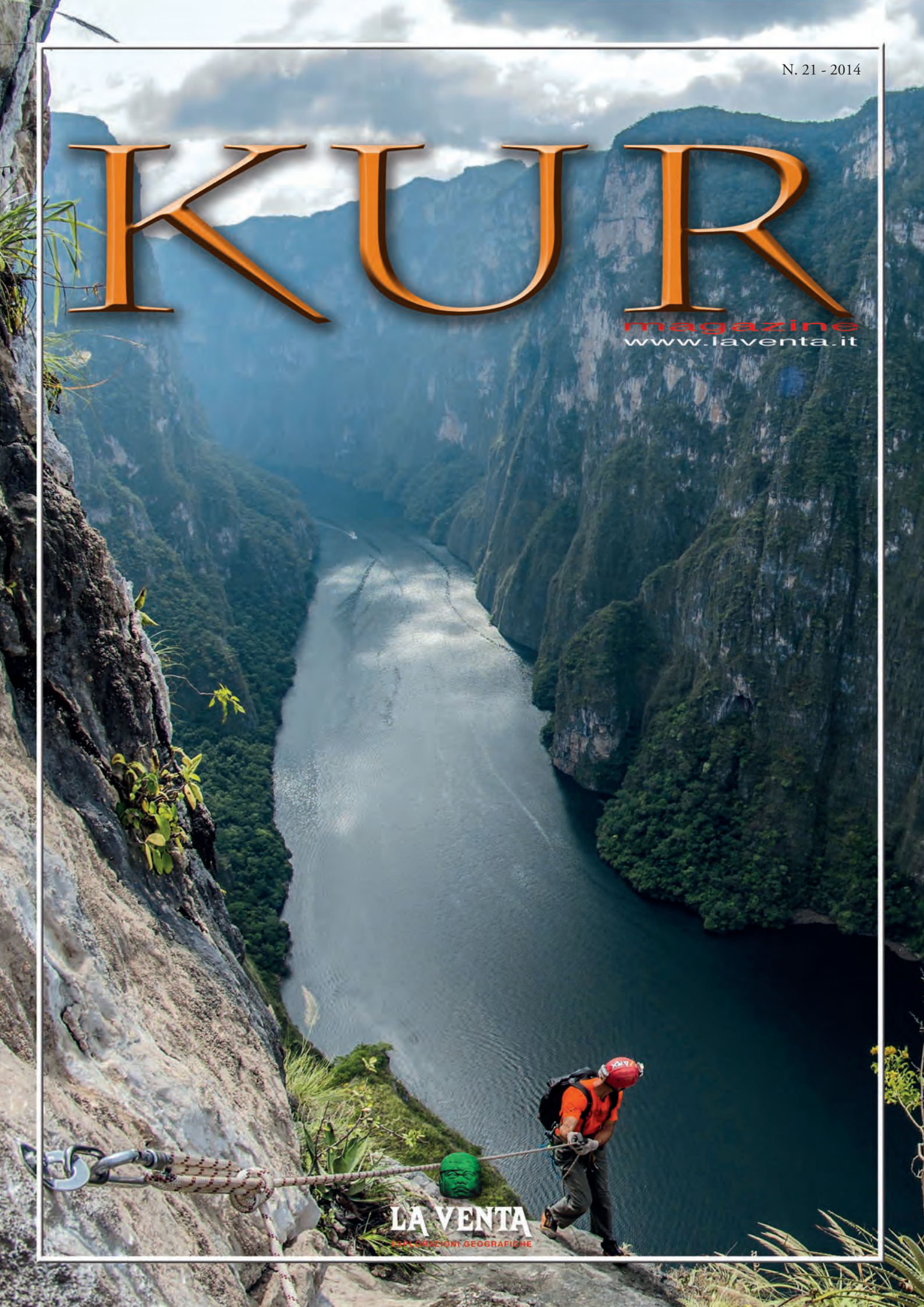


KUUR

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LA VENTA
PUBBLICITÀ GEOGRAFICHE



Yearbook

KUR

magazine
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Chiapas, Mexico

Second cover The entrance of R-19 Cave,
Bai Sun Tau, Uzbekistan

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GIOVANNI BADINO

Born a quarter of a century ago with limited purposes and especially oriented to the speleological context where it arose, our association has grown up over the years. Its growth has been induced by our endless research around the world, project after project. A kind of growth already well described by Dante Alighieri in the final *Canto* of the *Commedia*, where he describes his looking directly at God, the Light, immobile and invariable but inducing a change in the viewer, so that he can scrutinize it in a greater depth; at a point that, advancing forward, it seems to him that the light spot itself is changing:

Non perché più ch'un semplice sembiante
fosse nel vivo lume ch'io mirava,
che tal è sempre qual s'era davante;
ma per la vista che s'avvalorava
in me guardando, una sola parvenza,
mutandom'io, a me si travagliava.

*(Not because more than one unmingled semblance
Was in the living light on which I looked,
That is always what it was before;
But through the sight, that fortified itself
In me by looking, one appearance only,
To me was ever changing as I changed.)*

Paradiso, XXXIII

Well, our research has been changing us in depth, both individually and as an association.

It has been a change induced from the outside and very little led by us, because we have often clung to ideas and supplies of a past that was already well behind us.

The technological innovation arisen in recent years is only the tip of a phase of development and wealth involving a large part of humanity with Internet, digital image processing, abundance of means; and it all happened during these few years of La Venta's existence...

In this sense, many times we have found ourselves terribly inadequate and unable to "keep up" with the role that we could have. Born changing the film every 36 shots, being careful each time to prevent dust in the camera, we have encountered tremendous difficulties adapting to new ways to produce documentation about caves in unreachable places. Born on dusty bus taking us in reconnaissance to the most remote places, we have had difficulty exploiting the possibilities of Google Earth. Born exploring the deepest caves, pit after pit, we have struggled to geographically make sense to the underground worlds we have been discovering. But thanks to the changes in the World and in our mind, our projects have become really extraordinary.

Our research in Palawan has allowed the unexpected inclusion of the Underground River Cave among the "New 7 Natural Wonders of the World", generating a



Russians and Italians planning the approach pathway to the base camp, Samarcanda '89 expedition.

huge increase in the reputation of this incredible cave and ensuring great developments for the future research. The great efforts required by the past expeditions on the Tepuis have put us in the position to develop a research project of such a high level to win the Rolex Award for Enterprise. It is a very important result, and for us it has a special significance, because it comes after twenty years from the previous one, when we won with our project in Rio La Venta Canyon. That was an especially important event for us because in those early 90s it forced us to improve the quality and multidisciplinary of our research and, in fact, to start a new season for our association. We hope to be able to use profitably this fantastic opportunity also in this case.

Other projects are also taking off at an excellent level. The insights on glacial karst have become an integral part of glaciology, the research on Chiapas has settled an established tradition never failing us, producing moreover local research facilities. The research in the Stufe di San Calogero has opened unexpected horizons, not only for the proximity of these fantastic territories, but also for the interesting and unprecedented collaboration with our friends of the CGEB (Eugenio Boegan Cave Commission from Trieste, TN). The attempts toward the “garbere” (large mine crevasses) of Cozzo Disi are promising, and they have opened unexpected collaborations with other Italian speleo friends. The projects in Central Asia with the speleologists from the Urals are going on. The caves in Myanmar have not been neglected. And so on.

But all that glitters is not gold! Overall, we can point out what I have mentioned before: we have undergone several changes, but they are still far from maturity.

So, on one hand the principal projects are becoming professional commitments requiring “resident” researchers and therefore is very difficult for us to carry them on adequately. On the other, the “minor” projects attract many “external” people to be managed with a kind of competence that is often perceived by those who benefit it as a travel-agency activity, you can imagine how annoying. Moreover, the participation of people not sufficiently known reduces the guarantees of commitment and skill, and increases the risk for someone to think of taking part in low-cost and high-appeal expeditions, organized by a travel agency formed by missionaries. Alongside these -incomplete- restructuring projects, we have seen a collapse of the revenues from our sponsors and, consequently, to the dramatic reduction of the budget of the association, which in a few years has been reduced by three quarters...

On one side, we can be proud to be able not only to survive, but even to increase our activity despite a so radical crash diet, on the other, we must recognize that we have paid a lot for it: the resources have been concentrated on the projects and the associative structure which should coordinate them has been left behind.

Consequently, our social initiatives such as publishing, exhibitions, documentaries and meetings, have become less frequent, up to threaten the very meaning of our activity, that is not focused on this or that cave, but on the way to tell them. We hope to be able to emerge from this ford crossing in the coming years.



Take-off of the drone used for video shots at the Arbol de Naidad (Chiapas, Mexico), December 2014.

SUMMARY

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Arbol de Navidad

It is not the first time that La Venta Association promotes the environmental interest, especially in Mexico. During the first two weeks of December 2014 took place the “rescue” of the *Árbol de la Navidad*, an impressive travertine formation in the Sumidero Canyon, near Tuxla Gutierrez, in the State of Chiapas. The Italian-Mexican enterprise, lasting one week for the operative part, committed about 25 people from La Venta and from the Centro de Estudio Kársticos La Venta, several local people and the armed forces. The descent of about 700 m along the wall was complex but allowed us, as in the first expedition in 1993, to reach the cave safely and to begin a thorough study on the conditions that are leading to the progressive drying of this structure. Inside the resurgence, we removed towering heaps of earth, root and travertine newly formed, that have accelerated in recent years the clogging of the cavity. A platform floating on the lake was all the time the control point of the works and, besides that, an information point for the many tourists visiting the *Ár-*

bol. The government of Chiapas and the National Park of the Sumidero have been very pleased with this first successful action. We await the results of the analyses of rock and water to provide additional hypotheses on the factors that are undermining the health and the ecosystem of the *Árbol*.



Equipping the rope-descent toward the Arbol de Navidad

Survey at Serra do Aracá

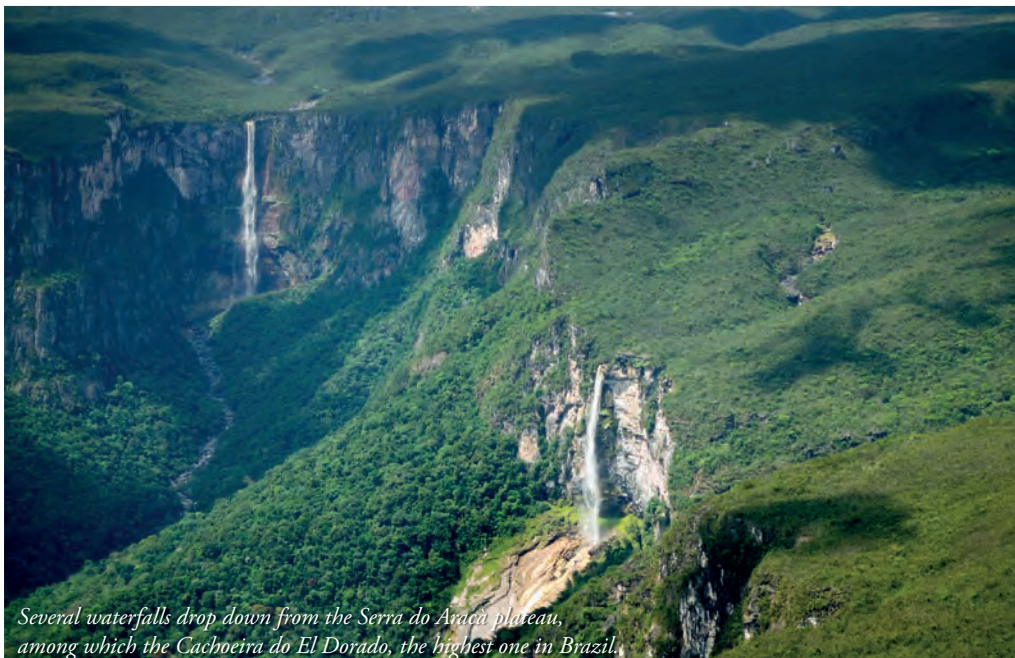
In November 2014, a short inspection to Serra do Aracá, in the Brazilian state of Amazonas, was carried out with the aim of evaluating the exploration potential of the area. With the support of the Rolex Awards, La Venta is developing a new project on the Brazilian tepuí, along with the Grupo de Pesquisas Espeleologica Bambuí Belo Horizonte. Departing from Manaus and shipping upstream the Rio Negro by boat, the group reached the town of Barcelos, the river station about 200 km from Aracá. Here, some miners, who have been working on the mountain, were interviewed in the 90's reporting

about some unexplored caves in the northern sector of the massif. Using a Cessna Caravan, the group had managed to do a flight of about three hours over the mountain, identifying some entrances on the western walls and documenting the spectacular waterfalls that characterize the southern walls (including the Cachoeira do El Dorado, 356 m, considered the highest waterfall in Brazil).

The mountain presents considerable logistical difficulties and the lack in the region of a suitable helicopter for transport of materials and people, makes a future expedition particularly problematic. However, contacts were

got with the Brazilian Army to obtain a support with aerial means.

In the last days of the trip, we visited an area of the quartzite plateaus north of Manaus, near the town of Presidente Figueiredo. The area has a number of cavities in quartzarenite explored by French cavers in the late '80s. However, this and other areas in the Amazonas, seem still largely unexplored, so we are planning an expedition together with Grupo Bambuí.



Several waterfalls drop down from the Serra do Aracá plateau, among which the Cachoeira do El Dorado, the highest one in Brazil.

2014 International Camp of Speleo-Glaciology - Gorner Glacier (CH)



A meander inside the G7 moulin, Gornerglacier, Switzerland.

The First International Camp of Glacial Speleology was held between 17 and 27 October 2014 on the Gorner Glacier in the Valais Canton in Switzerland. A reconnaissance in August identified a dozen glacial moulins in the upper zone of the glacier, where it was decided to settle the base camp.

During the 10-day camp (located on the central moraine of the glacier at about 2500 m a.s.l.) alternated 46 participants, speleologists and researchers, of 6 different nationalities including 32 Italians, 4 English, 7 French, one Lithuanian and one Swiss.

The organization provided two Ferrino "Base Camp" tents to accommodate a kitchen-table and a storeplace, containing about 700 m of rope and over 60 ice screws and karabiners, medicines and some first aid equipment for abseiling, as well as food for breakfast, lunch and dinner.

The exploration and topography of the glacial moulins was the main goal of this event.

Between 18 and 27 October were identified and explored about twenty glacial cavities including 3 marginal caves. Some of these were also mapped and photographed.

A glaciology student geo-referenced the entrances of the main moulins using a GPS. His purpose would be to compare the position of the moulins present in 2014 with those known and explored in the past to reconstruct the evolution of the cryo-karst in the Gorner in the past 15 years, in relation also to the superficial change (morphology and altitude) of the ablation zone.

A drone allowed the realization of 3D images of the surface of the glacier near the entrances of the more interesting moulins. Researchers at the Natural History Museum of Paris took samples of sediment collected in the cryoconites to observe them with the microscope. Part of the sampling was also done by Roberta Brayner PhD of the Diderot Institute in Paris to study the mineralogy and the content of nano-particles in the same cryoconitic sediment. Further samples were then sent to the biologist Stefan Leuko of the German Aerospace Center in Cologne.

The results of the camp will be published as soon as possible and reorganized in order to become a useful document for the future work of exploration and research on this ice giant that for so many years has been a destination for speleologists of all Europe and for researchers of different disciplines.

The Camp, included in the project "Dentro i ghiacciai" ("Inside the glaciers") was supported by: European Speleological Federation, Spélé'ice Association, La Venta Association, CAI Commission for Speleology, Montura, Scurion, Gaibana Shoes, Intermatica, DRYHEAT, Sovendi, Italian Speleological Society and CNSAS.

San Candido

The Adventure Outdoor Festival took place in July 2014 in San Candido, a small town bordering with Austria. Many activities were presented during the week: climbing, mountain biking, yoga, running, skiing, snowboarding, slacklining, bouldering, with representatives of all ages and of international fame.

Speleology took the field with La Venta, setting up a permanent photo exhibition about extreme speleology in glaciers and in the hot caves of Naica (Mexico) and Sciaccia (Sicily); gathering a lot of supporters, especially among the children who, for a day, clothed themselves in the shoes of the explorers.

La Venta was the main attraction of the night around the fire, where several athletes told their most exciting and fun experiences, sitting in a circle in front of a re-viving fire and a glass of good red wine. La Venta's presentation "Ai confini dell'esplorazione" ("On the edge of

exploration") was held on the main street of the village, calling a multitude of visitors and local people and telling the recent exploratory experiences in Mexico, Venezuela and the Philippines with photographic images and videos.



La Venta presents its projects, San Candido.



LUCAS RUIZ, THE BOY FROM EL OCOTE

Tullio Bernabei, Gianni Todini

On 25th October PY a friend left us. Lucas Ruiz Pérez, a Mexican member of La Venta and friend of many of us, who were able to share with him intense moments in the green forest of El Ocote, in Chiapas, and not only there. Lucas began to collaborate with La Venta in the early 2000s, as a guide in the archaeological expeditions. Then he became a speleologist, and what a kind of speleologist, while we have become lovers of the forest: an enchanted world where Lucas was at the same time king, child, hunter and prey. He came to work in Italy with Gianni Todini, he became an explorer in the Philippines: really far from his humble and beautiful place of origin.

And then he passed away, only thirty-three years old, leaving a young wife and three children, whom we will try to help. And soon we will recognize in them Luc: big, strong, helpful, and above all, good.

Tullio Bernabei

It is not easy for me to write about a brother who left me...If I can get on writing these words, it's because I'm trying to express the message given to me by his final departure.

