

UIS BULLETIN

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**16th INTERNATIONAL
CONGRESS OF SPELEOLOGY**

**BRNO
2013
CZECH REPUBLIC**

WHERE HISTORY MEETS FUTURE



IN THIS ISSUE:

- All about the 16th ICS - participants, sponsors, general activities, excursions, winners of the SpeleoOlimpics, UIS Awards, etc.

- International Journal of Speleology - 50th Anniversary

- UIS Mission of Expertise in Lebanon

*- Reports of Commissions
and more...*



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Union Internationale de Spéléologie

Founded in Postojna, Slovenia, 1965

The UIS is a non-profit, non-governmental worldwide speleological organization that promotes the development of interaction between academic and technical speleologists of a wide range of nationalities to develop and coordinate international speleology in all of its scientific, technical, cultural and economic aspects.

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COVER PHOTOS

General view of the BVV Convention Center, Brno, Czech Republic - by Iva Podskubkova
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Editorial

A NEW AWAKENING: UIS CODE OF ETHICS

By Efraín MERCADO (Puerto Rico)
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For many years the Union Internationale de Spéléologie have worked intensively in an enhanced version of the old Code of Ethics. Great and recognized minds in the world of speleology, like Prof. Dr. Stein-Erik LAURITZEN, from Norway, Prof. Dr. George VENI, from United States, Prof. Dr. Fadi NADER, from Lebanon, Prof. Dr. Arrigo CIGNA, from Italy and so many other worldwide, have met and support this great task.

The commitment of having an upgraded and inclusive document on Ethics is the result of years of experience. Such an important organization, with multiple relations throughout the world, is in need of clear and concise ways to deal with handful of activities among its nation members. UIS expects its better from each of us and especially in matters related to knowledge exchange in form of expeditions, research, publication and general education about speleology.

It is not possible to deal with such quantity of projects without a clear set of rules on what to expect from each other, taking into account the professionalism and respect we need to maintain in order to avoid misunderstandings and to create an environment of transparency. The health of an organization like the UIS depends on clear and precise accountability and commitment. That's why we have a Code of ethics.

The new version of the UIS Code of Ethics comes to fulfill this intention. This code replaces the old one and is much more precise and clear in certain aspects of speleological activities, such as international expeditions, sample collecting, cave and its environment protection and so on. The code is available in English, Portuguese, Italian and Latin and we hope sooner, with the help of our member nations, will be

in Spanish, Russian, German and all languages and dialects possible.

The UIS code of Ethics is a fine piece of good will to keep this organization under an umbrella of well-designed procedures and common sense to us, cavers, speleologists and scientists, to develop this community as strong, enhanced, clear and robust as possible. I have no doubt that in the years to come this excellent project will ease definitively our relations in speleology and strengthen the speleology in each our member nations.

It really pays to be clear. Is a great responsibility to handle an inclusive speleology in our world, with clear rules and behaving, in a professional and accountable way to avoid mistakes, misunderstandings and to raise the confidence in each other, for the sake of the science and our friendship. It is in our hands, in the hands of each member nation of the UIS, to accomplish the implementation of the Code of Ethics and to enhance it with their own set of codes and experiences. At the end, we all are a team working hardly toward the same goals: to research, to protect and to preserve caves and its environment for the future generations.

Lets' do it! I invite you, my respectful and professional reader, to navigate throughout the UIS website (www.uis-speleo.org) and to find out what's new in the UIS Code of Ethics!

I know you will find out so many new things.

This is the UIS working for every nation member, as it has to be. This is a way to reach and to help. Count with us, we count with you!

Respectfully,






FINAL REPORT

16th INTERNATIONAL CONGRESS OF SPELEOLOGY

BRNO, CZECH REPUBLIC, JULY 21 TO 28, 2013

Where the History met the Future

By Zdenek Motycka (Czech Republic)

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Chairman of the Organizing Committee

President of the Czech Speleological Society

INTRODUCTION

The 16th International Congress of Speleology in Brno on July 21 – 28, 2013 was organized on behalf of the International Union of Speleology by the Czech Speleological Society and non-governmental and non-profit organization Speleo 2013 established specially for this purpose. The congress symbolically followed after 40 years the 8th International Congress of Speleology held in Olomouc in 1973. Czech Republic was the second country in the world and first in Europe holding this event for the second time.

The congress was held under the auspices of the Ministry of Environment of the Czech Republic, of the Governor of South Moravia – Mr. Michal Hasek and Mayor of Brno – Mr. Roman Onderka.

Fifteen domestic institutions were partners of the congress:

- Ministerstvo životního prostředí ČR (Ministry of Environment of the Czech Republic)
- Jihomoravský Kraj (South Moravian Region)
- Město Brno (Brno City)
- Czech Tourism
- Czech Convention Bureau
- Agentura ochrany přírody a krajiny ČR (Agency of Nature Conservation and Landscape Protection of the Czech Republic)
- Město Blansko (Blansko City)
- Správa jeskyní ČR (Caves Administration of the

Czech Republic)

- Geologický ústav Akademie věd ČR, v. v. i. (Institute of Geology AS CR, v. v. i.)
- Česká geologická služba (Czech Geological Survey)
- Správa CHKO Moravský kras (Administration of the Landscape Protected Area of the Moravian Karst)
- Spolek pro rozvoj venkova Moravský kras (Association for Country Development in the Moravian Karst)
- Moravské Zemské Muzeum (Moravian Museum)
- Obec Rudice (Rudice Village)
- Hasičský záchranný sbor Jihomoravského kraje (Fire rescue service of South Moravian Region)

Eleven domestic and foreign companies supported the congress as sponsors:

- Mediform Ltd.
- Svaz výrobců vápna ČR (Czech Lime Association)
- Planteko
- Společnost pro Moravský kras (Society for the Moravian Karst)
- ESRI
- Pivovar Starobrno (Starobrno Brewery)
- Scurion
- Beal
- Vinařství rodu Pazderků (Pazderka Family Vineyards)
- BVV Veletrhy Brno (Trade Fairs Brno)
- Clever Maps

The motto of the congress “where history meets future” was inspired by a number of significant anniversaries which were commemorated during the year of the congress such as:

770th anniversary of the bestowal of town privileges upon Brno by the Czech King Václav I (1243)

290th anniversary of the first descent into the Macocha Abyss (1723)

80th anniversary of the overcoming sumps in the underground Punkva River (1933)

60th anniversary of the 1st International Congress of Speleology in Paris (1953)

40th anniversary of the last International Congress of Speleology held in Czechoslovakia (Olomouc 1973)

These anniversaries symbolically contrasts with the latest discoveries and scientific findings that have been presented at the Congress and in many ways actually mean the future, such as contributions in the field of Geomicrobiology, or the about “exploring” caves on Mars, or the training of astronauts in caves.

ORGANIZATION OF THE CONGRESS

The main organizer of the Congress was the Czech Speleological Society, de jure then the civic association Speleo2013, founded by members of the Organizing Committee for this purpose. Dr. Pavel Bosák, Director of the Institute of Geology of the Academy of Science, v. v. i. Praha, served as the Congress President and Zdeněk Motyčka, the President of the Czech Speleological Society, was the Chairman of the Organizing Committee of the Congress.

The members of the Organizing Committee, who were in the charge of the main organizational areas, were as follows:

Treasurer	Jan Sirotek
Scientific Secretary	Michal Filippi
Secretary	Katerina Motyckova
Registration	Kamila Svobodová
Promotion	Petra Holubcová
Accommodation	Eva Ludvíková, Robert Šamonil
Excursions	David Havlíček
Technical services	Libor Matuška
Transportation	Igor Forgáč, Igor Harna
Website	Tomáš Bohanes, Ladislav Blažek
Partners	Roman Šebela

There were many volunteers who cannot be fully listed here, especially members of the Czech

Speleological Society. Their work contributed the successful run of the congress. A Congress secretary was hired from November 2012 to August 2013. Some activities during the congress were covered by temporary workers. The company Mediform Ltd. provided storerooms and space for the Head Office. The Institute of Geology ASCR, v. v. i. also provided space. Some private space and technology was provided by the organizers themselves according to the need.

LIST OF PARTICIPANTS

The congress was attended in total of 1,007 participants from 53 countries, as follows (according to alphabetical order):

Algeria	3	Luxemburg	2
Armenia	2	Macedonia, The Former Yugoslav Republic of	1
Australia	27	Malaysia	1
Austria	39	Mexico	5
Belgium	10	Netherlands	11
Bermuda	1	New Zealand	6
Brazil	26	Norway	12
Bulgaria	5	Poland	20
Canada	13	Portugal	13
China	20	Puerto Rico	12
Costa Rica	1	Romania	17
Croatia	23	Russian Federation	16
Czech Republic	114	Serbia	5
Egypt	2	Slovakia	21
France	41	Slovenia	35
Germany	75	South Africa	1
Greece	9	Spain	9
Hungary	16	Sweden	17
India	1	Switzerland	44
Indonesia	2	Tunisia	4
Iran, Islamic Republic of	5	Turkey	7
Israel	7	Ukraine	7
Italy	51	United Kingdom	58
Japan	7	United States	147
Korea, Republic of	5	Venezuela	1
LAO Peoples Democratic Republic	1	Vietnam	1
Lebanon	11		

Participants organized themselves the transport to the congress centre (by plane, train or in their own cars), the organizers provided bus transportation from Vienna Intl. Airport to Brno. Some of parti-

cipants were transported to Brno by the organizers of the pre-Congress excursions.

The participants had a choice of accommodations in Hotel Voroněž I and Voroněž II, in hotel Garni, in dormitories of the Masaryk University on the Viniční Street and in a camp, which was originally located in areal TJ Favorit Brno, but in the end had to be moved to areal of the BVV because of the unsatisfactory conditions.

CONGRESS FACILITIES AND SERVICES

The Congress was held on the premises of the Trade Fairs Brno – BVV, known as the Brno Exhibition Centre. The main part – registration, information, exhibition and sales booths, photo and cartography exhibitions – were located on the premises of the Pavilion A. The SpeleOlympic competition was held in the same Pavilion. The SpeleMedia were held in in the Rotunda Hall. The General Assembly of the International Speleological Union was twice held in the Rotunda Hall and the ceremony for the best movies, photos, maps and works of art with speleological theme was held there as well.

The closing banquet, which took place Saturday July 27, was held in the Pavilion A1. The scientific program and all lectures took place in the building of the Congress Centre, in halls A, B, C, D and E with the total capacity of 630 seats. All scientific posters were situated also in the congress centre.

Two party tents were set up in the area between the Congress Centre and Pavilion A. Refreshments were sold in these tents – so-called SpeleoBar. There were other restaurants and cafe in the Congress Centre and pavilion A.

The central point of the event was SpeleoVillage, located in Pavilion A2, where information booth called ICS InfoPoint was available for participants of



INFO POINT - located in the Pavilion A2, offered a wide range of information and services to the participants.

the congress. The ICS InfoPoint offered continuous service of providing wide range of information to participants and ensuring for them a variety of services, from purchasing of bus tickets to renting a bike.

The registration booth that was located near had to manage the onslaught of most of the participants the first two days. Later in the week the registration had to mostly deal with one day registrations, changes to ordered services, one day excursion and so on. 35 exhibitions and vendor stands were located in the SpeleoVillage, where individual caving associations and clubs presented their activities, and offered wide range of speleological literature and materials.

THE LIST OF EXHIBITORS AND VENDORS

- Czech Speleological Society
- Australian Speleological Society
- Správa Jeskyní ČR (Caves Administration of the Czech Republic)
- DTD
- SCURION
- ZM Production
- Bibliography Commission UIS + Swiss SS Library
- Caving in the Abode of Clouds Project
- British Caving Association
- Postojnska Jama d.o.o.
- SpeleoProjects
- Societa Speleologica Italiana
- WKU Hoffman Environmental Research
- Verband der deutschen Höhlen-und Karstforscher
- Espeleo Club Almería – Fed. Andaluza Espeleologia
- Flash Black Corb Fotografia y Exploración Subterránea
- Michael Kehs Woodworks
- MTDE
- SpeleoBooks
- Romanian Speleological Federation



General view of the Pavilion A2. Exhibition and vendor stands of 35 individual caving associations and clubs.

- iCaverns
- League Speleological Franche-Comte
- SpeleoConcepts
- Cave Lighting Project
- Association of Omsk Innovators
- Jamarska zveza Slovenije (Slovenian Cave Association)
- French Federation of Speleology
- Speleodiving centre "Orda.cave"
- Býčí Skála Caving Club
- Devon Caving Club
- Slovak Speleological Society
- Verband der deutschen Höhlen-und Karstforscher
- Brasil + 20
- Polish Speleological Foundation
- Verband Österreichischer Höhlenforscher (VÖH)

CONGRESS PROGRAM SCIENTIFIC PROGRAM

The Scientific program was launched in the afternoon of Monday July 22 in the Rotunda Hall with three invited plenary lectures: Assoc. Prof. Dr. Martin Oliva (Moravian Museum): The Moravian Karst in the anthropological perspective, Prof. Dr. Derek C. Ford (McMaster University, Hamilton, Canada): From Olomouc 1973 to Brno 2013: a review of progress in physical Speleology during the past 40 years, and Prof. Dr. Annette Summers Engel (University of Tennessee, Knoxville, USA): The caves that microbes built – the frontier of caves and karst science.

