

N. 26 - 2020

KUUR

magazine
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LA VENTA
ESPLORAZIONI GEOGRAFICHE

KUR

MAGAZINE
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Kur, an ancient Sumerian term, means "mountain" or "foreign land", but it is also the name used to indicate the underworld, which one would access by "entering the mountain". On Kur, the location of which is ambiguous in the sacred geography, the brute forces of the universe clash with the gods of the Mesopotamian pantheon. Kur was, then, the sacred mountain but also a supernatural, wild place, far from the human world, a destination of heroic voyages and a theatre of epic undertakings.

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- Cover photo Main gallery of the Gruta Montecristo, which develops along a foliation plane of the metamorphic quartzites of the area of Diamantina, Brazil
- Second cover Canyon of the Rio La Venta, Chiapas, Mexico

The publication of this edition of Kur has been made possible thanks in part to the financial support of Tiziano Conte, a friend who appreciates our work and who has contributed to research projects that we have carried out in various parts of the world

collaborations & credits

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Leonardo Piccini

2020 – and probably 2021, too – will surely go down as the year(s) of COVID – the year(s) of the SARS-CoV-2 pandemic. Perhaps uniquely, this tragedy has struck the entire global population, directly or indirectly. The human race has given its all, exposing its weaknesses and its limits in the process. It has forced us to overhaul our day-to-day lives and reflect on the things that really matter to us. Optimists see in all of this an opportunity for change, for rethinking the objectives that humanity must set for itself in the medium-long term – we can only hope that they are right. An event of this scale could not fail to have consequences for our association, too, since our operations are carried out in numerous different countries around the world: from Greenland to Patagonia, from the Mexican deserts to the rainforests of the Philippines. These operations are based on the relative ease of moving from one part of the globe to another. Covid has struck a heavy blow against all of this.

On a beautiful spring day in 2020, hidden among the grass during full lockdown and intent on scrutinising the sombre blue sky at sunset, I suddenly realised there were no contrails in the sky. A perfectly clear sky, devoid of human interference and high-altitude pollutants. For a few months, the sky returned to being the (almost) exclusive domain of birds, insects and our friends the bats. And the link between bats and Covid is the subject of the essay by Paolo Agnelli, a great bat expert, debunking the lie (or, as we might say these days, the fake news) that claimed these extraordinary flying mammals were the cause of the epidemic.

Over time, flights have started to return and will continue to do so, but visitor flows are very far away from pre-Covid levels and are likely to remain so. Travelling hassle-free around the world at low cost is no longer so-

mething that can be taken for granted. All of this leads us inevitably to reflect upon and perhaps rethink the activities of an association such as ours.

In early 2020, just a few days before the world came to a standstill, we managed to complete our one and only expedition of the year, which saw us once again visit the island of Palawan and its extraordinary subterranean system of the Puerto Princesa Underground River. By that time, the organisational aspects had reached the point of no return and we managed to get on our way – albeit not without apprehension, thanks also to the fact it was a lightweight expedition, with pared-back logistics, the purpose of which was principally to support the explorations that our Filipino friends from the local La Karst club were pushing ahead with in the higher-up sector of the Saint Paul Dome system. Vittorio Crobu gives us an enthusiastic report of this trip, which highlights the commitment and insightfulness of a young generation of speleologists born and raised in Palawan. Also in early 2020, we engaged in a rapid, arduous but very promising reconnaissance (described by Francesco Sauro) in the Chiribiquete National Park in Colombia. The objective was to compile preliminary information and investigate the potential of a quartz massif about which we know next to nothing, lost in the heart of Amazonas. For his part, Antonio de Vivo describes an expedition that we did not get the chance to carry out – to Chiapas, planned for March 2020 and intended to continue, here too, the endless exploration of the Canyon of the Rio La Venta. The reasons for cancelling the trip were not purely technical or logistical – i.e. associated with the risk of having flight difficulties and with the unattractive prospect of quarantine – but, above all, ethical. In the end, our minds were made up for us by the fear that we,



The group heading for Palawan in early 2020. Even though it was not yet clear how serious the situation was, everyone decided to don a mask while travelling

ourselves, could end up being the unconscious carriers of an illness that was starting to claim its first victims in Italy.

In contrast, 2019 was, luckily, a year rich in activities, albeit without any major expeditions, and this enables us to fill the pages of this edition of *Kur* with fascinating stories of in-depth prospecting operations in Brazil, again in search of caves in the quartzites, and in the exceptionally remote Galapagos islands, where we have been attempting for a few years to implement an ambitious project to explore and study caves formed on the slopes of volcanos, which in terms of their development and dimensions can easily be compared to their limestone counterparts. Less remote, but no less interesting for it, is the activity that, for several years now, has seen us – together with other Italian speleological groups – take on challenging explorations in caves in nearby Albania. Tropical and Mediterranean limestones, South American quartzites and volcanos scattered across the Pacific Ocean – places far away or within easy reach, brought together by the fascination exerted by the discovery of new subterranean horizons or by their enormous scientific interest. Yes, because exploration is not just about going off the beaten track, but above all about documenting those tracks and studying them carefully. Exploration has no constraints in terms of scale. It is like a fractal, and the closer you look at it, the more it reveals its marvellous complexity. And thus a “strange” polygonal floor tells us the story of complex processes of sedimentation, erosion and precipitation, guided by the unstable meteorology of the island of Palawan. In contrast, the quartzite caves of Brazil reveal a multi-layered interaction between

apparently “resistant” rocks and micro-organisms for the most part still unknown.

Exploration also encompasses research and study, but it must be responsible and respectful of the environments that it uncovers. For millennia, it was nothing but the first in a series of events that often brought “conquest”, colonisation or even the destruction of entire habitats. The same applied to the scientific research conducted into nature, which was based – up until even just a few decades ago – above all on the compilation of samples to be catalogued and, at best, proudly exhibited in museums. Today, field research requires respect, first and foremost. The taking of samples must be reduced to the bare minimum and only carried out when you are sure that you are not collecting unique or fundamental material or living specimens, with a view to protecting delicate ecological equilibriums. Paolo Forti, Paolo Agnelli and Stefano Vanni address this issue in the final article in this edition.

It is something we should reflect upon every time we make our way into “terrains” we do not know, whether they be made of earth or rock, or even if they concern science, knowledge and progress. This is a form of respect that arises out of the (by now) unavoidable awareness of the extreme complexity and fragility of our natural systems, to say nothing of our social systems.

If COVID-19 helps us to get a handle on all of this, and to get rid of our ego and our illusory presumption that we are the uncontested masters of this extraordinary planet and its natural laws, then it will not have been all in vain.

The Canyon and the landing strip at Araracuara, Colombia



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PUERTO PRINCESA UNDERGROUND RIVER DAY



On 11 November, 2019, across the Philippines, the “PPUR - Puerto Princesa Underground River Day” was celebrated as part of the Festival of Biodiversity. Today, marking the end of the event, we presented the book on the PPUR, published by Skira editore and en-

titled “A Cave Between Land and Sea”, to the authorities, represented by the Mayor of Puerto Princesa, the Governor of the island of Palawan and the Chair of the Tourism Committee of the National Senate.

GIORGIO FANTAZZINI: 2020 MEMORIES OF THE EARTH



This is the first time that La Venta has published a book by a non-member, even though, in truth, he was a one-time speleologist and, moreover, in writing the book he availed himself of the input of an honorary member of our association, Paolo Forti.

This, however, would not be a sufficient reason to justify the decision to become his publisher; that decision was based on the fact that the subject matter (a private collection of African art), while at first glance apparently rather distant from our main area of interest, on closer inspection reveals itself to fit in perfectly with our concept of geographical exploration, which must include, perhaps first and foremost, social contact and cultural exchange with the populations who live in the areas that we travel through.

In this book, which is far more than a run-of-the-mill photo book, we can pick up on the empathetic relationships that the author has succeeded in establishing in his 50+ years of adventure travel, geared towards developing an understanding of the main African ethnic groups.

The scans of 200+ images of everyday objects – which often, however, due to the dedication and flair with which they have been made can be considered bona fide artistic masterpieces – alternate with short accounts of unusual or entirely unexpected events that occurred during his peregrinations on African soil. These tales, some written by Fantazzini and others by friends of his who share his love for exploring that continent, offer veritable “windows” on some of the aspects of African tribal culture, which is so complex and so different from our own, but in no way less rich...indeed, quite the opposite!

HELL'S BELLS SPELEO AWARDS 2020

On Tuesday, 18 February, 2020, at the Miela Bonaventura Theatre, as part of the 30th edition of the “Alpi Giulie Cinema” International Mountain Film Festival, orchestrated by Monte Analogo, the ceremony was held for the Hell’s Bells Speleo Awards 2020, a competition set up in 2012, which arose out of the collaboration with the Commissione Grotte Eugenio Boegan (CGEB - TS) of the Società Alpina delle Giulie.

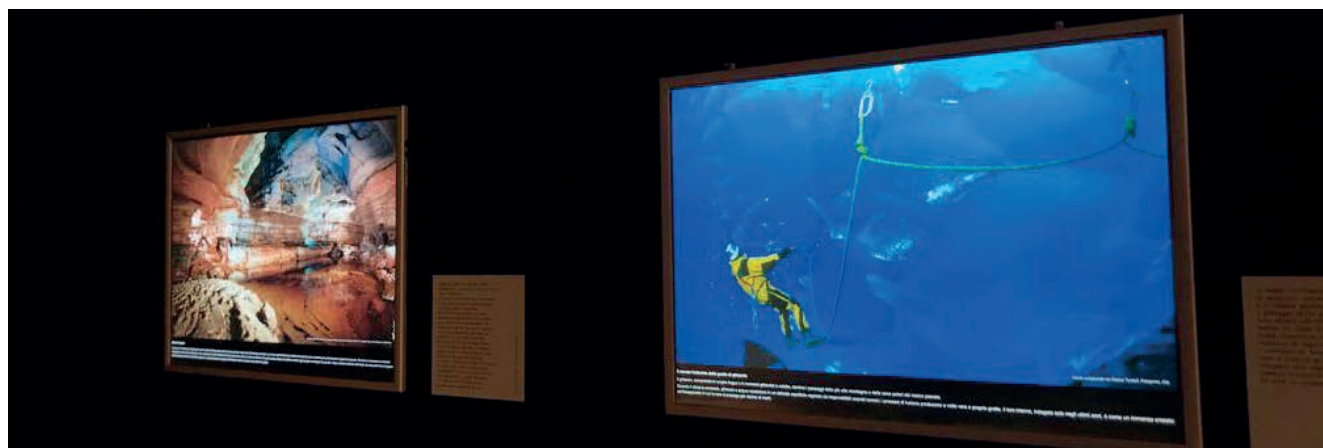
La Venta received a Special Mention for its video “Namak 2019”, produced by Mattia Bernabei, which tells the story of the 2019 expedition to Iran’s salt caves. Other prizes handed out on the evening included:

- Golden Bell to the video “I claustrofili”, produced by Sirio Sechi, who collected the prize.



- Silver Bell to the video “Corchia, la montagna vuota”, a historical documentary by Roberto Tronconi that charts the main stages of the exploration of the Antro del Corchia.

“XTREME: LIVING IN EXTREME ENVIRONMENTS” EXHIBITION



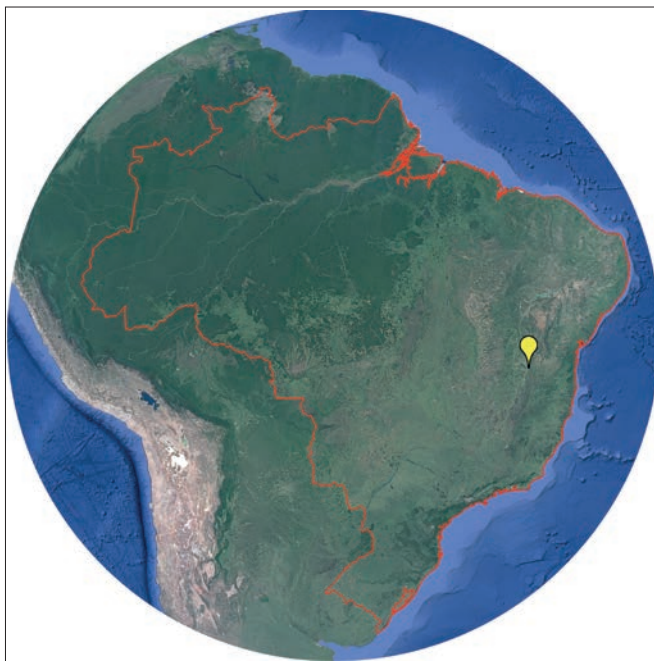
From 29 August to 11 October, 2020, Trieste’s Magazzino delle Idee played host to the exhibition entitled “Xtreme: Living in Extreme Environments”. Organised by the Regional Cultural Heritage Body in partnership with the Speleological Federation of Friuli Venezia Giulia, the “Felice Ippolito” National Museum of the Antarctic and the INAF-Astronomical Observatory of Trieste, the multi-section exhibition described how mankind has been able to adapt in order to explore extreme environments, such as those of caves, the Antarctic and space. Multiple themes were addressed, from the history of the explorations of these fantastic places to the technologies developed over time to survive there, and from the training of astronauts in cave to hypotheses on bacterial colonies that may populate natural caves on the Moon and on Mars. The whole exhibition was enriched by images owned by the ESA, the INAF, the National Museum of the Antarctic (MNA), the National Project for Antarctic Research (PNRA) and speleological groups including La Venta, and by the displaying of equipment for speleological exploration and exploration in the Antarctic.



TEPUI

The quartz mountains

The main canyon of Gruta de Torras in the Chiapada Diamantina



A JOURNEY INTO THE LAND OF BRAZILIAN QUARTZ

Francesco Sauro

Having explored and studied quartzite caves in Venezuela, Brazilian Amazonia, the Urals and India, for a great many years I had been dreaming of visiting the quartzite areas of Central Brazil, between the states of Minas Gerais and Bahia. Almost all of the quartz crystals and amethyst crystals found in the world's museums come from this area, and the potential presence of caves in a metamorphic quartzite as ancient and rich in crystallisations as this one had set my pulse racing. Several years ago, I began to correspond regularly with Augusto Auler, a geologist and speleologist from the Bambui group in Belo Horizonte, with which La Venta organised the 2015 expedition to the Sierra do Aracá. Although we had never had the chance to meet in person, in 2018 we decided to work together on the chapter entitled "Quartzite and quartz sandstone caves of South America" for the new edition of the *Encyclopedia of Caves*, edited by William White and David Culver. To this end, Augusto began to provide me with information and photographs on the wonders of the *Chapada Diamantina* and the *Serra do Espinhaço*, and then at last we received the news that in the Ibitipoca State Park, the cavers of Rio de Janeiro were exploring a quartzite cave that was now mapped to more than seven kilometres. Augusto invited us on a trip through all these mountains: a quartzite cave per day for two weeks, across 2500 kilometres. It was a one-off opportunity that had to be grasped, and all in all, it was also an enticing holiday for Daniela and I, since we had never visited this part of Brazil. But a journey of this sort must be documented at all costs, and so we brought Alessio Romeo on board to shoot all of the breathtaking places that we would have the good fortune to see first-hand.

We begin our "tour" of the largest quartzite caves in Brazil from the city of Salvador de Bahia. As guests of Fabio and Cristina, Italo-Brazilian speleologist friends, we prepare for Augusto's arrival by savouring a few days at the seaside. Augusto then flies in from Belo Horizonte, and after touching-down he collects a pick-up truck laid on by his company, the *Instituto do Carste*. From Salvador,



Gallery in the friable crystalline quartzites in one of the numerous caves of the Parque Estadual do Ibitipoca in the state of Minas Gerais

La Chapada Diamantina



Large through gallery in the *Gruta dos Fugitivos*, one of the most impressive in the Parque Estadual do Ibitipoca

we travel on the long road that leads inland, towards the massif of the *Chapada Diamantina*. This mountain chain, several hundred kilometres long, encapsulates all of what are the most mouthwatering prospects for a speleologist. The western zone rises up from the plains with a series of homoclinals and small tepuis modelled in the Precambrian quartzites of the São Francisco Craton. The siliciclastic rocks collect the water and channel it westwards, towards the central zone of the chain, which in contrast is mostly calcareous. As such, along the same chain we come across spectacular quartzite caves and, a few kilometres further on, enormous systems of limestone caves. But we decide not to devote any time to these, focusing instead entirely on looking for quartz.