Lucas Ruiz was the friend with whom I shared the explorations in the forest and not only; the man with

whom, fifteen years ago and involved by another great friend of mine, Paolino Cometti, by Tullio's invitation, for the first time I set about to get into a wonderful environment. I would never be able to enter inside alone, I like to do things in a group and the spirit of the association I belong to, was, and is still now, the best I have ever come across for an exploration.

Lucas was a man who immediately fascinated me for his ability to integrate with pure nature; he was at the top, higher up the majestic jaguar; he could exert his control on all the animals and situations; he lived this powerful prerogative in the most generous way I have



ever seen. He decided, resolved, offered his many skills to those who were beside him; it was difficult to change his mind...or rather, it was impossible, but his spending himself for others had no limits.

I have some beautiful pictures of his “human performance”; his wide and reassuring smile, his proud stubbornness, his living the most engaging moments.

I look at the pictures of the forest where I can see him seeking, in the act of exploration, fully involved and deeply absorbed in the teachings that the forest used to give us each time, teachings that forced us to look at every inch of the way we traveled and, during our rest, urged us to look at every inch of our souls, stimulating us to find the meaning of our walking, the meaning of life.

The ancients believed that in the forest lives our *nauhal*, our true spirit; I indeed think that the journey made with Lucas brought us to meet him. His spirit, now, lives in the people who had the good fortune to meet him, even once; his spirit is in his family, in Juana, his young wife, in Gianni, Vicente and Luciana, his wonderful children.

Lucas' body passed away, but he still lives in the people to whom he gave many moments of his life; I like to remember his namesake Luca, who photographed him many times during his life and who continues, with



strength and perseverance, his research in the forest. All what we experienced has brought us closer to the meaning of life, the greatest gift that can go through the pain not being destroyed by it.

Who took away Lucas' life must know that: the pain he has caused cannot destroy life.

Lucas is alive in his family and in all of us who met him.

Gianni Todini



TEPUI

Venezuela

Quartzite towers seen from the advanced camp, Auyan Tepui.



AUYAN 2014

Antonio De Vivo

In March 2014 took place the second part of La Venta Association's research project in the south-eastern sector of the Auyan Tepui (Venezuela). In 2013, an expedition carried on in collaboration with the Venezuelan Teraphosa Exploring Team and with the support of the National Parks Institute (INPARQUES) led to the discovery of a vast underground system of over 15 km of development. The cave, called Imawari Yeuta ("The home of the Gods" in the Pemon language), opens with several entrances to the base of the walls surrounding a series of collapse sinks and crevices, a hundred meters below the tormented top surface of the Tepuis. This year's expedition was especially dedicated to the documentation and scientific research of this vast underground environment, which is currently the largest system in the quartzite in the world. But we have been carrying on new explorations, too.

The participants, 18 Italians, 5 Venezuelans and one Mexican, were divided into two groups: a larger one, that carried on mainly the documentary work of the Imawari system, and a smaller one, that, with several advanced camps, tried to find new cave systems in some areas just to the north.

Despite the adverse weather conditions, with fog and rain everyday, and the resulting problems for moving by

helicopter and settling the camps, the achievements have been remarkable on all fronts.

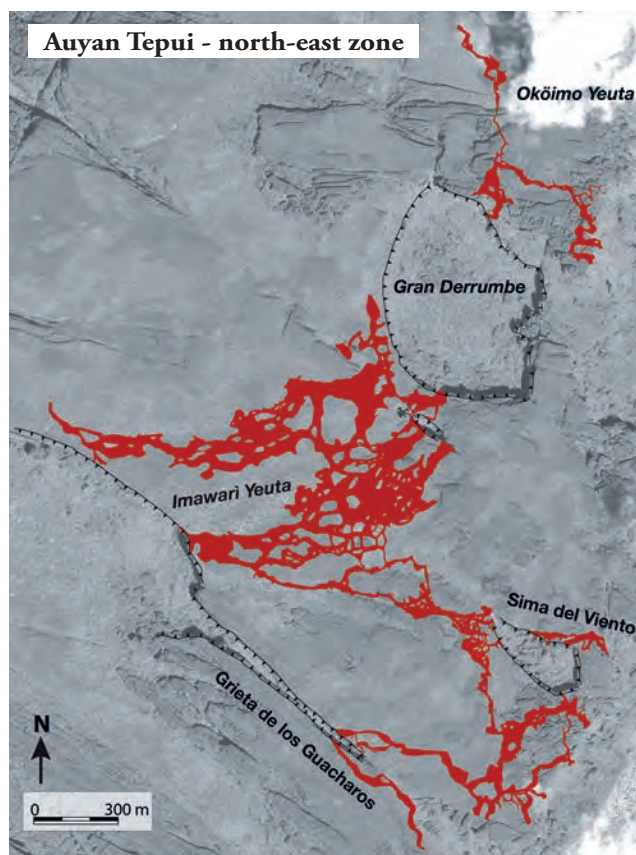
From the exploratory point of view, several new branches have been found in the Imawari Yeuta cave, which now reaches 18.7 km of length, and two other caves genetically related that, although currently separated by a deep sinkhole, bring the system to a total length of about 20 km. In the areas immediately to the north, where we argued the existence of other large systems of horizontal tunnels, for now only small caves have been found, with the exception of the Cueva de l'Arco (Oköimo Yeuta in the Pemon language), discovered just a few days before the end of the expedition, which in a last exploratory trip of 36 hours has been mapped for almost 2.5 km and explored for at least another 600 meters.

All the caves in this area are rich in very peculiar speleothemes, mainly composed of amorphous silica (opal) and gypsum, plus other minerals still under study. Even from a morphological and speleogenetic point of view, the caves are in many ways an extraordinary environment of not clear interpretation, involving a rethinking of the processes of formation of the quartzite caves proposed up to now.

The documentary part, too, engaged many people for



The rope-descent toward the Cueva de l'Arco.



several days, with both photographic and video teams, for a total of several thousand photographs and dozens of hours of high-definition video footage.

On a scientific level, were performed in situ chemical analyses of the runoff and seepage waters, were collected dozens of water samples for further chemical and isotopic analyses, and were observed and studied different types of speleothemes.

Sima del Corazón, March 23rd, 2014

“Vitto, is everything alright?”. My scream echoes in the darkness, amplified by the walls of the great Sima, that we have been descending for many hours. Equipping here is not easy: the wall is completely covered by a thick layer of peat and plants often suspended from slender roots, that along the way down we have to pull out, both to touch the rock and to avoid that these huge vegetal mass fall on our heads. Sometimes it is like unsticking and rolling the green blanket like a carpet, that for its own weight falls on the bottom of the large chasm with impressive booms. Other times we have to struggle with more persistence and even greater attention, because the roots hide very dangerous suspended boulders, too.

“I am equipping; it should be the last rebelay!”. Vitto’s voice reaches me from far below, weakened as the light that illuminates what seems to be an hanging spur: the rock is not very good, judging by the repeated attempts made by the hammer drill, that I can hear from up here. Vitto has been equipping since the early afternoon: this morning I started the work, resuming where he interrupted it last night. I went right down, at first on a nice clean wall, then jumping inside a tangled and thick vegetation, a yard of green vertically suspended. I descended for about 50 meters, believing to be sufficiently

close to the bottom. But then, what looked like small ferns proved to be palms 25-30 feet high, and the calculation of the proportions suggested a different approach. So Vitto has taken my place and has begun to equip a beautiful traverse on some roots, taking us vertically closer to our goal, the big arch of rock seen during our overflights, which seems to conceal the entrance of a gallery. He keeps on descending and I give him a hand in the disaggio, while Alessio, right above, is documenting without a break.

The late time and the fatigue would recommend to stop here and come back tomorrow, but there is little time left: today is March 23rd, we have only three days to explore before dismantling everything and returning to Kavak.

Now we are in a very peculiar advanced camp: a few hundred square yard among very deep crevasses it would be really hard to leave from. The helicopter left us here yesterday, after many problems and delays due to the weather conditions. Victor, the pilot, laid the runners of Raul’s Long Ranger on the smooth rocks of this remote outpost of the expedition two days ago, leaving Vitto, Alessio, Alfredo and José, the mechanic. We began moving the first advanced camp, with a complex logistics including flights and transport of materials and people among Kavak, the base camp at the Sima del Viento (the same as last year), the first advanced camp and this one where we are now, chosen for its undoubted exploratory interest. At the previous advanced camp things did not go very well: all the attempts to enter a system that could be connected to Imawari, from the north, failed. Long descents on the walls and abseiling into deep fractures among the fair protests of the guaciarí (the nice birds nesting along the walls or on the floor of the cavity), long journeys along their base, but all the caves proved not to be very interesting from an exploratory point of view. Nothing of what we hoped: getting into a big system and maybe coming out in the Sima del Viento together with our friends who were exploring Imawari.

We also made an attempt to reach the base camp from the outside, in the illusion of covering about 3 km of plateau dividing them between us and our friends leaving from the Sima del Viento. They went forward for about a kilometer, we covered a few hundred yards. It was a very instructive experience, geographically and environmentally. In spite of all the tests we underwent in many years of activity, for the first time we walked not on the ground, but on a kind of net suspended several meters from the ground, a net made of roots, branches, broken trunks, leaves. A chaos of plants where to move with grace and lightness, gaining a yard at a time. At the end of that hellish and heavenly tangle of bonetia we came outside, but only to lean out over the vast space separating us from the base camp.

“Off rope!”. Vitto’s scream shakes me from my thoughts, and I begin the last descent. Soon I arrive on the bottom of what we have called Sima del Corazón, for its clear heart shape. Alessio joins us and we begin together to move into the dense vegetation trying to figure out where

we have ended up. We follow the wall as far as possible, and in doing this we come inside a large entrance. We do not know whether it is the big arch of rock seen during our overflights, in the darkness it is impossible to say for sure, but the gallery continues and that is enough for us. The cave is wide and presents several galleries. We find the active branch and follow it both upstream and downstream. The upstream seems to close in a landslide, the downstream in a low flat passage. But we are just at the beginning. Now it is time to return to the camp. We start ascending accompanied by a light rain, that fortunately has spared us during the long descent. We are all outside before midnight, and following the red and white tape we cover the few dozen yards separating us from the tent of the base camp. The area of the camp is really small, and we cannot miss the way: in the rain or with a dense fog the tape prevents dangerous mistakes...

Oköimo Yeuta, March 25th, 2014

Oddly enough, this morning we have been waked up by the sun. It is very early, and it is the first time since we have arrived here that what makes our eyes open to the world is not the sound of the rain but the light and warmth of the rays of our beloved star. I leave the tent; everything is cloudless, clear, I have never seen a day like this, it seems to be in a new place.

On the satellite phone, while I have the first coffee with David, I talk to Cesco: from the base camp he confirms that at 8 o' clock there will be a flight boarding Tullio and Leo, coming to give us a hand in the exploration of the new fantastic cave we have recently reached. The flight was scheduled for yesterday, but, because of the rain, the helicopter was not even able to take off from Santa Elena. Vitto, Carla and David have descended the Sima del Corazón again to take pictures and to look for possible continuations. Vitto has climbed the big landslide upstream and has found an inactive gallery that has brought him to a big collector. Here we are; only for a few days, or rather for a few hours, but we have the chance to move another small step toward the under-

standing of this sector of the Auyan Tepui.

Tux and Leo arrive right on time: the helicopter lands in the few yards of rock free from the tents, with us bracing the base-camp, obviously the one at the greatest risk. In short we are ready to leave for the long exploratory trip: the entrance of the cave is not around the corner, and the descent and ascent of 150 meters into the Sima take a long time. We are going to stay in the cave for two days, sleeping inside to optimize time.

The descent into the Sima is beautifully poignant: time seems suspended, the sun shines on the tower rocks incumbent and dominating the mighty rock bridge that gives access to the cave. The wet and lighted vegetation stands in the dark frame of the entrance downstream the arch. There are not many options in the choice of the name and, in fact, the cave is immediately named Oköimo Yeuta, the Cave of the Arch.

At the entrance of the cave, waiting for their friends descending, Tullio and Leo tell me what they have done in Imawari: other galleries explored and surveyed for miles, other caves discovered on the bottom of the Sima del Viento, a huge work of photo and video documentation, the sampling of rocks and of those strange speleothemes halfway between the biological and the mineralogical world, that we do not know virtually nothing about. They tell me about the nice relationship established with the community of Kavak and especially with Ortensia Berti, who runs the small tourist village at the feet of the Tepuis and who for the first time went up the plateau and entered a cave. An experience truly extraordinary for her, considering that as a child she was not even allowed to watch the mountain, as it was the home of the gods, and that she used to look it in secret, reflected in the water of the river.

Within a few hours we all are on the bottom of the Sima and we go down the initial steep slope of the cave. We ascend the landslide on very unstable passages and we begin to cross the gallery discovered by Vitto yesterday. Its morphology surprises us, the flat paths of Imawari here give way to something looking very much like a phreat-



The exit on the Gran Derrumbe.

ic tunnel; its section is round, pot-holes peep from the ceiling and the floor, speleothemes of all sorts accompany every step. Soon we reach the collector. Vitto, Carla, Alfredo and Alessio disappear quickly upstream. I, Leo and Tullio begin to explore the downstream collector, but it ends in a large landslide. At some point Tullio disappears, and we do not know if he has preceded us at the confluence between the inactive gallery and the active one, or if is still looking for a walkable way between the rockfalls. We find him after more than a hour, while he is coming down the landslide, almost touching the ceiling. He has found another exit, and he is almost certain he has reached the Gran Derrumbe, the immense depression separating us from the northernmost galleries of Imawari.

We spend the last hours surveying and documenting the upstream collector up to a large final hall. We have a cold and rather frugal dinner before resting our tired bones on the wonderfully smooth surface of our temporary underground camp.

The darkness of the morning sees us mapping again, today until the new entrance, ascending carefully the unstable landslide. Going inside a new cave is always exciting, but returning to the outside world by a new route is even more. The day is not clear, but the clouds do not prevent us from appreciating the majestic environment we end immersed into. We are in the Gran Derrumbe, and for a while we dream about reaching the walls surrounding the depression to the south, towards Imawari. To tell the truth, we try to, and despite the lack of a machete we can walk a few dozen yards. We soon understand what is to be expected, in terms of effort and time, and we return in the underground. Other hours of survey, then we are again under the stars.

The last lesson

Carla and Alfredo are already on the ropes, Tullio is at the base of the ascent. Vitto and Alessio volunteer for disequipping, so I and Leo, just after completing the survey until the entrance, move along the track opened in the dense vegetation. It does not rain, it is not even much later. Everything is idyllic, perfect, we are happy and relaxed.

The stroke is sudden and very hard. I react falling back, the branch entered my eye. I swear in all the languages I know, I bring my hands to cover the eye just hit, the right, the only one that still can see something. Leo gets closer and assists me while I, terrified, try to reopen my impaired visual organ in the light of the headlamp. I can still see, it is like being reborn. The branch hit the eye laterally: it has surely caused an abrasion, but my eyes affected by maculopathy will take me around the world for another while.

I curse the fact of not having brought my goggles with me, and I swear this is the last time. Ascending into the void of the Sima, I find gradually again my inner peace, the muscle fatigue drives the pain and bad thoughts away.

At the camp, my friends confirm the abrasion and the ef-

fusion. We toast with a glass of rum to our last night on the Tepuis, to Oköimo Yeuta, and to the avoided danger. Tomorrow we are going to begin our long return.

The participants to the expedition:

F. Sauro, F. Lo Mastro, V. Crobu, A. Davila, F. Vergara, C. Corongiu, T. Bernabei, L. Piccini, L. Imperio, A. De Vivo, F. Iorio, L. Bessone, D. Barbieri, F. Pandolfo, A. Brunetti, L. Colavita, A. Romeo, R. De Luca, G. Annichini, A. Morabito, A. Moreno, L. Vargas, J. Vergara, D. Izquierdo

Aknowledgements:

Our aknowledgements go to Raul Arias for his support in the air, together with Karina Ratzevicius, and Ortensia Berti with all the community of the village of Kavak. The project has been sponsored by: Tiziano Conte with Fedra S.R.L., Luigi and Francesco Di Marzo with Getotec SPA, Raul Helicopteros, Rolex Awards for Enterprise, Renato Daretti with ATS, Dolomite, Intermatica, Ferrino, Amphibious, De Walt, Allemano Metrology, Chelab, Scurion, GTLine, New Foods, Bialetti, MountainHouse. The project has the institutional support of: General Secretary of the Gobernación of the Bolivar State Teodoro Porras Cardozo, Ambassador of the Bolivarian Republic of Venezuela in Italy Julian Isaias Rodriguez Diaz, Direction of INPARQUES Venezuela. The project has been institutionally supported by: Unesco Dolomites Foundation, Italian Speleological Society, CAI Central Commission for Speleology, CONI Veneto, Italian Institute of Speleology.



A sandy floor moulded by dripping water, Cueva de l'Arco.

TWO-DIMENSIONAL STORIES

Leonardo Piccini

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LA VENTA

ESPLORAZIONI GEOGRAFICHE

Venezuela, Auyan Tepui, Cueva Imawari: March 2014. Last year's explorations stopped here: on the right the stream flows rapidly in narrow passages among the blocks, on the left the ceiling lowers gradually forcing us to walk on all fours. No sign of walls...

What a strange cave. Formed by alteration processes on the quartzite rock, along bed surfaces slightly inclined, then gradually removed by mechanical erosion, leaving large gaps only a few meters high. When they become too large they fall down, forming collapsed passages with flat ceilings, supported here and there by slender pillars of rock.

A two-dimensional cave: a floor under our feet, a solid ceiling within reach, the walls far away, often invisible, beyond areas of flat passages too narrow to venture into. They remind me of the old slate quarries in eastern Liguria (Italy), where the miners used to follow the slate layers leaving behind only the minimum pillars needed to support the weight of the overlying rocks. But sometimes they were too confident or too greedy and everything collapsed...