The scientific program of the 16th International Congress of Speleology was divided into 11 main and 4 special sections. Each section was organized by convener(s), mostly the world's leading experts, who also reviewed and ensured reviews of papers contributed to the program and Proceedings. Peer-reviewed written contributions were thematically summarized in three volumes of the Congress Proceedings, with a total of 1,459 pages (extended abstracts of 240 lectures and 74 posters). The official Congress language was English. Each presenter had 15 minutes for a presentation and 5 minutes for a discussion. The convener of each section was responsible for time-tracking, however, lecturers showed extraordinary restraint and the whole week long program ran without any delays.

The sections and conveners (in parentheses without scientific and pedagogic titles) were as follows:

- History of Speleology and Karst Research
(*Stephan Kempe*)
- Archaeology and Paleontology in Caves
(*Martin Golec*)
- Exploration and Cave Techniques

- (*Aaron Bird, Robert Eavis, Jiří Kyselák*)
Karst and Caves in Carbonate Rocks, Salt and Gypsum
(*Pavel Bosák, Michal Filippi*)
- Karst, Pseudokarst and Caves in Other Rocks
(*Pavel Bosák, Michal Filippi, Jiří Adamovič*)
- Speleogenesis
(*Philippe Audra, Didier Cailhol, Aleksander A. Klimchouk*)
- Modelling in Karst and Cave Environments
(*Matt Covington, Franci Gabrovšek* ,
- Biospeleology, Evolution, Ecology and Threats
(*Ivan Horáček, Lukáš Faltejsek*)
- Geomicrobiology of Cave and Karst Environments
(*Anette S. Engel*)
- Protection and Management of Karst, Education
(*Jean-Pierre Bartholeyns, Christiane Grebe, Iona Meleg*)
- Other Topics – Medicine, Philosophy, Social Aspects, and Extraterrestrial Karst
(*Nadja Zupan Hajna, Pavel Bosák, Michal Filippi, Tomáš Bohanes,*)
- Cave Mineralogy
(*Bogdan P. Onac*)
- Cave Climate and Paleoclimate Record of the Global Change
(*Yavor Shopov, Derek Ford*)
- Karst and Cave Survey, Mapping and Data Processing
(*Peter Matthews, Mladen Garašič*)
- Speleological Research and Activities in Artificial Underground - (*Mario Parise*)

Totally 19 UIS Departments, Commissions and Working Groups organized their meeting(s) with discussions on topics related to their activities and eventually elections:

- Archeology and Paleontology Commission
- Artificial Cavities Commission
- Bibliography Commission
- Glacier, Firn and Ice Cave Commission
- Longest and Deepest Caves Commission
- Pseudokarst Commission
- Paleokarst and Speleochronology Commission
- Cave Mineralogy Commission
- Physical Chemistry Commission
- Microbiology Commission
- Material and Technique Commission
- Cave Protection Commission
- Permanent Commission on Speleotherapy
- Speleogenesis Commission
- Volcanic Cave Commission
- Education Commission
- Cave Diving Commission
- Cave Rescue Commission
- Informatics Commission

Special Round Table discussion about the current state of knowledge and consequences of the White Nose Syndrome was also held during. It was organized in the cooperation with the Institute of Vertebrate Biology ASCR, v. v. i. and ČESON (Czech Bat Conversation Trust).

The FEALC (South American Speleological Association) and ISCA (International Show Caves Association) organized their meetings during the Congress.

CONGRESS PROGRAM SALONS AND SPELEMEDIA

The variety of competitions were organized traditionally during the Congress: photographic exhibition (Photo Salon), presentation of maps (Cartography Salon) and art (Art Salon) related to caves and caving. In addition, there was a competition for the best film with the same theme called SpeleMedia.

Photo Salon (Chairman Jaroslav Šanda)

Fierce competition took place at the Photo Salon where 880 photos from 28 authors, in 5 categories were entered and 5 judges had to make the decision about the winner. And the awards went to:

Best in Category "Scenes from Nature"

Robbie Shone – "Blind Fish Qi Dong"

Best in Category "Enhanced and Surreal Imagery"

Robbie Shone – "Yoga in Gail Dong"

Best in Category "Cave Photo Image"

Philippe Crochet – "Nam non – Great gallery"

Best in Category "Story Series"

Robbie Shone – "China story"

Best in Category "Humor"

Guillame Pelletier – "Qi keng po"

Best of show

Peter Hofmann – "HDR panoramatic series"



Photo Salon

Cartography Salon (Chairman Jan Sirotek)

Had also many entries and that is 43 submissions in 6 categories and where 6 judges had to make the very hard decision.

These were chosen for an award.

Best in Category "Cave Cartography"

Stephen Gladieux – Base Camp Section, Fisher Ridge, Cave System

Best in Category "Regional Cartography"

Petra Gostinčar – Speleological map of the Kanin massif

Best in Category "Artificial Underground Map"

Traian Minghiras, Tudor Tamas - The city of Baia Mare medieval sewage network

Best in Category "3D Model"

Patricia Kambesis – Bull Cave System

Best in Category "Interactive Presentation"

Paulo Camelo – Digital Interactive Virtual Tour and Topography

Best of show

Paulo Camelo – Digital Interactive Virtual Tour and Topography

Furthermore, in the Cartography Salon were awarded the following honorable mention:

Philipp Hauselmann – *Hollgrotten bei Baar*

Olga Suldovská – *JESO and JESOVIEW*

Daniel Hutňan – *Grotta del Bue Marino*

Sarah Edalatian Araste – *Map Collection from Iran*

Art Salon (Chairman Ian Chandler)

Out of many entries there were three that were chosen for an award.

Best in Category "Painting/Drawing"

Taraneh Khalegali – "In the weil of Darkness II"

Best in Category "Mixed Media"

Veronika Vogel – "Wool works I"

Best of show

Yuriko Chikano – "My dream cave II"

SpeleMedia (Chairman Roman Šebela)

There were 20 authors with 25 entries for SpeleMedia. Three judges had to make the decision about the winner and the awards went to:

Tomáš Roth – "Hadí jeskyně (Snake Cave) Slovenia"

All together (including the films that were not part of the competition) 36 films from 27 authors were shown and the audience had the opportunity to choose the best one. The Audience Award went to:

Darko Bakšič – Expedition "Lukina Jama 2010"

CONGRESS PROGRAM UIS GENERAL ASSEMBLY

At the occasion of the 16th International Congress of Speleology two UIS General Assemblies were held. The first one took place on Sunday July 21 and the second on Sunday July 28. Totally 37 national delegates, the complete UIS Bureau and many guests attended the first UIS General Assembly.

At the meeting, reports on the activities of the UIS Bureau and of each UIS Department, Commission and Working Group were presented with a presentation of affiliated organizations. Amended proposals of the UIS Internal Regulations and the Code of Ethics were submitted to the delegates for discussion.

The second UIS General Assembly was attended by 41 delegates, the complete UIS Bureau and many guests. The amended proposal of the UIS Internal Regulations and the Code of Ethics was approved, the report of the treasurer and auditors was discussed and in particular the new UIS Bureau was elected as follows:

President:

Kyung Sik Woo (*Korea*)

Vice-president of Administration:

George Veni (*USA*)

Vice-president of Operations:

Efrain Mercado (*Puerto Rico*)

General Secretary:

Fadi Nader (*Lebanon*)

Adjunct Secretaries:

Christian Dodelin (*France*)

Giovanni Badino (*Italy*)

Jean-Pierre Bartholeyens (*Belgium*)

Mladen Garasic (*Croatia*)

Nadja Zupan Hajna (*Slovenia*)

Nivaldo Colzato (*Brazil*)

Stan Flavel (*Australia*)

Zdeněk Motyčka (*Czech Republic*)

The former President of the UIS Andrew Eavis, who chaired the UIS in a period of 2005–2013, was elected the UIS Honorary President.

CONGRESS PROGRAM SPELEOLYMPICS

Series of speleological simulators was installed in the side wing of the A2 Hall from Monday July 22 to Friday July 26, where candidates had the opportunity to test their skill and participate in the SpeleOlympics competition. In total, 145 persons competed in six categories and the winners were as follows:

Rope climbing contest – 30 meters

Junior group up to 17

Alexander Wendel – 5:13 min

Female age group 18 to 44

Amina Chanysheva – 1:48 min

Female over 45

Janine McKinnon – 2:54 min

Male age group 18 to 44

Vrvišcar Boščjar – 1:23 min

Male over 45

Giovanni Badino – 2:28 min

Rope climbing contest – 100 meters

Female age group 18 to 44

Amina Chanysheva – 7:56 min

Male age group 18 to 44

Henry Rockliff – 7:58 min

Male over 45

Giovanni Badino – 12:25 min

Cable ladder climb

Junior group up to 17

Maja – Lisa Krafft – 87:20 sec

Female age group 18 to 44

Rebecca Lawson – 11:08 sec

Female over 45

Lubov Chrapko – 17:48 sec

Male age group 18 to 44

Erik Pott – 9:34 sec

Male over 45

Giovanni Badino – 12:20 sec

Rope trainer

Female age group 18 to 44

Amina Chanysheva – 1:48 min

Female over 45

Janine McKinnon – 8:05 min

Male age group 18 to 44

Filipp Cherednichenko – 2:01 min



Participant testing his skill on CABLE LADDER CLIMB, one of the six categories of the SpeleOlympics competitions.

Male over 45

Alexandr Maramygin – 4:51 min

Obstacle course

Junior group up to 17

Zehnder Simeon – 1:20 min

Female age group 18 to 44

Amina Chanysheva – 1:07 min

Female over 45

Lubov Chrapko – 1:28 min

Male age group 18 to 44

Rob Eavis – 0:55 min

Male over 45

Wookey – 1:03 min

In the addition to the above-mentioned categories, the participants had an opportunity to try, what is the narrowest space that they can get through, and the winners in the men category were – Vrviščar Boštjan and Beat Heeb, getting through 15 cm wide narrow. In the women's category won Sophie Chollet, she got through 14 cm wide narrow.

CONGRESS PROGRAM

SOCIAL PROGRAM

The first social event of the Congress was the Opening ceremony. It was held Sunday July 21 at 19:00 in the open area between the Congress Centre and Pavilion A. Brass band “Blučičáci” and the dance group “Rudická Chasa” provided the introductory cultural insert. Speeches followed in the order: Andrew Eavis – President of the International Union of Speleology, Roman Celý – Deputy Governor of the South Moravian region, Zdeněk Motyčka – President of the Czech Speleological Society and the Chairman of the Organizing Committee of the Congress and Pavel Bosák – President of the 16th International Congress of Speleology.

Then the flag of the International Union of Speleology was raised, accompanied by Mrs. Barbara Šimečková singing old caving anthem “Rock spirit”. This was followed by social evening with a buffet of traditional local specialties and music by dulcimer band “Vonica”.

The opening night was very successful and was a major contributor to the friendly atmosphere during the Congress.

The bluegrass band “Druhá Tráva with a special guest Katka Garcia” put on a very successful concert in the open area behind Pavilion A on Wednesday July 24 at 20:00.

Participants of the congress liked the concert very much not only because of the quality of the performance but also because most of the repertoire was done in English and some in Spanish.

The closing banquet took place Saturday July 27 in the grand premises of Pavilion A1, where was prepared the seating for 1,000 guests, the head table for 11 people, large projection screen and buffet tables with a wide range of food and drinks.

The program of the evening begun with the speeches of Pavel Bosák and Zdeněk Motyčka. After the meal, another part of the program was dedicated to the ceremonial announcement of the traditional UIS Prizes, which was held by the past President of the UIS, Mrs. Julia Mary James (Australia).

PRIZES AND WINNERS

France HABE prize 2013

The prize is awarded by UIS for outstanding contribution in the field of documentation and protection of karst and caves. Winner is “Cave pearls of Meghalaya”, a book mainly written by Thomas Arbenz from Switzerland and speaking about many years of study, researches and cave explorations the Meghalaya State of India.



The UIS flag raising in the open area between the Congress Centre and Pavilion A.



Dance group “Rudická Chasa” - Typical dancing from Czech Republic during the opening ceremony of the 16th ICS.

Exploration Awards

The prize for the most important discovery in the period since the previous International Congress of Speleology took the research project Fort Stanton Cave, USA, Fort Stanton Cave Study Project. How far have you ever been in a cave from an entrance? 3 km? 5 km? Fort Stanton cave set the record with a distance of 18,4 km! Much of this is over Snowy River, the world's longest speleothem at 18 km.