Our first objective is the *Gruta do Lapao*, near the city of Lençoi, which is popular with tourists. The *Gruta* is a large hydrogeological tunnel, more than a kilometre in length. Making our way across terrain that is very reminiscent of the Venezuelan Tepuis, amid quartzite towers and rivers of tannin-red water, we reach the upper entrance. We get lost almost immediately in a large collapse gallery, with various parallel routes. The cave is well-known to the locals, and there are numerous signs of damage done by those who have come here to plunder minerals. However, it is still possible to see large opal flowstones and the fragments of a cut-down silica stalactite, probably one of the largest in the world. In a collapse zone, where we wander for an hour in search of a passageway, we even find walls completely carpeted in quartz crystals. Once we have identified the right passage, we return along the course of the underground river, where the cave takes on ever-increasing dimensions, eventually opening out into a channel that reaches 40-50 metres in height and leads to the outside through a gigantic portal. Not bad for the first cave we have visited, with the dimensions and level of scientific interest coming very close to those of the caves we have explored

on the Venezuelan tepuis.

The next day, we move to Igatu. A UNESCO World Heritage Site, this mining town was the centre of diamond production in the nineteenth century. It had a population of more than 10,000 miners, who built their homes with blocks of quartzite quarried from the mountain. It is an incredible place for a geologist, where we find ourselves sleeping in a hotel with rooms surrounded by walls of quartz sculpted by millennia of inclement weather. We head off straight away to visit the *Gruta do Torras*, an active gallery that slopes down for almost four kilometres, reaching a depth of 190 metres without a rail. It is a beautiful cave in which lakes alternate with waterfalls, where there are very deep potholes carved into the smooth, pink-coloured quartzite. Here, too, there is no shortage of secondary minerals of amorphous or cryptocrystalline silica such as stromatolites and flowstones, probably organogenic, alongside typical deposits of iron hydroxides with their classic reddish-brown colouration. At the bottom, we find the signs of quarrying by miners, and a date -1855 - marked in soot on the ceiling. Here, without knowing it, the miners had explored what was at the time the deepest cave in the Americas.

We leave Igatu behind, imagining how many other unexplored caves like Torras probably exist inside those mountains, and we head further south. The next stop is the town of Ituaçu, where we are welcomed by the local caving group. This little settlement is famous for its immense limestone caves, which can even be visited by tourists. But our interest is concentrated on the mountains further up, in a quartz plateau that hosts the *Gruta do Atoleiros*. This cave has been a dream of mine, I have seen photos of it and have been impressed by its similarity to Imawari and the other caves explored by La Venta in the *Auyan tepui*. The visit is no disappointment: the cave, traversed by an underground river, opens into galleries and chambers on an epic scale. But above all, wherever

They tell us that, given the abundance of limestone caves, they have not yet had the time to check out many of them! There really is a plethora to be explored here, too!

The Serra do Espinhaço

The journey continues southwards. We leave behind the *Chapada Diamantina* and reach another enormous mountain chain, the *Serra do Espinhaço*, a thousand kilometres made up almost entirely of metamorphic quartzites. The first stop is the city of Diamantina, which is paved with slabs of quartzite full of ripple marks, the signs left by the waves of a sea that existed more than a billion years ago. In Diamantina we visit the *Gruta do Salitre*, a cave with a spectacular entrance that leads to a sort of hill given a jagged outline by dozens of quartzite towers. The colony of bats that we find inside allows us to observe the interaction between the guano and the quartz in the formation of specific minerals. Another cave nearby, Monte Cristo, displays purple walls – the fruit of metamorphic mineralisations brought to light by erosion. We also visit a large ravine, carved into the quartz, with surprising morphologies. We know that in this area there is a multitude of other quartzite caves, but sadly time is tight and we must press on with our journey.

Our next stop is a remote village in the middle of the sierra, *Cabeça de Boi*, in the *Itambé do Mato Dentro* area. Only rarely have I been anywhere with such a fascinating landscape, so far from civilisation. The village is renowned for the cave known as the *Baixada das Crioulas*, currently protected within a nature reserve acquired by the Anglo American multinational mining group. It is a cave of around 1.7 km in length, formed by a river in metamorphic quartzites rich in sericites and veins of quartz. This cave, too, offers numerous fascinating possibilities, with various entrances that open onto the forest.



The Gruta do Atoleiros features extraordinary mineral formations, the genesis of which is still unknown. This image shows the large opal and baryte stalactites in the lower part of the cave.

you look, you can see deposits of silica, sulphates and other unknown cave minerals. We find the apotheosis in the gallery downstream, where great candelabras of opal and baryte hang from the ceiling. We spend hours and hours discussing the geology of this cave with Augusto, and we agree that it is one of the most interesting and rich in scientific questions that we have ever visited. The visit comes to an end with a party laid on by our speleologist friends from Ituaçu, at which we are informed of the existence of other as-yet unexplored quartzite caves.



Peculiar erosional forms due to percolation in a cave of Ibitipoca

The Park of Ibitipoca

After a brief stop in Belo Horizonte, we prepare for the final leg of this trip, the *Parco Estadual di Ibitipoca*. Augusto has talked to me about it many times as one of the places with the highest number of quartzite caves in all of Brazil. Looking at that mountain, which is not all that big, it seems unlikely that it can contain anything of great interest. But I am soon proved wrong. We spend three days on the mountain as guests of the park authority. It is not nearly enough time. On the first day, we cover almost twenty kilometres on foot, visiting a full nine quartzite caves! And large caves they are, too, with unexpected conduits and chambers, such as the *Gruta dos Fugitivos*. The limited time available is such that we cannot even visit the interior of the *Gruta dos Bromelias*, which is famous for having occupied the number one position in the rankings of the longest quartzite caves in the world, stretching as it does for 2.7 kilometres.

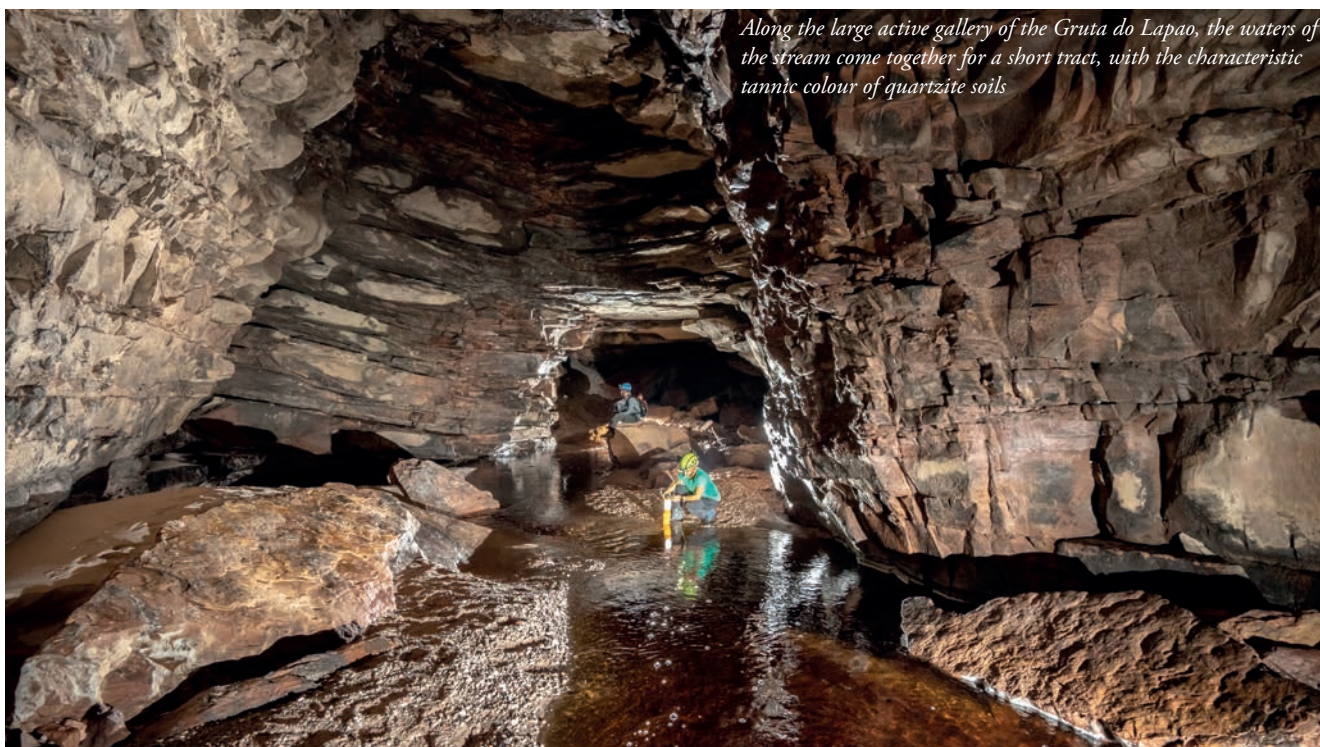
The next day, having been joined by our friend and fellow speleologist Daniel Menin, we focus our energies entirely on the *Gruta Martimiano II*, which is the great new exploratory hope thanks to the research efforts of a speleology group based in Rio de Janeiro (SPEC). The cave has been topographically mapped for 7.5 kilometres, and it is currently Brazil's longest quartzite cave. By a twist of fate, the cave extends right under the park house in which we are staying. It is a very complex cave, set on foliation planes where quartzites with a very large crystalline grain and tourmaline tend to break apart and become as soft as sand. These processes are not entirely comparable to those that La Venta has observed in Venezuela or to those of the *Chapada Diamantina*, but they are extremely fascinating and await further study. We also visit an active part, recently discovered, featuring an attractive subterranean stream that has smoothed down the floors of crystals along what are highly photogenic

chambers. In the end, we exit via the resurgence further down, concluding our journey with an exciting ascent amid walls and vegetation, until we find our way back to the park house.

The future frontiers

Thinking about this voyage, with profound gratitude towards Augusto who shared with us his great knowledge of this beautiful region of Brazil, we cannot fail to think about how many other quartzite caves certainly exist and are just waiting to be explored. A large number of the caves we visited are located close to the road or near towns and cities. But the mountains of the *Chapada Diamantina* and the *Sierra do Espinhaço* extend for hundreds of kilometres into territories that are little-known at best. Similarly, Ibitipoca is undoubtedly the place in the world with the highest concentration of caves of this type, and nearby massifs seem to indicate the presence of other unexplored systems. Another aspect that will surely encourage us to return is that of scientific research, because we found ourselves facing a *bona fide* natural laboratory, easily accessible compared to the tepuis of the Gran Sabana or the Rio Negro. Here, the logistical situation is very simple, and would enable long-term monitoring at low cost.

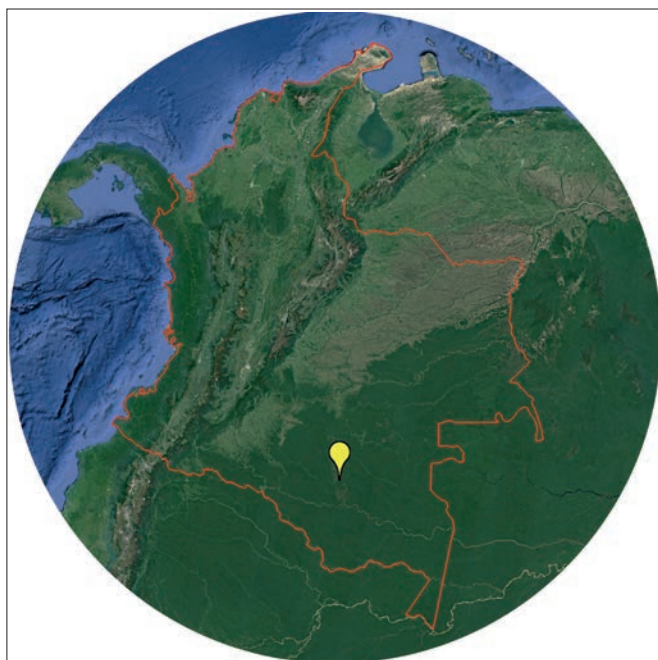
Caving is well-developed in Brazil, with speleological groups like Bambuí engaged in exploration and documentation at the highest level, but the quartzites have been somewhat neglected, perhaps because all manner of other limestone caves are there for the taking. It would be great to investigate in much more depth the speleogenesis in these systems and to produce all-encompassing documentation of these environments together with the local speleologists. It is a unique heritage, which makes Brazil the country with the highest number of such caves in the world.



Along the large active gallery of the Gruta do Lapao, the waters of the stream come together for a short tract, with the characteristic tannic colour of quartzite soils



The enormous gallery that leads to the downstream exit of the Gruta do Lapao in the Chiapada Diamantina



EXPLORING THE RIO CAQUETÀ, COLOMBIA

Francesco Sauro

The “Quartzites Project”, launched in 1993, is expanding its scope, focusing its efforts on unexplored areas of the South American continent. For many years, we have been following the situation in Colombia and particularly in the Colombian Amazonia area, into which the westernmost limits of the Guiana Shield extend. These are represented by the two massifs of the *Sierra Macarena* and the *Serrania del Chiribiquete*. These areas have yet to be studied by speleological expeditions, despite the exploratory and scientific potential being, without doubt, exceptionally high. However, they are very remote places, posing logistical challenges that are even more complex than those of the Venezuelan and Brazilian tepuis. The *Chiribiquete* National Park is also the world’s largest protected area of forest, renowned for having some of the oldest documented rock paintings in the Americas. This year, finally, it became possible to conduct a survey of these extremely distant zones, concentrating on the area of the *Rio Caquetà*, to the south of the *Chiribiquete*.

In early February 2020, a five-strong group departed in a Cessna from the city of Villavicencio: Francesco Sauro and Daniela Barbieri for La Venta, along with two American speleologists, Dan Straley and Brady Merrit, and a biospeleologist from the *Instituto Humboldt*, Carlos Lasso. The objective was to reach the Araracuara landing strip in the Caquetà sector, and from there the villages of the Monochoa native. The region controlled by these indigenous peoples includes the southern part of the quartzite massif of *Chiribiquete*, but is outside the National Park. As such, the native peoples have absolute authority, and research in the area can only be conducted on their say-so. That said, the situation in this region is still far from peaceful, because the area is intermittently visited also by the FARC revolutionaries and by the pa-

ramilitaries, and as such we had to advance with extreme caution. The area had been inaccessible until three years ago, due precisely to the presence of the FARC and of drug smugglers – these mountains were the location, in the 1980s, of “Tranquilandia”, Pablo Escobar’s city-cum-laboratory, which was later bombed by the army. The Americans, Dan and Brady, succeeded in making contact with the head of the Monochoa tribe, Rogelio, via a Colombian kayaker, Jules Domine, who is putting together a documentary on the area and in particular on the three large “*chorros*” (rapids) of the *Rio Caquetà* (Araracuara and Angostura) and the *Rio Yari* (Gamitana). Flying towards Araracuara, we identified the area



The biologist Carlos Lasso talking with Marcelino, one of the wise men of the Monochoa community, within the large communal maloca hut

One of the large, unexplored simas in the central sector of Chiriquete. Photographed by numerous flyovers, this cave has been named "El Estadio", but we still do not know if it contains continuations, nor how long and deep it actually is



of interest, a sort of low tepui to the north of the *Rio Yari*, where there are at least two large entrances. Once we reached the runway, which has a military base next to it, we had to continue on foot for almost two hours to the top of the rapids of Araracuara and from there by boat to the main village of *Resguardo Monochoa*, where the following day the meeting was held with the tribal chiefs (governors). The place is a true wilderness and the villages are constituted by just a few huts. It is very difficult to negotiate our way through the forest, and the conditions are pretty awful, with temperatures above 35°C even at night, and during the middle of the day the sun is so strong as to prevent us from accomplishing very much at all.