The one before us seems to be the "flat passage" by definition. We slip into on all fours and suddenly it is evident that it may not be easy finding our way back. To guide us there is only the babbling of the stream, flowing on our right, a few dozen meters away.

There are not stones within reach to build the usual "stone mens" we have left behind so far in an endless series: the only guide able to bring us back to the entrance where we have come from, now far away as the several kilometers of vast labyrinths we have traveled.

We are not used to this type of caves. We miss any references. Many horizontal caves have a maze setting, but it is generally a network of conduits that can be walked forward or backward until the next bifurcation. So it is

all about memorizing the bifurcations and leaving some direction indicator here and there. Here it is different. In many areas there are not any walls to guide you. Every step is uncertain. To find the way back you have to follow the reverse of your trail and rely on small piles of stones, but sometimes a silly thing happens: a distraction, a few steps out of the way, and you find yourself lost in a wide horizontal vastness, without contours.

Flatland! How not to think about the booklet by Edwin A. Abbott. Flatland: an unlikely two-dimensional world, inhabited by eccentric beings without a third dimension. A little book, published in 1884, ironic and funny but also deeply acute that, in the late nineteenth century, anticipated in some ways the paradoxes of the dimensional relativity by Einstein.

Ours is a world with three geometric dimensions, plus a time dimension (which has nothing different from the others for a physicist). In everyday life, however, we usually move along two dimensions, bound by gravity to walk on the surface of our planet. Moving up and down is perceived as an ascent or a descent, on the basis of the greater or lesser difficulty in walking, or riding a bike, or the effort made by the engine of our car. What is "below" is almost non-existing, what is "above" is not exactly within reach, it is somehow abstract. In fact, even when we get on a plane, we carry with us our two-dimensional perception. The world flowing thousands of meters below us is something unreal, like a movie passing on a screen.

Only the speleologists deal with a really three-dimensional world. The "below" is something concrete, when you are hanging from a rope on a deep pit. Above our heads often peep chimneys and windows, possible ways to continue our underground explorations. Noticing it

The low flat passages in the "Universe of Silence", Imawari Yeuta.



is not easy and it has taken years before the speleologists learn to see the karst systems as three-dimensional systems, to give “three-dimensionality” to the world, as was pointed out sharply by the great geographer Franco Farinelli at “Casola 2010”.

In the “normal” caves it is hard getting lost in the literal meaning. Usually, you have two solid lateral walls around you, and going along a cave is limited to moving forward or backward. It is often the floor that fails under our feet, while the ceiling is sometimes concealed in the darkness, but the walls are usually within our sight. You can sometimes lose some key passages, but just coming a little back on your steps is enough to find your path again. Here is different. Without walls is really difficult to orient yourself. Every direction can be the right one and there is almost nothing to guide you.

We move forward, while the ceiling is getting lower. By now it is difficult going on all fours and we start crawling. I begin to have sore, as well as cold and wet, knees and elbows. The led headlight becomes increasingly dim, the batteries are probably running down. The darkness surrounding me gets closer and orienting myself becomes even more difficult. My friends have moved forward, I can still hear some sounds, then only silence, apart from the comforting babbling of the stream on my right. I continue, a little lingered after the others, but then I realize I am not sure to be following their trail. I stop, uncertain whether to change the batteries now; but I have to do it in the dark, because I have left the emergency light in my bag, at the beginning of the flat passage. I decide to go back until I remember the path in my mind.

Poor fool! With this vague light now surrounding me everything becomes even. I cannot recognize anything familiar. I continue to move forward along what seems the easiest route for me. Eventually I stop in front of a stretch with a thin layer of sand on the floor: no sign of passage. This is not the way and suddenly I realize that I can no longer hear the sound of water.

I try to make a deviation on the left, while I think about finding the way and hearing again the sound of the stream, but after a few meters I am in a low, too low passage. I go back, I find some tracks, but I am no longer sure of the direction I am following. The ceiling rises before returning low again, until following the path becomes tiring. This is not the way I was looking for.

I stop again. Probably I am not very far from the right path. I try to pick up any sounds, from my friends of from the water, but here there is only silence. Maybe it is better if I wait for them, I am sure I will be able to hear them passing on their way back. What a shame getting lost like this, between the floor and the ceiling, with my almost forty years of speleological experience... eventually the pride prevails: I must find the way, but I must change the batteries before.

I find a place a little more comfortable, but with the ceiling still pressing on my back. The lacking walls put some anguish on me: it seems I can feel the full weight

of the hundred thousand tons of rocks overlooking me. How can they stand up like this?

I take the two batteries out of my pocket and put them in front of me, within reach. I unfasten the helmet, I take it off, and I open the battery case, breaking the contact. Total darkness.

I close my eyes, even if it makes no difference. But with the eyes closed I think to have a better tactile perception, like when you have to go through a very narrow passage; it is better passing it with your eyes closed.

I drag a bit my feet with the batteries. I am not sure of the polarity but I have laid them on the ground with the negative pole towards me. It does not turn on. Maybe I have done something wrong. These lithium cells have not a relief positive pole and I cannot feel the polarity. I retry with various schemes. Then, suddenly, here is again the light! When I open my eyes I have a strange feeling, as if the world has been turned upside down. Am I lying on my stomach or on my back? I feel dizzy, I close my eyes again, and then everything is back in place.

I pause to think about this strange feeling. Crushed in a two-dimensional world, “below” and “above” become meaningless. And what if I, back on a three-dimensional word, find myself in an upside down reality, walking on what is the ceiling of the cave for the others?

I smile, dreaming about seeing my friends emerging away, walking on all fours on “my” ceiling... This cave is somehow strange; or maybe it is the mould we breathed yesterday studying those strange spongy formations on the ceiling of the inactive branches. Hallucinations? Who knows? It is better to look for the way back.

Now that I can better see the environment where I am, I understand where I come from and I am rescued by my experience as a geologist. Here the rocks are slightly inclined and the water has formed necessarily these environments eroding them more on the side where the layers dip; I only need to follow the inclination to find the stream again, then the right path.

I begin my way back, crawling. The ceiling slowly gets up and I can continue on all fours. I find a slightly higher passage and I can almost sit down. I look around, I can recognize the place. I found some signs of passage and I rest for a moment; I can hear the sound of water again.

Soon I see the distant lights of my friends flashing; they are coming back and I stop awaiting them. They tell me they have walked another 200 meters in a flat passage down below.

I rather keep to myself my little mishap and I say: “I have a weird idea. Let’s take a couple of pictures, then I’ll explain...”

LA VENTA AWARDED BY ROLEX, FOR THE SECOND TIME!

The editorial staff

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Francesco Sauro gets the award from Kevin Hand, NASA researcher and member of the jury. ©Rolex Awards/Nick Harvey

In June 2014, during a press conference at the Royal Society of London, big news came for La Venta: Francesco Sauro, active member and current vice-president of our association, has won the Rolex Award for Enterprise with the Tepui Project. An award to the perseverance shown in recent years, and to promote the expansion of this project, including the Amazonian Tepuis.

The Rolex Award for Enterprise was established in 1976 to commemorate the 50th anniversary of the Oyster chronometer, the first waterproof watch, symbol of that same innovation supported by the Rolex Program. The award is aimed at picking out enterprising men and women who use their talent and initiative to improve the world in five major areas of research: science and health, applied technology, environment, exploration and discovery, protection of the cultural heritage. Francesco Sauro has been chosen for the exploration topic by an international jury composed by eight eminent experts and he was part of a list of candidates selected among 1,800 applications from all over the world.

This award acknowledges for the second time the quality and the international impact of our projects: Francesco, actually, is not the only Italian to have won this prestigious award, but also Antonio De vivo, La Venta founder and current member, was honored with the same award in 1993 for the explorative project of some caves in Chiapas.

The award consists not only of a donation of 50,000 Swiss francs to support the project, but also of an intensive media campaign, aimed at making the world know the Tepui Project and La Venta.

In the months following the notice of the award, Rolex, assisted by the important communication brand JWT, has brought the news and contents of the project in newspapers like The Guardian, Washington Post, Re-

pubblica, Corriere della Sera, Messaggero, besides several reports on magazines like National Geographic, Internazionale, Times, GQ, Sette, l'Espresso.

A short video presentation of the Tepui Project has been broadcasted on National Geographic Channel in 27 countries. A special press conference was held in Shanghai, China, with the participation of more than 70 journalists from all over the Southeast Asia. Another important event took place in London, organized by The Guardian, the "Every Second Counts" meeting, where Francesco Sauro presented to an audience of over 200 young people the activities of La Venta and the exploration of the Tepuis, together with other distinguished guests.

A real escalation ended on November 17th with the awards ceremony at the Royal Society of London. Francesco got the award from the hands of Kevin Hand, jury member, NASA researcher of extraterrestrial life and former National Geographic Explorer. The ceremony was attended by about two hundred people, including the famous British physicist Bryan Cox Phd., the geneticist and TV presenter Adam Rutherford, the president of WWF International Yolanda Kakabadse, and several members of the Royal Society and senior diplomats. Special guest of the ceremony was Antonio De Vivo as Former Laureate in 1993, who has supported Francesco throughout the project.

A great satisfaction for our Association, a new prestigious award, which will give new impetus to the exploration of the Tepui zone between Venezuela and Brasil.



Antonio De Vivo, winner of the Rolex Award in 1993 with the Rio La Venta Project, with Francesco Sauro, winner this year with the Tepui Project. ©Rolex Awards/Nick Harvey

THE FLOATING WORLD

LA VENTA
ESPLORAZIONI GEOGRAFICHE

The first part of "Condotto Vasariano", Greenland.



GRAAL (Greenland Research Animal and Algae) Project

Speleological exploration and scientific research on the trail of the polar explorer P.E. Victor

Alessio Romeo (Ass. La Venta and Ass. Spélè'Ice)

Geographical and historical context of the area of exploration and research

The three expeditions of the GRAAL project, the acronym meaning Greenland Research Animals and Algae, (2007-2010 and 2013) took place on the west side of Greenland about 80 km north of the town of Ilulissat (more than 300 km from the Arctic Circle). This area is situated, to be precise, between the Bay of Quervain, where flows the Equip Sermia glacier, and the ice cap on its back, up to a distance of 28 km from the coast to the east.

During the 2007 and 2013 expeditions, the exploration and research were focused both along the coast, covered with marshes and tundra, and on the more marginal ice cap, reached on foot via a path opened by polar explorers in the middle of 19th century and still one of the easiest accesses to the Inlandsis. The supporting accommodation on the coast was the *cabane*

of the French explorer Paul Emile Victor (founder and leader of the Expedition Polaire Francaise Project) at the natural mooring known as Port Victor. Now, near this rundown structure, has been built a touristic resort consisting of a dozen small houses, being their main attraction the glacier Equip Sermia and the constant and thunderous collapses of his front.

During the 2010 expedition, the entire team, with the use of an helicopter, reached the innermost parts of the cap at a distance of 28 km from Port Victor and about 1000 m a.s.l.. The choice of this area of research and exploration has been due to the “easy” logistics of this place and to its exploratory history, recent and past.

History of the project

The GRAAL project began in 2006 from an idea by Serge Aviotte (veteran of the French speleology and founder of the French School of Speleology and of

Beginning the descent in an ice shaft.





Moulin Gabriel.

the Spélè'Ice Association) and Alain Couté (from the Museum of Natural Science in Paris, expert on micro algae and aquatic micro fauna).

Alain and Serge's meeting goes back to the '90s, during the expeditions they organized with Janot Lambert on the Greenlandic ice cap. During those years they shared exploratory and scientific results that strengthened their interest in this part of the planet, so as to continue their research and exploration activity even after the "Inlandsis" expeditions.

Since the first expedition, in 2007, Spélè'Ice Association team has continued in the wake of the previous exploratory campaigns, carrying out simultaneously both a geographical-exploratory and a speleological-sports activity, keeping a supporting role to the scientific team led by Alain Couté and to the team of video-reporters engaged in the shooting of popularizing documentaries for the television network.

The restoration and conservation of the *cabane*, and of the written records kept inside, have always been one of the goals of the expeditions. This building, dedicated to Alain Joset and Jens Jarle, who lost their lives during one of the crossings of the Expedition Polaire Francaise (EPF), was used in the '90s by Serge and others as a shelter and logistics base before and after the expeditions on the Inlandsis. For this reason it has gained through the years a sentimental value not only for Serge but for all his team.

For bureaucratic and financial reasons, however, this year the building has been left unkempt, and in ever more declining conditions. Even in 2014, however, it was used as a canteen and storage for materials but, if it will not be restored quickly, this was probably the last expedition able to use this construction, while it

would be perfect to keep on accommodating future research and exploratory expeditions; besides it would be a great loss for France as a proof of its period of pioneering explorations of these regions.

Paul Emile Victor's cabane

It's a typical French wooden roadhouse of the '50s, that was brought here and put up again by the French explorer and his men in 1951 and that served as a shelter for some of the eight campaigns of the polar project, begun in 1948 and ended in 1952.

The signs of these periods and of other subsequent expeditions, that used the building as a support, are still alive inside the now rundown building: the walls covered with paper still preserve the emotions and memories of those explorations and of the difficult days spent in the arctic territory.

From the *cabane* starts a path marked by two parallel furrows carved by the passage of tracked vehicles (of them remain only a few mechanical parts at the *cabane*) used by the French explorers, that for about 11 km runs through the harsh territory and disappears near the ice cap. The road probably follows the traces of the previous expeditions that, since the end of the 18th century, used this area as the best access to the Inlandsis: among them there were the expeditions of H.J. Rink (1848) followed by those of De Quervain and Mercanton (1912), M.P. Posild (1913), Alfred Wegener (1929-31), Martin Lindsay (1934), until the assault of the ice caps, after the Second World War, that especially in Greenland saw a succession of campaigns of investigation and survey to complete the work of the previous explorers as K. Rasmussen. Let's remember that in this area, in addition to the EPF project (1948-1953) led by P.E. Victor, took place also the Expedition Glaciologique International au Groenland (EGIG) (1957-1960) and Weidick and Thomsen's campaign (1983).

The new technologies and the modern road vehicles allowed the installation of some base camps inside the ice cap, using the aircrafts to supply them. Thus began the study of the climate and glaciology of these immense reserves of fresh water, archive of huge information on the history of our planet. For more than forty years even speleology has given its contribution to the research of the hydrology and physics of these glaciers, through their internal observation.

Speleological exploration

The French explorers of the EPF have left many important records on their diaries and some of them have attracted the attention of expert glacionauts like Serge. These explorers tell about huge rivers, sometimes real canyons, found during the crossing of the ice cap, rivers to cross but more often to bypass because of their dimension. Rivers flowing into lakes, but also into deep chasms: the moulins. These annotations were sufficient to consider and undertake some exploratory campaigns in the area of Port Victor that, for its

history and logistics, has proved to be a perfect and interesting site for speleologists and researchers.

The search for caves in the ice has ever been the main goal of the '90s expeditions, with the aim to exceed the limit of depth, but also to extend the knowledge of this particular pseudokarst process in the ice. In most of those expeditions there were many scientists and researchers working on several fronts, especially glaciology and biology. The GRAAL project saw mainly the interaction of the exploratory team with the scientific and documentary teams, leaving behind the exploratory part and the race for the depth record.

The cryo-karst areas found in 2007 and in 2013 were located a few miles from the edge of the ice cap, and were reached on foot from the coast, settling the camp directly on the ice.

In 2010, the entire team was transported by a large Sirkosky helicopter 28 km away from the coast at an altitude of 1000 m. The most favorable place for the camp, with an easy access to a broad stream, turned out to be more than 3 km far from the area. The camp was located in the middle of a huge depression, collecting the waters of a lake of about 10 square km; the main river flowing next to the camp turned into a deep canyon with walls higher than 7-8 m, before reaching the final absorption plain with a flow of 7-8 cubic m per second, in August. Then the water made a jump within a fracture deeper than 100 m, before reaching the bottom of the moulin, that was named Gabriel.

The exploration, fortunately, was not completed...at a depth of 70 m from the surface, a lack of rope prevented us from reaching the baseline; furthermore, the constant roar of the huge ice dome above, largely fractured, suggested a rapid retreat. Less than 15 minutes

from the exit of the last explorer, the roar of a huge collapse took away our breath!

This area has nevertheless proved to be extensively crisscrossed by smaller streams coming from all directions and gathering in a small area of 500 square m where were identified, and partially explored, 11 moulins, mainly opening on fractures with NW-SE direction.

The more interesting and aesthetically appreciable cavity is the "fossil" of the big Gabriel Moulin, that is a shaft without a waterfall falling into. The initial tunnel, beginning just three meters below the surface of the glacier and opening on a fracture, was named "The Vasari Gallery" and gave access, after a few dozen meters, to a pitch 50 m deep, with a siphon on its bottom, for a total of 67 m of depth. Most of the moulins we visited didn't have either a terminal siphon or a passable size. The period when they were explored was indeed suitable for a speleo-glacial exploration because it was between the melting period and the cold season.

We cannot say the same for the 2013 expedition that, instead, faced issues related to the weather conditions, characterized by an anticipation of the cold period and snow.

The 2013 camp, settled between August 27th and September 4th, was located in an area characterized by the presence of small sinkholes no longer active for a couple of weeks: their exploration gave no results worth mentioning. A survey to the northeast, however, gave its fruits and, in a couple of days, it was possible to explore a group of moulins opening on two fractures with direction 300°N, very close to each other.

The largest stream (no longer active) had a develop-



Preparing the base camp before the arrival of a wind-storm.