Another passage has possibly 2nd longest speleothem, 1 km of green-to-yellow flowstone. Excellent exploration is conducted with excellent science, and follows to standards for cave protection. The Fort Stanton Cave Study project stands as a shining example for all members of the UIS to follow.

In the same category were awarded two honorable mentions:

- *Sistema K'oox Baal*, Mexico, Czech Speleological Society. Between 2009 and 2012, over 30 km of passage were discovered in the K'oox Baal cave system, making it over 75 km in length, and so the 4th longest underwater cave in the world.



Map of the K'oox Baal Cave System, in Mexico, the 4th longest underwater cave in the world (75 km of passages). The work carried out by Czech Speleological Society between 2009 and 2012 yielded one of the awards for best exploration.

- *Hang Son Doong*, Vietnam, Joint British-Vietnamese Caving Association. The discovery of Hang Son Doong, which at 8,5 km long with an average passage diameter of 67 m (including side passages), it is arguably the largest cave passage in the world.

Scientific Posters Awards

Best Scientific poster by Scientific Committee – *Holocene Temperature Fluctuation in Central Europe Recorded in Stalagmite M6 (Milandre Cave, Switzerland)*, Anamaria D. Häuselmann, Adam Hasenfratz, Hai Cheng, Lawrence R. Edwards, Dominik Fleitmann.

People's poster prize

Predation Mediated Carbon Turnover in Nutrient – Limited Cave Environments (Milandre Cave, Switzerland), Melissa Wilks, Hazel A. Barton.

Special Books Awards

The traditional prize for the best book with the speleological theme was awarded to *Speleothem Science: From Process to Past Environments* – Ian J. Fairchild, Andy Baker and to *O ser humano e a paisagem cárstica (Humans and Karst Landscape)* – Heros Augusto Santos Lobo, Luiz Eduardo Panisset Travassos.

After the UIS Award ceremony, the banquet continued with a special surprise for the participants – a spectacular fireworks display, which was donated by the UIS President, Mr. Andrew Eavis.

This was followed by free entertainment with dancing until the late hours of the night.

THE CONGRESS PROGRAM – OTHER

It is not possible to mention everything that happened during the Congress in Brno, but I would like to at least mention the photographic exhibition “Karel Absolon and the Czech Speleo Photo”, where in the first part of the exhibition could be seen the unique large-format photographs taken by Karel Absolon during his research in the Moravian Karst and in the second part the winning photographs from the first three years of the photographic competitions Czech Speleo photo.

Worth mentioning is also the film screening and presentation in 3D technology, which was technically and partially materially secured by photographers of the group “La Salle” who specialize in this technology. The presentation of colored 3D slides taken by Karel Absolon nearly 100 years ago caused uproar (in a positive sense).

EXCURSIONS

The 16th International Congress of Speleology

offered a wide variety of pre- and post-Congress excursions held in near and far karst regions. These excursions were organized not only by the Czech Speleological Society and Caves Administration of the Czech Republic but also by speleological associations and clubs from Slovakia, Hungary, Germany, Austria, Slovenia, Romania and Ukraine. Special excursion guides were prepared for each excursion with excursion description; the excursions participants received a copy at the registration.

Excursions were categorized and labeled with letters expressing the character of the category:

B – pre-Congress excursion, 10 excursions in total with 160 participants.

WED – Wednesday excursion, 2 excursions with 576 participants.

NC – One day non-caving excursion, 5 excursions with 255 participants.

EC – Night caving – 7 excursions with 85 participants.

A – post-Congress excursion, 8 excursions with 111 participants.

B – pre-Congress Excursions

Below are listed all pre-Congress excursions, including brief reports from the organizers of the excursions. Due to considerable inconsistencies were some reports modified and shortened.

B1CZ, Show caves and UNESCO monuments in the Czech Republic

(David Havlíček)

23 participants from 5 countries (United States, Australia, Brazil, United Kingdom and Sweden) were present for the excursion.

Originally the excursion was calculated for 25 participants unfortunately 2 of the participants canceled their participation due to serious injury of one.



Karlštejn Castle, one of the attractions visited during the B1CZ pre-Congress excursion.

The program of the excursion corresponded with the declared one with two exceptions.

Due to a time limit we did not visit Baroque Holašovice Village in Southern Bohemia and the visit of the Valečov Castle in the Bohemian Karst. On the other hand, an excursion of the Konrad brewery with refreshments has been added to the program.

Participants were satisfied with the excursion and to this day I am receiving thank you letters. Somewhat hectic can be described the visit of the Karlštejn Castle (2nd circuit – only 16 people allowed at once), where we had to divide the participants into two groups and enter the castle gradually in hourly intervals.

Moreover, given the age and physical abilities of some of the participants, the 20 minute walk up the hill was problematic. We solved this problem by hiring a taxi. This solution was acceptable but the car could not go the same way up and had to go around the castle from the other side and this took also approximately 20 minutes.

The group that was waiting for their turn of the castle tour spent it by examining of fossils on the Budaňská Rock under the guidance of Dr. Irena Jančaříková.

I must compliment as clearly positive and well prepared the reception of the group in show caves. Thank you Jarda Hromas, Karel Drbal a Dušan Milkov. Nice surprise was the hired transport to Brno with the dining cart and dinner where we met participants from the excursion of B5CZ.

B2CZ, Caving in the Moravian Karst ***(Petr Polák)***

Pre-Congress excursion focused on local sites took place on July 15 to 21 and was attended by 59 participants.

All participants were informed about organizational matters relating to the accommodation, meals, excursions and transportation for the duration of the excursion upon their arrival. Accommodation was provided in Jedovnice in the camp Olšovec which had cabins with two or four beds.

Meals were in the form of half board and in addition every participant received a packaged lunch each excursion day. Participants could choose from a total of 18 different excursions. They had a choice of both classic excursions in Amaterská Cave, Býčí Skály, Rudické propadání and many others and also excursions for lovers of SRT such as Skleněné domy or rappelling into the Macocha Abyss.

Sign up for excursions took place every night, always one or two days in advance in the form of forms, which were posted on the cabins of the organi-

zing team along with the maps. Information was also available in a printed excursion guide.

The participants were transported to their excursions by bus according to a predetermined schedule in two stages. Upon arrival at the agreed location they were picked up by guides from local caving clubs who then carried out the actual excursion.

After the excursion all the participants were transported back to the camp. For participants of the pre-congress excursion was organized a social evening in the form of grill-party with rich food, Czech beer, wine and live music.

The excursion was highly rated by participants. There have been no accidents or other events that would somehow upset the course of the excursion. There were participants from England, Germany, France, Sweden, Spain, Poland, Italy, Austria, Switzerland, Holland, Russia, Australia, USA, Brazil and Canada.

The team of organizers was comprised of R. Nejezchleb (excursion), J. Pernica (logistics), L. Smetana (accommodation), F. Doležal (operational issues) and P. Polák (communication and management).

Special thanks go especially to all speleological

groups and their guides who made the realization of excursions possible, as well as to the Management CHKO Moravian Karst for their support of both campsites and providing us with their staff for guiding activities, to the Cave Administration of the Moravian Karst for allowing us to visit the Punkva caves and last but not least, to the staff of the camp (Šárka a Kamila), who provided all participants with appropriate facilities and support.

B3CZ, The most interesting karstological phenomena of Moravia (Jiří Otava)

B3CZ Excursion took place from July 15 until July 19, 2013. There were 5 participants from 3 countries (Australia, Germany and USA).

Monday, July 15 we met at 17:00 and departed for Olomouc. In the evening we toured the city.

Tuesday July 16 – transfer to Hranice karst. Overview of the geological situation, surfa facies of Miocene, examples of Cretaceous and Miocene paleokarsts, Karpatian folded into the Paleozoic limestone. Explanations were presented by J. Otava, Z. Masařík. Guided tour through the Zbrašovské caves – genesis, paleokarst phenomena, the problem of CO₂, speleothems, raft stalactites, etc.

Guided tour of Hranická abyss, genesis, history of discoveries and diving, explanations by J. Otava.



B2CZ Excursion - A boat trip along the Punkva Stream and a spectacular view from the bottom of the Macocha Abyss.



B3CZ Excursion - Visiting different karst phenomena and localities of the eastern part of the Czech Republic (Moravia and Silesia)

Svatý Kopeček Hill, geology and history of the area, explanations by J. Otava.

Wednesday July 17 – Transfer Olomouc to Hrabová, museum of the quarry and limestone industry in the region, and the explanations by R. Morávek, P. Hrbek, J. Otava, astronomy observatory, Czech Brethren Church, Vitošov Giant Quarry: karst and paleokarst forms, Genesis, spelothems, paleontology, history of documentation, terra rossa, terra fusca, fault zones. Na Špičáku Cave– Genesis, history of discoveries, geology, speleothems, explanations by Mrs. E. Vozábalová, Mr. R. Morávek, Mr. J. Otava.

Glacifluvial sites: Supíkovice old quarry and Velký Kraš, minipar of erratic boulders of Nordic provenience- polish border, interpretation by J. Otava, R. Morávek. Na Pomezí Cave: the Genesis, history of discoveries, geology, speleothems, discussions about the speleogenesis. Explanations by M. Kubalák, J. Otava, R. Morávek.

Thursday July 18 – Olomouc – Třesín Hill, a tour of the northern foots of the Třesín – loess sedimentation, the karst resurgence, the old entrance into the caves, Lichtenšteinské structure, Pokova Cave, total geological, karstological and hydrogeological situation. Explanations by R. Morávek, J. Otava. Mladečské Cave – archaeology, paleontology, speleogeneze, hydrografy, history of discoveries and research, interpretation by Mrs. M. Coufalová, Mr. R. Morávek, Mr. J. Otava. Javoříčské Caves, interpretation about speleogenesis, geology, history of discoveries done by S. Vybíral, J. Otava, R. Morávek.

Off road surface excursion, Zátvořice, Zkamenělý zámek, Šprének Valley, confluence with the Javoříčka Stream, ponor of the Za hájovnou Cave. Explanations by R. Morávek, J. Otava.

Friday July 19 – Geological and geomorfological interpretation on Helišově skále, J. Otava. Suchdolský ponor, the history of the discovery, geology, paleokarst development at the Eifelian/Givetian bondary, hydrographyy. Geology, geomorphology and hydrography of the Sloupské Valley, archeology, Kůlna Cave, ponor of the Sloupský Creek, Hřebenáč Hill, explanations by J. Otava. Na Bradinách Quarry, karstology, Cretaceous and Paleozoic paleokarst, terae calcis, explanations by J. Otava.

Saturday July 20 – Geological, geomorphologic and paleokarst evolution, the Lažánecký Glen and Rudice – Seč sand-pit, detailed tour on the site, explanatuins by J. Otava. Geopark Rudice, surrounding area of Větrák, Rudické propadání, archeology, karstology, karst hydrography, history of metallurgy, sedimentology of the strata of Macocha. Visit of the worksite of the Suchý Žleb sinkhole No. 1 while working.

Resurgence area of the Jedovnický Creek – Josefov, Býčí skála, Jáchymka caves, archeology, paleontology, mining of phosphates, on the way to Švýčárna, Františka ironworks, history of mining from paleokarst deposits, the history of iron manufacturing, reconstruction of melt. Explanations by J. Otava.

Summary: the best moments - the discussion in the Hranický karst, Vitošově, Na Pomezí, Mladeč, many other locations of the Moravian Karst. Problems: too small of a group can hardly be economically viable, it is, however, counterbalanced by the more smooth progress.

B5CZ, Bohemian Karst (Karel Žák)

The field trip with duration of six days was organized for 13 participants from six different countries (Australia, France, Israel, Germany, Switzerland, USA). The scientific guides originated from Institute of Geology ASCR, v. v. i., Faculty of Science of the Charles University in Prague and National Museum in Prague.

Cavers of several local caving clubs, units of the Czech Speleological Society, served as guides in the caves. Specialists M. Slezák and J. Mottl from administration of the Landscape Protected Area Bohemian Karst participated in part of the surface hiking trips.

The main theme of the field trip was karstolo-



B5CZ Excursion - Planned to show an overview of the evolution of the Bohemian Karst from the Cretaceous to the present.

gic evolution of the Bohemian Karst from Cretaceous until present. Each field trip day had its special topic. Explanation of basic principles of local geology and of the karst evolution present on Monday, July 15 evening, was followed by field trip to Koněprusy area on Tuesday, July 16. The topic of this day was pre-Quaternary speleogenesis and importance of hydrothermal processes during the early karst evolution.

Except of visit of the Koněpruské jeskyně Cave, a surface hiking trip to the Kotýz area was also organized, with presentation of prehistoric fortified settlement and archaeological cave localities. Genetic and hydrogeological relationships between the Beřounka River and the caves were the main topics of the following day.

Caves important for Quaternary vertebrate paleontology were visited as well. Deep phreatic caves of the Čerínka Quarry and history of limestone quarrying in the area of Amerika Quarries, including underground visit in the main adit of the Amerika-West part, were the main topic of the Thursday, July 18. Hiking trip along paleokarst features of the upper level of Solvay's Quarries terminated by descent to the Svatý Jan pod Skalou completed the program of this day.