The meeting with the indigenous chiefs, who made their way from all of the local villages for the occasion, began in the morning in the large *maloca* (circular hut with conical roof, venue for community events) and continued throughout the day into the evening. The discussions were very animated and in-depth, since the caves are ancestral places in their tradition, and the final decision on whether or not to allow the foreigners to access certain mountainous regions lay with the elders. Also fundamental was the contribution made to the discussions by Carlos Lasso, a researcher who has a great deal of experience in dealing with native peoples in Venezuela and Amazonia. Together, we explained how knowing their territory from every perspective would be a tool for protecting it in the future, and with that in mind the elders of the community granted their permission for the implementation of a real exploratory project. However, the area that we wanted to reach is considered extreme by the locals, aside from also being a sacred site. To get there, we would have to make our way up the *Rio Yari* to the Gamitana rapids, via an 8 km path through the forest. We would then have to transport a lightweight boat along this path upstream of the rapids and from there continue along the river to the base of the mountain. We would then need to advance another 4 km into the interior, through unknown lands, avoiding numerous *grietas*. We were not convinced it could be done! But the thirst for exploration felt by the youngsters in the

community was strong, in part because they had been commissioned by the government to develop a *plan de manejo* for the reserve and they realised that here was a unique opportunity to explore that mountain. At the end of the meeting we reached an agreement that we would organise an initial, exclusively-native expedition, purely for reconnaissance purposes, with the objective of reaching the caves, and only after that would we conduct a proper expedition to explore them. The indigenous expedition is planned for the autumn of 2020, and if the objective is reached, the first international speleological expedition may be carried out in March 2021. On the last day, before returning to Bogotá, the native people were kind enough to take us to see a cave in the *Canyon del Chorro di Araracuara*. This is an attractive, active tunnel, still in part to be explored, made of quartzite, with a large colony of guacharos. This provided proof positive that the area must be full of caves.

A waterfall within the Cueva de los Guacharos in the Canyon di Araracuara



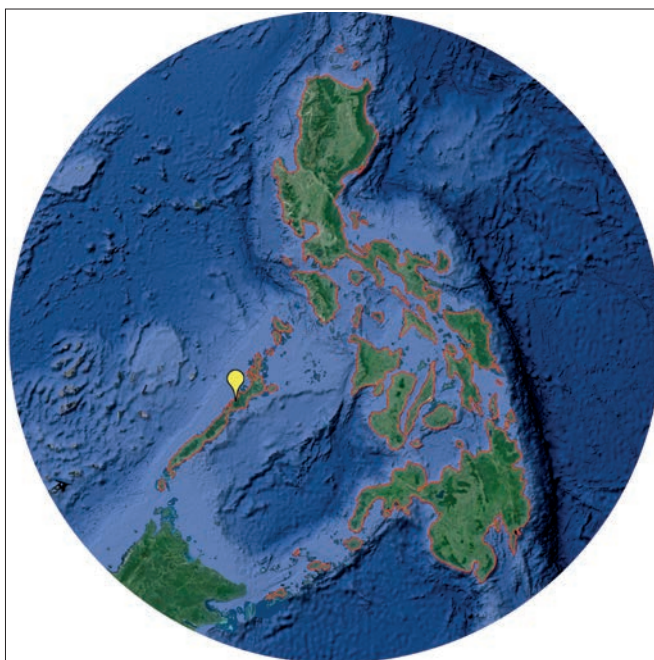
PALAWAN

Philippines

LA VENTA

ESPLORAZIONI GEOGRAFICHE

Thanks to a short free-dive, Bebim Jala, a speleologist from the local group, helped us to locate a number of branches of the so-called "Big Lagoon", which are otherwise invisible from the surface of the lake; numerous underwater routes in the new branches start from these areas



PALAWAN 2020

Vittorio Crobu

“2020” could still seem like an advert for a kite, for an Atlantic flyover in a hot-air balloon: the new year seemed lightweight and frivolous. The two years since the last expedition to the Puerto Princesa Underground River had passed very quickly indeed, thanks in part to the ongoing contact with our Filipino friends and to a new publishing project conceived at La Venta, focusing entirely on the subterranean giant of the island of Palawan. As such, we had all the justifications we needed to head back there....

Shortly before our departure on 21 February, the sky-blue breeze of hope is turning into a storm, due to the worsening Coronavirus emergency in China. This unscheduled event does not sit well with the desire to travel light that we have for this new expedition, especially after the last two missions, which were tied to a complex, highly disciplined scientific project of international importance and which brought La Venta and the park authority even closer together.

The situation in Italy seems calm enough when the time comes for us to leave: the flights to Manila are still on, and so we grab this opportunity, planning to stop-off in Beijing; we are forced into making a rapid change to the airline, amongst numerous other adjustments to the trip. On our arrival in Palawan, we note that there are very few tourists around. The blocking of travel between the Philippines and China, as well as the other countries that find themselves in the thick of the emergency, is starting to make its effect.

Having left behind the confusion of the chaotic town of Puerto Princesa, the grey concrete road meanders its way amid hills and little villages, on a tranquil route that runs alongside small bays and deserted beaches, bathed by a silvery sea. With a certain amount of relief, we feel

once again the sensation of lightness. In the comfortable white pick-up driven by our dear friend Andrew, with its air conditioning and blacked-out windows, the talk flows freely, in the way it does when there are only seven participants on an expedition.

Surrounded by rice fields and suffocated by the forest, we see the first limestone formations sticking out – they still manage to blow us away, as we hurtle along in this strangest of years, the like of which has never been seen before. The road is as arid as the season, and for us coming from the northern Italian winter this provides an excellent opportunity, also in light of the exploratory camp that we are to set up in the forest. Our Filipino companions are already waiting for us, and they welcome us very warmly into this private paradise in the small village of Cabayugan. Jones, the chair of the local group known as P.S.G. (Palawan Speleological Guild), presents the whole group to us. They work on the reserve as cave specialists – highly appropriate for a park that was created around one of the world’s most beautiful caves. Everything is well-planned, we just need a couple of days to reorganise our stuff as we gaze out to sea here in Sabang, savouring some delicious fish. All we have to do is recover a number of measuring devices left in the main gallery of the Underground River, so we set aside a day to do so. We make our way inwards from the coast, navigating on *bancas*, the small traditional outriggers used for visits. It feels for all the world like a timeless journey as taken by the first explorers; the greenery caressed by the breeze soon disappears amid the perfumes of the cave in the gradual shift to darkness, and a thousand other memories are reawakened when we come upon the great stalagmite known as the “Cathedral”, rising up into the air, dressed in its elegant limonitic shade. The expanse of water is utterly still, so goodness only knows why it has



Crossing “God’s Highway”, one of the longest and straightest tracts in the cave, set on obvious cracks into which rainwater infiltrates, generating numerous calcite formations on the ceiling

been nicknamed “God’s Highway” – the dull thud of the heavy wooden paddles on the boat echoing endlessly in the tunnel. The clarity of the water is surprising; with our floodlights, the electronic viewfinder turns green for a sequence of photographs. The extremely reduced flow of water during this period has cleaned out even the depths of the lakes. We collect up and catalogue all of the sensors, some still operational despite our two years of absence. We make our way into the “Navigator’s Chamber”, documenting the various guano holes, forms of corrosion on the rock observed on previous expeditions. The customary snakes, mygales and centipedes are present and correct, along with a wealth of fauna (very much a feature of the ecosystem of this cave), but no swiftlets are to be seen until we reach the muddy beaches of “Rockpile”; it would appear that it is not a period of deposition for them – they will, no doubt, return later in the evening. In the tepid afternoon, we are once again outside, the sun shining on the desert beach and illuminating an unforgettable landscape. Swims in the internal lagoon and in the sea are a waste of energy, the usual group of little monkeys presses ahead looking for food, but it is already time to get back in the boat amid the evening waves, as the lights of Sabang are turned on. The next day we find ourselves struggling straight away with the heavy backpacks that weigh us down as we go to meet our Filipino friends in Cabayugan a few kilometres away. Having quickly passed material along the line to fill the motorised vehicles, including a van owned by the PAMB (Protected Area Management Board), which runs the protected area and is supporting us with equipment and manpower. The rough track that passes through the rice fields is filled with voices and sounds; long and rectilinear it seems to sacrifice itself under the powerful spurs of Mount Saint Paul. We are intoxicated by this Disneyland in the tropical karst, complete with its infernal spires and walls that stand out against the surrounding jungle – magnetic places for speleologists like us, who can make out dolines, chasms and caves of all types amid the severe and impenetrable slopes. The

entrance to “Daylight” is right in front of us, thoroughly covered by the lush forest. It will be the main focus of the explorations over the coming days. The restful camp is located just a few minutes away from the dirt road. A farmworker comes to our aid with his *carabao*, a hefty water buffalo that is typical of these areas, delivering two loads of material transported on a rudimentary sled, constructed from planks of wood and perfect for moving across the mud of the rice paddies. The man follows the manoeuvres of this primitive form of articulated transport, steering the animal with just a few commands – a great example of human and animal working together. The *Paroparo* (nocturnal butterfly) camp is a large rocky shelter in the middle of the rowdy forest. The Filipinos build solid shelves with natural fibres and wood; they sleep on hammocks carefully positioned in the ravine, while we sleep in tents in the forest, which are soon crowded out by aggressive ants that can sting like wasps. The crowns of the trees form a single roof, forty metres above us. In the late afternoon, the rays of the sun dance across the smoke of a just-lit fire, and the outline of the great cave is sharpened in this magical place as we prepare a hearty dinner, planning out tomorrow’s activities.

Searching for a connection

In the two years that we’ve been away, Jones and his group have pushed ahead with determination on the project, carrying out systematic exploration and surveying operations underneath Daylight. The karst sink hole is an important element of this system, and after various research trips the local group succeeded in finding the entrance to what is known as the “So-Ut Inlet”, the underground drain for the *Rio Cabayugan*. The inlet was previously thought to be little more than a narrow opening into which water flowed between the rocks, but now it has been shown to be a cavity extending for more than two kilometres. In short, before us we have a challenging puzzle that we have to try to solve. On the first day of exploration, we rig up a new entrance, once again found by the PSG, which enables us to reach in no time



Rope climbing in the Daylight zone

– by means of a couple of rappels – the upstream parts of Daylight. On the same day, we get prepared for an ascent to the main gallery using a drill and removable bolts, followed by a free climb that allows us to get to an enormous window. This time our group is very well-matched. The gallery, which we call *Paroparo*, starts wide, with a floor covered in layers of guano, very light walls and multicoloured concretions that are highly photogenic. The idea is to avoid the more treacherous flooded areas. The upper levels, though, are often interspersed by large sunken areas that put us to the test with several wall crossings, in environments that are extremely hot and slimy due to the guano, and are also home to thousands of gnats that invade both our lamps and our upper airways. Fauna and organic life are the real attractions

of these areas. Accumulations of lightweight sediments, deposited on the edge of deep fissures, occasionally collapse under our weight, opening up to reveal the spaces below. Over several days, we make our way up and down the main active routes that we saw in 2017 and which are called *Nilanguyan*, exploring other active zones on parallel pathways, in a maze of passages often with ceilings that have cracks way up high, through which we can glimpse other exploratory prospects. It amounts to a new world within tubes of exceptionally hard limestone, shining like steel blades, which rip our wetsuits. The floods patiently wear away the compact mass of the rock into sinuous, bizarre forms, covering them all over with scallops. We wear our wetsuits even though the water seems relatively lukewarm, avoiding the risk of hypothermia during the long periods spent there, while our courageous Filipino friends are clearly shivering as they swim through the area to map it topographically. All of the areas observed in the lower levels end in sumps and as such they require the use of underwater speleological diving equipment, but trusting in the stable weather conditions we manage to cross some of the more predictable passages by free-diving. Another important mission is to rig out other climbs in the nearby So-Ut Inlet, where the River Cabayugan enters and connects via sumps to the active branches of *Nilanguyan*. The cave features the same morphologies, with the presence of numerous branches that terminate in submerged passages. We note inflows from other, higher sump branches – affluents that are active even in periods of low water – which reach here from the karst area further in; they afford a great deal of exploratory potential, yet to be studied in depth.

In contrast to all of our rivals who live inside this cave, on the evolutionary ladder we have been downgraded to a subspecies of *Homo spelaeus*, lacking the ability to fly and to climb unaided. However, we do have the option to take notes during our painstaking visits, and so over time the explorations can grow and multiply. During the underwater surveying operations in the *Paroparo* galleries, a free descent along a number of well-worn cracks



Transporting the materials for the Paroparo camp by Cavabao

allows us to find the link with the active levels below. Making a number of marks as reference points on the ceiling of the small gallery, we identify from below the conjunction beyond a brief sump, which we explore by free-diving in the branches of *Nilanguyan* and which presents other branches constituted by fossil zones and submerged tracts. Late in the evening, we head back along the corridors of the cave with our heads bowed, amid the collisions of dozens of swiftlets, and we pause briefly, shattered, to take in what is a breathtaking spectacle for those who are not aware of the extraordinary life of this cave. Enormous rooms serve as a soundbox for the deafening racket made by the rudimentary navigation system used by these birds in the dark. Here, nature comes across as insane, and every day, in the darkness, an unstoppable ritual is performed, a macabre collective celebration that attracts tens of thousands of swallows in flight, the walls becoming covered by them; many of the birds crash into those walls or into each other, falling fatally onto the surface of the lakes or thudding into the ground and soon becoming the treat of choice for all types of opportunist predators. The cycle of life repeats, and so every evening while the bats leave, the swallows enter, creating a display like no other. The doorway to Daylight, shining in the sunlight, has its dark side in the form of the slimy depths hidden in the total silence of those sumps. But the Filipino youngsters are hard at work conquering another unknown geography behind these smoothed-down marble walls. The next expedition will be, as always, a surprising journey inside the damp cellars of Mount Saint Paul.

From hypothesis to exploration

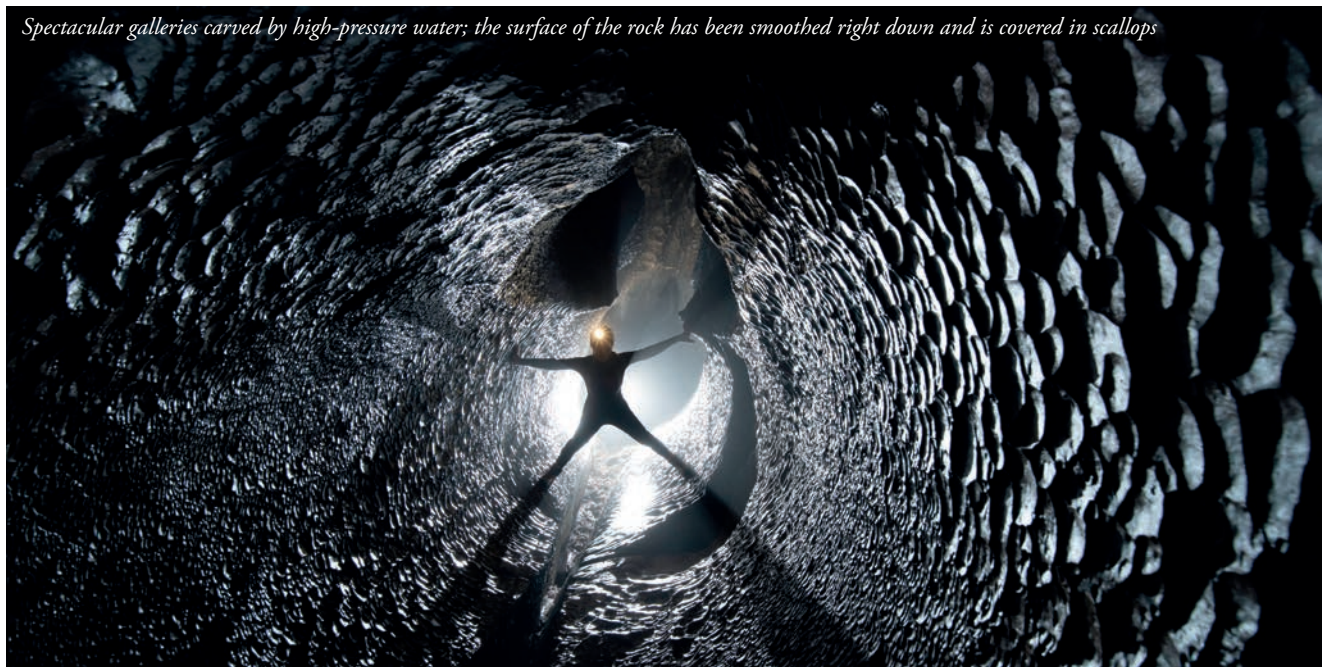
In 2017, at the end of the last scientific expedition, we often found ourselves passing through the galleries under Daylight; in the darkness of these spaces, the rays of the sun shone through faintly, brightening up ever so slightly the summits of these vertical walls. The large entrance to Daylight is the natural way into the long subterranean tunnel, a romantic voyage between land



Survey of the Nilanguyan galleries

and sea. The “tropic of limestone” crosses the heart of Mount Saint Paul, enclosing unexplored regions of great beauty, where the tides blend with the rivers, the humidity of the forest with the salty sea air. The natural direction of the large underground estuary that drains the floods of the *Rio Cabayugan* out into the sea looks for all the world like it was plotted! It is difficult to think of the sector upstream of the cave as a no man’s land. Indeed, in the opposite direction, a little further upstream from Daylight, the galleries come to an end, sinking down and branching off into a tangle of blocks, seeming to confirm the definitive defeat of the cave in its battle against such an obvious and predictable karst phenomenon. Everything appears to give way to the inebriating brightness of Daylight, which from down here invites you to leave the darkness. But carefully observing the majestic volumes of these environments, an equal number of truths seem to pique your curiosity. And so, from time to time, when the cave allows me to do so, I manage to make the odd visit on my own, discovering flooded areas and other branches that develop under

Spectacular galleries carved by high-pressure water; the surface of the rock has been smoothed right down and is covered in scallops





The lakes of the Nilanguyan galleries

what looks like nothing more than a terminal collapse. Different questions arise just inside there, and so on the last day of the expedition I head back better-equipped. A heavy storm fills the great underground expanses under Daylight with thunderous cascades, the air is saturated with water droplets, and we make our way around what is a highly evocative environment, while violent showers hit the floor from dozens of metres above, flooding it. Jones and his wife Khyllie accompany me; we go to visit one of the galleries spotted a few days previously. We arm ourselves with ropes and descend through various shafts at the end of the branch where there is intense air movement. The floor branches off into horizontal galleries, with completely different morphologies. Despite the disturbing meteorological situation, I free myself from my harness and immerse myself in the deep water, swimming against the current. Some gallery intersections meander for more than one hundred metres from their companions; in the end, a dry branch allows me to get out, taking me to an immense chamber filled with murky water. I'm very curious about it, so I dive

in once again: the water temperature is higher than it was in the lakes that I swam across earlier – the cloudy, hot Rio Cabayugan is not the only river feeding into the system...