Microscope analysis of crioconite filling.

ment of more than one km and had formed in the final stretch of a canyon 4 m wide, that disappeared beneath the surface to form a meander with two waterfalls, until reaching 30 m in depth and finishing in a siphon. Unfortunately, this is very common later on, because there is not enough water to keep the fractures open. The three entrances along the route allowed the observation of the whole gallery but not a complete survey, because of the danger of the central stretch.

On the fracture intercepted by the “small” river were descended two moulins: the “fossil”, one or two years old, partially blocked by a snow bridge, and an active moulin, a shaft almost 90 m deep with a starting diameter of 10 by 4 m, ending with a basal line where started, in the direction of the inactive pit, a narrow tunnel, recently formed, that we followed till a depth of about 100 m from the surface, but was too narrow to be passed through.

We could dedicate only two days to these explorations, in an area 3 km far from the camp, with adverse weather conditions (strong wind and snow) that didn't facilitate the operation at all. During the exploration was also performed a shooting to realize a documentary.

Scientific research: biology and glaciology

Biology

Alain Coutè's scientific team is composed of his collaborator Catherine Perrette, who took part in all three expeditions and, for the first time in 2013, of dr. Roberta Brayer from Denis Diderot University in Paris, who is specialized in nano-particles.

The field of research was not limited to the coastal areas but included the surface of the glacier and, of course, its internal side. Near the *cabane* were sam-

pled mainly the water of lakes and streams, in order to catalogue their micro life forms as accurately as possible. The groups found are mainly green, red and blue micro-algae and ciliated microorganisms. Surprisingly, these studies have discovered species never identified at these latitudes and in this area of the planet.

Several decades have passed since the discovery of life on the surface of the ice caps at the poles. However, their study and comparison always provide interesting surprises. Alain has a special focus on sampling and studying the cryo-conites and the microorganisms living and interacting inside them.

Cryo-conites are natural holes with a diameter ranging from a few millimeters up to a few decimeters, with a depth of even several tens of centimeters. They can be found on the surface of ice and their formation is due to the melting caused by the dark pigmentation of dust and organisms carried by the wind and by their mechanical action when they are moved by it, resulting in some holes that form, when they unite with each other, ponds and even lakes.

The hole is filled with melted water and, on the bottom, with a brownish mush composed of mineral sediments (mainly micrometric quartz crystals), besides vegetable and animal microorganisms. In these years has been observed a prevalence of green algae* followed by a lower proportion of blue algae (cyanobacteria) and, last, small organisms like tardigrades and rotifers in almost equal proportion, and only a small amount of ciliates.

Tardigrades, considered one of the extremophile species in our planet, stimulate a great scientific interest for their ability to expel water from their bodies, so as not to succumb during the period of frost, and to regain it at the thaw period, coming back to life. Their study has not only an interest linked to medicine but also to the so-called panspermia hypothesis on the origin of life, that is the arrival of life forms from space.

Glaciology

In 2013, the French glaciologist Luc Moreau joined the expedition, accompanied by Farouk Keddad, surveyor engineer at Leica Geosystems. Their work was the continuation of a project to monitor the glacier Equip Sermia that they began in 2011.

The glacier is about 3.4 km wide, with 80-250 m of emerged front. This calving glacier was, and still is, a subject of study and constant monitoring, as well as one of the main attractions of this area for the frequent collapses of his front, and therefore a daily touristic destination. The purpose of this study is to monitor the sliding speed of the glacier, confirming its acceleration and understanding the sliding dynamics at this stage.

Recording the variation in length of the glacier with a simple comparison of the photographs. Moreover, using time-lapse allows to check what are the periods in the year with the most mass loss and the subsequent retreat of the glacier (for example in July 2013 was

verified a very wide retreat).

The installation of a second camera in a higher area, made during the last expedition, will allow both to monitor the right part of the glacier and to perform photogrammetric measurements.

Furthermore, using a GPS station, was also performed a speed measurement of the daily speed during the first week of expedition in several areas of Equip Sermia, obtaining a record measurement of about 7 m per day. The advancing speed has not increased much from the '50s to the early 2000s, recording an increase from 1.5-2.4 m/24h (1912) to a variable speed of 2-3.1 m/24h in the '60s; between 2000 and 2005 there was a 30% increase, up to over 4 m/24h in 2009. Recent studies have also shown that the underwater currents in the Bay of Quervain (with a temperature of about 4 °C) accelerate the melting process of the front of Equip Sermia.

The future of the project

During the three expeditions, the biologists were able to sample plenty along the coast and on the surface of the Inlandsis, but did not have the possibility to collect deep samples, even for the exploratory difficulties occurred. So, in the future, if possible, a deeper sampling will be made. These samples would have the aim to collect biological material several centuries old, interesting for paleo-climatic studies and others.

From the exploratory point of view, the next goal is the identification of a large moulin with the purpose to eventually exceed a depth of 200 m inside the ice cap. This results would allow us to collect data at an exceptional depth.

In the future schedule of Spélé'Ice there are also the glaciers of Patagonia, Argentina and Chile, maybe already in 2016, and there could be a reconnaissance trip to study their exploratory and scientific potential, relying on the extensive work carried out in this area during the last 20 years by La Venta Association.

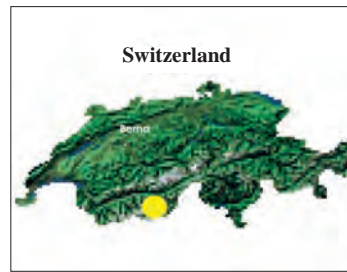
Notes

Many sheets of paper written by the explorers line the inner walls of the building, collecting comments, concerns, feelings and fears of those exploratory campaigns.

*Micro algae: primary producers, through photosynthesis, of the molecules necessary for all the other organisms; so they are at the base of the food chain. They are also the main producers of oxygen because they are present everywhere in large quantities, being colonizers of different environments, aquatic and terrestrial, revealing with their presence the state of health of the territory. The study of their ecology, diversification and state of health in this period of such rapid climate change is important to outline a list of them and of their evolutionary states etc. Another interesting aspect about these algae is related to their ability to produce substances useful to overcome some critical phases of their lives, especially in extreme environments: for example, dehydrines and extensins are some of the substances protecting them.



The base-camp of 2013 expedition.



THE DIRTY GLACIER, OR THE DAY I REALIZED THAT SOME THINGS DO NOT DISAPPEAR

Larry Engel

A couple of years ago I received a polite e-mail inviting me to participate in a panel discussion as a part of the Festival del Cinema Rurale, in Lake Orta.

Rural Cinema?

"But why inviting me?" I ask.

"Your name, prof. Badino, has been brought to our attention by Larry Engels", they answer me.

"Larry? What's the link between Larry and Lake Orta? I ask to myself.

I make some enquiries, this is an event of international standing that, I will find out, is very interesting and deals with issues related to the problems of the rural world in the present society. Besides, I find that Larry, who several years ago shot a documentary for National Geographic on our activity in glacial caves, has meanwhile become the Guru of Ecological Documentaries.

But, why inviting me, of all people?

I go to the festival and I find out. Larry tells me that for him the journey over and into the Gorner glacier was a very important event and convinced him to engage on a different kind of documentary commitment. I am very surprised and pleased that our strange researches have produced so important and unexpected effects. So, I ask him to tell us his story. Here it is.

Years ago, we were producing for National Geographic Channel and History Channel a television series on science in extreme conditions. To shoot one of the episodes we went on the Gorner Glacier, Switzerland, in front of the Matterhorn or Monte Cervino, as you prefer depending on your language of choice. We were working with La Venta in an expedition led by Giovanni Badino. The story was about the exploration and study of the caves and rivers running through glaciers and some-



Emerging remains of an East German roped party dating back to the early sixties.



The glacier is full of waste materials, coming from mountain houses or due to accidents, which are returned during the following decades.

times, as in these caves, providing drinking water to the nearby villages.

We arrived there with our equipment, either by helicopter or on foot, we settled the camp and chose the place of our first descent. It was a beautiful place, in a wonderful landscape, with white ice carved by small streams of water. Also the Alps, around us, were spectacular and it was difficult to detect any sign of civilization in the middle of the glacier. The isolation, silence and peace were impressive, it seemed truly a place never touched by humanity. Gorner reminded me of Antarctica, a more outlandish and remote place that still is one of my favorites on the entire planet. Even here, however, I felt at home.

Early in the morning we walked up to the selected point, a narrow crack in the ice, actually a small crevasse. We wore our suits, equipment and crampons, and we began the descent and shooting. I carried the lights and a couple of members of La Venta team helped me to place them: they were underwater waterproof lights and, although they worked well, we had to avoid their overheating in the air.

At the beginning of the descent, I noticed some strange brownish and blackish lumps within the ice walls of the narrow crevasse. I did not pay much attention, imagining it was mud coming from the top of the glacier, the one closest to the mountains and to their soil.

We filmed for much of the day, going down for 20-30 meters up to a waterfall that was descended by Giovanni, but too technical and dangerous for a novice like me. Meanwhile, we had to keep an eye on the water level

in the cave, because of the constant danger of a sudden flood.

Descending on a rope, hanging from ice screws and going up slowly with the handled ascender were exhilarating experiences. Even filming the research activities - sampling, temperature measurement etc. - was just as much fun, just the kind of entertainment I enjoy.

After returning to the surface, I asked to Giovanni about those dark lumps in the ice. "It's shit,.. human shit", he answered briefly. I remained amazed by the fact that a place seemingly untouched and remote could be filled to this point by human waste. The Alps, I was told, have been attended for decades by mountaineers, skiers and hikers putting up their tents everywhere and, until recently, leaving all their rubbish on the glacier. Then, every winter, new snow fell, burying their waste and hiding it from the view and the thought. But it did not go away.

I never realized how polluted is the water drunk by the inhabitants of the villages at the feet of the glacier. It was nevertheless one of those episodes that made me more aware of how much each of us contributes to pollution, as well as of the need to minimize any kind of environmental impact. Some years later, when on Mount Rainier we adopted a strict policy of waste removal, it was not a burden to carry those blue bags full of my...stuff.



Fecal deposits clearly emerge inside a moulin.

ANTONIO DE VIVO

The ghost with the golden bullets

Published for the first time by the French publisher Dargaud in 1972, "Le spectre aux balles d'or" (*The ghost with the golden bullets*) is part of the Lieutenant Blueberry's long saga (composed of four series), created by Jean-Michel Charlier (script and wording) and Jean Giraud (drawings) in 1960.

Charlier and Giraud are two real giants of international comics, for their extraordinary production, the originality of their scripts, the meticulous attention to detail. The first one, a Belgian (1924-1989), is considered, together with Goscinny, the most important scriptwriter of Franco-Belgian comics. The second one, French (1938-2012), is also known by the pseudonyms of Gir and Moebius. Best known for his fantasy and science fiction stories, he ranged in an eclectic and creative way from comics and design to publishing (founding the magazine *Metal Hurlant*) and cinema, collaborating to the realization of films like *Alien*, *Tron*, *The Abyss*, *The Fifth Element*. Lieutenant Blueberry's environment is the Wild West of the second half of the nineteenth century, where all the classic components are present: the natives in search of gold, the cowboys' hard life, the railroad... Thanks to the precise and historically impeccable setting, Lieutenant Blueberry's series guides the reader to discover the west side of the United States, but with a tone closer to the adventure comics rather

than to the classic western movie.

Blueberry is a cavalry lieutenant stationed at Fort Navajo. He certainly is an unconventional and nonconformist military, as well as his friend and companion in adventure Jimmy Mac Clure, who can drink massive amounts of alcohol and is always getting into a big mess.

"Le spectre aux balles d'or" is the continuation and the conclusion of "La Mine de l'Allemand perdu" (*The Mine of the Lost German*).

In this first episode, Blueberry is sent to Palomito, a small frontier town swept by the scorching wind of the desert, to replace the sheriff, passed away for a shower of lead in his back. The town is inhabited by gold miners, adventurers passing through, and derelicts in search of fortune. Among the eclectic population are also the German Werner Amadeus Von Luckner, aka Prosit, one of the main characters of the story. Luckner, a former Prussian officer, half doctor and half geologist, swears that he has discovered a gold mine, located in the Mesa of the Dead Horse, among the Superstition Mountains, where even the Apaches, who consider them sacred, do not dare venturing into. Because of the danger of the mission, Luckner seeks some companions to reach the mine, determined to eliminate them when he will find gold, and in his trap, as well as two murderers, falls also Mac Clure.

After reaching the area of the mesa, Luckner abandons



the three men in the desert, desperate and tired out. Mac Clure and the others are found by Blueberry, who has left in search of the two murderers in order to arrest them. "La Mine de l'Allemand Perdu" ends with Mac Clure's saving, Wally's (one of the two murderers) catching, and with the killing of the other one during a duel.

"Le Spectre au Balles d'Or" starts with the three men, exhausted and thirsty, following Luckner's trail. In a flurry of events, Prosit try to kill them while they are drinking at the only existing spring, but eventually he is captured by Blueberry. Then come the Apache, and during the chase Wally escapes with Luckner as a prisoner, while Blueberry and Mac Clure manage to run away, riding only one horse, on the Mesa of the Dead Horse. The Apache, terrified, dare not to continue, so the two men save their life. More incredible adventures follow at a fast pace, including a quicksand on a giant dune for Blueberry and a painful death for Wally, murdered by Luckner with a rattlesnake hidden in his boot. But, during the night, a bloodcurdling scream echoes among the moonlit canyon walls. Neither Luckner, nor Blueberry or Mac Clure have an idea of who, or what, has given it out. They only know that he fires bullets of gold, damaging the water reservoir of the German and putting seriously his life at risk. The figure of the "ghost" begins to appear among the rocks and fractures of the mesa: a skinny and scruffy being, his hair long and unkempt, an old musket in his hands.

For Luckner, the golden bullets brushing against him are the confirmation that he is in the right direction: who is shooting those bullets certainly produces them in the mine. When he finally crosses a rocky ridge and overlooks the canyon below, following the footsteps of the "ghost", he is sure that he has achieved his goal. In front of him, on the other side of the canyon, opens a huge cavity, with an ancient pre-Columbian pueblo inside. It seems to be in an Anasazi site, and you would think that Moebius was inspired by the Canyon de Chelly o something similar.

From this moment on, the adventure unfolds within the large cave.

Despite the deadly bullets that the ghost keeps on shooting, Luckner, even if despaired for the lack of water, during the night can descend into the canyon and ascend the wall leading to the ancient pueblo. Among the ruins of the village, he locates the place where lives the ghost: it is a kiwa, an underground room accessed by a trap door, used by the natives to perform sacred rites. Luckner, cautious and incredulous, looks at the back of the room, where he finds a basin of water, a crucible of molten gold and the meager food reserves of his enemy; he shoots at what he thinks to be the sleeping body of the ghost, but once entered into the kiwa he discovers horrified that he has shot at the mummy

of an old Apache, and that the water reservoir is polluted by the corpse of a big lizard. At this point the ladder goes back upwards, leaving Luckner prisoner. From above resonant laughter and words in German that make him shiver: Luckner begins to understand whom they belong to, but the secret is not yet revealed to the reader. The scenes inside the kiwa are particularly evocative; anger and despair seem to be amplified by the light and shadow of the torches.

Desperate, Luckner risks his all: shooting at the ceiling of the great cave, very low near the kiwa, Prosit manages to hit the "ghost" indirectly and to get out through the trapdoor, his rifle hooked to a rope. Interestingly, there is a difference in the wording between two different Italian editions (Alessandro Edizioni and Mondadori): the first tells of a granite ceiling, the second does not mention the type of rock. In fact the geographical area, the presence of caves, the drawing and also the supposed presence of a strand of gold suggest a sedimentary rock.

Luckner gets out of the kiwa, Blueberry and Mac Clure reach the pueblo and find some traces of blood belonging to the ghost. Following them, through a secret passage (a classic stone door to be opened placing one hand in a precise point) they enter the mine, chock full of gold already extracted and ready for transport. Then they come into a narrow tunnel leading to another cavity, this time an accurate description of karst: underground water, stalactites and stalagmites. They find the "ghost" lying on the floor, still alive, who tells them he is the real Baron Von Luckner. Prosit is none other than his former assistant, who tried to kill him at the time of the discovery of the mine, replacing then the real baron to seize his gold. He survived thanks to the care of the old Apache now resting in the kiwa...

Also Prosit reaches the mine and blocks its entrance, intending to blow up the entire pueblo with explosives. There seems to be no hope for Blueberry and Mac Clure.

We find again Prosit in front of the canyon, enjoying the show of the immense explosion, then in the desert with his horses laden with gold, fleeing desperately from an attack by the Apache. Miraculously, he is rescued by a squad of cavalry, who escorts him up to Fort Navajo. We find him again in luxury places with a pleasant company, puffed up with his immense wealth, and then in New Orleans, ready to embark for Europe. At the boarding a bitter surprise awaits him: Blueberry and Mac Clure that, ignoring any proposal to exchange gold for freedom, arrest him, sending him on the gallops in advance.

But how did our heroes survive? The cave has obviously a second entrance: the real Von Luckner revealed them its existence before passing away...

Caves, often, save lives...

CHIAPAS

Mexico

LA VENTA
ESPECIALIZADO EN RESERVAS

The great tunnel, Canyon of Río La Venta, Chiapas.



CHIAPAS - MACONDO AND OTHER STORIES

Natalino Russo

April 2014. The explorations in the Río la Venta Canyon and in the Selva El Ocote continue. Nearly twenty-five years of work have led to the discovery of more than three hundred caves, for a total length of over eighty kilometers. The most important cave of this area is the Cueva del Río La Venta, a tunnel 13 kilometers long, connecting the plateau on the orographic left of the canyon with its bottom, where flows the river, four hundred meters below. It is a magical place, one of the richest collections of underground morphologies in the world. But in those places, just beneath the tangled vegetation of the forest, open thousands of caves. Expedition after expedition we keep on mapping this treasure, along with dozens of speleologists not only Italian, and especially thanks to the collaboration of the local people.