Nad Kačákem Cave and unfinished adits of German World War II underground production plant in the Alkazar Quarry were visited on Friday, July 19. The most enthusiastic cavers could visit the most difficult cave of the area in the Javorka Hill in the

afternoon of this day, while the others explored the beauties of the medieval Karlštejn Castle.

The morning of Saturday, July 20, was focused on recent karst hydrogeology and accumulations of the Holocene calcareous tufa (and caves in them). Except of the Svatý Jan pod Skalou tufa body and St. Ivan's Cave in it, the tufa cascades in the Císařská gorge near Srbsko village were also visited.

B1A, Ice caves of Austria (Lucas Plan)

Seven participants were present for the whole excursion. Unfortunately one of the signed up participants did not receive Visa for Italy and Austria so she could not participate. Two other participants were not cavers and not familiar with SRT so they decided to leave the excursion after two days. The first two days we visited the major show caves.

After that the excursion went very well without any problems and all caves were visited as planned except Eis Palast (an artificial cave in the glacier) on Dachstein. Instead we visited Kraushöhle in Gams.

B1H, Budapest hydrothermal caves (Szabolcs Leél-Össy)

On the pre-Congress excursion B1H (July 17 to 20), 13 participants joined us in Buda Thermal Caves from 8 countries (Austria, Czech Rep., Russian Federation, Ukraine, Brazil, Japan, Sweden and France). We divided them into 2 groups. Everybody could visit Ferenchegyí, Józsefhegyi, Mátyáshegyi and Pálvölgyi Cave, the non-touristic part. We were together in Szemlőhegy show cave and in Rock Hospital Cave under Buda Castle.

The participants received a home-made dinner every evening (in 0 day also, somebody arrived earlier), and last night we made a big camp-fire. The accommodations were organized in Józsefhegy cave house, in 2 rooms, with WC and bathroom and kitchen. The bigger part of the group was sleeping in their own tents, in very big garden. At the end of the excursion, we transported all participants to Brno. We think, everybody was satisfied with the program.



B1A Excursion - The participants were able to contemplate the beauty of some Alpine Ice Caves, in Austria.



B1H Excursion - Typical thermal karstic caves of Budapest, Hungary

B2D, Caves and castles between Munich and Brno (Baerbel Vogel)

Our pre-Congress excursion B2D Caves and castles was very successful. We had 17 participants from 4 countries. Saturday 13th of July we took little walk along pedestrian zone to Marienplatz and Hofbräuhaus then we had dinner at Hofbräuhaus with traditional Bavarian dance and folklore evening. Sunday 14th July, 2nd day 10.00 sightseeing Munich centre on foot lunch at Viktualienmarkt was not possible - I forgot that it was Sunday ...but we had a nice walk and a snack in the city, sightseeing Munich by bus, travel to Oberammergau, guided tour in Linderhof Palace, special guided tour in the artificial cave "Venus Grotto" in Linderhof Garden.

Monday July 15 – departure from hotel Weinbauer to bus parking Neuschwanstein Castle, short walk to Hotel Müller, walk to the entrance of the castle, special guided tour before official opening in English, special guided tour before official opening in German, sightseeing around the castle and walk to the busparking, departure bus to Hopferau, visit of local cheese dairy with cheese lunch Käserei Lehern, Lehern, departure to Wieskirche, special guided tour in the rococo church Wieskirche, UNESCO world heritage site we were 1 hour late due to Veronika had to see the doctor because of a allergic reaction and a road construction detour, so we had to cancel our

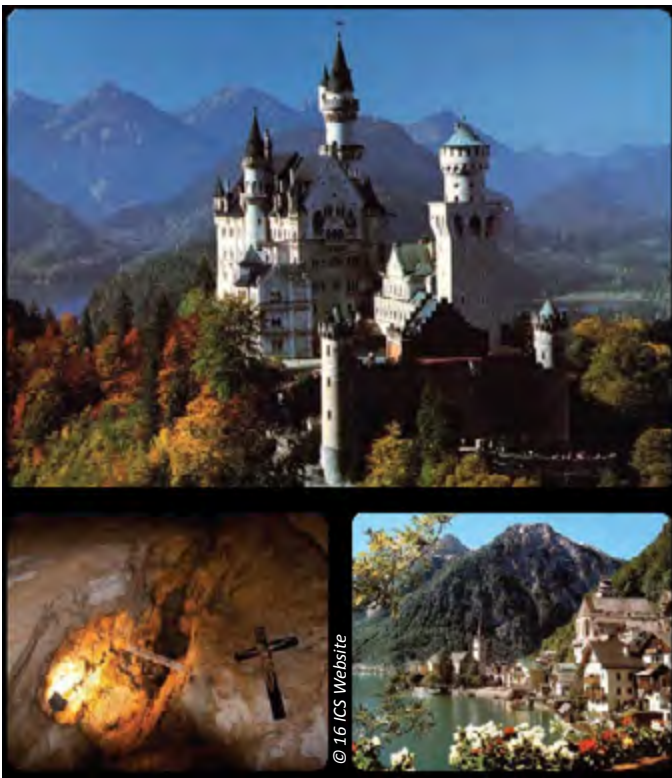
stop at the small pilgrimage church of Fischbachau, evening presentation of caves around Wendelstein by Peter Hofmann.

Tuesday July 16, departure on foot: short walk to Wendelstein cable car, Wendelstein cable car (in 7 minutes to the top/from 933 m a.s.l. to 1,724 m), short walk to Wendelstein show cave, special guided tour Wendelstein and Wendelstein show cave by Peter Hofmann, lunch at Wendelstein restaurant, departure rack railway, arrival in Brannenburg, departure bus to Salzburg, sightseeing Salzburg, we lost 2 participants in the middle of overcrowded Salzburg – by chance Veronika met them and went with them to the next meeting point, optional visit of Mönchsberg cave (very small and very beautiful) in the city (access with ladder), departure bus to Hellbrunn Palace Salzburg Caving Club presentation „caves around Salzburg“ Salzburg Caving Club and snack, departure bus to hotel Axelmannstein in Bad Reichenhall.

Wednesday July 17, departure bus to Königssee, departure boat to St. Bartholomä, arrival in St. Bartholomä (604m asl), guided walking tour to Eiskapelle (930 m a.s.l.) glacier cave with Andreas Wolf (VdHK) 1,5 hours walking to cave entrance, 326 m altitude difference, last part trackless optional walk with Werner Vogel (National Park Berchtesgaden) and visit of "Obersee" (= upper lake) by boat (half hour trip one way), lunch in St. Bartholomä, meeting point for the group at boat landing stage, departure boat, arrival boat Seelände and walk to the bus parking, departure bus to Dokumentationszentrum Obersalzberg, Berchtesgaden bus driver forgot to take 3 participants who did not join the morning program from hotel in Bad Reichenhall, so they missed the visit of the Dokumentationszentrum.

I bought guidebooks for them. And the bus had technical problems with the mountain. Departure bus to Ramsau and Hintersee visit of traditional wood work and return to Berchtesgaden, medieval dinner Kanzlerhaus Berchtesgaden, departure bus to hotel Axelmannstein Bad Reichenhall .

Thursday July 18, departure bus to Lamprechtsofen show cave, special guided tour to Lamprechtsofen show cave, till 2001 deepest cave of the world (-1,632 m), departure bus to Eisriesenwelt, Werfen bus had technical defect, we were 2 hours late, but finally did it to catch the last guided tour to Eisriesenwelt, guided evening tour in Hallstatt had to be cancelled due to being too late, arrival at the visitor centre Eisriesenwelt 20 minutes walk (1.000 m asl tot 1.080 m asl) to cable car (5 minutes uphill), 20 minutes walk (1.575m a.s.l. to 1.641m a.s.l.) to cave entrance, guided tour in the ice cave, 75 min. walk with many steps and 134 altitude of meters to climb



B2D Excursion - Caves and castles between Munich (German) and Brno (Czech Republic).

inside the cave. Departure bus to Hallstatt, arrival at hotel Bergfried, Hallstatt,

Friday July 19, departure bus to cable car valley station bus company ordered a bus from local company to replace their broken bus, Dachstein Ice Show Cave 15 min. walk to cave entrance 70 m altitude difference, 50 min. guided tour, 800 m walk and 80 m altitude difference (steps) inside the cave altern. Dachstein Mammot Show Cave: 15 min. walk to cave entrance, 40 m altitude difference, 50 min. guided tour, 800 m walk and 70 m altitude difference inside the cave, cable car to valley station and bus to hotel Bergfried, short walk from hotel Bergfried to saltmine, special guided tour to prehistoric saltmine, 4 hours walk underground, return to hotel Bergfried, presentation "Dachstein caves" due to technical problems the presentation could not take place but a guided city tour to Hallstatt was provided.

Saturday July 20 – 08.30 am departure bus to Aurach, visit of the Erdstall Oberhauser Familie Starzinger, Aurach; guide: Peter Ludwig, departure bus to Melk, visit of the monastery in Melk, departure bus to Brno.

B1RO, Caves and karst in Apuseni Nature Park (Paul Lacobas)

Trip highlights: The initial itinerary has been changed in order to fulfil better the participants' expectation regarding "real caving" so we switched over from surface karst exploration towards cave exploration. The itinerary contained the following caves and karst systems: Craiului Cave (crystals and nice speleothems), Farcu Crystal Caves (show cave, crystals), Meziad Cave (show cave), Cetatile Ponorului karst phenomena (the most important karst phenomena in Eastern Europe), Ciur Izbuca cave, Toplita de Rosia karst spring as well as Gruet Cave. Participants: 6 participants, from Australia, US, Germany and The Netherlands.

Feedback from the participants: the participants were very pleased that we managed to change the itinerary on the spot and include more caving exploration and visits, as well as maintaining some of the previous highlights (e.g Cetatile Ponorului).



B1RO Excursion, in Apuseni Mountains, Romania.
A paradise for cavers and nature lovers, sheltering more than 7,000 caves.

B1SL, Speleological excursion to the Dinaric Karst of Slovenia

(Mateja Ferk)

Excursion had 10 participants. The timeline of the scientific group program went according to plan. There were no unforeseen problems at all. The biggest highlight could have been the 3 hour trip to Križna Jama Cave, where they had the unique opportunity to visit delicate parts of the cave which are otherwise closed for visitors, and could enjoy a boat trip with special light effects along one of many lakes in the cave.

The program foresaw a mixture of independent trips and common activities. Everything went according to plan. The only trouble we had was a trip to Labodnica Cave. With 329 m of depth this cave held the record of the deepest known cave in the world for half a century. Nowadays it is rigged with fixed ladders and the back trip lasts between 2 and 5 hours. One of the participants experienced fatigue even descending but insisted to carry on. The ascent went accordingly slow. The participant was very tired at the end but the next day he was cheerful as ever.



B1SL Excursion - Križna Jama Cave, in Slovenia - a boat trip with special light effects along one of many lakes in the cave.

B2SL, Sport caving in the Caves of the Dinaric Karst of Slovenia

(Mateja Ferk)

Excursion had 6 participants. On Sunday we had a brief test of caving excursion participants' rope access skills. Despite discrepancies in techniques and some speed problems, most of them climbed satisfactorily (meaning safely).

One of the participants acknowledged he is not climbing ropes for quite a while and will follow us in easier caves while the remaining days will join the scientific group.

The timeline of most of the caving group program went according to the plan. Meaning that even though caves may be unpredictable or the skills are



B2SL Excursion - Kačna Jama Cave in Slovenia, one of the main attractions in the tour.

lacking, we were following the schedule rather tightly.

There was one occasion when this was not the case. Luckily it turned out as a minor problem. At the trip to Odolinske Ponikve Cave, a generally easy and clean ponor cave with a few short drops, on the very bottom of the cave, part of a large block cracked from underneath of one of the participants while he was standing on it.

He fell for a meter with the piece broken away from the block in between his legs. At first we feared a fracture or sprained ankle but luckily he got away with few bruises and a good dose of adrenaline.

It is difficult to point out one highlight – each participant had his/her own – I would pick the visit to Kačna Jama Cave, for its deep and wide entrance pit, the underlying giant entrance chamber and the river Reka which participants were able to see sinking in Škocjanske Jama Cave.

WED – WEDNESDAY CONGRESS EXCURSIONS

Wednesday congress excursions were held in the course of the congress. Participants were transported from BVV by buses and then brought back after the excursion. On the agenda were the following excursions:

WED01 – Excursion to the Punkevní Caves and Macocha Abyss

The excursion was organized in collaboration with the Caves Administration of the Czech Republic with total of 398 participants. The participants were transported by buses from BVV to the Skalní Mlýn (Rock Mill) in half-hour intervals, from where they continued by train to the Punkevní Caves. Here took over the guides of the caves and all the participants were shown the tourist circuit of the caves, including the water voyage.