Participants

Alfredo Brunetti, Carla Corongiu, Vittorio Crobu, Carolina Maimone, Igor Marini, Andrea Meloni, Patrizio Rubcich, Noel "Jones" Tabujara, Edralin Orpilla, Bebim Jala, Luisito Celino, Jered Maquitoque, Rymond Camron, Solomon Calago, Dennis Andrew Golez, Arnold Magallanes, Bobby Nasuduan, Gullermo Celino.

Thanks

Elisabeth MacLane, PAMB, Associazione Speleologica Progetto Supramonte, Matteo Casula, Salvatore Manca, Gruppo Archeo Speleo Ambientale Urzulei, Andrea Argiolas "Argolamp", Fabio Giannuzzi, Ilenia D'Angeli.

Sponsor

Amphibious, Ferrino, Gaibana, Insula, Italcane, Mon-



After sunset, the large karst tunnel becomes home to tens of thousands of swiftlets, whose chaotic flight creates a breathtaking natural spectacle

THE LATEST PALAWAN DISCOVERY: THE “HONEYCOMB PAVEMENT” OF THE NEW BRANCHES OF THE PPUR

Jo De Waele, Paolo Forti

With the exploration of the new branches of the PPUR, we have added yet more concretions to the already exceptionally high number that we know were formed due to the particular climate of Palawan.

This time, the structure is constituted by small bowls (Fig. 1, centre) grouped together so as to resemble very closely the cells of a beehive – a “honeycomb pavement”, in other words. The credit is due exclusively to Vittorio Crobu and his passion for cave photography, which has made it possible for us not only to know of their existence but also to study them in detail. Indeed, everything that we now know about these strange concretions comes from the shots that he was kind enough to take whilst exploring the new upstream branches of Daylight.

On the basis of our previous knowledge of the climate of Palawan, which is characterised by short but heavy rains, and above all on what we have been able to discern from the images, it is clear that there has been

a relatively long genetic process here, encompassing at least three distinct evolutionary stages.

Initially, the (sub-horizontal) area was covered by a thin layer of loam and mud that was completely soaked during the wet season, whereas in the dry season evaporation caused its total desiccation, with the formation of a series of cracks resulting from the consequent decrease in the volume of clay (Figs. 2.1-2.2). Given that, during the subsequent wet period, the water failed to seal up entirely the fractures formed in the clay, the alternation of the wet and dry periods gradually deepened and widened those fractures (Figs. 2.1-2.2), which thus conserved ever-greater volumes of water. The evaporation of this water trapped in the mesh of the mud cracks led to the development of an internal concretion. Over time, then, CaCO₃ filled the lattice of the cracks right up to the outer edge of the mud and, thanks to capillary rising, the concretion rose slightly higher than the mud (Fig. 2.3A). Had this process continued unchan-

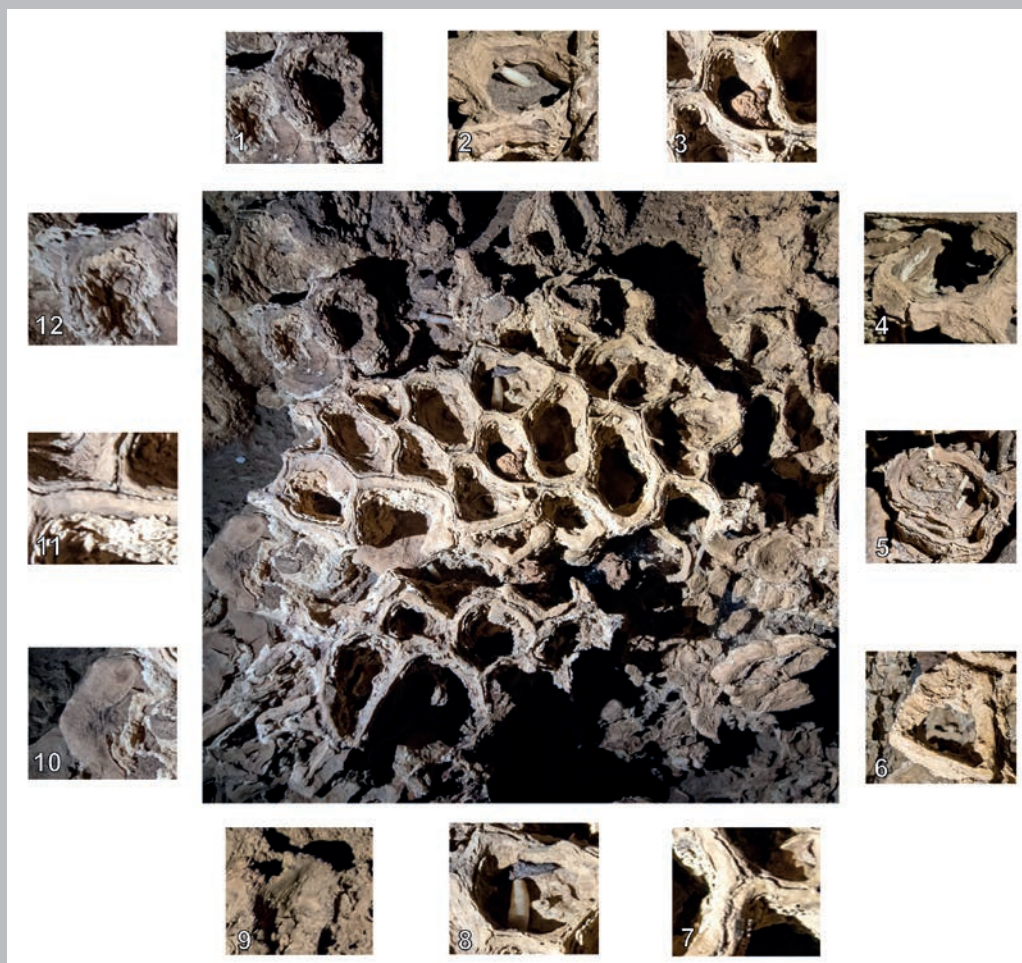
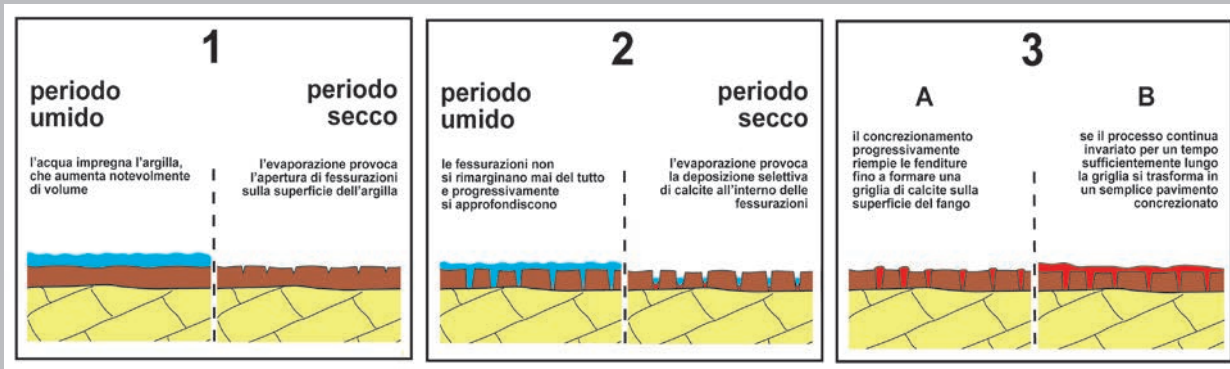


Fig. 1 – In the centre, the honeycomb pavement surrounded by the details that have enabled us to trace its development; 1) bowl partially destroyed by the flow of water along a drainage channel; 2) fragment of concretion on the recent mud base; 3) drifting pebble trapped in a bowl; 4) almost entirely destroyed structure, from which the original clayey substrate has also been eroded; 5) fragments of tubes within a highly eroded bowl; 6) recent mud sedimented within a corroded bowl; 7) close-up of the dividing walls with clear detachments of the structure; 8) fragment of stalactite and piece of non-drifting rock within a bowl; 9) recent, still-plastic mud; 10) basal portion of a totally dismantled bowl showing the mud solidified by the CaCO₃ deposited within it; 11) close-up of a bowl, showing internally the concretion films formed after every flood; 12) calcite films that have developed over an almost entirely destroyed structure.

Fig. 2 – Main stages that lead to the evolution of polygonal soils in clay (1-2), which can then evolve first with the formation of concretion grids (3A) before leading to the formation of a stalagmitic floor (3B).



ged over time, the whole area would have ended up being covered by a relatively thick layer of concretion, thus transforming itself into a normal sub-horizontal outflow (Fig. 2.3B).

Within the PPUR, however, this final stage was never able to occur because, evidently, the hydrodynamic conditions of the area changed, seeing an increase in the peak kinetic energy of the water, to such an extent as to permit a gradual erosion of the clay layer, even if delineated, and therefore partially protected, by a concretion grid. Therefore, in a relatively short period, the erosive action of the water during heavy storms removed most of the original clayey layer, thus allowing the emersion of the calcium carbonate grid (Fig. 3A, left). This lattice, with its isolated polygonal cells, gave rise to the embryonic geometrical structure, from which – thanks to the evaporation of the water cyclically trapped within – the ‘bowls’ developed (Fig. 3A, right). However, after a certain period – the duration of which can be calculated to a high degree of accurately simply by counting the growth bands in the dividers that separate the single bowls – this second stage also came to an end, giving way to a new stage, characterised by even greater hydro-energy. Indeed, in this third evolutionary stage (fig. 3B), the water erosion also affected part of the bowls that, in certain areas, have been almost completely destroyed, with the creation in their place of small flow channels. These have partially carved the limestone that functioned as a substrate of the “honeycomb pavement”. Moreover, during the high

level of water ingress immediately following the great tropical storms, the power generated by the water was sufficient to transport small suspended clasts and fragments of concretions that, with the lessening of the floodwater then became trapped within the single bowls and, on occasion, even became solidified on the ground by the formation of a new concretion.

As the final observation based on the general appearance of the concretion that forms the “honeycomb pavement”, we can state with confidence that the water flow disappeared some time ago, transforming them into practically inactive (almost fossilised) forms, on which the corrosive effect of condensation is starting to become more significant, while the formation of newly-formed carbonate crusts has decreased markedly. This final evolution is in perfect alignment with the fact that the “honeycomb pavement” is located on a terrace suspended over a canyon that has recently increased in depth (verbal report by Vittorio Crobu).

In conclusion, I would like to underline the fact that all of the observations I make here derive from my study of two photographs taken very rapidly. It is, indeed, essential that all speleologists, rather than taking samples that, nine times out of ten, get thrown away, should always document through photographs whatever strikes them as unusual, or at least not immediately comprehensible, along the way, in order to enable specialists to make the preliminary observations without pointlessly impoverishing the subterranean environment.

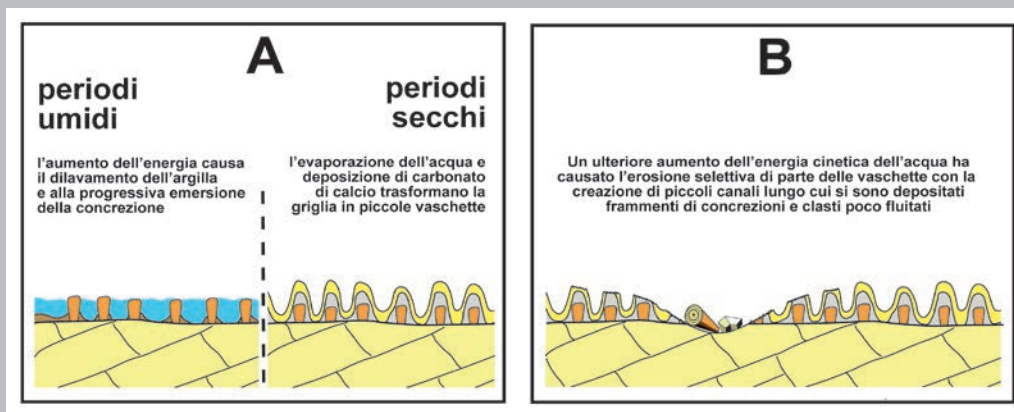
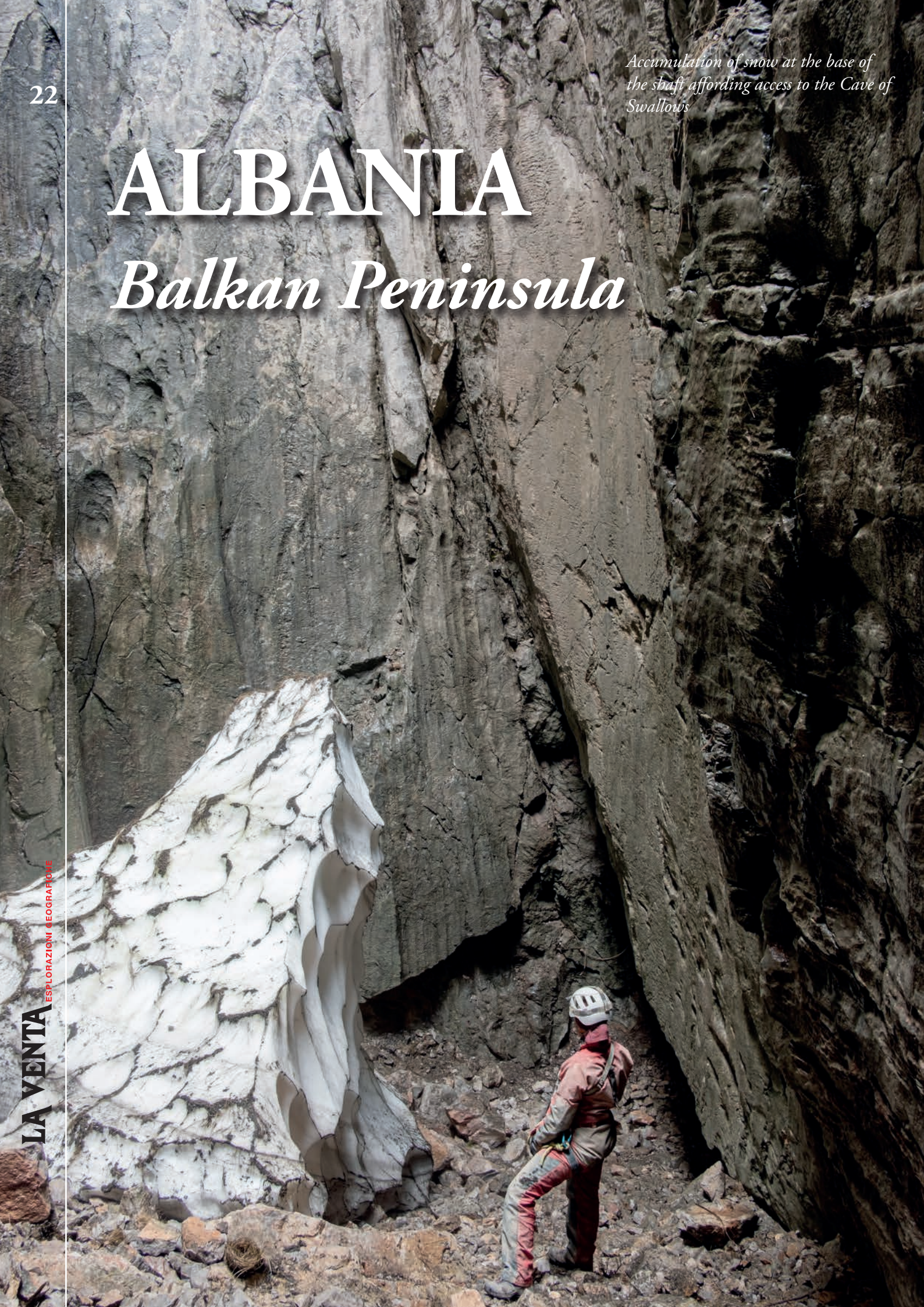


Fig. 3 – In figure 3A, we see how during heavy storms the erosion of the clay causes the emergence of the polygonal-cell concretion that, thanks to the depositing of CaCO_2 in the dry periods, is gradually transformed into a “honeycomb pavement”; in 3B, we can see how the development of flow channels leads to the erosion of part of the “honeycombs” and to the accumulation of clasts both inside and outside of them.