During the last expedition we have flown over the forest, thanks to a helicopter provided by the Protección Civil de Chiapas. We have come into the western area of El Ocote, where, from the dense vegetation, poke out the ridges of huge sharp karrens. Here, among the shadows

and the deep green of the forest, we have identified a large portal still unknown. We have named it Macondo, in tribute to Gabriel García Márquez, who passed away in Mexico in those days. It is located in a remote and difficult accessible area, Macondo, and unfortunately a week of storms has prevented us from reaching it. But it is on top of our list of future goals.

A second group would have to work in the forest, inside caves already identified in the past, but when it rains the forest is inaccessible, so the group has dedicated itself to finding new entrances around the village of Monte Bonito. Here it has begun the exploration of a new cave over two hundred meters deep, with internal pitches with waterfalls lashing against; and in the surroundings has been performed some speleo-diving in the big resurgence of Pajalaná, near the Aguaclara colony, and in the clear siphon of the Chute Redondo.

A large group has worked in the area of La Conchuda, on the orographic right of the canyon, ascending the spectacular waterfalls of Los Bordos. The water comes



The Soiano Macondo, in the Selva el Ocote, seen during the aerial survey.



The entrance of Cueva El Amate, La Pera San Rafael.

from a huge conduct entering the mountain for over three kilometers. It was already explored by the French at the end of the '80s, and a La Venta expedition came there in 2013, beginning new explorations and mapping again part of the topographic survey. In addition to completing this work, our last expedition has focused on the video and photographic documentation. The cave is beautiful and opens on a landscape of great charm, in a bend of the canyon, at the foot of high walls, among travertine pools, where from the dense vegetation poke out the ruins of a Zoque settlement, already visited by one of our expeditions in 2001, when it was mapped and named - perhaps with not much imagination - La Conchuda. Just moving a few hundred meters, you can run into other large and inactive caves, rich of rock paintings, tombs, altars. Like the Cueva del Porche de Los Bordos, unfortunately sacked in the '40s.

After a few days spent in the Reserva La Venta, to equip again and make safer the Cueva del Naranja, many participants to the expeditions have moved to La Pera area, invited by the municipality of Berriozábal. It is a nature reserve halfway between El Ocote and the plateaus of Tuxtla Gutiérrez. It is a beautiful place, with dense forests and deep unknown pitches. Here, in a few days, have been explored several kilometers of caves, especially in the Cueva de El Amate, where the local has ever known its initial stretch, but that includes also two active and very wide lower levels, so far unknown.

BOX - Centro de Estudios Kársticos La Venta

In autumn 2012 was born the Centro de Estudios Kársticos La Venta (Ceklav), a non-profit association based in Mexico and dedicated to the knowledge and protection of karst phenomena and environments in Chiapas. To its foundation have contributed many La Venta members, Italian but especially Mexican.

The Ceklav works closely with groups and associations already existing, and has already signed agreements with several institutions to create a register and to develop educational projects. Among them there are: Protección Civil, Universidad de Ciencias y Artes de Chiapas (Unicach), Universidad Politécnica de Chiapas, Academia Nacional de Investigación y Desarrollo (Anide) and Comisión Nacional de Áreas Naturales Protegidas (Conanp). The Ceklav organizes basic speleology courses and seminars at university level, obtaining the consent of many students. In the near future it will work also with the Reserva de la Biósfera Selva El Ocote.

BOX – Viva la ceiba!

Near the colony of Los Joaquines, in the municipality of Cintalapa de Figueroa, La Venta Association has bought some land and set up a reserve. The area is located on the orographic left of the canyon, in a populated and deforested zone. The goal of the Reserva La Venta is to contribute, planting trees, to the rebalance of the forest. For this purpose we have launched the project «Viva la ceiba!» (*up with the ceiba!*), inspired to a tree sacred for

the cultures of many pre-Columbian people, including the Zoque. Everybody can contribute to this project by making donations. All information on the website www.laventa.it

Participants *Italy*: Daniela Addis, Tullio Bernabei, Leonardo Colavita, Paolo Forconi, Luca Gandolfo, Michele Ladini, Marta Lazzaroni, Piergaetano Marchioro, Andrea Meloni, Paolo Musiu, Pier Paolo Porcu, Giovanni Rossi, Natalino Russo, Tommaso Santagata, Luca Sgamellotti, Gianni Todini, Paolo Turrini. *Mexico*: Kaleb Zárate Gálvez, Alicia Dávila (Beba), Pepe Pez, Israel Huerta, Ar-

gelia Tiburcio, Mauricio Náfate, Lucas Ruiz, Oscar Raúl Sanchez Morales, Patricia Elizabeth Pérez López. *Spain*: Cecilio López Tercero, Natalia Zapata.

Technical supporters Ferrino, Dolomite, Intermatica, Scurion, Amphibious, De Walt, New Foods, Chelab, SAE, Hennessy Hammock, Mountain House.

Institutional supporters and collaborations Reserva de la Biósfera Selva El Ocote, Protección Civil del Estado de Chiapas, Municipio de Cintalapa de Fuguroa, Municipio de Berriozábal,



A flooded passage in the Cueva Los Bordos, La Conchuda.

Impressions of a Matra

Matra Lazzaroni

I am one of those who get lost. I get lost physically and mentally.

As an intern for the Centro de Estudios Kársticos La Venta, I was asked to go to Chiapas to work on a project that I was following from Italy. My friends thought I was crazy: «Third internship? You're not obliged. Validate one of them and that's all!».

No, no, absolutely no. The idea was suggestive, I intended to go. After many hours spent on the survey of those caves, transcribing their names and fantasizing about those underground voids, it was time to see them live. In Italy I had to do a lot of things, including my last exam and my thesis, I would have had to take part to a trip of my speleological association, as well as tackling some troubles in my own house. Instead, I had this idea fluttering compulsively in my head: leaving. And so, I usually get lost everywhere, and in got lost also in this adventure.

In Mexico we immediately found a nice climate: the temperature was 20 degrees Celsius at an altitude of twenty-five hundred meters a.s.l. As we approached to Chiapas, the temperature raised and the landscape changed. The (future) geologist in me could not help but notice the famous «cockpit karst», seen again and again during the geomorphology lessons, and the meander bends of the Río La Venta, the red soil, the sinkholes in the Altos, the forest crushing the landscape. Breathtaking waterfalls welcomed us at the resurgence of Los Bordos; together with a steep ascent carrying all the bags on our shoulders. But what could stop us? We camped in a place that seemed being there just for us, with those small natural pools, and some vines stretched over the crystal and turquoise water. And then the cave, with its well-preserved tombs, an inactive branch so large you

can ride a bike inside, the upper branches, ring-shaped and always coming back on the active stream, and finally the water, which at some point seems to flow upstream. And the Cueva de El Amate, in the karstic massif of La Pera: definitely underestimated at first, it has quickly become several kilometers long, showing us jellyfish-like formations, huge columns and a terminal area that, during the rainy season, oh my god, may become a fantastic lake.

In Chiapas I have learned that smiles are free, that tortillas have a sound, that the fresh hammocks are those made of cotton, that in the morning you have to shake your boots if you do not want a tarantula under your feet; that in the intersections you pass «one for one», that to buy something you have to haggle, that I need many less things than those I have carried, that ten people can sit on the back of a pick-up but the driver must fasten his belt, that a small pitch can lead to miles of continuations. I have learned that you cannot refuse to eat anything offered by your host, that the Mexican time is compatible with the speleo-time, that water flows where it wants to, that lentils soaked in rum are not that great. And that if you dive into a pond it's better not to wear many clothes, unless you have Phelps' arms.

In Chiapas I have learned that exploring is respecting. I have learned that Mycrodin and Tang (a water purifier and a drink) are our friends. I have also discovered that you can be a revolutionary, but you cannot forget the national flag and the Virgin of Guadalupe. That in the jungle there is no silence at all, in fact, there's a great buzzing (the deafening sound of cicadas). That calling a Mexican takes a quarter of an hour, as they have eighteen names and according to them they are all «el primero» (*the first*). That TVs can be knickknacks, that horses made of mud are beautiful. And that explorers don't get lost, they explore! So now I don't get lost anymore.

Los Bordos, La Conchuda.



EVOLUTION OF PISOLITES

Paolo Forti

31

On the basis of the morphological evidence of the sinter pool, which has a depth that is much less than the diameter of pisolites, and of the internal structure of the sampled one, the evolution of the pisolites found in the cave can be divided into three consecutive stages. In the first stage, from the beginning of concretioning up to a diameter of about 3-4 mm, the development occurred in conditions of constant and total submersion by water flowing over the sinter pool: as clearly indicated by their perfectly spherical structure, finely laminated with regular accretion bars and smooth external surfaces. The only genetic mechanism active in this period was CO₂ diffusion from the solution to the atmosphere of the cave.

In the second stage, that affected pisolites for another 1-2 mm, only a small portion of their top was left outside of the water in the sinter pool. In fact, their accretion bars present an outer surface more “rough”, but it

is renewed from band to band and does not increase in size over time. Indeed, these characteristics indicate that their outer surface was totally submerged in water for most of the year; therefore the dominant process in their development was again CO₂ diffusion in the atmosphere. But the ripples on the outer surface of their accretion band are a clear indication of the partial surfacing of pisolites for short periods, when diffusion was joined by evaporation, resulting in the development of small ridges due to the phenomenon of migration by capillary action and evaporation.

In the third and last stage, that characterized the development of pisolites until reaching their current size (12 mm of diameter), they were partially out of the water all time. The mechanism by far predominant, if not exclusive, of their growth, was evaporation with the progressive development of a coralloid structure, with its individual elements becoming bigger year after year

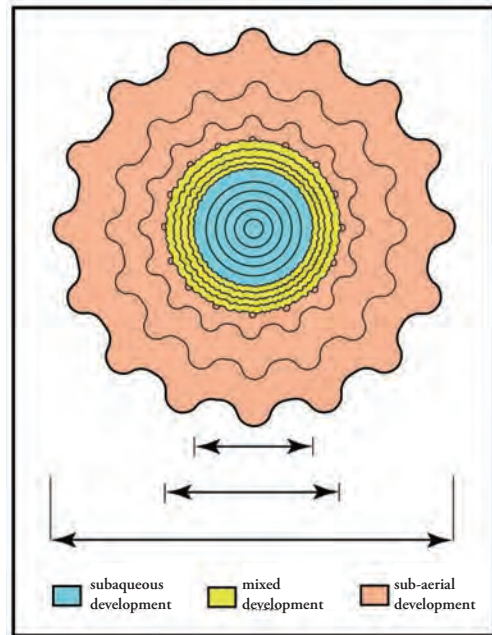


Pisolites discovered in the Cueva Los Bordos.

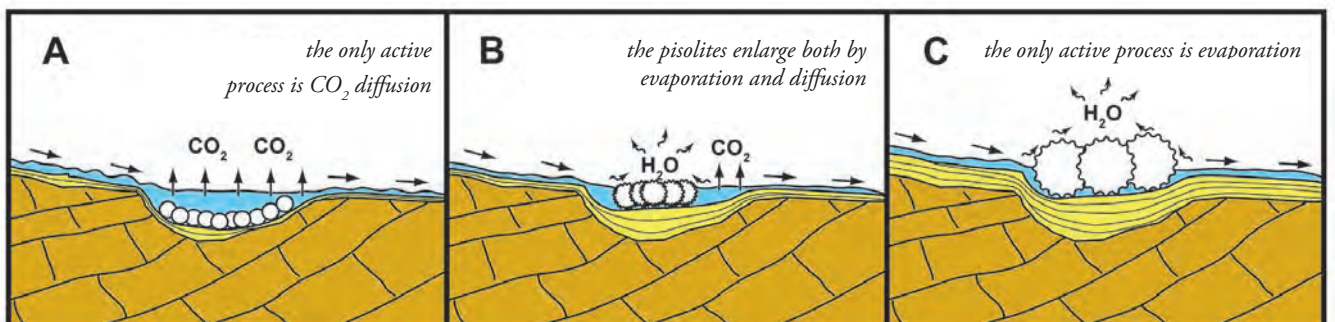


The pisolites found in Los Bordos show a clear coralloid structure.

until they reached their current size. However, despite the fact that pisolites were partially out of the water for the whole year, they have maintained their perfect spherical shape, and coralloid ripples have developed almost evenly over the entire outer surface. This fact demonstrates in a clear manner that pisolites rotate on a regular basis to allow the whole pisolite, and not only a portion of it, to be the site of phenomena of capillary migration and evaporation, responsible for the formation of coralloid structures. An explanation is to be found in the floods caused by the external precipitation that, given the geographical area, can be very intense and, therefore, can cause a rise in the water level in the pool area, making turbulent its flow with sufficient energy to cause the partial rotation of pisolites.



Section diagram of the pisolite with its three different evolutionary stages and their dimensions highlighted



Evolutionary stages of pisolites inside a cave ...

GOOD FRIDAY

Tullio Bernabei

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LA VENTA

ESPLORAZIONI GEOGRAFICHE

18/4/2014. Serious accident today at the Ranchito-Reserve La Venta, municipality of Cintalapa, Chiapas, Mexico

LC, known and experienced speleologist from Cam-pobasso, and La Venta member, was about to enter the Cueva del Naranja together with TB, another member of ours and frequent visitor of these places. They were carrying heavy bags full of material useful to equip again with ropes some points of the Cueva, together with several wine bottles destined to form the first supply for an underground "cellar", cherished for a long time and finally about to be realized.

On the second front step, so practically still outside, LC improvidently did not evaluate the green color of the wet stone, therefore sliding in a spectacular and thunderous way. Before twirling and falling to the ground, he put his right arm under his stocky body, thickened by years of Molisan diet.

TB, attracted by the huge thud, turned back just in time to see LC lying on the ground, screaming, with his arm caught between his legs, shouting: "Is it broken, it is broken!" and, in fact, you could easily notice an incorrect alignment between his arm and his hand.

Facing this tragedy, the first spontaneous thought of TB was for the wine bottles. After a few seconds of confusion due to his age, he remembered that he was carrying them on his shoulders, so they were safe.

Now also LC needed to be rescued, but he claimed that he could faint if put suddenly in a standing position. Unfortunately, the area of the Ranchito has no cell phone

coverage and the satellite phones prudently provided to La Venta expedition were at the two advanced camps of Los Bordos and Monte Bonito: so it was not possible to notify our friends of the local Civil Defense who could send a helicopter in a few minutes.

LC asked TB to enter alone and to arrange at least the wine, or even the ropes on the pits, but TB answered that it would take a long time (you cannot improvise a cellar) and he did not want to leave him alone with a broken arm and the simultaneous presence of dangerous animals including: a jaguar, several species of venomous snakes, howler monkeys, vultures and butterflies.

TB then tried to convince LC, successfully, to head down the road next to the Reserve, where was parked one of the vehicles of the expedition, and to be driven to the next hospital.

They walked slowly but relentlessly along the path and arrived at the parking, where they warned the guardian of the Reserve, Don Poli, who watched the injured man in dismay and regretful, wondering in what difficult underground passage occurred the accident.

TB replied that the tragic event did not happen inside the cave, but on the front steps, and invited him to replace the stone of the second step for the upcoming visits. Don Poli, visibly moved, solemnly promised to do it as soon as possible.

Meanwhile LC and TB put haphazardly in the trunk their stuff, leaving the wine locked in the house-guest. The jeep left and the poor LC complained at every jolt, holding his wrist. In about 30' of fast driving TB took LC to the charming town of Cintalapa and in particular



The hands-free operation by the huesero.

to the Roma clinic, a good omen, after picking up Don Efren Ramos at his house. He has been a local inhabitant and sponsor of La Venta expeditions for twenty years, and of TB for thirty years (or best, forever) for reasons that is unnecessary to specify here.

Don Efren, knowing the staff of the Roma clinic, briefly allowed LC to undergo an X-ray of his right wrist/arm. The report was sadly predictable: according to the technician, there was a fracture of the radius near the wrist, evident though not compound.

Lighting the photograph, he allowed them to notice that the radius seemed to penetrate by a few millimeters in the next wrist bones. There were no doubts, even for a non-expert.

In the clinic, as well as throughout Cintalapa, there was not any orthopedic surgeon, so Don Efren asked the radiologist for advice: they agreed that perhaps the only option, being Good Friday (that in Mexico is equivalent to the American Thanksgiving Day) was turning to Don Nacho (pron. na-chee-o), very competent and famous. TB asked where they could find this doctor and Don Efren answered that he used to live in Vicente Guerrero, near Jiquipilas, a town smaller than Cintalapa and about 20 km far.

TB knew Jiquipilas, but he did not know Vicente Guerrero, and frankly he did not understand why a medical service impossible that day in Cintalapa could be available in a smaller town, but with the impending tragedy there was no time to wonder about these questions. So they left soon towards Vicente Guerrero, municipality of Jiquipilas.

During the journey, TB came back on this subject and asked Don Efren in what hospital worked Don Nacho, being answered that he worked in his own house and he was not a medical doctor. TB, surprised, decided not to

reveal this news to LC to spare him a shock, with unpredictable consequences in his conditions.

Don Efren, understanding the disappointment of TB, smiled and stated that even many doctors used to turn to Don Nacho's treatments. The plot thickened, but probably TB's intuition to pick up his camera at home would make sense.