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WED01 Excursion - Punkevní Caves and Macocha Abyss, which is more than 138 meters deep, and the deepest abyss of that kind ("Light hole") in Central Europe.

After the visit the participants were transported by cable car to the Macocha Abyss where they had lunch and after they took short walk to the upper and also the lower bridge above the Macocha Abyss. The transport back to Brno was organized from the parking lot at Macocha Abyss.

WED02 – Excursion to the Sloupsko-Šošůvské Caves and Macocha Abyss

Also prepared in cooperation with the Caves Administration of the Czech Republic, with a total of 178 participants. The transport to the caves was also organized by bus in half-hour intervals from BVV. Each group was as well shown the tourist circuit of the Sloupsko-Šošůvské Caves by local guides.

After the excursion participants were transported to the Macocha Abyss, where they had lunch at the chalet and then went for a short walk to the upper and lower bridge. Subsequently, they were taken back to Brno.



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WED02 Excursion - In the Moravian Karst, the participants visited Sloupsko-Šošůvské Caves and Macocha Abyss, where the first climbed down to the bottom was in 1773.

NC – Congress one day non-caving excursions

Another series of excursions focused on the natural and cultural attractions of Moravia and was designed especially for accompanying persons. There were five excursions to choose from, brief reports from the organizers are below:

NC1 – The most attractive tourist places in the Moravian Karst (Hana Blažková)

Excursion was aimed at visiting attractive places of the Moravian Karst that are off the beaten track. Participants started the excursion by visiting the technical monument Stará Huť near Adamov City, here they viewed the historical exposition of the iron manufacture from the end of the 18 century.

Then they continued through the Křtinské Valley to Býčí skála and stopped at the resurgence of the Jedovnice Creek.

Through the same valley they were transported by bus into the Křtiny village, where, accompanied by the local priest visited the renowned Baroque church and were given opportunity to listen to the music of recently completed wind chimes.

After lunch they walked along Rudické propadání and along beautiful scenery of the Kolíbky Rocks to the Rudice Village, where they could not miss the Rudický Mill with an exhibition of the original rural housing, a collection of minerals and historical research into the local speleological research.

The participants also tasted local specialties served in the form of refreshments. The excursion was completed by visiting the tourist centre of the Moravian Karst and the Macocha Abyss. A total of 37 persons took part in the excursion.



NC1 Excursion - The famous parish church by Santini in Křtiny and the windmill in Rudice were among the attractions.

NC2 – Lednice-Valtice Cultural Landscape – a UNESCO World Cultural and Natural Heritage Site (Hana Blažková)

This excursion was dedicated to the visit of the romantic castle in Lednice and its surroundings. 44 participants had a guided tour through the ceremonial halls of the castle. Some participants took ad-

vantage of the free program option of the excursion and visited the beautiful gardens built in the French style, some visited the castle's tropical greenhouse, exposition of marine aquariums or demonstration of work with birds of prey.

After lunch in the castle restaurant, we sailed through the park on the Dyje River to the Minaret, which we climbed to look out into the surrounding countryside.



NC2 Excursion - The chateau of Lednice and its breath-taking French formal garden.

NC3 – The Pálava – a UNESCO biospheric reserve (Hana Blažková)

During a tropical day 45 participants embarked on crossing the Pavlovské Hillo. On the way to the start of the excursion we stopped at the entrance to the archeological museum in Dolní Věstonice Village, where supporters of this discipline took photos of this world famous site where the statute of Věstonická Venuše was found. From there we took the green path to the ruins called Dívčí Hrad.

Then we followed the red path but on the way we realized that due to the high temperature most of the participants of the excursion cannot finish the hike. In Klentnici the group split and most of the participants left by the bus to Mikulov City, where they spent the time in cool stylish restaurant and around the castle.

A total of 8 tourist-oriented enthusiasts have completed the entire crossing over Sirotní Hrádek, Stolová Mount all the way to Mikulov. They hiked 13 km and conquered elevation of 800 m in drenching heat, but with unforgettable views of the landscape of Pálava.

On the way back to Brno, we drove though the wine-growing region and tasted the wine in one of the unique historical cellars in the Vrbice Village.



NC3 Excursion - Ancient cultural landscape of southern Moravia, were prehistoric camping sites of mammoth hunters were discovered.

NC4 – The Kroměříž Chateau and Gardens – a UNESCO World Cultural and Natural Heritage Site

(Hana Blažková)

During the excursion 45 participants visited the historical interiors of the archbishop's castle in Kroměříž City, and had a free tour of the Podzámecká gardens, where in particular they admired the runs of kept domestic animals and deer.

The participants had a lunch in a restaurant where they enjoyed the stylish furnishings and the presentation of traditional beer production. The group took pleasant stroll through the city, and moved into a unique flower garden, where participants admired the labyrinths of green walls, colonnade, historic greenhouses, rotunda, flowers and sculptures on their own.



NC4 Excursion - Views of Kroměříž Chateau and Gardens

NC5 – Hranice Karst – a unique hydrothermal karst with the deepest abyss in the Czech Republic

(Jiří Otava)

The excursion to the Hranický Karst took place on Thursday July 25 and it was attended by 84 participants. Two buses brought participants from Brno City to Teplice nad Bečvou Village, and from there they made their way to the Hranice Abyss.

After familiarizing themselves with this karst phenomenon and also with the history of its exploration, participants moved on foot to the Aragonite caves where they had a guided tour.

Lunch was served at the spa house Moravan, from where the bus transported participants to Běloutín Village to the European Baltic – Black Sea watershed and then to the Skalka Quarry, where participants familiarize themselves with the geological conditions. They returned to Brno in the late afternoon.



NC5 Excursion - Caves and abysses created also by springs of hot acidic water rising from great depths along geological faults.

EC – Night caving excursions

Excursions were designed for those who could not participate in the pre-congress and post-congress excursions in the Moravian Karst, but who would like to at least look into the prohibited underground of the Moravian Karst. Selected were two sites that were relatively close together and easily accessible:

EC 1, EC 3, EC 5, EC 7 Rudické propadání Cave

A total of 33 participants took advantage of the opportunity to visit the Rudické propadání Cave in the evening and night hours. Participants were transported from Brno to the Rudice Village always after the end of the lecture program from where they set out to Rudické propadání Cave.

The length of each excursion was customized according to the abilities of the participants. They returned to Brno around midnight.

EC 2, EC 4, EC 8, Býčí skála Cave

A total of 52 participants took advantage of the opportunity to visit the Býčí skála Cave in the evening and night hours. The participants took the same bus as the participants of the excursion Rudické propadání Cave. The form and the lengths of each excursion was customized to the numbers and capabilities of the participants. The return to Brno was once again together with the participants of the excursion to Rudické propadání Cave.

A – POST-CONGRESS EXCURSIONS

Listed below are all post-Congress excursions, including brief messages from the heads of individual excursions. Due to considerable inconsistencies were some reports modified and shortened.

A2CZ, Caving in the Moravian Karst (Petr Polák)

The post-Congress excursion focused on the locations in the Moravian Karst took place on July 28 – August 3, 2013. There were 29 participants. The organization and the progress of the camp was absolutely identical to the pre-congress excursion B2CZ, which is described above, in the section dealing with the pre-congress excursions.



A2CZ Excursion - Camping for cavers of all levels of experience.

A3CZ The most interesting karstological phenomena of Moravia **(Jiří Otava)**

The excursion took place from July 29 until August 3, 2013. There were 9 participants from 5 countries (Australia, Switzerland, Great Britain, Germany and Israel).

Monday July 29 we met at 8:00 at the statute in front of BVV and departed in two minibuses and a car towards the Hranice-Skalka Quarry. Overview of the geological situation, Miocene surf facies, examples of Cretaceous and Miocene paleokarsts, folding of Karpatian into the Paleozoic limestone.

We had a lunch in the city Teplice nad Bečvou and then visited the springs, quarry Baránka with the old entrance into the Zbrašovské aragonite caves, as well as a guided tour through the Zbrašovské caves – genesis, paleokarst phenomena, the problem of CO₂, speleothems, raft stalactites, etc.

Guided tour of abyss Hranická abyss and surrounding area, the mogotes of Velká and Malá Kobylanka.

Tuesday July 30 – Departure in the direction of Hrabová, museum of the quarry and limestone industry in the region, explanations by R. Moravek, J. Otava, Velkolom Vitošov: Karst and paleokarst forms, Genesis, speleothems, paleontology, history of documentation, terra rossa, terra fusca, fault zones.

Discovery of hollow bones and skulls of bats in the sinter zone 52 at the higher level. Interpretation by R. Moravek, J. Otava. Na Špičáku Cave– Genesis, history of discoveries, geology, speleothems, explanations by E. Vozábalová, R. Moravek, J. Otava. Na pomezí Cave: the Genesis, history of discoveries, geology, speleotémy, discussions about the speleogenesis.

Wednesday July 31 – Křelov-Hvozd, a tour of the highest cave paleo-levels – the Průchodnice Cave. Geology, geomorphology, speleogenesis. Stop at the site of the Koňský sinkhole, the workplace of prostějovské group, a reading about the history and perspectives of discovery R. Morávek, explanations and translation by J. Otava.

Javoříčské Caves, interpretation of speleogenesis, geology, biology, etc. the explanations by S. Vybíral, J. Otava, R. Morávek. Mladečská Cave – archaeology, paleontology, speleogenesis, hydrography, history of discoveries and research, interpretation by M. Coufalová, R. Moravek, J. Otava. In the evening Svatý kopeček at Olomouc, history of the city and the region, geological and geomorphological situation. Explanations by R. Morávek and J. Otava.

Thursday August 1 – Transfer Křelov-Šošůvka, geological and geomorphological interpretation at the site of the Helišova Skála Rock by J. Otava. A visit to the production factory of the local specialities from goat's cheese – Sedlák Šošůvka. Suchdolský Ponor,

the history of the discovery, geology, paleokarst at the Eifelian/Givetian boundary, hydrography. Explanations and tour by J. Otava, the head of Topasu L. Lanik, J. Dvořáček.

Friday August 2 – Interpretation of the paleokarst history of the edge of the Jedovnické kotliny – Újezd, Lažánecký Žleb, Rudice, lokality Seč. Geological and geomorphologic situation, paleokarst development. The type locality of Rudických layers, the history of mining at Rudice and Olomoučany, more detailed inspection of the site, sedimentary, litotypy, fosiliferní zbrídlíchnaté Devon limestone, remnants of the old mining.

Visit of the Museum in the wind mill in Rudice (Speleological part, mining, life in the village), geopark in the front of the mill, the history of the abyss Tumperek. Visit of the Rudické sinkhole and Kolíbek, explanations by J. Otava on the subject of archaeology, history of mining (slag), hydrography (karstic piracy, draught and the underground part), geology and geomorfology.

Visit to the resurgence area of the Jedovnice Stream, geology, stratigraphy, hydrography. Býčí Skála Cave, archaeology, history of discoveries, the tour of the entry part. Josefská huť, karst springs, basal parts of devon, smelter Františka, the history of ironmongery, illustration of the melt. Visit of the temple Křtiny, interpretation about the Křtinské and Luční valleys.



A3CZ Excursion - A trip to the most spectacular and important surface and subterranean karst phenomena and localities of the eastern part of the Czech Republic.

Saturday August 3 – Transfer Jedovnice-Vilémovice-Macocha, interpretation about geology, geomorphology, speleogenesis, hydrography, discovery – upper and lower bridge. Křenkova trail into the Pustý žleb, Pukvení Cave. Geological and speleological interpretation in the Punkevní Caves and then in Pustý Glen – a Malé propadání (ponor) of the Punkva River, Malý výtok (resurgence), Stajgrovka, Skální Mlýn. Visit of the Holštejnské Valley and the Holštejnské Cave – the history of exploration, geology, hydrography. Explanations by J. Otava.

A7CZ, Cave diving Camp (Michal Piškula)

Time: July 27 and August 4, 2013. Place: Moravian Karst and Hranický Karst. Participants: 8 persons + 3 guides – members of ČSS – ZO 6-09 Labyrint. Accommodation for all participants was provided on the premises of the ATC Olšovec.

Trips were organized in the course of the excursion to the speleodiving sites in the Moravian Karst and Hranická Propast. But first all went scuba diving in the quarry Řídelov, where participants had the opportunity to meet each other and also to get to know the equipment used by their colleagues.

These excursions took place in following days:

- 29.7. Quarry Řídelov, introductions, equipment demonstrations
- 30.7. The Moravian Karst: Čtyřicítka, Červíkovy caves, Lower Lake



A7CZ Excursion - For cave divers trained only.

- 31.7. Hranická Propast
- 1.8. The Moravian Karst: Čtyřicítka, Červíkovy Caves, Stovka
- 2.8. Hranická Propast
- 3.8. Moravian Karst: Čtyřicítka, Stovka
- 4.8. The end of the excursion, departure of participants.