Accumulation of snow at the base of the shaft affording access to the Cave of Swallows

ALBANIA

Balkan Peninsula





OF SHEPHERDS, CAVES, MOUNTAINS, MEMORY AND ALBANIA

Norma Damiano, Claudio Pastore, Roberto Romano

When we leave the tiny village of Vrane e Madhe, in Albania's northern Alps, with its four houses in a cross formation, and we head onto the plain that turns first into steep woodland and then into rugged, isolated scree, we do not come across any other human beings aside from a group of speleologists looking for the void and for the memory of a shepherd.

Dealing with these mountains, and with their unexplored caves, necessarily involves dealing with shepherds followed by sheepdogs exhausted from keeping watch over the flock. There is something unique about mountain shepherds: when you ask them about caves, they tell you about the mountain. They do so through the use of gestures that are different from those that you normally encounter in everyday life. They use their arms, making wide gestures as if they were sowing – like the ones farmers use when throwing down seeds and grain after the soil has been left fallow. It is as if they want to remind us that the planting of a seed begins from a hole in the ground.

The only thing for it, then, is to put your faith in their memory, which is nothing but that of the mountain and which, in turn, is nothing but the coming together of steps, one at a time, heading towards the upland pastures.

One morning on the Albanian mountains, under the boiling sun of a far-off August, we learned that every shepherd has his own altitude, his own territory, which he knows his way around and which he begins to resemble. He is at ease in the landscape, he encompasses it with his gaze and, above all, he reflects it – economical in his speech but overflowing with beauty. Everything he knows is enclosed in his memories.

Lazhar is one such shepherd. He works on the slopes of Mali e Shtrezës. Every day in summer, he leads his flock to the pastureland, and he knows the mountain like the back of his hand. It was on one of these very days, when shooting stars light up the summer sky, that we met him as we were searching for a hole pushing out air. We came upon him by chance. And it was him who, stroking his

Panoramic view of the valley of Vrane e Madhe, Mal Shtrezë mountain



The Pantheon, one of the largest chambers within the Shpella Shtares cave



bristly beard as grey as the rocks of this mountain, pointed out *Shpella Shtares*. Lazhar wanted just one thing in return: that we tell him what our eyes had seen.

For three years, twenty or so speleologists belonging to the Martinese Speleological Group, the Faentino Speleological Group, the Bolognese Speleological Group and the La Venta Association met up in Vrane to explore this cave, which year after year has shown itself to be one of the most extensive in the Albanian Alps. During the last expedition, in August 2019, *Shtares* allowed us to reveal new chambers and new “storeys”, affording us the privilege of illuminating for the first time that dark world just a stone’s throw from Italy. Having the good fortune to find explored places so close to home enables us easily to learn more about the subterranean world, to study, experiment and gather ideas, transforming them into hypotheses that can then be verified calmly, back at home.

We studied the climate, the air currents and the life to be found within the resurgence that opens up almost at the base of the slope of the Mali e Shtrezes mountain. *Shtares* has a mostly sub-horizontal extension, and to explore it we needed to climb back up continuously. We told Lazhar that we succeeded in reaching the large galleries on the upper levels (the “Upper Storeys”). These develop along two meanders. One heads north, parallel with the path along the bottom; after climbing up a 42-metre shaft, we reached the largest spaces that have been explored thus far, and also the highest altitude, situated 73 metres above the entrance. The second meander proceeds in a south-westerly direction, and offers an array of exploratory possibilities: the most interesting of these made it possible for us to investigate an offshoot at +40 m, which leads into an enormous chamber formed along a large section of fault. This chamber is known as the “Cathedral” and the cave continues with other tunnels and rises that are yet to be explored.

Lhazar sat with us at the table, enjoying some pasta with tuna, and was dumbstruck. Looking at the photos and

videos of the day, he could hardly believe what he was seeing. He scratched his head. He opened his eyes wide. We also described to him, although he knew it already, that despite the large spaces of *Shtares*, the air current is forever strong and cold – the temperatures measured during the year vary from -3.0°C to 3.2°C , with an average of 1.6°C .

It was, however, only when we told him that, within that cave – so difficult for people to spend time in – there was life, albeit different from us, that his eyes lit up. A very interesting discovery arose out of the biospeleological research: systematic sampling made it possible to identify the mites, beetles, earthworms, spiders and pseudoscorpions to be found there. All of the specimens are subject to in-depth study by lecturers and researchers from the “Aldo Moro” University in Bari. These samples will go on to enrich the biospeleological bibliography of the Albanian and Balkan Alps – areas that are lacking in research of this type.

What has been explored thus far encourages us to return once again to the Albanian Alps and to try to illuminate other areas of darkness, searching for that ascent that will take us to an entrance up high, seeking other subterranean species and looking for ways to conduct new scientific tests. We will go back because Lazhar, the shepherd, has promised to teach us the language of the mountains, the water, the stars and the sky, which is nothing but the language of our memory.



Shpella Shtares – numerous earthworms were found in the cave

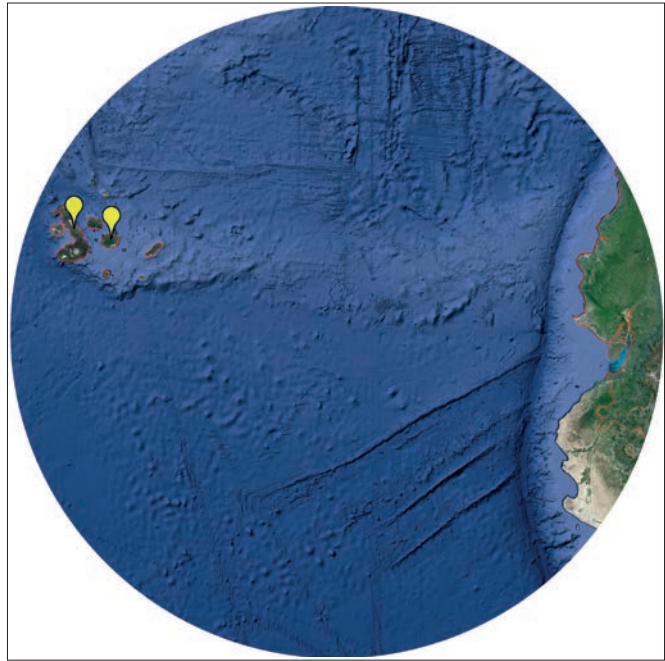


Shpella Shtares, exploring the new branches

GALAPAGOS

Inside Volcanoes

Lava tunnel on the island of Santa Cruz. It is often possible to see collapses within the underground caves



LAVA TUNNELS OF THE GALAPAGOS ISLANDS

Tommaso Santagata, Livia Savioli

We take a map of the world and try to put our finger along the equator, off the coast of Ecuador, in line with those green splotches scattered in the middle of the Pacific Ocean. It seems almost impossible to even think about trying to reach somewhere so remote. And yet, after a twenty-hour journey involving two stopovers, we land in one of the few places in the world where nature can be still said to be truly untainted: the archipelago of the Galapagos. Our first stop is the island of San Cristobal, dedicated to Saint Christopher, the patron saint of sailors. The authenticity that characterises these islands emerges the moment you leave the airport: we understand immediately that we have reached a corner of the world far removed

from our idea of space and time, a place where it is nature that beats out the rhythm of everyday life. Tranquillity envelopes us and creates a delightful, relaxing atmosphere. Straight away, we come across some of the animals that will accompany us for the rest of the journey and which represent an unusual feature of these islands: sea lions, swallow-tailed gulls, tropical birds and sea iguanas. We will have to wait a few days yet, though, before we can get up close and personal with the giant tortoises. Charles Darwin: we all know him for his masterpiece, *On the Origin of Species*, one of the cornerstones of the history of biology and science in general. It was specifically his observations of the fauna of the Galapagos, and in



The giant tortoises at the Charles Darwin Centre on the island of Santa Cruz



The morphological characteristics of the volcanic galleries explored on the island of Santa Cruz.

particular of their tortoises, that provided the basic inspiration for Darwin's theory of natural selection. Speaking of evolution, we cannot fail to take into account the fact that the Galapagos are relatively young islands in geological terms; the oldest of them dates back just four million years – a very short time frame compared to the average age of the continents, which is around 65 million years. The archipelago encompasses thirteen islands, seven larger and seven smaller, scattered north and south of the equator, which passes through the northern part of

the largest island, Isabela. The most fascinating aspect of these islands is their volcanic origin. The archipelago is located on the Nazca plate, one of the various plates that form the earth's crust. The element that made the formation of these islands possible was the presence of a hot-spot, a portion of the terrestrial crust in which volcanic activity is generated due to the rising currents of hot material that make their way up from the upper layer of the mantle. At this point, the heat melted part of the crust, giving rise to eruptions that led to the formation of the islands. Driven by the tectonic thrusts, the plate moved slowly east, whereas the hotspot remained where it was. Looking at the development over time, it is clear, then, that the islands to the east are the oldest, whereas those to the west, such as Isabela and Fernandina, are the youngest. It is those islands that correspond to this day to the hotspot and are still subject to frequent volcanic activity. Volcanic eruptions are often impressive, and they can be observed on the surface, but associated with them is a subterranean world that is equally fascinating – the world of lava tunnels. These are long underground ducts created by the lava flowing down the sides of volcanos; protected by a crust of surface solidification, the lava can flow along these conduits, hollowing them out, leaving in its wake underground cavities that are sometimes very large indeed. This is the *raison d'être* for our journey into the heart of these islands. Three years on from the first survey, in the summer of 2019 we participated in an expedition orchestrated by the American speleologists of the Cave Research Foundation, which for several years has been exploring the forests of the archipelago in search of these caves. The main objective of the expedition is to push ahead with the research on the island of Santa Cruz, the second largest in the archipelago after Isabela. From San Cristobal, we move on to hook up with the group of Americans. Despite the small number of days available, we explore



A number of galleries were surveyed using a laser scanner

and survey almost three kilometres of new galleries. The caves are located just a few metres below the external surface; in certain cases, they are easily accessible through surface collapses that are located right in the middle of the forest. The search for these collapses, though, ends up being one of the most adventurous experiences: their location is not known, and for this reason we have recourse to GPS devices, not just to find them first time around but also to find them again on the way back. The unstable soil and the thick vegetation demand that we use all of our expertise when moving around. Our guides, local farmers who know the area inside out, accompany us, clearing the way ahead with their machetes; in the meantime, we take a break every now and then to record the co-ordinates on the external accesses and to evaluate their exploratory potential. Often, the collapses have caused the galleries below to cave in, completely blocking the way and making access to the subterranean system difficult, if not impossible. Equipped with a laser scanner, we conduct the 3D survey of the most interesting tracts of the caves we are investigating. During the operations, we do not have time to stop and observe the development of the ducts and the marks left by the flow and then by the solidification of the lava. The sinuous curves and the secondary cave sections trigger daydreams, and we are soon imagining fluid, boiling lava flows in those ducts. At the end of the explorations, we make the most of the opportunity to visit the Charles Darwin Research Centre in Santa Cruz. Here at last we can marvel first-hand at the giant tortoises, which are true titans, aged over one hundred. We then move on to Isabela, the wildest of all the islands. We instantly get the impression that we have been thrown into another dimension – here, nature

really does take centre-stage. The island is the result of the fusion of six volcanos, aligned in a north-westerly/south-easterly direction, and the resultant shape is reminiscent of a seahorse. We cannot resist the temptation to see with our own eyes at least one of these volcanos, and we make it to the Sierra Negra, which is amongst the most active of the entire archipelago. The last eruption occurred as recently as June 2018 and continued throughout that summer. On reaching the summit, we stop to look to the north, towards the volcano that rises up majestically, immersed in the morning mist, and we let ourselves be carried away by daydreams of future explorations: this is the Wolf Volcano (aka Mount Whiton), at 1707 metres the tallest in the Galapagos. This is a demanding place, where nature is uncontaminated, and is home to unique species not found even on the rest of the island; there is a volcano and, in all likelihood, a multitude of unexplored caves – quite enough to whet our appetite. Isabela island also plays host to the headquarters of the *Parque Nacional Galápagos*, and here we meet with one of the managers to plan out our future operations and agree on low-impact methods of exploration. Our journey into the heart of the Galapagos reaches its conclusion. We head back home with the usual feeling – that we have seen far too little. We are more determined than ever that we will have to come back again soon.

This expedition was carried out in partnership with the Cave Research Foundation and the Parque Nacional Galápagos, with the support of the Vigea company for the 3D laser scanner surveys, and the Gaibana company for the provision of footwear tested by the astronauts of the European Space Agency.



On the island of Santa Cruz, we carried out laser scanner surveys of a tourist cave featuring large, mostly horizontal galleries

Inside the Volcanoes

Francesco Sauro

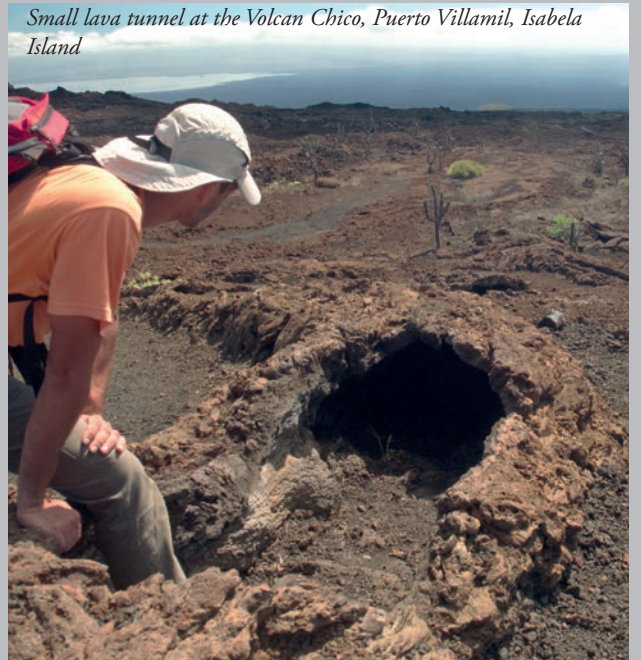
New Lava Tube at the Hotel Royal Palm - Puerto Ayora, Santa Cruz Island



There is only one type of cave that, without doubt, you are sure to find not only on Earth but also on other planets: lava tubes. Wherever there are volcanic phenomena in the solar system, or even in other planetary systems, there certainly exist similar underground networks. These are caves that are formed by means of “construction” rather than by the erosion or dissolution of a pre-existing rock. For this reason, they are referred to as “syngenetic”, meaning that they have the same age as the rocks that enclose that void. Nowadays, vulcanospeleology is a recognised branch of exploration of the Earth’s subterranean world, with its own committee forming part of the International Union of Speleology. However, from the exploratory and scientific perspective, a great deal remains to be done. Often, volcanic areas – and, above all, large volcanos with active shields – are located in zones that are difficult to access. Lavic terrain poses substantial difficulties to those who want to traverse it; and often there are also eruptions to be taken into account, which are difficult to predict when working on a research project in these far-flung parts of the world. In 2015, we were developing a project for the exploration of a number of lava tubes identified via satellite images as being on the slopes of the Wolf Volcano on Isabela island (Galapagos). We had even flagged up the possible location for a base camp, but in the May of that year a major eruption wiped out that very area, destroying forever the caves that we had picked out and creating new ones in the process. Every volcano is a continuously evolving territory, a little like a glacier, but in this case the caves are formed by fire; and every new cave amazes us and takes our breath away, passing through its cooling phase, which offers up unexpected meta-stable concretions, themselves destined to disappear when the inside of the tube cools down. In these veins under the skin of volcanos we are discovering a lot about the formation of the

Earth’s crust, the evolution of species and their adaptation to extreme environments. This is a frontier that remains little-known compared to classic karst caves. Dozens of lava tubes have been explored in Hawaii, Iceland, the Canaries, Réunion Island, Queensland, Vietnam, Japan and even in the great Italian volcano, Etna. But there are still places that are entirely unknown in terms of their fiery subsoil, such as the Galapagos (in large part), but also the remote archipelago of the Kerguelen Islands, a giant shield volcano that emerges from the Indian Ocean and runs towards the coasts of the Antarctic. Having explored tropical caves, glacier mills, sea caves, meanders in salt, abysses in quartzites, La Venta now wants to focus on this frontier. Looking from the Earth towards the other planets. Perhaps before the end of this century we may just manage to see an astronaut exploring a lava tube, like those described here, but under the volcanos of the Moon or even of Mars.