After crossing the desolately empty center of Jiquipilas, where here and there appeared only men with walking difficulties due to their high alcohol level, the car continued towards Vicente Guerrero as directed by Don Efren. After arriving to a bridge over a river, they noticed that along the banks there was a big popular party with bathing, songs, food and a typical orchestra, a nice glimpse of a Mexican party that could not be enjoyed because of LC's unstable conditions. His pain, in fact, increased, despite the quick bandage applied by the radiologist, and he could not move his fingers or wrist.

Once in Vicente Guerrero, a small country village composed of humble low houses and sunny streets, Don Efren asked for information to a passerby who immediately pointed to the right direction to find Don Nacho: "aquí a dos cuerdas".

In fact, two blocks away, there was a corner house made of bricks and painted with two bands: red at the bottom and white at the top.

TB, who speaks Spanish, immediately noticed the alarming writing on the wall: "Huesero". The translation "bone healer" is too elegant. Maybe "bone fixer" it's better. Also LC, that despite twenty years of Mexican frequentation understands little Spanish (and speaks it worse), sensed that there was something strange in that name, but he did not focus very well, perhaps influenced by the severe pain.

Don Efren was aware of the delicate moment and sud-



After the operation.

denly, with a pat on his back, accompanied by sexual jokes not to be reported, brought LC inside the open door of the building. TB, instead, stopped outside to take some photos and videos, thinking that this opportunity could not be missed.

In doing so, he noticed other interesting details on the façade: on the left of the word “Huesero” were indicated his office hours (nearly every day for twelve hours a day), while on the right there was a simple but significant figure in black and white. It depicted a person lying and another one on her side, standing, in the probable act of giving a massage to the first one. The lying person, supine, was unmistakably a woman, judging by the big pointed boobs where the therapist’s hands were pointing to, crystallized an instant before contact by the drawing. While TB thought about this issue, beginning to feel curious to know Don Nacho, LC came outside clamoring



The huesero's ambulatory.

where was the radiography. It had been forgotten inside the car, but they immediately arranged for bringing it inside.

After an antechamber, they accessed to a small room where were Don Nacho and a woman, probably his assistant, and maybe even more. The man, over sixty, with a nice look, was on a wheelchair and had clearly suffered the amputation of a foot. Certainly, this detail further worried LC, but nothing leaked out from his eyes.

Don Nacho, short for Ignacio Díaz García, knew Don Efren like everyone in the valley of Cintalapa, so they immediately began to talk about youthful memories, of course including women. Brought back to reality by LC’s suffering look, after making introductions, the bone fixer looked absently at the radiography, then he grabbed LC’s wrist and began to touch it, focusing on his feelings.

When TB timidly asked if he had already dealt with that kind of problems, Don Nacho became serious, saying that in his life he had treated ALL the bones in the human body, including the skull. Then he claimed that LC’s wrist was not “quebrado” (broken) and that he had only to put it back in place. Starting to manipulate that limb, he asked LC if he could bear the pain or if he wanted some anesthetic, and he clearly declared to prefer the latter.

So the assistant prepared a syringe full of anesthetic (Novocain, or similar) and Don Nacho began to inject it directly between the bones of his wrist, searching for the

right point with the needle. LC was screaming in pain, Don Efren kept on telling jokes not to be reported to cheer him up, TB did not interrupt the video recording, realizing the importance and the commercial value of that documentation.

After the injection, in a moment of pause, Don Efren proclaimed, pointing to the area between LC’s legs: “se orinó!” (he pissed himself). All eyes turned to that point but they did not notice any spots of moisture between the legs of the poor LC, who declared his innocence. Again, obviously, it was a joke to cheer the group up. But now there was no time: Don Nacho asked the help of two strong men who would stand on LC’s sides, evidently in order to immobilize him. In the room there were only two men available, the choice was obvious. Again, TB (and obviously Don Efren) understood immediately, while LC did not grasp everything about what was going to happen: this allowed them to settle well. However, TB, in extremis and masterfully, could place his camera on a chair, facing the dramatic scene that was about to begin.

At this point, without waiting for the action of the anesthetic, Don Nacho began a series of maneuvers on the wrist and arm that were impressive just to look at, and on a healthy limb.

LC screamed and tried to wriggle, finally succeeding on Don Efren’s side. But, not to lose his grip in that topical moment, Don Nacho stood on one leg, continuing its relentless and violent action. Actually it all lasted for less than a minute, then the bone fixer declared a stentorian “ya quedó” (it is in place). Three hours after the accident, amazingly, LC could move his fingers and wrist as nothing had happened to him.

While bandaging the lower part of his arm, the healer declared that LC could remove the bandage after only 2 (two) days, and then lead a normal life, being just a little attentive not to overexert it for a few days.

TB at this point specifically asked if he had ever put anybody in plaster, and Don Nacho replied that plasters are harmful, he had applied at most, in severe cases (multiple fracture, disintegrated bones etc.), a plant bandage called vilma and composed of a bean shake and egg white, for 28 days. He concluded by arguing that plates, nails, months of plaster, are all useless.

After paying a very modest amount, a little more than the value of the anesthetic, they happily returned to Cintalapa. The big party on the river was going on, the people were happy, Good Friday reached its climax. After a few hours, LC could move his hand and fingers and did not feel any pain. TB, after extensively interviewing his friend, dedicated himself to the editing of the video images of his journalistic scoop.

Obviously it was soon scheduled a new trip to the Cueva del Naranjo, with a well defined goal: settling the canteen and in that place toasting to the Huesero and to Don Efren.

The posterity will make a medical assessment of what happened.

BAI SUN TAU

Uzbekistan

The Red Lakes Gallery at -600 depth, Dark Star Cave.



THE DREAM CONTINUES

Antonio De Vivo

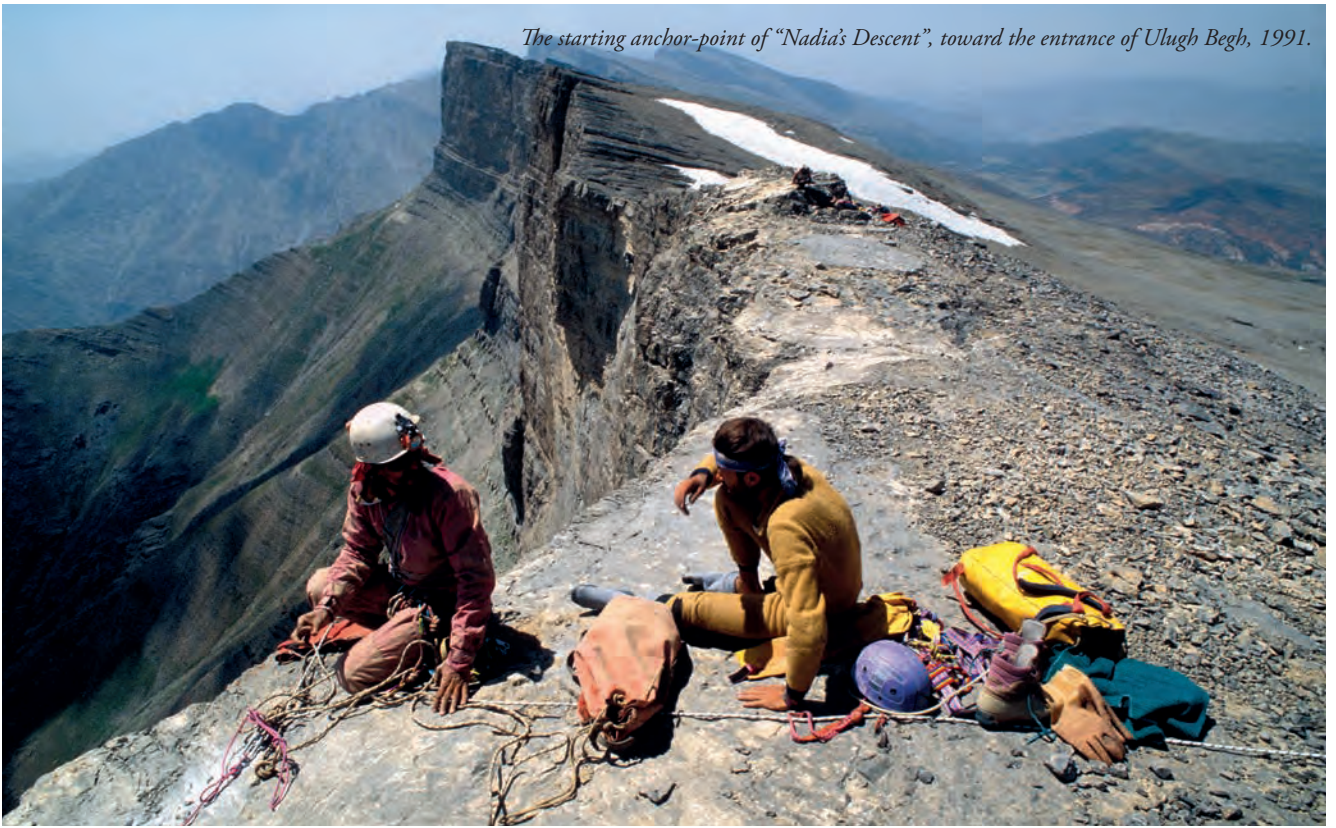
We met the Russian speleologists for the first time in 1988. They had been invited to the national speleology meeting in Costacciaro to present the speleological activity in the U.S.S.R. (as it was called then) and Tullio did not miss the opportunity to make contact with them for a future joint expedition in that distant country. At that moment were meeting two worlds, two approaches to speleology, two different situations of techniques and materials. That alone was enough to make that future project mythical. Our choice fell on the endless chains of

Baysun Tau and Chol Bair in Uzbekistan, where also for our Russian friends was not easy to arrive and explore. They had been going to that area for several years, but the new frontier seemed so vast to leave room for any dream. It came the time of the expedition; in the summer of 1989 we sweated on endless heaps of stones, bearing impossible loads, overcoming several times two kilometers in altitude to settle the base camp, hardly concealing a deep envy towards our Asian colleagues who seemed indifferent to fatigue and altitude. It was the year when



Approaching the base camp at 3500 m asl, Samarkand Expedition, 1989.

The starting anchor-point of "Nadia's Descent", toward the entrance of Ulugh Begh, 1991.



we explored new continuations of Festivalnaja and Boy Bulok to their bottom, almost incredulous in front of a karst phenomenon so original and challenging. Those first explorations created strong friendships, which were cemented even more during the visit of some of those participants in Italy, at the Costacciaro meeting in 1989. They arrived to Mestre from Sverdlovsk (now Yekaterinburg) after four days of journey by train, and they

drowned fatigue and tiredness in a series of drinks with different alcohol content.

The Samarcanda Project was born, and we came back with them in the high Uzbek homoclinal two years later, we went down breathtaking descents and we named the most beautiful cavity after the great Timurid mathematician and astronomer Mīrzā Mohammed Taragai bin Shāhrukh, better known as Ulugh Beg. Those, even more than for speleology, were crucial moments for the geopolitics of that area and of the entire world. In 1989, the Berlin Wall fell, while we were exploring voids inside another wall, the Hodjā Gur Gur Atā; in 1991 the coup d'état in Moscow risked to block us all at the top of a mountain as distant as Mars.

During that expedition, we realized a documentary and, in 1992, we published a book dedicated to that project, the first made by La Venta.

In 1994, I returned to that area with Paolo Pezzolato (Fox) to try new explorations and to unblock a clogged branch of Boy Bulok; it was a disaster from the point of view of the results (our Russian friends used explosives to blow a concretion in a branch without a breath of air...) but our participation was much appreciated. Those areas, those caves, are very selective and who ventures into must be very motivated. And it is this motivation that creates respect.

After many years, we came back in that area together with Russian speleologists from several caving groups: since 2010, every summer some of us have participated in those that now are real international missions. Our old Russian friends of the '80s and '90s do not longer take part in the explorations, but their imprinting is still visible in the enthusiasm of the new, very strong speleologists that today continue to dream of ever deeper bottoms...



Close to the entrance of Ulugh Begh Cave, 1991.

THE ENDLESS STORY OF DARK STAR

Giuseppe Spitaleri

Baysun Tau Chain, Surkhandarya Province, South Uzbekistan.

Thirteenth awakening at high altitude, the majestic Chol Bair opposite the camp, the solo yoga of Evgenii from Cheljabinsk, the oil stoves are already boiling pots of chai. Tents, bags and gears scattered around the slope debris, the only water vein in this portion of "wall" masterfully conveyed with stones, wide leaves and pieces of mat. Having some water available up here is really a great thing, almost exclusive to the base camp of Dark Star. At the Festivalnaja camp, in the past years, we were forced to descend more than a hundred vertical meters up to a small stream, plus a strong risk of contamination, as nearby often grazed the sheep of the Tagiki shepherds. Like every morning, we manage to win that sense of exhaustion mixed with a light altitude sickness and we drag ourselves to the slabs of limestone that we use as a table. We begin to sip some Uzbek tea, someone prepares the usual single course made of emmer, bacon, chicken powder, beef salami, onion, ketchup and the omnipresent mayonnaise. We retrieve the last bags of freeze-dried coffee and cappuccino, accompanied by cheese, chocolate and sesame nougat.

We begin to make plans for the day, several teams are already in the cave: the Tonia and Ulaf's one has been mapping the new meanders at -600 for a couple of days, the three Israelis have been digging and exploring the bottom at -850 for more than a week, the young "li-

ons" Misha, Vanja and Evgenii Sakulin have been really trying hard to descend more deeply, and finally the National Geographic team, in other words Mark, Matt and Robbie, have also been inside from a couple of days to photograph the beautiful environments of the Red Lakes (-600) and of the Full Moon Hall.

We, the Italians, are a bit crushed but active. In recent days, Alex, Aldo and Giovanni and the young Alexey Mikhalkin have explored the R-19 cave, trying to join it with the system of Dark Star, while I have worked for a couple of days at the bottom with the Israelis and the strong Evgenii.

After a short briefing, Vadim sets out three possibilities, that after five minutes become two, and finally we choose one of them: continuing the exploration of the new level of galleries at -500; to do so, we should spend one or two nights at the internal camp "Gothica" at -400. We take some equipment with us, we will find a drill and some ropes inside. In short, the base camp is empty, we all come inside to explore every passage available, I have never seen so much determination: this year big discoveries have not been made yet, but we all hope in a coup the theatre.

We carry inside also the equipment of the two speleodivers, Dima and Georgii, who will try to explore the sumps at -850 and -300, the young Russians move huge quantities of bags from one place to another in the cave. Some of these guys have started to go caving from less



Toward the Tagic village of Dumbalo.



Exploring the final sump in Sifonnaya Cave.

than a year and now they are exploring one of the most complex karstic areas in the world. Speleology courses lasting six months and involving an average of one hundred boys and girls under thirty years of age.

The usual endless walk along the slope debris; when we meet the first scrap of the Soviet aircraft, crashed on the wall about twenty years ago, we start climbing towards the R21 entrance of Dark Star. We wear our cave suite and gears and ascend for about a hundred and fifty meters on hyperstatic ropes. On the last rebelay we find snow and icy wind and we overcome the initial glittering galleries. We ascend a couple of pits and frozen meanders, then finally we get down to the impressive galleries leading to the Connection branch, discovered in 2012 during an Italian-Russian expedition.

We do not find anyone at the first internal camp, not even the ropes we could use for the exploration, never mind, we recover a piece from the ascent that takes us to the new level of galleries. We walk along the new branch, the topographic team should be ahead. We descend a series of pits and cross acrobatically some concretionary lakes, overlooking a nice pit, twenty meters deep and

very wide, already equipped. At the base, the usual inclined meander takes us down again until a criss-cross of galleries already explored previously. Coming back, we check each passage without finding other continuations. We return to the -400 camp at about eleven o'clock in the evening, there are Tonia and Ulaf who have mapped some missing parts of the Red Lakes, the three National Geographic fellows are sipping some tea in the tent, Evgenii Tsurikhin and Alexey Seregin have just returned from an exploration at -700 and tell about a new meander that could lead to new areas of exploration. While Evgenii describes the new continuation, we understand that the potential is really interesting, Dark Star does not stop to give us emotions for the fourth year in a row. Also come Larisa and Ulyana who, along with Vadim, have performed many shots and interviews during the explorations. They have also used a drone to film the approach to the base camp and the surveys on the plateau. At the camp there is not enough room for everyone, somebody will have to go out or descend to the -800 camp, vacated by Boaz, Vladimir and Yuri, who have go out in the afternoon. Evgenii, Toni and others invite us



to descend and map the new meander tomorrow. The idea of going back to the bottom after the fruitless attempts of the whole day does not get us excited, but we realize that placing on paper also this new section of the cave is really important, this meander probably continues parallel to the “wall” and could join other cavities to the system.

We leave the warmth of the tent and put on our cool suits, the advancing toward the deep camp is never trivial, punctuated by endless ups and downs and a heavy sleepiness.

The next day Evgenii and Alexey are awaiting us at about -700, we will follow them while mapping. The continuation was discovered ascending a vadose pit of 37 meters, the first pendula until the vertical line right outside the waterfall are dripping wet. Alex and I follow the two Russians, slipping into the narrow beginning of the meander at the top of the waterfall, while we hear the curses of Aldo and Giovanni, who are lumbered with this first stretch, very difficult to map. They continue along a secondary meander that, in the description of Evgenii, after a tortuous turn is connected to the main one.

We move forward very slowly, in opposition along the wet walls, trying to go up a bit at a time.