Also, presentations were given in the course of the excursion:

- Barth, Layberg: Research of flooded caves in winter conditions in Sweden.
- Schafheutle Markus: Speleological and speleodiving research in the area of Leichingen, Germany.
- Michal Piškula: The history of cave diving in the Moravian Karst, Speleodiving research in Bosnia.

Technical equipment of the camp was provided by the members of ČSS ZO 6-09 Labyrint. Participants used their own equipment and were also responsible to organize their own transportation. The support group was responsible for transportation when filling the tlakové láhve and when traveling greater distances by private cars. The support group was also responsible for filling air for divers.

A1SK, Show caves in Slovakia (Peter Gážík)

A1SK, Show caves in Slovakia – The field trip with duration of five days was organized for 19 participants from three different countries (Australia, Italy, USA). The whole excursion took place as planned. The program of the excursion was carried out according to the itinerary.

The participants of the excursion expressed their satisfaction with the program and the organization of the excursions during the excursion as well as after the excursion via emails.

The arrival of the participants at the starting point of the excursion was marked by exhaustion due



A1SK Excursion - Caves and other natural phenomena in the most significant karst areas of Slovakia.

to the train ride from Bratislava to Liptovský Mikuláš.

The train stopped in the Žilina City for 6 hours which was planned so the participants could have a night of rest before starting the excursion, unfortunately the train did not have working air-conditioning and the temperature during the night was very high, also the participants could not open windows or get any refreshments during the night.

We were proactive and when the participants arrived in Liptovský Mikuláš we arranged for them to check in the hotel early and had the breakfast ready.

The rest of the time of the excursion was carried out according to plan without any complications. Places we visited: Demänovská Ice Cave, Demänovská Cave of Liberty, Belianska Cave, Harmanecká Cave, Krásnohorská Cave. Four of the visited caves are on the World Heritage List.

We also visited attractive cultural locations – Levoča, Rožňava cities, Špania dolina Valley and Krásná Hôrka Castle. Other natural phenomena visited comprise of hydrothermal springs and pools, travertine outcrops, etc.

A2SK, Karst, caves and caving in Slovakia (Lukáš Vlček)

A2SK, Karst, caves and caving in Slovakia – The field trip with duration of 7 days was organized for 7 participants from three different countries (Australia, Germany and USA). The course of the excursion



A2SK Excursion - Visiting different caves and types of landscapes along its 100 km long route in Slovakia.

happened as was described in the excursion guide. Check-in took place on Sunday July 28 for two participants and on Monday July 29 for the rest of the participants.

The excursion ended Sunday August 4 in Bratislava. The sites of the excursion were selected in a way that they would coherently represent the karst area in Slovakia and their own morphogenesis. Each cave represents specific genetic types of karst formations, karst decorations of all types as well as the differences in approach of the explorers and researchers, of the technical forms of rigging and cave protection, and the way of making them available to public.

Participants of this excursion had the opportunity to familiarize themselves with elements of history and culture, geology, climate, hydrology, zoology and botany as well as with different dimensions of speleology in Slovakia and compare them with knowledge of their own home sites.

The success of the excursion was the result of teamwork. Tour guides Lukáš Vlček and Pavel Herich accompanied the participants during the whole excursion. At different times thorough out the week they were joined by Michal Danko, Štefan Ratkovský, Alena Koščová, Milan Štéc, Martin Budaj, Dominik Miler, Dušan Hutka, Jaroslav Stankovič a Zoltán Jerg.

Participants of the excursion were satisfied with the program of the excursion, and with the fact that they were able to visit all the caves listed. In addition to gaining new knowledge of karst, caves and caving in Central Europe and Western Carpathians, they made new friends and established new professional contacts and pledged further cooperation in the future.

A3SK, Excavation in the caves of Slovakia (Peter Holubek)

A3SK, Excavation in the caves of Slovakia – This excursion took place from July 29 until August 4, 2013. There were 7 participants from 4 countries.

29.7.2013 – a visit to the caves of Starý hrad, the Občasná vyvieracia in Čierna dolinka Valley and Malá Stanišovská Cave. In the Starý hrad Cave, we descended above the Studňa radosti.

30.7.2013 – a visit to the entrances to the caves of Líščia diera pri Važci, Kónská priepasť, Priepadlé, Šoldovo and the entrance into the Važecká Cave. In the afternoon transfer through Dobšinská ice cave into the Hája, where we spent night on the base of the košice caver's accompanied by J. Tencera.

31.7.2013 – a visit to the cave Skalístý potok, guided by Mr. Z. Hochmuth with Mrs. A. Petrvalská and Mr. P. Kanričák. First we had to dispose of hornets' nests which have settled in the shelter created

for cavers, that was successful thanks the hat of Mr. Farkaš from the Háj Village. From there we went over a traverse into the dry corridors where we have seen the work of cavers from Prešov City.

1.8. 2013 – a visit to the entrances to the caves of Ardočka, Majda Hraškova, 9 tree caves and Silická ľadnica Cave. Then we went through Kralovany City (visit to the Kralovany Tunnel) to Priedhorie where we camped at the cave base of the Strážov Mountains.

2.8. 2013 – exploration of the Dúpná Cave and of the entrance of the Abyss between Kačkami with the President of the SSS Mr. B. Kortman, then we moved to Čachtice, where we were joined by Mr. I. Demovič and M. Vrábel at the fossil resurgence. Then we visit the entrances to the Čachtická Cave, Štepnica Cave and three sinkholes called Špringerove jamy. From there we move to Borinky, where Ľ. Janečka with P. Magdolen was waiting for us.

3.8. 2013 – a visit to symbolic tramp cemetery, an entrance to the Stará Garda Cave, 60. Anniversary Cave, Veľký závrť Cave, Notre Dame Cave, Ananášová Cave and Sedmička Cave and later descend into the depth of fifty meter in the Veľké Prepadlé Cave.

4.8. 2013 – a visit to the Prosiecka Cave under the guidance of Mr. J. Szunyog and Ľ. Halička, then a visit to the Demänovská dolina Valley (Tunelová Cave, Okno Cave, Barania Cave).

Thank you to all cavers who helped us with the excursion.

A2H, Aggtelek Karst (Szabolcs Leél-Őssy)

A2H, Aggtelek Karst – On the post-Congress trip A2H (July 29 to August 1) in the Aggtelek Region 18 participants joined us. They were from 9 countries (Australia, United Kingdom, United States, Netherlands, Russian Federation, Switzerland, Germany Brazil and China). On the first day they arrived from Brno by bus (organized by UIS), and in the afternoon we had a short excursion organized on Lófej Valley (in typical karst valley) from Jósvalfő until Vass Imre Cave, where we watched the illuminated part of the dripstone cave, and outside we watched the beautiful view.

On second day we went together to the Baradla Cave, the long tour, but we made it in 3 groups. The Chinese guests (prof. Douxian and his wife) did not have a cave suit, and instead they watched the illuminated part in Aggtelek, and after we transported them to Jósvalfő Village, and showed the other illuminated part of the cave (the middle-tour).

The bigger part of the group we led into the Retek Branch too, but who didn't want to take this extra tour and went directly to the Jósvalfő exit with our leader. On the 3rd day we had 4 groups: the participants that didn't want to go to the cave, took an surface excursion of the beautiful sinkholes, lakes, and viewpoints. The Chinese prof. and his wife we transported to the Slovakian tour: to Ochtiná, Gombasecká and Domica caves.



A3SK Excursion - Excavation in the caves of Slovakia.



A2H Excursion - Typical karstic caves of Aggtelek region, Hungary.

The main tour went into the Meteor Cave, and 5 persons took a vertical shaft cave tour in Baglyok (Szabóballagi) and in Almási cave.

Last morning we showed to the participants the illuminated Esztramos (Rákóczi I.) Cave, and after a few people from the group went by their own car to Slovakia and in Hungary to other places, but the majority of the group we transported to Budapest by bus (they paid for this transportation fee 6,000 Ft).

The accommodation were in Kövirózsa Hostel, in Aggtelek Village (belongs to the National Park), where were 4 big rooms, 2 kitchens, 4 lavatories and 2 bathrooms. Every evening the group received home-made dinner. We think, everybody was satisfied with the program.

A1UA, Gypsum karst in Podolie (Volodymyr Kompaniyets)

Dear caving friends and organizers of the 16th International Congress of Speleology!

This is the statement that we, Chortkiv Speleological Club "Crystal", fulfilled our obligation to host 16th ICS Post-Congress Excursions in Ukraine.

Every participant was handed a welcome pack with this program and other useful literature on their arrival so they were fully aware of what was ahead. We tried to stick as close to the estimated times on the program as we possibly could and happy to confirm that every trip and excursion from our program was



A1UA Excursion - Gypsum karst and natural historical heritage of Ukraine.

attended by the participants of the post-congress.

Extra trips were offered to the new regions of the cave "Mlynky" and some members of the Post-Congress visited those added trips in their spare time.

There were 15 participants in total. The 16th participant Franz Lindenmayr was unable to attend. We were told by the other members that he lost his passport and was refused an entry at the Ukrainian Border. We are hoping that he will contact us in the near future with his plans to come and visit us.

It was a fantastic experience for both the organizers and people who took part. We have received many e-mails after the Excursions with thanks and lots of photos to share as we had quite a few keen photographers. It was lovely to see the friendships developing, with hours of chat and sharing of caving experience. It was a great pleasure to see people having fun!

The biggest difficulty was to get people back home after the Post-Congress. We assisted few people by buying tickets for them from Ukraine to their desired destinations as most of them needed to be bought in advance. As far as we are aware, everyone got home safely.

Quite a few people were discussing a possibility of coming with members of their clubs next year. Judging by the great interest in staying in touch with our club members, we can call it a success. We are immensely happy with all the help and support we've received from everyone!

CONCLUSION

The organization of the 16th International Congress of Speleology in Brno represented a several years long process that begun in 2005 at the 14th ICS in Greece, where the idea was first presented to speleologists of the world and culminated at the Congress in Brno.

Dozens of volunteers worked very hard during the preparation time in order to prepare this world event. This objective has been fully achieved and hundreds of participants and their grateful thank you letters and emails are the best proof.

The participants appreciated the level and the richness of the program, which ran without a hitch and any changes, the location of the venue and its extraordinary architecture and in particular the excellent and friendly atmosphere.

Very positively were also evaluated the pre and post congress excursions, albeit some organizers had to overcome ideas of some participants about their abilities and physical conditions.

We can say that the 16th International Congress of Speleology was successful, which was without a doubt the work of everybody who contributed to its

successful course. We would like to say thank you to all our partners and sponsors for their financial and material contributions.

Another thank you goes to all Speleological associations and clubs from neighboring countries that organized excursions in their karst territories as well as to all the organizers and guides from among the

members of Czech Speleological Society.

Thanks, as well goes to all conveners for their hard work in the assessment and review of contributions and in particular to all members of the organizing team who have sacrificed tens or hundreds of hours of their time, at the expense of their own activities and families for the success of the congress.



Brass band "Blučičáci" animating the opening party



Prof. Pavel Bosak, the Congress President



Opening party



Zdeněk Motyčka, the Chairman of the Organizing Committee



Speleo Bar - tradicion in all UIS Congress



Paulo Valsechi (Brasil), What a happy caver!



Attractions for kids



Delegates voting at the second General Assembly of the UIS



First General Assembly of the UIS



Andy Eavis and Julia James presenting the UIS Awards



UIS Flag being folded to go to Australia where it will be raised again in the 17th ICS in 2017



16th UIS special wine



Closing Banquet - seating for 1,000 guests

For more Congress photos, access: https://www.facebook.com/Speleo2013/photos_stream

REPORT

2013 UIS AWARDS

By Julia M. James (Australia)
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The 2013 UIS Awards were presented at the 16th Congress of Speleology, Brno, Czech Republic, 19 – 26 July 2009. The awards were presented at the UIS banquet.

UIS DISCOVERY/EXPLORATION AWARD

This award is for the most significant discovery/exploration in the period August 2009-July 2013. This award was judged by a panel of experts from the USA, United Kingdom, Australia, chaired by Prof. Julia M. James. Presented to:

Fort Stanton Cave Study Project

The group has set a world record for exploration to a distance 18.4 km from the nearest entrance. Much of the exploration took place over the Snowy River, the world's longest speleothems, which has a length of 18 km.

Concurrent with exploration, cave survey and scientific studies have been carried out. After each expedition a comprehensive report has been published. An outstanding feature of the exploration has been with team's dedication to the environmental protection of Fort Stanton Cave.

HIGHLY COMMENDED

1 - The Czech Speleological Society's exploration of the K'oox Baal cave system, Yucatan, Mexico. The divers discovered over 30 km of passage in making the system over 75 km in length, and so the 4th longest underwater cave in the world.

2 - Joint British-Vietnamese Caving Association's discovery of Hang Son Doong, Vietnam which at 8.5 km long with an average passage diameter of 67 m is arguably the largest cave passage in the world.