Small lava tunnel at the Volcan Chico, Puerto Villamil, Isabela Island





THE MYSTERIOUS ISLAND

Gaetano Boldrini

I have never understood if we are born dreamers and books just nourish that oneridic dimension, or if it is the stories we read that plant the seed of fantasy within us. It is certainly true that those like me, who were teenagers in the 1970s, read a lot. In fact, we read everything we could get our hands on: Melville, Conrad, London, Stevenson, Defoe, Kipling and – naturally – Verne. The incredible visionary nature and clairvoyance of Verne's novels had a deep impact on the lives of many people of my generation. Specifically, of course, *Journey to the Centre of the Earth* inspired a great number of future speleologists who, losing themselves in those pages, would imagine themselves as Professor Lidenbrock or his nephew Axel, dreaming – albeit in an awareness of the impossibility that such an immense subterranean world could actually exist – of one day emulating that fantastic voyage. But, over and above books, in those years another means of disseminating information and imagination was taking shape: the comic as high art. Illustration thus replaced writing, maintaining intact the dimensions of creativity and freedom. The real bolt from the blue, though, and the one that gave me an accurate idea of speleology, came when I flipped through the pages of Verne's *Mysterious Island*, a less exciting novel, we would have to admit, but perhaps for that very reason more convin-



Edition: Epipress/Famiglia Cristiana 1973-1974

cing in terms of realisable dreams. Franco Caprioli drew very evocative illustrations of the cave that would provide shelter for the shipwrecked. The cave is viewed not just as a cavern full of mystery and superstition, the final frontier of mankind's conquest through epic, unforgettable struggles, but also as a safe and welcoming place, affording refuge from dangers and calamities. In the drawings, the representation of the cave is pared down, with little flesh on the bones, there is no sign alluding to any sort of arcane mystery. It is simply – and, at the same time, incredibly – a cave depicted as a natural phenomenon that Man can and must understand.

Franco Caprioli (Mompeo 1912 - Rome 1974), destined to follow in his ancestor's footsteps and become a painter, went to art school and learned the techniques of divisionism and pointillism, which he would then re-cast in a highly personal fashion in his future works. Very soon, though, he abandoned this style and, from the 1930s onwards, decided to focus on the new mode of narration: comics. He produced numerous works in the field of illustration, but his most memorable would be his condensed versions of many adventure novels, especially those of Jules Verne, published in editions of *Il Giornalino*, which then re-appeared in comic books published by Edizioni Paoline.

Transcoding the novels of Verne into cartoons is exceptionally easy for those with the skills to do so. The writer's descriptive power is such that the stories flow naturally before the eyes, as in a film, and so transposing them into illustrations becomes a stylistic exercise that does not require a great deal of inspiration. Caprioli, though, does not just reproduce the story: he reinvents it through an almost photographic idiom, while also leaving space for the reader's imagination and emotions. The panels are not mere tools for popularisation; rather,



Ed. Epipress/Famiglia Cristiana 1973/1974

they represent the soul of the illustrator, who expresses himself with extraordinary poetic force using a clean, linear, painstakingly rendered style that is instantly recognisable thanks to his typical shading technique, made with dense dots.

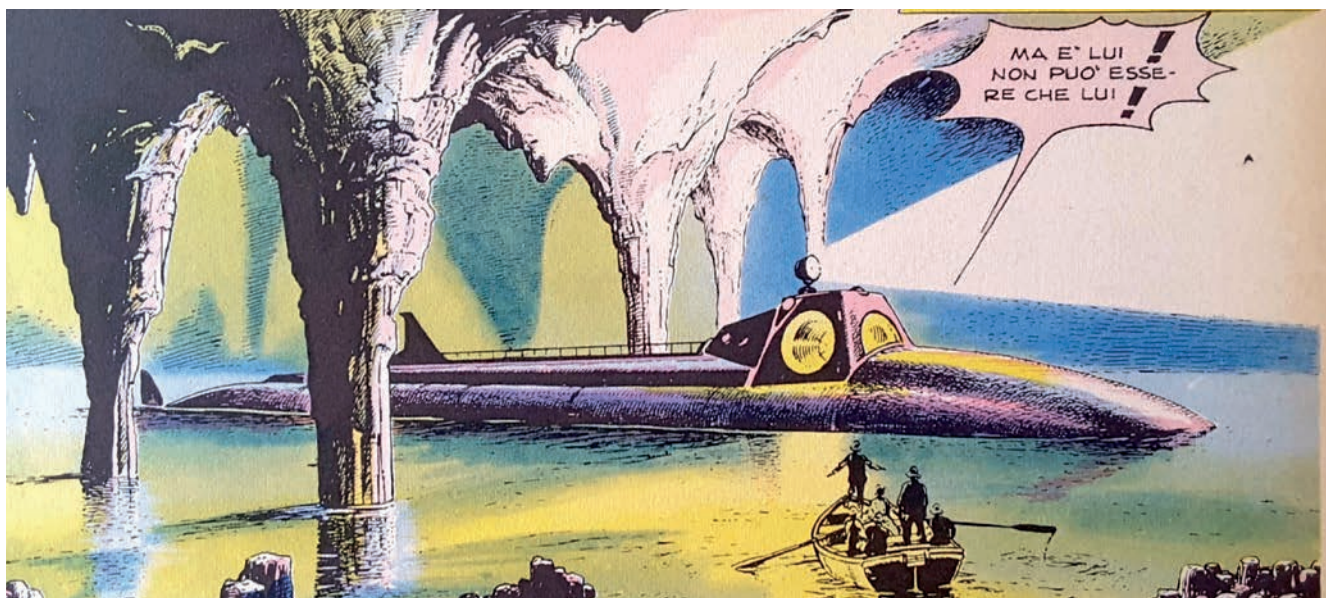
The Mysterious Island is the novel that brings to an end the trilogy that also includes *In Search of the Castaways* and *Twenty Thousand Leagues Under the Sea*. Initially, it was published episodically in the *Magasin d'éducation et de récréation* from 1874 to 1875 and, again in '75, it was compiled in a single volume, published by Hetrel, featuring acclaimed illustrations by Jules Férat. The novel, in Verne's typical mode, represents the triumph of technological Man and the faith in progress that was so ubiquitous in the late nineteenth century. Loyalty and friendship, regardless of class or race, constitute the glue that enables human beings to adapt to their environment and bend it to their will.

The story begins in 1865, during the Civil War, with the escape of five Federal prisoners of war and a dog from the city of Richmond; they make their getaway in a stolen aerostat. After several days, a storm hurls them onto what will reveal itself to be a remote island in the Pacific, which the castaways call "Lincoln Island". Thanks to their knowledge and skills, they go from being castaways to colonisers. Feeding on game and fish, they fashion every sort of tool, becoming blacksmiths, carpenters, farmers and breeders as they succeed in adapting perfectly to the environment. They even produce nitroglycerin, with which they blow up a riverbank, deviating the water course and accessing a natural cave carved out of granite. Having explored it, they demolish a rock wall, creating an opening that faces outwards, thirty metres above the beach. This becomes the new entrance to the cave, renamed the "Granite House", which serves as their home. From the outset on the island, mysterious, incomprehen-



Edition: Epipress/Famiglia Cristiana 1973-1974

sible events take place that always tend to facilitate the efforts of the members of the group to resolve difficult or dangerous situations. The suspicion that they are not alone, and that there is someone who has decided to help them from behind the scenes, becomes a certainty as time passes. In the end, the mystery is unveiled: the island is the hiding place of Captain Nemo who, only at the end of the novel, decides to tell the castaways how they can reach him. Our castaways arrive at his hiding place, which is a cave accessible by sea only at low tide; here, aboard the submarine *Nautilus*, the captain lives in complete solitude. Nemo, now old and tired, manages before dying to tell them his tale and to let them know that the island will soon be destroyed by a volcanic eruption. The *Nautilus* eventually sinks, becoming his tomb. The novel ends with the explosion of the island and the rescuing of the castaways, sheltering on a rock, by the yacht *Duncan*.



Ed. Epipress/Famiglia Cristiana 1973/1974

Tono De Vivo

E-mail has some downsides, but also some unquestionable advantages, which include the fact that, if you don't delete a message, it leaves a trace – one that can become a sort of diary of what we've been doing and thinking, at least in those cases where we put not just technical information but also feelings into our messages. Many of us have been organising expeditions since the 1980s; back in those days, communication was of course by telephone, only later would we meet up in person for planning and organisational purposes. Everything was slower, more enjoyable and more human, but fewer traces were left – or, at least, they were traces that were harder to follow the further back you went.

In the early '90s, e-mail became part of La Venta's way of doing things, too, driven by the enthusiasm shown by Giovanni, who used it at work and talked about it as a revolutionary step forward – which is, indeed, what it was, and since then a great deal of our history can be mapped out through those messages composed at a computer screen. Now and again, it's fun to read some of those old mails, recalling lots of things we did in the past. Normally, though, our time and our dreams are dominated by the present and the future, and so past journeys and expeditions are consigned to history and there's no need to re-examine the digital correspondence that was involved in organising them.

When we want to tell the tale of something we've experienced, if not that much time has passed, then we don't need to go rooting around in the archives. It's more difficult to describe something that has NOT happened, and to explain why. In that case, the graph that starts with the curve rising up from the idea to the moment of departure for remote, thirsted-after destinations, before proceeding with a stable exploratory line and ending with the curve falling back down to indicate your return home, is suddenly interrupted. At times, the interruption comes during the first part, due to tangles of red tape, or political, financial or health complications. Rarely does the curve get interrupted at its apex, at the moment of departure. But that is what happened to us with Chiapas 2020 and, in order to capture that interrupted graph, it was useful to re-read the mails from those days. Some details had got lost along the way and, in light of what then happened, finding them again often made us smile.

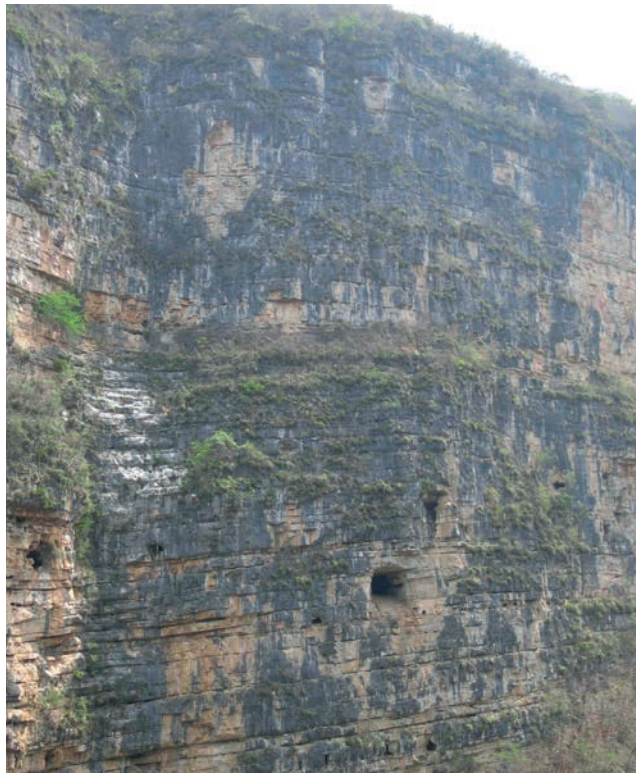
In the August and September of the previous year, we had talked about three expeditions for the autumn-winter period: Rio La Venta, in Chiapas; the Underground River, in the Philippines; and the salt caves in Iran; as well as a survey of the Chiribiquete Park, in Colombia. Iran was soon off the agenda: the news from the media and the short, infrequent bits of information that Luca

received from our local friends left us with no hope of returning there any time soon. The socio-political situation is extremely dangerous, particularly for us as Westerners. Despite the desire to return to explore together in the myriad still-unknown salt domes, it was the Iranian speleologists themselves who told us not to come. Palawan is a paradise, our caving friends from Sabang and Puerto kept on finding new caves and new extensions, and Vito and Carla had no trouble identifying new travelling companions to press on with the explorations in the large underground river. The trip to Colombia was to be a reconnaissance mission, to make contact with the native peoples, and the team would be constituted solely by Cesco and Daniela, who were to go in January.

The Chiapas project was being organised by Tullio, who set an extraordinary, fascinating series of objectives: entrances to new caves located on the vertiginous walls of Rio La Venta, almost all invisible from the bed of the canyon and revealed through helicopter flights. The date for the trip, set in September 2019, was to be 5-22 March, 2020. Between October and December, while in Wuhan they were recording the first spike in cases of an unusual form of pneumonia, we worked out who would be participating in the expedition, we refined the schedule, dreamed about the dark entrances visible in the aerial photographs and thought about how to reach them. There would be almost twenty of us, divided into different groups with separate camps, and we were to have the support of the Chiapas civil protection service, and even a helicopter to reach the attachment points for the descents. Fantastic.

On 8 January, Leo sends us our plane tickets, split into the various groups and departure airports. Now we are sure that we're going... On 9 January, the Chinese authorities inform the local media that the pathogen responsible for the cases of pneumonia is a new strain of Coronavirus; on 10 January, the World Health Organisation makes the announcement internationally, providing the first, cautious indications on preventing the spread. But China is far away, and we're going to the other side of the world. On 21 January, the WHO states that the virus can also be spread from person to person. On TV we see images of the megalopolis of Wuhan in total lockdown. The Italian authorities advise against travelling to China – but we're headed for Mexico...

Now that we have the tickets, we have to think about the materials and how to divide them up amongst us. Having four separate camps means having a mountain of logistical as well as technical equipment. Staying in a forest for so many days demands self-sufficiency from lots of different angles: food, of course, but also sources of energy – we have to decide on generating sets or



photovoltaic systems. From mid-January, we start getting everything ready and working out what we have and what we still need. Leaving from here with four generators would be madness, so we begin looking for them on site through our *chiapanecos* partners and friends. We sub-divide the material into 23-kg packs, then we send them across Italy; every participant will have to carry their own bag and one for the team.

From the health perspective, experience tells us that tropical caves often play host to a rather unpleasant fungus, *Histoplasma capsulatum*. Breathing in its spores causes histoplasmosis, a very serious lung disease. So we get ourselves well-prepared: Mirco, who works in the medical devices field, gets hold of a substantial number of FFP2 masks, the seemingly OTT ones with the filter that, nevertheless, give excellent protection against the disease. Back then we don't know it, but we will soon be needing them for protection against something else. On 29 January, two Chinese tourists coming from Wuhan are admitted to the Spallanzani hospital in

Rome. Crumbs...the virus has made it to Italy. But the two tourists are identified quickly, so we are sure the situation will be sorted out in no time. The first spikes begin to appear in certain countries around the world, but there are just handfuls of people affected at this point. On 30 January, the WHO declares an "international public health emergency" and Italy blocks flights to and from China, the first country in Europe to do so. The idea that the situation could impact on our plans in any way has still not occurred to us.