The water flowing to the bottom of the meander does not help us at all, we continue climbing narrow pits without protections, we place a survey station every meter and a half. There is a strong air draft, it seems to be in the icy initial environments of the Full Moon Hall, sometimes we are almost in contact with the ceiling of the meander and we delude ourselves to be able to get to an horizontal stretch, instead we keep on ascending. A dozen hours and about seventy survey shots later, we hear Evgenii and Alexey coming toward us, excited: they have explored the meander for about another kilometer, many lateral continuations plunge down following the inclination of the monoclin. We are exhausted but satisfied, we secure the precious survey data and come back down to the deepest camp leaving behind other voids to imagine.

Finally we arrive in the tent, Aldo and Giovanni have returned recently, the last one has been hit by a stone



A rope-traverse before the internal camp “Gothica” at -400 depth, Dark Star.

of about one hundred pounds on his foot, now really swollen.

At first, finding ourselves at -800 in a cave in Central Asia, we worry a bit, but the pack made of garlic by the “shaman” Aldo surprises everyone: the next day the swelling is significantly reduced.

We dismantle the camp and begin the long ascent, we cross the other teams recovering material from other areas of the cave. We come out and descend from R21, enjoying the view of a starry sky, a last look at the wall partially illuminated and to the rebelay, then we aim at other friendly lights: those of the base camp. Vadim, Larisa, Evgenii T. and all the others come toward us offering hot tea; strong hugs and satisfied smiles sweep away fatigue and misunderstandings. Again, we return to be only women and men fatally attracted to these special places, where the concept of geographical exploration lives its highest expression.



Dark Star expedition team members, 2014.

PALAWAN

Philippines



LA VENTA

ESPLORAZIONE GEOGRAFICHE

The Puerto Princesa Underground River estuary, St. Paul Bay, Palawan.



PUERTO PRINCESA UNDERGROUND RIVER 2015 ANOTHER SIGNIFICANT IMPROVEMENT AMONG LA VENTA ACTIVITIES

Antonio De Vivo, Paolo Forti

Now it seems almost certain: we will return soon and in great numbers to Palawan to continue the exciting adventure that, for some of us, began in 1989, even a couple of years before our Association had a formal existence.

In recent years have been carried out many expeditions that have always led to brilliant results, not only from the exploratory but also documentary and scientific point of view.

Over time, thanks especially to La Venta, the cave has reached, from 8 km in 1989, over 32 km of development in 2011, in 2000 was realized a documentary that has been very successful nationally and internationally, "The river of swallows", and from the scientific point of view now we know much about its speleogenesis, its very peculiar ecosystem, its hydrodynamics and waters, its concretioning and mineral content.

Yet we are still far from being able to put an end to this adventure...

Suffice it to say that so far the maximum height differ-

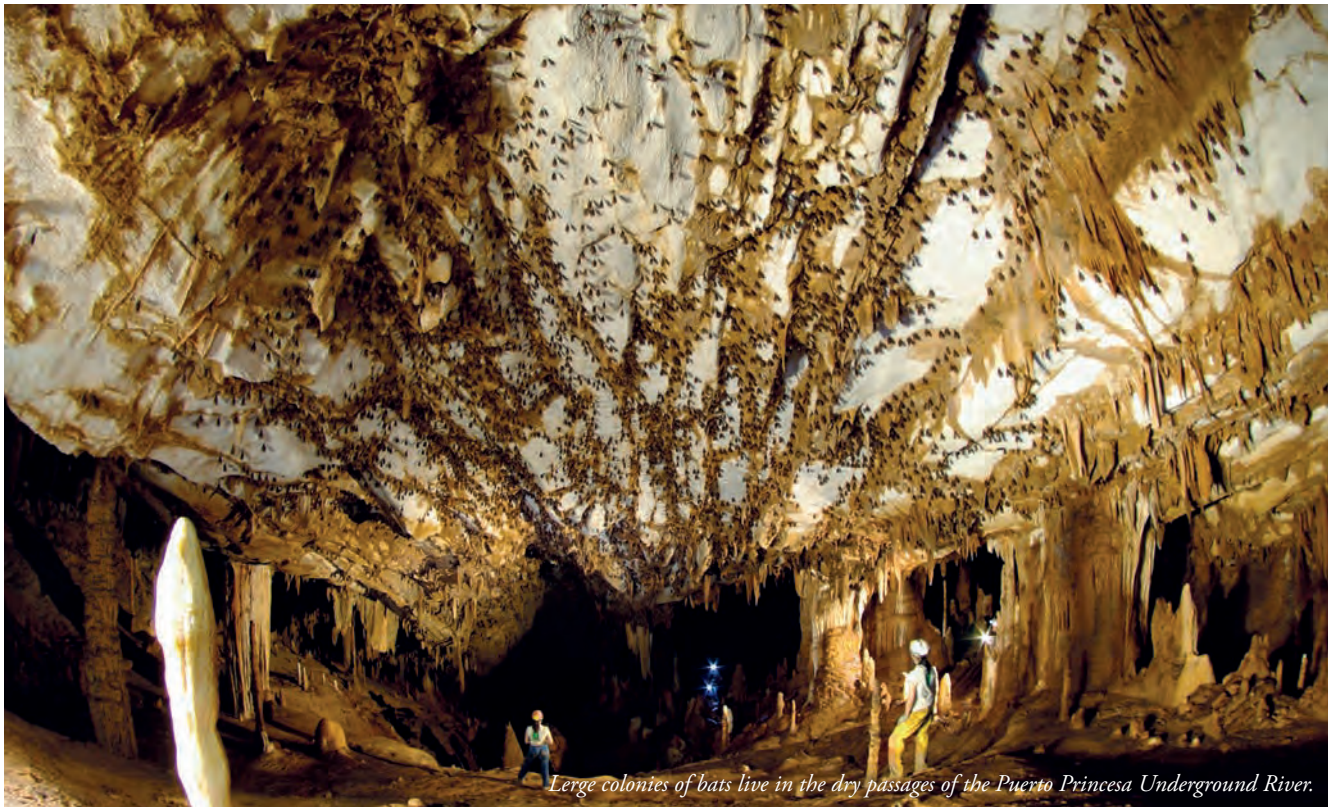
ence of the system is just 100 meters, while we have evidence of sinkholes probably connected to the Underground River that open close to the top of the St. Paul at almost 1000 meters of elevation. And there is still a lot to be done in terms of underground meteorology, of the relationship between external tides and the underground river, of the ecosystem and wildlife, just to mention a few of the most promising fields of investigation.

Yet these, in hindsight, are just some details of secondary importance when compared to the global challenges that the PPUR must face and overcome in the near future.

To understand it we must start from some essential points: the PPUR is the first cave that has been declared a UNESCO World Heritage Site back in 1998, while in 2012, as a result of a global survey, which involved millions of people from all continents, it has become part of the "New 7 Natural Wonders of the World". The park, established in 1971 with an area of over 22.000 ha, has been declared National Geological Park, Asean Heritage Site, UNESCO Biosphere Reserve; for its peculiarities,



The first part of the underground river is visited every year by hundreds of thousands of tourists.



Large colonies of bats live in the dry passages of the Puerto Princesa Underground River.

in 2012 was listed as a Ramsar site, the international convention on wetlands and waterfowl signed in 1971 in Iran during the conference organized by IWRB (International Waterfowl and Wetlands Research Bureau). Simultaneously, the tourist part of the cave has grown from less than 20,000 visitors in 1991 to almost 400,000 in 2012, becoming the most important tourist attraction of the Philippines, with a huge economic impact not only for the nearby village of Sabang, but for the whole region.

Consequently, the Underground River has become the main mean by which they will try, in the coming years, to solve most of the underdevelopment problems that still characterize a large part of the island. Obviously this is not a bad thing at all, indeed it is quite the opposite, but it is necessary that the tourism development occurs in total respect first for the underground ecosystem, but also for the external part: in fact we should not forget that the whole area is a natural park with a delicate balance absolutely not to be upset.

Then the challenge for all the Philippines and for Palawan particularly can make somebody tremble at thought: will be there a way to make ends meet between interests usually diametrically opposed, such as those of mass tourism and those of the preservation of a vast and very fragile environment?

Just in order to find a solution scientifically valid and that satisfies everyone, La Venta decided to present, together with Tagbalay Foundation Inc., a non-profit environmental and educational association founded in 2002, an ambitious project of exploration and research that must however proceed hand in hand with the involvement of the park authorities and of the local communities at all levels (educational, exploratory, scientific, managerial); primary purpose of this project is not knowledge as

such, but its use to allow the local communities to profit by the heritage of the Underground River and of the entire National Park without pauperizing it.

For the first time La Venta will be structurally involved in scientific and technical courses dedicated, first, to the rangers of the park, but open also to local people, to increase as much as possible their awareness of the scientific and economical importance of the Underground River and of the absolute need to preserve it intact for future generations. Another key aspect of the project is raising the awareness of governors and politicians at local, regional and national level, to ensure an adequate regulatory framework to enhance the whole area in an environmentally friendly way. We hope to achieve all this through official meetings, conferences and workshops to be held not only in Palawan but also in Manila: at this stage the involvement of La Venta will be very significant, too.

The occasion for the presentation in 2013 of this ambitious project was the funding grant resulting from the partial cancellation of the international debt of the Philippines, which was accepted also by Italy. In that context it was requested the presentation of projects of bilateral cooperation between the Philippines and Italy, having as their primary purpose the economic development of areas still disadvantaged (Philippine-Italy Debt for Development Swap Program). La Venta was not prepared to the burdensome administrative paperwork required, moreover at very short notice, for the elaboration of a program to be submitted officially at an internationally cooperative level, but thanks to the collaboration of the Tagbalay Foundation and even more to the dedication of some of its members, we have managed to present the project properly and in time.

In the months following the presentation, the project

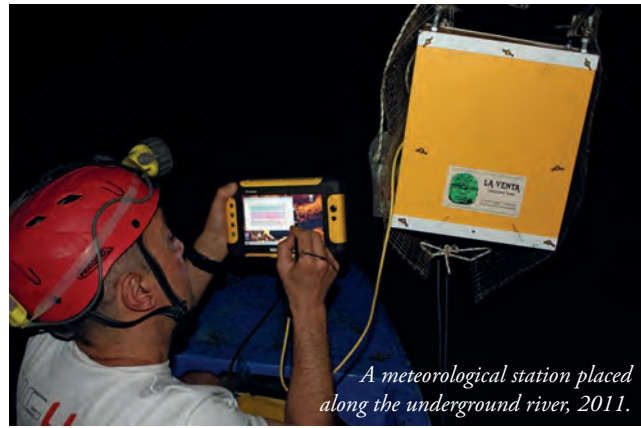
about the Underground River has passed a series of selections and rigorous controls that have required several additions and clarifications that La Venta has always provided in a comprehensive way.

To date, the selection phase has ended favorably and, although the bureaucratic process has not formally concluded yet, it is absolutely reasonable to believe that the Underground River Project will be funded and that, in 2015, La Venta will have to face what promised in its presentation.

To get prepared for this challenge, La Venta has decided to start immediately to work on the project. We have begun reviewing all the data collected from our previous expeditions that, for the most part, were still waiting to be analyzed in detail.

This has allowed us to realize the attached map, where is reported on one side the map of the Underground River updated with the latest discoveries made during the 2011 expedition, while on the other there are all the hydrological, hydrochemical and hydrodynamic data that, in almost a quarter century, La Venta has collected along the over 5 kilometers of the navigable stretch of the cave. They are, in many cases, thousands of data that, to be more easily usable, have been converted into graphics in order to highlight their evolution through time. Among them there is first the bathymetry along the main axis from the Outflow to the siphon of the Rockpile (about 4.7 km), completed by 17 bathymetric cross-sections and by the physico-chemical properties (temperature and conductivity) of the water at different depths.

The latter, as the flow rate, have been measured under conditions of upstream supply of fresh water very different from case to case. They vary from about 100-150 liters/s in 1991 to a cubic meter/s in 2011, until the monitoring of the first part of a great flood in 2001 with a flow rate that, probably, has far exceeded 5-10 m³/s. Finally, we have measured the phase shift of tides between



A meteorological station placed along the underground river, 2011.

the outside environment and the siphon of the Rockpile, that is zero for a flow of the underground river exceeding one m³/s, while progressively it increases when its flow decreases, till reaching a value of almost two hours of low water level, with flow rates below 150 l/s.

These data will allow us to program in a targeted way new collections planned during the first expedition of the project, so to have all the hydrological, hydrochemical and meteorological data to assess, at least from the energetic point of view, the upper limit of tourists that the Underground River can accommodate without suffering a permanent damage. This step is critical in order to prepare, after assessing also other essential biological aspects (regarding the colonies of bats and swiftlets living inside), the management protocol for sustainable tourism, while ensuring also the economic advantage required for the socio-economic development of this region.

We are reasonably optimistic and highly motivated not only to make this project achieve the planned goals, but over all we hope it will become for our Association a kind of ethical model allowing us to continue our activity in other areas of the world where we are currently present only as explorers and researchers.



Downloading meteorological data along the underground river, 2011.

SHAN STATE

Myanmar

LA VENTA
INFORMAZIONI GEOGRAFICHE

The Te Toke Taung swallow-hole, Shan State.



THE NAMUN SPRING CAVE SYSTEM

Joerg Dreybrodt, Umberto del Vecchio

Our minibus goes slowly along the windy road toward the central areas of Myanmar. We drive along the new road connecting the city of Pinlaung with Nyapayidaw, the capital, so in about an hour we are already close to our destination. A signal on a tree announces the steep descent of 1,000 meters that from the plateau of Shan, at 1400 m a.s.l. goes down toward the valley of the Paung Laung River. A modern bridge dominates the river near the village of Leinli and provides us with the opportunity to have a fantastic view of the limestone ridge containing the Namun Spring Cave System. During the 2005 expedition it was necessary a half-day trip from Pinlaung to approach that place, finding and reaching then the entrance of the cave. Just the time for a quick visit, barely enough to see the first wide environments run through by water and to hear the roar of

distant waterfalls. Now, in February 2014, a new international expedition composed of eight speleologists of five different nations goes again along these first traces to explore thoroughly the Namun Spring Cave System. In 1988 the Australian speleologist and scientist JR Dunkley found on a map a large sinkhole, where a river seemed to disappear in a huge chasm and then re-emerge in the vicinity of a source named Namun, which means "clear water". The impressive sinkhole of Te Toke Taung was noticed during a flight of the first survey expedition in 2004 and then it was reached and partially explored during the 2005 expedition. Now, after nine years, the aim of this expedition is to verify the possible link between Te Toke Taung and the resurgence of Namun Spring. As the crow flies, the sinkhole and the resurgence are about 5 km far, with a vertical drop of



Travelling toward Phinton.



Toward Namun Spring.

about 500 m, suggesting the existence of a large karst system. Short visits were made in 2012 and 2013 by small teams as part of the activity carried out by the Myanmar Cave Documentation Project, begun in 2009 (see box). During these expeditions were verified the entrances and established a relationship of collaboration with some local villages and monasteries.

Leinli

The Ven. Thu Seik, abbot of the Leinli monastery, welcomes us and allows us to stay in a bamboo hut throughout the period of exploration. Accompanied by the curiosity of the villagers, we quickly settle our material in the assigned accommodation. It is noon and there is time for a quick trip to the entrance. A short drive on our minibus and then we begin to follow a

path that goes back this short tributary of the Paung Laung. We are accompanied by our guides, the Ven. abbot, an agent of the local police and other onlookers. The first section of the path runs through fields of ginger and then passes through the river bed, forcing us to cross it several times. After about an hour we get to a large pool, bordered by massive travertine concretions, where the water coming from the spring gets out. Here the slope increases and the river goes back with small drops and waterfalls until reaching the entrance portal. Just the time to wear our caving clothes and equipment and we cross the entrance passage, 5 meters wide. We begin to walk along the first 100 m of the cave until reaching a deep lake, about 50 meters long and presenting several lateral tributaries. Beyond the lake a short ascent is awaiting us and we equip it for the following days. Then we come back to our mates, who have been waiting with curiosity and amusement. We spend the evening in the last restaurant remained in the village, managed by a family. The construction of the dam that will block the river is almost completed and the area will be soon flooded, including the village, which is finding a new place in another area. This could be really the last chance to enter the system before the whole valley will be permanently submerged.

Namun Spring Cave

The following days are spent exploring and mapping all the accessible environments of the cave. The cave is very different here, with passages where you have to swim, climb and crawl among large blocks, now ad-



The entrance of Namun resurgence.



One of the out-flow mouths of Namun Spring.

vancing in the sand, now in the mud, now on eroded limestone boulders, all in short sequence. The Namun Spring Cave develops in NS direction, parallel to the rocky ridge where its entrance opens, conditioned by the geo-structural setting. The water supply comes from two lateral siphons placed on the eastern and internal side of the system.

The northern branch of the system, already partially known, is formed by high, dry and sandy passages that occasionally allow to reach the river below. In the vicinity of the branch leading to the siphon that feeds this stretch of the cave, have been explored two branches: one comes back to the south and is characterized by the typical morphology of a canyon, while the other closes in a gallery clogged by collapsed blocks after a development of about 100 m.

Crossing the lake near the entrance you feel the presence of water at a higher temperature, coming from the south side of the lake. The branch where the hot water comes from develops toward south and ends on a siphon that represents the southern water supply of the system. In this area a lateral branch, parallel to the first one, is interested by a strong current that transports quickly the explorers again toward the entrance.

Three days of exploration and survey allow us to calculate a length of about 2.6 km for the Namun Spring Cave System, making it the second longest cave in Myanmar. Now it is time to come back. Our next goal is to descend the sinkhole of Te Toke Taung, on the plateau near the village of Pinhton.

Te Toke Taung

In the evening, the return trip from Leinli takes us to the village of Minbu, located on the road to Pinhton. Despite the late hour the head of the town welcomes us kindly. He vaguely remembers some of us during a survey journey we made two years ago. In less than 10 minutes he manages to organize for the following day our transfer to Pinhton, with all the necessary equipment. We will be accompanied by a large group of motorcycles, the only motorized vehicle able to travel along the dirt road connecting this remote village.