UIS POSTER AWARD

This award was for the best posters displayed at the 16th International Congress of Speleology. The poster could be on any cave or karst topic, however, entries in the cave photographic and surveying competitions were ineligible for this award. This award was judged by a panel of experts from Australia, chaired by Prof Julia M. James.

A people's poster prize was voted for by members of the Congress visiting the Poster display.

Winner of the judged scientific poster prize: Melissa Wilks and Hazel Barton: For the poster titled: Predation Mediated Carbon Turnover in Limited Cave Environments.

Winner of the Peoples Choice award: Anamaria Häuselmann, Adam Hasenfratz, Hai Cheng, Lawrence Edwards and Domink Fleitmann. Holocene Temperature Fluctuations in Central Europe Recorded in Stalagmite M6 (Milandre Cave, Switzerland).

SPECIAL BOOKS

Each four years the UIS Bureau acknowledges books that are important speleological publications. For the period 2009-2013 the following books were acknowledged:

Speleothem Science From Process to Past Environments

By Ian J. Fairchild and Andy Baker

Published by Wiley-Blackwell in the Blackwell Quaternary GeoScience Series.

O Ser Humano e a Paisagem Cárstica (Humans and Karst Landscape)

By Heros Augusto Santos Lobo and Luiz Eduardo Panisset Travassos.

Published by Brazilian Speleological Society in the Brazilian Karst Areas Series.



The two books acknowledged in the Special Books category

ACTIVITY REPORT 2009-2013

COMMISSION ON BIBLIOGRAPHY

By Patrick DERIAZ (Switzerland) - patrick@sslib.ch
Translation into English by Nathalie Uomini

1. INTRODUCTION

This document reports on the decisions made during the Bibliography Commission meeting at the 16th UIS International Congress of Speleology, in Brno, Czech Republic, in July 2013.

2. PRINTED VOLUMES

The next Bulletin Bibliographique Spéléologique/Speleological Abstracts (BBS/SA) double volume 51 (2012) – 52 (2013) will be printed and delivered with the CD. From volume 53 (2014) onward, only the electronic version will be available.

This will be provided as a downloadable database, or as a PDF document that can be printed at home (the PDF will be generated automatically from the database).

3. PREVIOUS VOLUMES

Previous volumes 1 to 27 will be scanned and made available for download on the Internet (www.ssslib.ch/bbs). We are looking for someone to do this work.

4. SUPPORTING THE UIS

The UIS contributes to BBS coordination work

(about 200 hours per year) with a 500 Euro fund. Agnès Darnoux (France) has agreed to do this work.

From now on, she will be in charge of communicating with collaborators around the world, collecting and checking analyses, and bringing them all together to produce the BBS in good time.

5. COLLABORATION WITH THE KARST INFORMATION PORTAL

The goal is to publish/input all of the BBS analyses onto a modern, interactive, and multilingual infrastructure. Currently the BBS is available online at <http://www.ssslib.ch/bbs/public/anglais/index.htm> and we will start collaboration with the KIP (Karst Information Portal).

6. NEW COLLABORATORS

The Commission is always looking for new collaborators/country coordinators. All that is required is to read the speleological publications in your country and type a summary of them using the BBS input software.

The list of current collaborators and detailed explanations is on line <http://www.ssslib.ch/bbs/collabo/fr/frame.htm>.



Members of the UIS Commission on Bibliography in Brno, Czech Republic, July 2013

© UIS Commission on Bibliography

The possibility of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in Solotvino village, Tyachiv district, Transcarpathian region, Ukraine

By Iu. Simionca^{1,2}, Y. Chonka^{3,4}, L. P. Bosevska⁵

- 1- President of Permanent Commission on Speleotherapy / Commission permanente de spéléothérapie (PCS / CPS – UIS);
- 2- MSRII, Dr., Ph.D., Pr. Immunologist in National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania;
- 3- Ph.D., M.D., Director of Ukrainian Allergic Hospital Ministry of Health of Ukraine, Solotvino, Tyachiv district, Transcarpathian region;
- 4- Vice-President of Permanent Commission on Speleotherapy / Commission permanente de spéléothérapie (PCS / CPS – UIS);
- 5- S.R., Ph.D., Geol., Ukrainian Research Institute of Hydrochloric Industry Ministry of Agrarian Policy and Food of Ukraine (UkrNDIsil), Artemivsk, Ukraine.



Presidium of International Scientific-Practical Conference “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region”. October 22-23, 2013, Solotvino, Ukraine.

The disaster in salt mines from Solotvino, Tyachiv district, Transcarpathian region, Ukraine, particularly flooding of mines Nr. 8 and 9, not only has blocked salt extraction and activity of salt mines complex - “SE of Solotvino Salt Mine” but also it stopped functioning of SI “Ukrainian Allergic Hospital Ministry of Health of Ukraine” and “Allergic Regional Hospital” speleotherapy underground sections, where or treated patients with bronchial asthma and other chronic allergic and infectious-inflammatory respiratory diseases since 1968 year, therefore almost

half a century, and also skin and airway burns - after the catastrophe at Chernobyl (Ukraine).

Relaunching of speleotherapy in of Solotvino is of interest not only for patients but also for the two alergology hospitals with specialists in the field (pulmonologists, allergists, pediatricians, scientific researchers, PhDs, doctors of sciences, professors) that emerged along with the development of speleotherapy in salt mines from of Solotvino, Alergology hospitals with speleotherapy sections from Solotvino salt mines were the basis promoting scientific speleotherapy in other salt mines in former USSR and in world.

The interest for revigorate of speleotherapy in the salt massif from Solotvino is based on specific and significant therapeutic effects. In relaunching activity of speleotherapy are interested miners that would prolong the the extraction of salt, population of Solotvino small town and the neighboring localities and Solotvino Local Council, but also the Health Ministry of Ukraine and other institutions.

The problem of reconstruction speleotherapy sections in the salt massif from Solotvino, Tyachiv district, Transcarpathian region, was discussed at the First Kiev International Scientific Conference “Scientific and methodological Foundations of medical geology”, 17-18 April 2013 (Ukraine), were invited MSRII, Dr., Ph.D. Iuri Simionca - the President of Permanent Commission on Speleotherapy (PCS) / Commission permanente de spéléothérapie (CPS) of the UIS, Pr. Immunologist at National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucha-

rest, Romania and also Ph.D., M.D. Jaroslav Chonka - Vice President of this commission, *Director of Ukrainian Allergic Hospital Ministry of Health of Ukraine, Solotvino*, Tyachiv district, Transcarpathian region.

To the respective international conference was 4 communications and a lecture dedicated of speleotherapy, especially efficiency of speleotherapy in salt mines of Solotvino.

The First Kiev International Scientific Conference “Scientific and methodological Foundations of medical geology”, 17-18 April 2013 (Ukraine), through the decision (p.16, from 18 April 2013), has recommended: “In connection with high value and high efficiency of speleotherapy treatment of patients with bronchial asthma in the conditions of microclimate of Solotvino salt mines (Transcarpathian region) considering the presence of large of explored reserves of high quality rock salt and based on the conclusions of leading specialists about the possibilities of usage; appeal to President of Ukraine Yanukovich VF Prime Minister of Ukraine Azarov with the proposal to consider question of restoring institutions of for of speleotherapy on Solotvino salt deposit”.

Another scientific event dedicated to reinvigoration of speleotherapy in Solotvino was the International Scientific-Practical Conference “**Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region**” (Excerpt of conference materials).

The conference was held in the hotel resort complex “Speleocentr”, village of Solotvino in October 22-23, 2013 under the auspices of *Permanent Commission on Speleotherapy / Commission permanente de spéléothérapie (PCS / CPS – UIS)* and the *Association of Ukraine allergists. Organizators - SE “Solotvino salt mine”, SI “Ukrainian Allergic Hospital Ministry of Health of Ukraine”, Solotvino Village Council and Community Resource Centre. Solotvino.*

At the conference the following issues should be considered:

1. The history of salt production in Solotvino, Ukraine.
2. The history and effectiveness of speleotherapy in Solotvino salt mines (Ukraine); status, problems and opportunities of speleotherapy development in Solotvino salt massif.
3. Sharing experience of salt extraction, development of mining tourism and speleotherapy treatment in salt mines of Romania and Poland (Actualities and perspectives).
4. Design and conservation measures of salt mines in Poland and Romania.

6. Suggestions and conclusions on the perspectives of salt extraction in Solotvino salt massif and construction of a new underground section for speleotherapy.

The conference was presided by: *Dr. eng. Kajetan d’Obyrn - Chairman of the Board of “Wieliczka” Salt Mine Inc., Poland; Iurii Uchali - Mayor of Solotvino; Vasyl Buga - Deputy Chairman of the State Administration from Tyachiv district; MSRII, Dr., Ph.D. Simionca Iuri - President of Permanent Commission on Speleotherapy/Commission permanente de spéléothérapie (PCS/CPS – UIS) and Pr. Immunologist at National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania; Ph.D., M.D. Jaroslav Chonka - Director of Ukrainian Allergic Hospital Ministry of Health of Ukraine, Solotvino, Tyachiv district, Transcarpathian region and Vice-President of Permanent Commission on Speleotherapy/Commission permanente de spéléothérapie (PCS/CPS – UIS); Aurel Bucur - General Director of SALROM (Bucharest, Romania); Prof. Dr., M.D. Pavel Gorbenko - Health Institute, Sankt Petersburg, Russia (Past Director of Ukrainian Allergic Hospital Ministry of Health of Ukraine, Solotvino).*

TITLES OF LECTURES AND COMMUNICATIONS FROM THE CONFERENCE

Geological and lithological aspects of the development of underground space salt formations - S. Shehunova¹

1 - *Institute of Geological Sciences of Ukraine)*

Achievements and Prospects of the use of Romanian Salt mines in Speleotherapeutic and Tourism purposes - N. Grudnicki^{1,2}

1 - *National Society of Salt SALROM, Bucharest, Director;*

2 - *Working Group “Speleotherapy in salt mines and salt chambers” (Advisor Member) – Permanent Commission on Speleotherapy - UIS).*

Zabezpieczenie poprzeczni Mina w Kopalni Soli “Wieliczka” przed doływem wód pozazłożowych - Dr inż. Kajetan d’Obyrn^{1a,2}, MSc, inż. Krzysztof Brudnik¹

1a - *Kopalnia Soli “Wieliczka” S.A.- Chairman of the “Wieliczka” Salt Mine Inc. Board, Wieliczka, Poland; 32-020 Wieliczka, Parków. Kingi 1;*

2- *Politechnika Krakowska.*

Newsreel and Strategy for Tourism and Spe-

leotherapy Development of National Society of Salt SALROM at Targu Ocna Salt Mine, Romania - A.Bucur¹

1 - National Society of Salt SALROM S.A., General Director (Bucharest, Romania)

Salt Mine “Wieliczka”: Touristik - Recreation – Treatment - MSc Jakub Czerwiński^{1,2}

1 - Advisor Member of Working Group “Speleotherapy in salt mines and salt chambers” The Permanent Commission on Speleotherapy (PCS) / Commission permanente de spéléothérapie (CPS) – UIS;

2 - Director of Health Resort – “Wieliczka” Salt Mine / Uzdrowisko Kopalnia Soli “Wieliczka” Director; Oddział Spółki Kopalnia Soli “Wieliczka” Trasa Turystyczna Sp. z o.o., Wieliczka, Polska (Poland).

Water penetration - risk factor for the stability of the salt mines - PhD, Geol. Ovidiu Mera^{1,2}, Dan Tiberiu Mera²

1 - Responsible Secretary of Permanent Commission on Speleotherapy – UIS;

2 - Turda Salina Durgău S.A., Romania.

Speleo and haloaerazolterapiya in Transcarpathia - formation, present, prospects - Prof., Dr., M.D. Lemko I. S.^{1,2}

1 - SI “NPMT” Rehabilitation “Health Ministry of Ukraine”, General Director¹;

2 - Working Subgroup: Halotherapy (speleotherapy in artificial salt chambers) of the Permanent Commission on Speleotherapy (PCS) / Commission permanente de spéléothérapie (CPS) – UIS.

Underground section of Ukrainian Allergic Hospital - the world’s best speleotherapeutic hospital. Description and history of creation.

Prof., Dr., M.D. Gorbenko P. P.^{1,2}

1 - National Institute of Health, St. Petersburg, Russia, General Director;

2 - Working Subgroup: Halotherapy (speleotherapy in artificial salt chambers) of the Permanent Commission on Speleotherapy (PCS) / Commission permanente de spéléothérapie (CPS) – UIS.

Work Experience of Ukrainian Allergic Hospital - Ph.D., M.D. Chonka Y.V.^{1,2}

1 - SI “Ukrainian Allergic Hospital of Health Ministry of Ukraine”, General Director / Head physician;

2 - Vice President of Permanent Commission on Speleotherapy (PCS) / Commission permanente de spéléothérapie (CPS) – UIS and Chairman of Working Group:

“Speleotherapy in salt mines and salt chambers”.