In the first couple of weeks of February we concern ourselves with technical issues relating very much to speleology, with dedicated meetings, exchanges of opinions and analysis of the available photos. While the date of our departure approaches, towards the end of February the situation is to take a turn for the worse. On 22 February, the first governmental decree is issued, which states that the hotspots of Lodi and Vò Euganeo are now red zones. The Palawan expedition gets under way on 21 February, but none of the participants from the Veneto or Lombardy regions are on board...

With the worsening of the situation, we begin to get worried, not just about the medical aspects but also about the logistics and the responsibilities involved. Italy is among the hardest-hit countries in the world. There are as yet no limitations on flights to Madrid or Mexico City, but we wonder what will happen if a passenger starts to feel ill or developed a fever? You'd be looking at a long period of quarantine in a hangar or a hospital, with several hundred kilos of material to deal with. Amongst the future participants, many of them come from the Veneto region, which is one of the worst-affected areas in the entire world.

On the other hand, there is the possible loss of our plane tickets if we decide not to go. At Point H of the "Specific Exclusions to the Travel Cancellation Guarantee" of Iberia Airlines it states that "the following are not covered by the insurance policy: telluric, terrorist, sociopolitical, meteorological and natural events, epidemics and the risk that such events may occur". Every attempt to contact the airline through 4 Winds, our travel agency, gets nowhere. We are not all of the same opinion, in part because we all come from different places, but fortunately we do have frontline doctors, capable of thinking

Group material for Chiapas 2020, ready to be distributed amongst the participants



straight, who in the general media scrum help us to get a handle on what is happening and on what might happen.

On 28 February, in a long virtual meeting, we try to put together the pieces of the puzzle to see what we can come up with. We have the further problem that Leo has to leave within two days, to organise things on-site in the run up to the group's arrival. He is very calm about it and decides to get going. We are prepared to wait it out, sacrificing his time and the cost of his ticket if we have to, before taking a definitive decision. During the meeting, though, something comes to the fore that had seemed to be not particularly important; an aspect that we thought was a thing of the past, when explorers, travellers or missionaries, unwittingly or deliberately, devastated entire communities by bringing diseases that the native peoples had built up no natural immunity to – in other words, the ethics associated with the deontology of exploration. At the time, we do not know that the virus will also penetrate the Chiapas community – independently from us – but we feel it would not be acceptable for us to end up as plague spreaders simply because we cannot bring ourselves to cancel the trip.

On 1 March, Leo flies to Mexico, via Madrid, and he writes to us from Cintalapa that he has not encountered any problems, nor has he been subject to any checks. Very few people are wearing masks, and temperature-testing is non-existent. On the face of it, the situation is reassuringly normal, but for my part the thing that preoccupies me the most is the lack of controls, which indicates to me that those involved are more interested in ignoring the problem than in dealing with it.

The doubts become stronger and are shared by more and more members of the team. On those first two days of March, our email group is bombarded by opinions being exchanged back and forth. In the end, the risks associated with the medical, organisational, legal and, above all, ethical aspects lead us to decide to postpone the expedition. In a lengthy email sent to the participants on 2 March, expedition organiser Tullio and association chairman Ciccio communicate the decision, proposing the month of May as a possible future alternative. That mail also includes the evaluations made by Beppe, who as a doctor involved directly in the health emergency

does not leave any wriggle room for others to play down any aspect of the crisis, and especially not the ethical implications of pressing ahead.

The mail comes as no great surprise to the participants, since it has been anticipated by a plethora of phone calls and WhatsApp messages. The responses to the message from Tullio express obvious disappointment but also profound comprehension; they demonstrate that the spirit of La Venta – that deep-seated respect for the environment and the people who populate it – is shared by everyone in the association. We cancel an expedition but feel better for doing so; we have got our priorities right. Out of all the mails, the one I like the most is that sent by Andrea Pasqualini, which I have edited to make some of the language a little less 'colourful'.

"Joking apart, guys, I am of course ok with the decision taken. I'm not good at making speeches, but I want to thank you for doing the right thing, which betrays a sense of ethics that's rare these days and shows respect for people, first and foremost! In this regard, La Venta has always demonstrated that "something extra" that makes it very popular with people all over the place! I'm really happy to know you and to be able to quote Vittorio Arrigoni, who said that in our own small way we have managed to stay human! I'm sending you my best wishes y un fuerte abrazo, especially to Leo, a refugee in Cintalapa! Andrea"

Leo, of course. He has before him the long process of getting back home, this time with masks and checks by the dozen. Having flown via Madrid and Frankfurt, he reaches Rome on 14 March and enters quarantine. But by then we are all at home. Lockdown begins on 10 March, and the very next day the WHO declares the pandemic.

At the time of writing, late October 2020, the pandemic of those early months appears to have made a comeback. The planned May expedition seems ridiculous, in retrospect, as does the subsequent attempt for June. We should count ourselves lucky, though: thus far, everything has gone well, and we live in a country with a healthcare system that – while worn-out after decades of destruction and political rapaciousness – still guarantees the health of everyone, as a constitutional principle.

Chiapas 2020 is going to have to change its name – the second part, I mean.



Press conference with the Health Secretary of Chiapas, Mexico. On 1 March, the General Manager of the Hospital de las Culturas, Dr Sergio Gomez Mendez, with Dr José Manuel Cruz Castellanos, Secretary of Health and Director General of the Instituto de Salud, together with Dr Claudia Nolasco Gomez of the Department of Epidemiological Vigilance and Dr Leticia Jarquin Estrada, Deputy Director of Epidemiology, informed the public that a possible case of Coronavirus had been discovered in Chiapas. The individual in question was an 18-year-old student who had been in Milan.

*One of the caves sighted during the flyover of the
Canyon of the Rio La Venta*



THE NAME “LA VENTA”

Tullio Bernabei

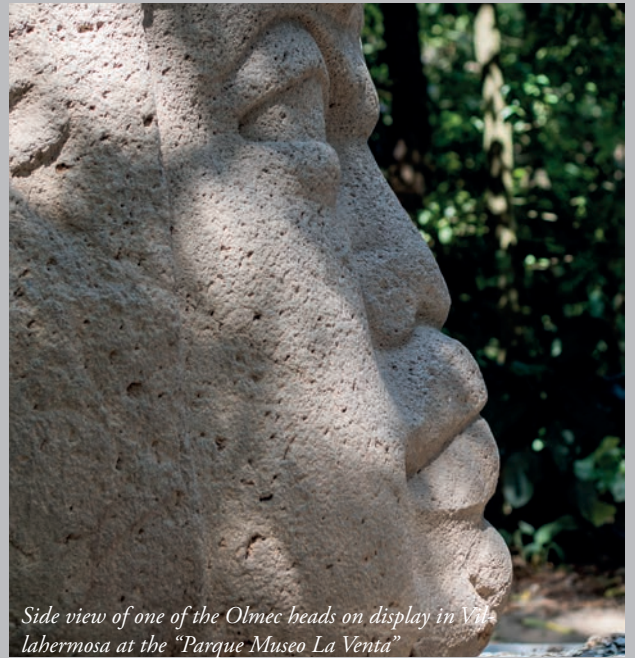


March 1989. Due to a strange twist of fate, a “transversal” group of speleologists, hailing from several different parts of Italy, finds itself on an expedition to Palawan, in the Philippines.

A few months later, in the August, an even larger, wider and more battle-hardened group organises, in partnership with Russian counterparts, the first “Samarkand expedition”, to Central Asia, which produces exceptionally good results.

There was something in the air...the frontiers of exploration were reachable. In January 1990 we carry out the descent into the canyon of the Rio la Venta, which brings six people to breaking point and, at the same time, demonstrates that it is possible to execute, with great success, missions that are small, fast and efficient. These three intense experiences, completed in just ten months, convinced some of us that the time had come to set up an association specialising in geographical exploration – a potent group dedicated exclusively to the threefold purpose of discovering, documenting and disseminating. We did so the following year – on 20 June, 1991, to be precise – and the name La Venta came naturally...but not only because of the wonderful canyon we had just made our way through.

Certainly, the canyon was then, as it still is now, an encapsulation of what exploration is all about: speleology, archaeology, geology, biology...and so the name encompassed all of these different aspects. But in that “Mexican” period, which for me had begun a decade before, we had got to know another place with the same name, which its own way had inspired us tremendously. In the state of Tabasco there is an archaeological site called La Venta, which is famous for its colossal heads



Side view of one of the Olmec heads on display in Villahermosa at the “Parque Museo La Venta”

with their Negroid features, carved out of the basalt by persons still unknown. It is another small mystery in the context of a whole culture – that of the Olmecs – about which little is known. This is a stimulating place, then, which fascinated us and provided food for many a dream. We did not know at that time that those Olmecs had also been leading lights of the area of the Rio la Venta, which we were once again promising we would explore.

And so it came to pass. Thinking of two places that we liked for different reasons, but which had the same name, we decided that the new group of darkness-loving explorers should take that name, too. And perhaps our group would fascinate many others on the long journey that we hoped to take.

One of the Olmec heads on display in Villahermosa at the “Parque Museo La Venta”





One of the numerous entrances overlooking the forest in the Baixada das Crioullas cave in Cabeza de Boi, Brazil

Paolo Agnelli

Just four years ago, the Word of the Year in the monumental *Oxford English Dictionary* was “post-truth”, defined as “relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief”. This means that, while the scientific community promotes conduct and strategies based on evidence, modern society may have arrived at a new model in which what counts is not veracity but social signalling and attention (McCarthy et al., 2020). This often translates into the dissemination of speculative or misleading information, which is then reinterpreted as if it were true.

Today, while the SARS-CoV-2 emergency continues to devastate human health and national economies, the media are still searching desperately for the most unusual, unsettling and extraordinary news concerning this pandemic. In this crazed search, the available scientific information is clumsily reworked in a deceptive way purely to provoke a reaction and give free rein to people’s imagination. To cite one example: last summer, medical research evaluated that, on average, COVID-19 was lethal in around 1% of the cases of contagion, being particularly dangerous for the elderly, whereas the common flu virus had a 0.1% chance of being lethal – i.e. ten times lower. Nevertheless, a well-known online newspaper featured the following headline: “Coronavirus is ten times more lethal than flu”. It did so, however, without adding the essential complementary information, which is that, without the periodic flu shot, the seriousness of influenza would be similar to that of coronavirus! Clearly, in cases such as this, the purpose is not to offer the public a more understandable message, but to attract readers, clock up more contacts on the web and sell this visibility for advertising purposes. In practice, the interpretation of complex research conducted by a qualified and articulate scientific community ends up being dependent on the limited medical competence of a journalist.

And then there is the sudden high profile of many so-called “experts” who all too often, when placed in the limelight, give opinions on matters outwith their specific field of expertise. As such, even complex questions of ecology and zoology get “simplified”, and this is why the fact that “bats are a natural reservoir of Coronavirus” rapidly became “bats are responsible for COVID-19”. The ease and speed with which lies such as these are shared on social media accelerates the spread of disinformation and substantially amplifies the repercussions in the real world.

Would you ever entrust the care of someone who is ill to a landscape architect? Or the design of a bridge to an origami specialist? Well, then, why not put your faith in Biology to get a more reliable, wide-ranging vision of

this natural phenomenon known as a “pandemic” and to glean an understanding of how things really are on the planet on which we live? This is the perspective of a naturalist.

It is difficult to define viruses. They are not even cells, but something simpler, because they are formed only by a protein casing and by nucleic acids. They are utterly ancient micro-organisms that have been circulating for more than three billion years, and so they are certainly very well-adapted and successful; we only arrived 250,000 years ago, just to put the earlier figure in context. We know that they cannot reproduce themselves under their own steam – they need host cells in order to do so. Darwin’s theory of evolution applies to all life on Earth, including viruses, which – from the time of their first appearance – have gradually become specialised at reproducing themselves and surviving as effectively as possible within other living beings, diversifying into a large number of different types. Every viral form ends up living in equilibrium with its host, which over time develops an adaptive immunity. This means that the host survives this sort of “parasitism” and the virus can prosper and propagate.

The event that can unbalance this equilibrium is the so-called “spillover”, the jump from one species to another. This occurs following a rare, casual mutation that changes something in the virus and, if the mutation is favourable and if there are, at that time, suitable conditions such as proximity to another species, then a new virus tries to expand in the new host. Even when the new host species is a human being, in most cases the virus turns out to be innocuous, but sometimes it can cause pathologies of varying levels of seriousness, from the common cold to HIV. The human species is showing itself to be the ideal host for viruses, thanks to our presence across the entire planet, our social habits, the ease with which we can move from one continent to another – all factors that facilitate the dissemination of the infection. Sometimes the virus adapts in a particular way that shelters it against any excess damage caused to the health of the host, meaning that it shows itself to be innocuous for certain “parasitic” subjects (our species calls them “asymptomatic” subjects) and so the virus not only does not risk being killed along with the host, it actually increases its possibility of spreading to other individuals. It would seem, then, that we have no way out, but in truth there is a way to reduce the risk: we simply need to stop increasing our numbers and invading every natural habitat and every virgin territory, deforesting, polluting, hunting indiscriminately, causing climate change... Once and for all, if we stop changing the natural equilibriums and even altering the behaviour of other species, we will greatly reduce the opportunities to come



into contact with viruses, making the “species jump” all the more improbable. What happened in the market in Wuhan is an extreme example of how NOT to conduct ourselves: the presence in a single place of an array of different wild animals, alive or just-butchered, in very poor hygienic conditions, in direct contact with people or even being consumed as food, made such a cross-species contamination extremely likely, with the repercussions that we are all feeling first-hand.

In relation to this new pandemic, it is still not certain from which animal species the spillover was made; as of today, the most likely candidate seems to be the pangolin (*Manis javanica*). The South China Agricultural University has flagged up the fact that the genome of our SARS-CoV-2 is 99% identical to that of a virus found in this small, scaly ant eater. It is not yet clear how transmission occurred, but in all likelihood what happened is that the pangolin was sold to be used as food in the markets of China. In previous epidemics, mammals carrying viruses with zoonotic potential – i.e. with the capability of “jumping” from animals to humans – have included the Asian palm civet (Sars), the pig (A/H1N1) and the camel (Mers).

The initial investigations into animals geared towards finding the progenitor of SARS-CoV-2 had concentrated on bats and had highlighted a genetic similarity of between 85% and 96% with viruses that live in at least a couple of Chinese bats: *Rhinolophus sinicus* and *Rhinolophus affinis*.

At this point for the journalist, or the expert on duty, whose patience and attention have already run out, and who has to provide a summary, then this information in itself is sufficient. In this way, the conclusion is reached in an instant that the original source of this pandemic was a bat – a conclusion rendered all the more palatable by the fact that, for a great many people, bats are dark and terrifying creatures (though fewer and fewer people appear to be thinking of them in this way of late), so what could be easier than turning the humble bat into the scapegoat responsible for all of our woes? Here, too, at least three essential pieces of information have not been taken into account:

- The 96.2% similarity between the two viruses in question is relatively meaningless (we are 98.6% similar to gorillas, but no one would claim we are the same), and then there is the fact that the virus found in *Rhinolophus affinis* is not compatible with human beings and cannot infect them (our ACE2 membrane receptor is incompatible with the surface proteins of that virus)

- Bats are easy to capture and study around the world, and due to their characteristics – which we will discuss in more detail later – they can tolerate many different types of viruses, so any virologist worth their salt who wants to find something to study and publish turns, in the first instance, to this animal group. The result is that bats are the most-studied species in this regard, and they are known to carry multiple viruses, so much so that they are often defined as a “reservoir species”. In reality, recent research conducted on each order of mammals indicates that the number of viruses that can infect human beings is similar for bats as it is for other mammals (Mollentze and Streicker, 2020; Olival et al., 2017)

- The term “bats” (order of Chiroptera) encompasses more than 1400 species, scattered across the world, and so making a general accusation against “bats” is meaningless and causes people to become unduly alarmed. Every species is different from the others (naturally) and even their viruses are not always the same. It would be like saying that those belonging to the order of Carnivores, from the stoat and the lynx to the dingo and the tiger, are all the same...