But we have to split into two groups, because the logistics of the village of Pinhton, with the only goal of reaching Te Toke Taung, recommend employing a smaller team, composed of four people. The other team will be based in Pinlaung, from where they will perform surveys and work in other known caves in that area.

The team going to Pinhton is formed by two Italians, an Englishman and a Dutch. The departure takes place in the late morning, and, when we arrive again at the village of Minbu, a dozen motorcycles are awaiting us for the transfer.

The road to Pinhton is a single dirt street, winding and bumpy, where only the locals manage to drive with ease and maneuverability. Our destination is the monastery of the village, where we will be hosted and have our dinners. Just arrived, we are kindly greeted with a cup of tea in the main hall of the monastery. On one wall is proudly displayed an old poster of La Venta, hanged during the 2005 expedition.

The following day we are accompanied to the entrance



Inside the buddish monastery of Leili.

of Te Toke Taung by local guides. Unfortunately we don't have the permission to spend the night in the forest and we will have to reach the sinkhole every day with a long walk of 2-3 hours both for the outward and return, leaving little time for exploration.

The entrance of Te Toke Taung is impressive: an entire river rushes into this cave, making a leap of 50 meters



The entrance shaft of Te Toke Taung.

and then disappearing, swallowed by darkness. In 2005 some of our members managed to descend the pitch on the western side, despite a very unstable rock. This time we try to get down on the eastern side, with the aim to skip at its base the mighty waterfall that stopped the 2005 exploration. We begin a long transverse passage on a spongy and altered rock, the two teams taking turns while equipping, and on the second day we get to a good place to start the descent. A 30 meters leap allows us to reach the base of the initial waterfall. The whole team is at the base of the waterfall and we are immediately lashed by the water, up to our necks in a roar that does not allow us to communicate easily. We manage to find a passage between the concretions, allowing us to descend another pitch of about 25 meters. At the bottom of the following pitch, however, a water barrage closes the passage. There is no time left to try other paths: Te Toke Taung is still a mystery!

On the day scheduled for our return we make a quick trip to the river upstream Te Toke Taung, just enough for a quick visit to some partially known sinkholes and resurgences north of Pinhton, including the The-Shwe Cave.

War Lee Kwey

The team left in Pinlaung explores and partially maps the cave of War Lee Kwey, found the previous days during the return trip from Leinli. It is a through cave about 700 m long, crossing an isolated hill in one of the valley coming down from the plateau to the Paun Laung River.

At the resurgence the size of the cave is remarkable, 30

m wide and 15 m high, interrupted by spectacular waterfalls, lakes and underwater passages. On the other side the sinkhole has a smaller size, although a morphological observation makes us assume that in the rainy period other passages could open up.

Some local people tell us that the water of this resurgence comes from the plateau of Pinhton, on the northern edge of the valley. After the explorations in that area it seems plausible to conclude that the water coming from Te Toke Taung may be discharged both along the valley in the War Lee Kwey Cave and in the Namun Spring Cave System.

Hti Ngut

The last two days are dedicated to the exploration of an interesting sinkhole located 3 km east of Pinlaung. The Hti Ngut cave has a large entrance cavern, used in the past by the locals, where a first leap of a few meters leads above a 90 m pitch, where at the bottom the cave continues active with a series of short jumps. We are left without rope over a 10 m leap, at a depth of -157 m, with the certainty that the cave continues. Considering that the cave opens at an altitude among the highest in Myanmar, at about 1636 m a.s.l., and that is already characterized by a remarkable depth, a few meters less than the deepest cave, we assume for the cave of Hti Ngut a high exploratory and depth potential. A great reason to come back soon. For the farewell dinner we all have gathered around a table in our favorite restaurant in Pinlaung, where Manuel is intent on preparing a Swiss fondue, brought here just for the occasion. Served with wine of the Shan State and cooked in a traditional Chinese pot, our meal fills the other local guests with curiosity, so they begin taking photos while we are enthusiastically eating our Swiss fondue, in a way unknown in Myanmar. And in Switzerland. The following day we greet warmly the family running the hotel that has hosted us in Pinlaung. We reach the Heho airport to catch the flight that will take us to Yangon, where everybody will depart for his new destination. While we are taking off from Heho, a last look at the karst landscape opening below our eyes. We have had an exciting experience and we have met hospitable people in a unique place.

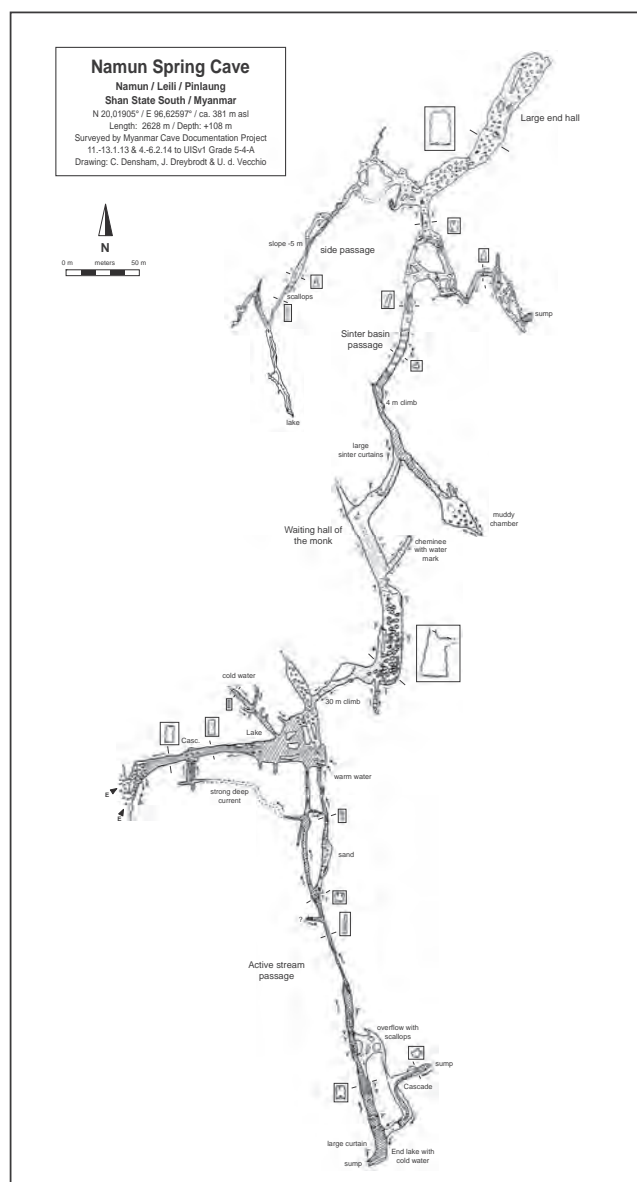


The 2014 expedition team members.

We thank U Phyo Wai Yar Zar for the logistic support to the expedition, our untiring guide Khun Soe Kham and our driver Mr. Myoe Lwin. The project has received the status of "EuroSpeleo Project" by the European Speleological Federation.

The participants: Chris Densham (UK), Ferdinando Valentino (I), Manuel Borruat (CH), Joerg Dreybrodt (co-ordinator, D), Barbara Mancini (I), Umberto del Vecchio (I), David Eskes (NL), Timme Koster (NL).

For the 2014 expedition La Venta collaborated with the "Myanmar Cave Documentation Project". This project originated from the "Northern Lao - European Cave Project" and began in 2009. Its aim is the documentation of the caves of Myanmar as a basis for future research and local development. Currently two teams, one British and one international, are working in different areas of the Shan State. Further information on: www.myanmarcaves.com

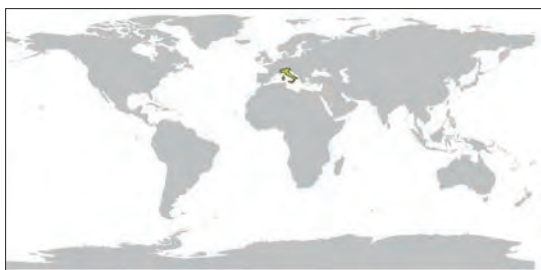


COZZO DISI

Italy



The access door to the Fifth Level of Cozzo Disi mine.



THE “DARK CAVES” OF COZZO DISI

Giovanni Badino

It's a fairly embarrassing situation to admit that we can't find 90 percent of the Universe.

Bruce H. Margon, Washington Un.

You think about the Universe and you imagine stars, galaxies, sidereal nebulae, namely what we have been able to peer into the sky through the centuries. The night sky seems really crowded with huge bright objects, yet there is evidence that stars are only a minor component of the cosmos, a component that seems to be dominant because it shines while the other, the main one, is simply invisible. It is Dark Matter.

The world of caves has perhaps a similar structure. What we have been exploring for centuries are not “caves” but “accessible caves”, because they have a suitable entrance for our passage. Are there any others?

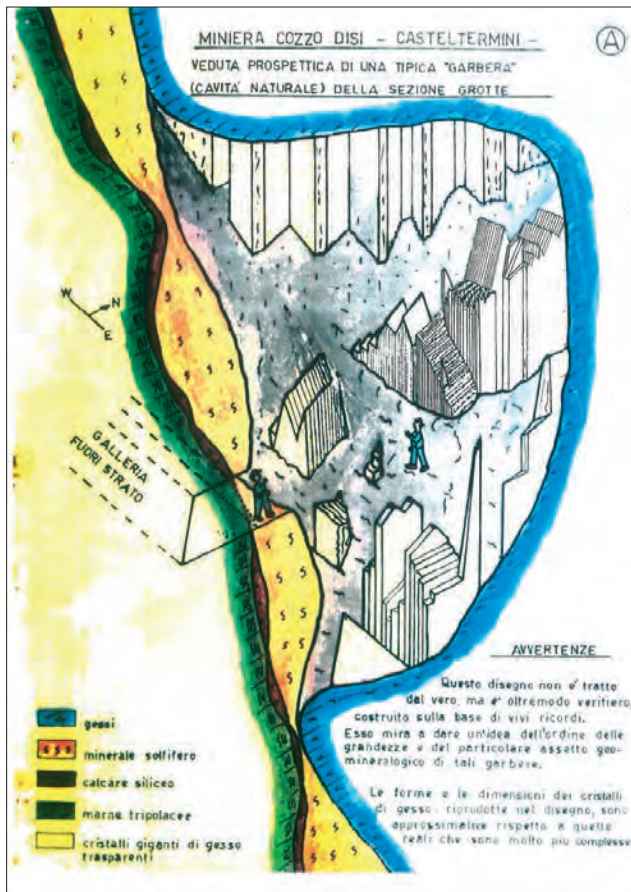
Apparently, yes and perhaps they are the majority. In the last decades, has been growing evidence that to form a cave is not necessary a viable entrance, indeed; and that

consequently the majority of the existing caves is substantially inaccessible. The trouble is that those without an entrance are the most interesting, because the presence of a human-sized passage makes the cave come into thermodynamic contact with the outside, which tends to level the morphology of the cave, transforming it into a kind of “dark gorge”.

On the contrary, the caves formed in the depths of the rock, without any entrances, can preserve a peculiar atmosphere, with minimum starts and irrelevant energy flows. So, they assume morphologies that are in balance with those depths, and not with the external atmosphere, and are filled with strange and wonderful shapes. We are talking about hypogenic caves fantastically concretions rich, such as those of Carlsbad, but also, to make an example known by many, about the caves of Castellana, formed in the depths of the Murgia in an atmosphere rich in carbon dioxide, and then opened up after the collapse of the Grave. The areas close to this “geological

Inside the galleries of the Fifth Level.





The original drawing of the "Garbere" made by Amedeo La Porta, topographer of the mine.

accident" that has allowed their discovery are worn away, eroded, but as you proceed into the cave, it increasingly appears ever more fantastically concreted; ever more "natural". The whiteness of the final part is due to the fact that in origin it was a Dark Cave...

To assess the destructive effect of an entrance we can think about the case of the painted caves (Altamira, Lascaux, Porto Badisco...), all discovered unblocking their entrance, all small cavities that local geological vicissitudes had obstructed, preventing the paintings to be dissolved by outer atmosphere.

How many "Dark Caves", formed in the depths of the underground, do we know? Very few, almost only those that have been met by industrial excavations, especially mines. They are the most fantastic just for their developing away from the Earth's surface: Cristales, Pulpi, Santa Barbara... We have called them with the ugly term "Mine Caves" because they have been discovered in that way.

Years ago, during a conference, we were told that in a mine in Sicily, in the '50s, had been described the presence of a complex of these caves, the "Garbere", with giant crystals.

It was the sulphur mine of Cozzo Disi (Casteltermini), one of the largest in Italy, active until 1988.

In the following years, for the disused facilities began an intricate series of jurisdiction transfers, environmental recoveries, dreams of a mining park and unfinished works, handled over the many local authorities that had a say in this or that sub-sector. In the meanwhile, many speleologists dreamed of reaching what promised to be

the European Naica, hampered by the state of neglect of the galleries, by the residues of hydrogen sulfide (sulfuric acid), but even more by the impenetrable bureaucracy. Thanks to the credibility gained through the Naica Project, we can renew a stronger interest for this underground treasure. In March 2013, thanks to the Mining District of Caltanissetta, we make a preliminary survey together with some speleologists of the Sicilian Speleological Federation.

We go through a long horizontal gallery until reaching the main pitch of the mine ("Pozzo Ippolito"): there, at an altitude of 192 m, begins a steep helical descent ("Via Operai") that leads to the lower levels. We manage to reach the Third Level (80 m of altitude), where there are the Garbere, but the gallery leading there is in poor condition, flooded, not ventilated and with gas pockets making the operation much more risky than expected. However, we can reorganize ourselves and the following day we walk for two hundred meters till the place where the conduct is interrupted by a small dam. Over there, after a few meters of a grey and sinister small lake, the gallery is blocked by a landslide, while on the right a wall interrupts what was obviously a deviation. We are now a few dozen meters from the caves, but the way is blocked and the air is hardly breathable...

In the following months the Sicilian speleologists try to get around the underground block looking for caves outside, but they find a few and not very promising ones; evidently to create the giant crystals, the Garbere did not ask for an external help!

A year of meeting, bureaucracy, commissions passes. In March 2014, we can try again, this time our goal is to demolish the wall on the right and try to continue along that way. We do it, with many precautions for fear of finding a pocket of poisonous gas beyond; but no, there



Approaching the Fifth Level.

is just a huge mass of mud and collapsed reinforcement. Definitely, to continue from this level it is necessary to start mining excavations again.

The following day we begin to study the old maps of the mine at the District. They show us that there is still a possibility, abandoning the long attempt at the Third Level, and descending until the Fourth or even the Fifth one – but, according to many opinions, it should be flooded by now - and from there moving up beyond the landslide area. Then coming back and trying to reach the Garbere from the opposite side. Between saying and doing there are meetings and discussions, just until our entering the mine, when even at the last moment it seems we would not have the permission to go inside... But at the end we manage to enter, with the main goal to measure the level where has gone up the water that from years has been flooding the mine, we are four, all speleologists: Marco, Spit, Claudia and me.

We go down the steps of the Via Operai until the Third Level, where we wear our gas masks and, preceded by Spit who carries an analyser, we continue the helical descent. After a few minutes we are at the Fourth Level (54 m of altitude) and, what a surprise, it is crossed by a large air flow, evidently its galleries are free of obstructions. We explore them briefly, they are closed by lop-sided and permeable walls.

We return to the Via Operai and, of course, we decide to make an all-out attempt to reach the Fifth, at an altitude of 38 m. We wear again our masks and we continue the descent, with great caution because surely we will come

soon into contact with toxic gas, we are now only a few meters from the water of the aquifer. A few more minutes of tension, then here is a door, it is the Fifth Level, and it is out of water.

We enter the gallery, large and healthy, well ventilated. Evidently here, too, the mine has survived. We go up, where there are grey, sulphur waterholes, they are dangerous and it is useless to cross them, now our time is up and we have obtained our results. At the bottom of a stretch of gallery peeps the Pozzo Ippolito, here we are now at its bottom. We move to its edge.

Below us, a few meters away, we see the water that from years has been filling the mine, grey, dark and still. Marco measures its level, 7.1 m below the walkable floor of the Fifth Level. That's enough. We take some photos, enthusiast, and then a helical run take us back to the surface.

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The flooded bottom of the mine-pit “Ippolito”, seen from the Fifth Level.



PAOLO FORTI



The bat-code

It is absolutely not common for satirical cartoonists to devote themselves to the world of caves. Anyway, one of them, Stefano Bassi (aka Bax), very well known in Italy during the '80s and '90s of the last century, for years has been a frequent contributor to the magazine "Speleologia" and has realized also its own comic strips about karst and speleology. Among the strangest, most rare and precious pieces, produced in that period by Bas, there are certainly the glazed ceramic dishes that he presented all together in a national meeting over 20 years ago: they were about ten, maybe less, all strictly "unique works"

and entirely made by him, who wanted in this way to master a completely new technique.

Each of these dishes was ironic about a particular aspect of speleology, but one especially attracted me: the bat-code. I think that every speleologist cannot help but thinking, at least once, about how the bats manage to recognize each other within their colony and to find their place among several thousands of individuals...

The solution for Bax was absolutely simple: bats, in fact, in addition to their well known ultrasound radiolocation system, have also an infrared barcode reader.

The dish, 36 cm in diameter, makes a fine show of itself in the Centro Anelli collection.



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*Third cover: big moths often share with covers the base-camp tent, Auyan Tepui, Venezuela.
Back cover: written expedition reports dating back to the fifties.*

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