Unfortunately, the media try every which way to create headlines, without realising the damage that certain statements can make. Getting people worked up about the alleged dangers posed by bats can have very damaging effects. Even just a few misplaced actions, taken out of fear and targeted at a colony of bats, have the potential to cause irreparable damage to species that are already vulnerable. And now, after years of patient, laborious mythbusting by zoologists, the critical, multifarious contribution made by bats to human wellbeing should be clear to everyone (Kunz et al., 2011). Think, for instance, of the work that every bat does every night, silently and relentlessly hunting down insects that are

damaging to agriculture or health, without generating any pollution or asking for anything in return. They are also an important resource for scientific research, because understanding how they manage to be particularly resistant to viruses is extremely important in the medical field. Aside from other advantages, these mechanisms also seem to be responsible for their incredible longevity, which can on occasion reach the record of forty years, as opposed to the two-year lifespan of a common shrew, which has the same dimensions. We must, then, look carefully at these animals and avoid coming hurriedly to superficial conclusions that could give rise to foolish fears and compromise their survival, throwing into even deeper crisis the already profoundly altered and deeply plundered ecosystems of the planet.

In this Anthropocene, we are witnessing a severe crisis of biodiversity, triggered by manmade changes to the climate, the landscape, the flora and fauna, as well as to soil composition and consumption. Many species are failing to adapt to the situation that we are bringing about, and sadly even the populations of many species of bats are undergoing drastic decline due to the disturbance or destruction of important shelters, the widespread use of pesticides, the development of intensive agriculture, the felling of old or dying trees, windfarms poorly located in the countryside and, more generally, due to the alteration, fragmentation or disappearance of the natural environments in which these mammals hunt and take refuge. So, let us not add yet more, idiotic threats by treating these wonderful animals as if they were plague-spreaders. It is very much worth bearing in mind that, in this pandemic of ours, the plague-spreader *par excellence* is, without a shadow of a doubt, mankind. We are the ones who are causing SARS-CoV-2 to spread like wildfire across the globe. And we can pass the virus on even to the animals with which we come into contact, as has already occurred. Indeed, one of the first infections involved a tiger in a zoo. Recent research examined 410 different species of birds, fish, amphibians, reptiles and mammals, to evaluate which are potentially most vulnerable to SARS-CoV-2 on the basis of the compatibility of their ACE2 cellular membrane receptor with the virus. It emerged that certain species, as could be expected due to their genetic proximity, are particularly at risk, including various species of primates, such as the lowland gorilla, the Sumatran orangutan and the white-cheeked gibbon. They are followed, still at high risk, by marine mammals such as the grey whale and the bottlenose dolphin, with cats, cows and sheep all deemed at medium risk, and dogs, horses and pigs at low risk (Damas et al., 2020). An albeit remote risk is that of us humans transmitting SARS-CoV-2 to our bat friends. Yes, you read that right, even though it is the opposite of what people normally assume. For this to happen, there would need to be a rare spillover, because the genetic distance between us and bats is large, but we cannot dismiss the possibility of it happening. This is why EUROBATS (the United Nations' Agreement on the Conservation of Population of European Bats) issued a notice last May

in which it recommended that all precautionary measures be adopted to reduce to a minimum any potential risk for wild fauna, including bats. The chiropterologists who study them (of whom there are around forty or so in Italy) must avail themselves of special permits from the Ministry of the Environment and the Ministry of Health to be allowed to handle them, and must wear gloves and a mask when doing so (<https://www.eurobats.org/node/2602>).

If we want to find a way out of this singularly punishing year in the best shape possible, we all need to work hard to combat disinformation, adopting a critical perspective at all times on the information bouncing around the web, going to the necessary lengths to verify the sources. We need to take a broad overview of the phenomena, refuting all reductive, anthropocentric perspectives. Specifically, as speleologists, we have to work together, sharing our passion and knowledge and undertaking at all times to safeguard the good name of bats, because it is upon the survival of these extraordinary animals that a large part of the life in our caves depends. And if, for reasons of social distancing or reduced numbers of medical staff (or for any other good reason), we should inevitably have to cut back on our speleological activities, let us behave responsibly and take account of the fact that, if we want to limit the number of deaths and the pain that this virus is causing, we must perforce give up a certain amount of our freedom. There is no other solution available to us.

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Leaf-nosed bat, Hipposideros diadema; it groups together in large colonies, formed by thousands of individual bats

Paolo Forti, Paolo Agnelli, Stefano Vanni

Caves and Science

The aesthetic value of caves is well-known right around the world. However, few people know that natural caves are a significant laboratory in which it is possible to conduct studies and research that, in many cases, it would be impossible to carry out elsewhere.

Caves are characterised by a total absence of light, and often by minimal variations of the main environmental parameters (temperature, relative humidity, etc.). Inside them, the flows of energy (physical, chemical and biological), dampened by the great thickness of the rock, are extremely low compared to the outside. The particularly stable cave environment constitutes, then, a perfect “accumulation trap”, in which whatever is deposited there remains there intact (Fig. 1). These properties mean that an ever-increasing number of scientists are taking an interest in the underground environment. All of the different branches of geology are encompassed by caves. However, limiting the scientific interest of natural caves to this field alone would be a schoolboy error: in contrast to what may be expected, other fields of science can also learn as much from caves as geology can, if not even more (Tab. 1).

Over the past fifty years, the importance of cave deposits has increased markedly, especially in the fields of paleoenvironmental studies and paleoclimatology. Thanks to

them, it is now possible to reconstruct with considerable accuracy the chronology of the climatic events that have taken place in a given geographical area over a very long time period, which can reach or even exceed tens of millions of years.

From this perspective, concretions are far and away the most important cave deposits, because their banded structure is ordered chronologically (the upper bands are necessarily younger than those below). There are various laboratory techniques that enable precise absolute dating, sometimes down to a specific year or even less. Due to their laminated structure, concretions can be considered a *bona fide* “Book of Stone”: each growth band corresponds to a page of a multidisciplinary encyclopaedia.

Caves as delicate ecosystems

One particular chapter in this encyclopaedia concerns biospeleology. At least until the early 19th century, it was thought that in the total absence of light nothing could grow or develop. Only after the initial studies of insects in Postojna Cave (1831) was it realised that, in actual fact, the animal life in this environment was very particular and very different from that of the surrounding external environment. It was then that we began to understand the importance of biospeleology and of caves as the ideal laboratory for studying the mechanisms of natural

selection in an environment that was more contained and populated by fewer species with respect to the external ecosystems. From then on, it was clear that in caves there is not only an abiotic component (rocks, minerals, water, speleothems, etc.) but also a biological component, which contributes to the formation of a complex and fascinating hypogean ecosystem.

As things stand, we are currently in a position to read only the titles of the chapters and the first few paragraphs of this book of stone. In the near future, when research and enhanced technology will enable us to read all of the pages, the scientific importance of caves will increase exponentially. This will necessarily result in a major increase in demand for the analysis and study of an ever-larger number of natural caves, coming in part

Disciplines	Fields of interest	
Archaeology	Finds, graffiti, wall paintings	
Social Sciences	History, theology, folklore	
	Systematics	Classification of living organisms
	Ecology	Relationships between organisms and the environment in which they live
	Ethology	Intra- and interspecific behaviours
Biology	Physiology	Adaptations of vital functions
	Evolutionary Biology	Adaptive strategies and evolution
	Microbiology	Structures and functions of micro-organisms
	Zoogeography	Geographical distribution of animal species
Physics		Meteorology, climatology
Engineering		Large voids, oilfields, tourist caves
Medicine		Speleotherapy, physiology, psychology, new medicines
	Geomorphology	Karst, speleogenesis, paleoenvironmental reconstructions
	Geochemistry	Stable isotopes, absolute dating
	Geophysics	Terrestrial tides, seismology
	Hydrogeology	Karst aquifers
Geology	Mineralogy	Cave minerals, low-enthalpy processes
	Palaontology	Fossil populations, dens, sedimentary traps
	Sedimentology	Clastic sediments, speleothems
	Stratigraphy	Stratigraphic sequences
	Structural Geology	Structural elements, neotectonics
	Vulcanology	Morphologies of lava flows, deep volcanic structures

Tab. 1

from researchers and scientists who have previously had no connection with the subterranean world and its attendant issues, with the consequent risk of excessive impoverishment, degradation and loss of the naturalness of the environment. As such, it is important to start preparing for what is shaping up to be a threat to the conservation of underground environments, and to develop a deep understanding of the operations that can be put in place, with a view to evaluating the intrinsic level of danger for a given cave.

Not all of the activities involved in research necessarily have an impact and, when they do, the level of impact varies widely from case to case. We can begin by saying that studies that do not envisage the extraction of samples to be analysed in the laboratory have, for the most part, an impact that is low or even negligible. These studies include, for example, the measuring of environmental hydrological and hydrochemical parameters (air and water temperature, relative humidity, air currents, etc.). The same applies when the studies require the introduction of foreign substances into the air and water (tracers), on condition that these substances are not damaging for the subterranean ecosystem.

On closer inspection, though, mistakes made by a careless researcher or one with minimal experience in the underground environment can have a substantial impact, for example on delicate, hard-to-see microconcretions, which risk being trampled on or inadvertently tampered with. There is also a risk of compromising the integrity or polluting small pools of water, and of contamination due to the involuntary introduction of fungi, spores, algae, bacteria and other micro-organisms that are potentially damaging to the local fauna. One example of how easy it is to cause damage, albeit without being aware of doing so, is provided by the so-called white-nose syndrome,



Sampling of a column in the PPUR, Palawan

which in North America has led to the deaths of millions of bats. The cause is a fungus that grows around the nose of the bat, disturbing them and preventing them from hibernating during the winter, condemning them to death by starvation. The fungus came from Europe and was simply transported via the mud on unwashed caving equipment. American bats cannot tolerate it, since their evolution has never required them to adapt to it.

Far more important and critical is the impact made by destructive sampling – i.e. actions that are dependent on biotic or abiotic material within the cave being transported for subsequent laboratory analysis. Naturally, samples of air and water, or of small quantities of physical sediments (clay, sand, gravel and small rock fragments) and biogenic sediments (guano) have a low impact. Other types of samples (partial or total sampling of concretions and mineralisations) can, however, result in substantial defacement. If the removal concerns paleontological or archaeological material, there may be serious consequences also from a legal perspective, in the event that the sampling is carried out in the absence of the authorisation and direct supervision of the competent authorities.

For its part, biospeleology – involving direct study in the caves – can also pose conservation risks. It is worth stressing that conservation requires knowledge, and to learn about, recognise and classify the various forms of underground life it is indispensable to collect them in order to study them using the most appropriate techniques. Often, the diagnostic characteristics needed to investigate fauna demand specific techniques, as well as the use of sophisticated instruments such as high-resolution microscopes, and complex laboratory techniques, including dissections, genetic sampling and measuring, to the extent that certain specimens, ideally very few,



Cueva de los Cristales, Naica: the sensors are installed that will make it possible to measure the temperature with a precision of 0.004 °C

must necessarily be sacrificed to allow them to be studied and appropriately conserved in a museum or research institute. The sampling of underground fauna, for which the collecting of specimens to study may be necessary, should be carefully evaluated before proceeding with the research. This applies, above all, in cases where there is no other option but to use traps, which must always be removed at the end of the research activity, thus avoiding pointless bloodshed on the part of the species in question and of many other species. We wish to underline that it is not always easy to evaluate the impact of taking biological samples in an environment as fragile as that which lies underground. The species and the specimens are almost never abundant, and their relationships are strictly intertwined, in a delicate equilibrium lasting for multiple millennia. The risk of altering such a sensitive ecosystem is always present, and we recommend that the precautionary principle should always be applied; not only in the event that specimens have to be taken, but also every time you are preparing to enter a cave.

In cave research, collaboration and the sharing of information with the scientific community is essential, not only to avoid useless repetitions of sampling operations, but also to compile and share knowledge. In this way, it becomes possible to identify the caves that are of the greatest importance in terms of biospeleology, geology, etc., and to concentrate the opportune management and conservation actions upon them.

The role of speleologists

Along with all manner of different activities, speleology has evolved, and having started out as pure exploration, today it also takes in research and has become more aware of the great value and fragility of underground environments.



Sampling of a scorpion in the PPUR, Palawan

It is no easy task moving around in these chambers, and often the researcher, who may well not also be a good speleologist, must put their trust in the indispensable assistance of those whose focus is, and has been, subterranean exploration. As is (happily) occurring more and more often, it is important to work as a team. Only in this way is it possible to understand and protect the underground environment.



Geological samples in a cave in the Atacama Desert, Chile

These environments have remained unchanged for millions of years, and today they are subject to an ever-increasing number of visitors. It is, then, the principal responsibility of speleologists, and in particular of local speleological groups, to promote scientific research and to make the most of the results provided by that research to identify the most effective management and conservation options to be implemented in caves. It is unthinkable, and would in any case be plain wrong, to prevent scientific research from progressing through studies in caves, but it is essential that speleologists work constantly in partnership with researchers, monitoring at all times that the research is conducted sustainably, with a view to minimising, if not entirely eliminating, the impact on the natural caves in which the studies are conducted.

What then should be the ideal behaviour when it comes to initiating a study that requires destructive sampling? The “pole star” must be the minimum impoverishment of the cave – the lowest number of destructive samples, which must always be of the smallest possible dimensions. In certain cases, it may be preferable to forgo conducting research and wait instead for technology that will make it possible to conduct the same study with non-destructive analyses.

In the near future, we expect to see a remarkable increase in research based on the study of concretions, which will provide an increase number of paleoclimatic and paleo-environmental data. This will inevitably involve a gradual increase in destructive sampling. The problem will be worsened by the fact that an ever-increasing number of researchers, many without a background in speleology, will want to conduct research of this type. Scientists with a purely academic background may not have the requisite focus on safeguarding and conserving the subterranean world, electing to prioritise their personal ambition at all costs. The upshot could, then, be a dangerous and futile mass sampling exercise. In this regard, of particular significance is the code of ethics that, for many years now, the researchers who study cave minerals have voluntarily signed up to: a given speleothem must absolutely not be subject to sampling if it is the only one of its type.

Another important impact on caves that is all too often neglected when the focus is on reaching a research objective, is the disturbance generated by the mere presence of the researchers. Starting from the foot traffic, which can easily devastate important microenvironments, to the disturbance caused by light, noise, pollution and the increase in temperature – all of these factors can significantly alter numerous environments within the cave.

It is then essential to achieve greater awareness, sensitivity and responsibility through the adoption of simple rules of conduct that every speleologist worth their salt must respect and go to great lengths to ensure are respected also by those who visit caves only infrequently. We know, for example, that the guano produce by bats and cave birds constitutes a source of essential nu-

trients for life in caves. To promote the presence of these animals, it is worth following a number of basic but non-negotiable rules of conduct: move silently, do not illuminate the animals directly, stay as far away as possible from them and always evaluate the opportunity of opening up or widening narrow passageways in order to avoid altering the microclimate (and in any case selecting the most suitable period in which to visit).

To this end, an agreement has recently been signed between the Società Speleologica Italiana and the Gruppo Italiano Ricerca Chiroteri, with the shared intention of informing and raising the awareness of those who visit caves on the matters of the conservation of troglophile bats and on the need to behave respectfully in caves, and also on the necessity of collecting and sharing significant knowledge on the distribution of the various species.

As such, in order to guarantee the sufficient safeguarding and conservation of caves, it is necessary that the speleological community make the new generation of speleologists aware of and sensitive to the uniqueness of the hypogean environment, with a view to promoting, in the full knowledge of the facts, the sustainable study of caves, but above all to flagging up the importance of respecting caves to all those who frequent them, even if only for recreational purposes. This latter aspect is the most important and the only one that, over time, can guarantee that the “book of stone”, having been preserved for hundreds of thousands of years, albeit leafed through by an ever-increasing number of hands, may remain intact and may continue to serve as an extraordinary archive of our planet.



Archaeological finds in the Los Bordos cave in the Canyon of the Rio La Venta, Chiapas, Mexico

Paolo Forti



Magic Lanterns

The first magic lanterns were made in the late 17th century and, until the advent of photography in the mid-19th century, used glass that had been painted by hand. Public projections were geared towards astonishing the viewers with strange and unusual images. From the early 19th century onwards, in Britain there were regular projections of the natural attractions that the first travellers encountered on their explorations. Fingal's Cave,

on the island of Staffa, is the only natural cave on our planet to have had the honour of being depicted in one of these slides (teak frame, glass 8 cm in diameter, early 19th century, "F. Anelli" Documentation Centre).

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