Historical aspects of Regional Allergic Hospital - Ph.D., M.D. Danko L. I¹,

1 - Regional Allergic Hospital, Solotvino, Ukraine. Director / Head physician.

Regarding the Status and Development of Speleotherapy in the world context - MSRII, Dr., Ph.D. Iuri (Gheorghe) Simionca^{1,2}, Pr. Imunologist

1 - National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania, Pr. Imunologist;

2 - International “Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie – UIS“(PCS/CPS-UIS), President.

Arguments for Speleotherapy - Ph.D., Biol. Const. Munteanu^{1,2,3}, Diana Munteanu^{1,3}, MSRII, Dr., Ph.D. Iuri Simionca^{1,2}, Ph.D., Bioch. Mihai Hoteteu^{1,2}

1 - National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania;

2 - “Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie – UIS“(PCS/CPS-UIS), Advsor Responsible Secretary;

3 - Romanian Association of Balneology (Bucharest, Romania).

Study of Salt mines air composition and Microclimate influence on some biochemical and physiological parameters of Wistar white rats with induced pathology - Ph.D., Bioch. M. Hoteteu^{1,2}, MSRII, Dr., Ph.D. Iu. Simionca^{1,2a}, Ph.D., Biol. C. Munteanu^{1,2,3b}, Ph.D., physicist L. Enache^{1,2}, Ph.D.stud., Biol. A. Iliuta¹, Ph.D stud. M.D.H. Lazarescu¹

1 - National Institute of Rehabilitation, Physical Medicine and Balneoclimatology, Bucharest, Romania;

2 - “Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie – UIS“(PCS/CPS-UIS), a-President, b- Advsor Responsible Secretary;

3 - Romanian Association of Balneology (Bucharest, Romania, WebSite- Responsible.....

Measurement and evaluation of Radon concentration in some Northern Romanian salt mines: Cacica, Ocna Dej and Ocna Turda - Ph.D., physicist M. R. Galin^{1,3}, MSRII, Dr., Ph.D. (Ghe.) Iu. Simionca^{2,3}, Ph.D., M.A. Galin⁴, I. Radulescu¹

1 - “Horia Hulubei” National Institute for Physics and Nuclear Engineering - IFIN HH, 30 Reactorului Street,

PO. Box MG-6, 077125, Magurele, Romania;
 2 - National Institute of Rehabilitation Physical and Balneoclimatology, Bucharest - INRMFB, Romania;
 3 - "Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie - UIS"(PCS/CPS-UIS);
 a- President;
 b- Advsor of Working group "Assessment of potentially curative underground environment in caves, mines and other artificial spaces; measurement techniques";
 4 - National Institute of Research & Development for Optoelectronics, INOE 2000, Bucharest.

Phased- comprehensive rehabilitation of burn patients in salt mines - Prof. Dr. M.D., P. Gorbenko², Ph.D., M.D., V. Gorbenko¹, MSRII, Dr., Ph.D., Simionca Iuri³

1- Universitet "Ukraine" (Hust, Ukraine)
 2- National Health Institute (St. Petersburg, Russia)
 3- National Institute of Rehabilitation Physical and Balneoclimatology, Bucharest - INRMFB, Romania.

Speleotherapy and severe asthma - M.D. Danko Svetlana¹, Ph.D., M.D. Danko L.I²,

1 - SI"Ukrainian Allergic Hospital of Health Ministry of Ukraine", Solotvino;
 2 - Allergic Regional Hospital, Solotvino, Ukraine, Solotvino, Director / Head physician.

Program of solving environmental, social and industrial problems of town Solotvino - Khrushchev D.P¹

1 - Institute of Geological Sciences, National Academy of Sciences of Ukraine, Kiiv.

Mining and geological argumentation of capabilities further use of Solotvyno salt massif to restore speleotherapy and use of salt resources - Ph.D., Geol., Bosevska L.P¹

1 - Ukrainian Research Institute of hydrochloric Industry Ministry of Agrarian Policy and Food of Ukraine (UkrN-DIsil) of Artemivsk Cities, Donetsk region, Ukraine.

Engineering and geological problem square of Solotvino Salt Deposit - Prof., D.of Techn. Sc Demchishin MG¹,

1 - Institute of Geological Sciences, National Academy of Sciences of Ukraine, Kyiv.

Prospects for recovery of salt extraction and speleotherapy in flooded mine Nr. 9 of Solotvino Salt Mines - Ph.D, Geol., Dyakiv V. A¹

1 - VGXC AGNU, Lviv

ROUNDTABLE

Perspectives in Speleotherapy at Solotvino

Head – Ph.D., M.D., Chonka Y.

Secretary – Cand. Sc., Geol., Bosevska L. P

- With the participation of: the construction company of underground mines with penetration of great diameters trunks and wells (Pervomaysk, Luhansk region);

- PAT "Kharkivmetrobud" (Kharkiv, prepared. Director Logvinov AV)

Resolution of the International Scientific-Practical Conference "Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region", October 22-23, 2013, Solotvino, Ukraine:

As a result of an emergency situation in the SE "Solotvino salt mine" the functioning of underground departments of allergic hospitals of national importance and salt production were ceased. According to the order of the President of Ukraine from 19.11.2010 and the order of the First Vice Prime Minister of Ukraine, Chairman of the State Committee on technogenic and environmental safety and emergency situations in Ukraine - A.Klyuyev from 09.02.2011 Nr. 1121/07/1- 11 and according to paragraph 8 of protocol number 2 of the field meeting of the State Commission on technogenic and ecological safety and emergency from 27.01.11 the construction of underground departments of allergic hospital in the village of Solotvino is provided.

In recent years, scientific-research and design organizations of Ukraine (Institute of Geology, National Academy of Sciences; Ukrainian Scientific-Research Institute of Salt ; Ltd. "Hirhimprom", etc.) conducted researches to assess the current state of Solotvino salt deposit, emergency response activities in the SE "Solotvino salt mine" strategy recovery measures of ecological balance within the field and opportunities for further use of underground spaces and salt resources.

The programme on solving environmental, social and industrial problems of the village is worked out by the National Technical Commission (Institute of Geology, National Academy of Sciences; Ukrainian Scientific-Research Institute of Salt ,etc.). The programme contains sections on creating a new underground branch of Alergologic Hospital and limited production of salt.

The conference was attended by 94 experts from scientific-research, design and production orga-

nizations of Ukraine, Russia, Poland and Romania (9 professors, and 8 PhDs), representatives of national communities of Hungarians and Romanians in the village of Solotvino. A meeting of three sections, and the Round Table were conducted. 36 papers and reports were heard in accordance with the program.

As a result of discussions it is observed that in the world practice the treatment of allergic diseases in underground spaces of salt environment is the most effective tool that has also proven cost-effectiveness. There are underground allergic hospitals in Poland, Romania and other countries.

The experience of underground departments of allergic hospitals in the village of Solotvino prove that here are the most favorable conditions that lead to high efficiency treatment of asthma, allergic diseases and rehabilitation after burn injuries and more.

This is due to the specific mineral composition of rock salt (phase composition of nano fraction of insoluble residual, trace-element composition, etc.), unique microclimatic conditions in the underground space and complement treatment with brine and clay silt of salt lakes, for sustaining medical properties of which it is necessary to replenish the lakes with brine from excavation (mine Nr. 8,7) in volume 200 m³ per day.

Based on the results of synthesis of ecological and geological studies (Institute of Geology, National Academy of Sciences; Ukrainian Scientific-Research Institute of Salt, etc.) within salt deposits the areas that are marked by undisturbed geological structure, absence of hazardous geological processes and satisfactory protection of salt massif are found.

These areas are suitable for underground use, in particular, to create a health center underground spaces and limited use of salt resources. This creates preconditions for solving social, industrial and urban environmental problems in Solotvino by organizing activities in two ways:

- Construction of underground departments of speleotherapy;
- Creating objects of salt resources use (limited production of salt).

Projects of these areas are attractive for investments. Undisturbed volume of salt environment of Solotvino has benefits of underground facilities creating compared to other salt objects in Transcarpathia.

The organization of investment projects must take into account the prerogatives of state institutions and investment institutions.

Prerogatives of government agencies include:

- Providing scientific basis for investment projects;

- Legislative and regulatory-legal framework for investments and projects in view of favorable terms.

Prerogatives of interested institutions and investment initiative group:

- Attracting investment structures, organization and implementation of project activities, organizational support (scientific, advertising and information, finance, logistics, human resources, etc.);
- Organization and execution of investment projects in accordance with the current legislation of Ukraine and the requirements of the current regulatory and technical documentation on the basis of favorable terms.

As a special note it is worth to take into consideration the proposals of the initiative group of Solotvino Public Resource Center (the head is public organization “Hope”) for public comment and approval of “The programs to solve environmental, social and industrial problems of the village of Solotvino” due to paragraph 5 of the protocol of the field meeting of the State Commission on technogenic and ecological safety and emergency from 27.01.11r. The community also expresses wishes for the full support by government agencies to restore underground departments of Allergic hospitals in the village of Solotvino.

As a result of discussions and reports it is RESOLVED:

1. Due to previous recommendations of National Technical Commission (Institute of Geology, National Academy of Sciences; Ukrainian Scientific-Research Institute of Salt, etc.) to restore speleotherapy and exploitation of Solotvino rock salt deposits and selecting potential sites in Solotvino for further investigation in accordance with applicable regulations of exploration and construction activities under investment projects.

2. To recognize the investment projects of construction of new underground departments and further exploitation of salt resources as potentially attractive.

3. Solotvino village council, SE “Solerudlikvidatsiya”, SE “Ukrainian Allergic Hospital, Ministry of Health of Ukraine” should form an interagency initiative group involving stakeholders with the following tasks:

- to work out programs in two ways: the construction of new underground departments of speleotherapy, the exploitation and conservation of salt lakes as a supplement treatment and recreation; limited production of salt;
- organization of activities to attract investors and work out projects based on local infrastructure.

4. To request the Ministry of Health of Ukraine to approach the Cabinet of Ministers of Ukraine with proposals for legislative support of the project of construction of underground departments of speleotherapy with preferential terms .

5. To request the Ministry of Agrarian Policy and Food of Ukraine to turn to the Cabinet of Ministers of Ukraine with proposals for legislative support for the project of salt extraction.

6. To request Transcarpathian Regional State Administration to submit for approval by Regional Council of Transcarpathian region "The programs to solve environmental, social and industrial problems of the village of Solotvino" with further intercede for the approval by the Parliament of Ukraine.

Chairman of the Organizing Committee: *Y. Chonka*
Secretary: *L. Bosevska*

Working Meeting of Board of the "Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie - UIS"(PCS/CPS-UIS) and PCS /CPS Working Group "Speleotherapy in Salt Mines and Salt Chamber" at the Scientific-Practical Conference with International Participation "Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region".

Solotvino, October 23, 15.00 – 16.00, 2013

"REGARDING THE STATUS AND DEVELOPMENT OF SPELEOTHERAPY IN SOLOTVINO SALT MASIF (Tyachiv District, Zakarpatya Region, Ukraine)". Resolution:

Speleotherapy (ST) is officially recognized in the years 1950-1960 in Germany (Yang B., G. Schubert 1962) and Poland (M. Skulimowski, 1968). In salt mines with 9-24 °C temperature operating 15 speleotherapy centers, 34 in karst caves with 9-18 °C and 4 centers in thermal caves with temperatures higher than 24 °C (Iu. Simionca et al., 2005).

Number of speleotherapeutic centers has increased considerably. Speleotherapy in the underground effective practice in: Austria, Czech Republic, Germany, Poland, Russia, Slovakia, Ukraine, Belarus, Romania, Hungary, Italy etc.

The most significant world speleotherapy center was Solotvino (Tyachiv District, Zakarpatya Region Ukraine), in which two allergy hospitals (regional and republican) have benefited of underground sections for speleotherapeutic treatment in salt mines

Nr. 8 and No. 9.

But these superb speleotherapeutic sections no longer exist because were flooded with salt mines.

Although the availability of funds and the desire to work the new underground section of speleotherapy can be constructed and used for patients while along with this the can be resumed salt extraction (Л. П. Босевська, Д. П. Хрущов, 2011).

In the Scientific-Practical Conference with International Participation "Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Zakarpatya (Transcarpathian) region", which took place in Solotvino, October 22-23, 2013 (Organizers: SE "Solotvino salt mine", SI "Ukrainian Allergic Hospital Ministry of Health of Ukraine", Solotvino Village Council, Community Resource Centre of Solotvino), the Board of Permanent Commission on Speleotherapy / Commission permanente de spéléothérapie- UIS (PCS / CPS – UIS) and Speleotherapy Commission Working Group "Speleotherapy in salt mines and salt chambers" noted the following:

1. Scientific studies conducted in the years 1973 - 2011 on the salt environment from underground (speleotherapy) sections of allergy hospitals in Solotvino (SI "Ukrainian Allergic Hospital Ministry of Health of Ukraine" and Zakarpatya Regional Allergy Hospital), located in salt mines Nr.8 and Nr. 9 from SE "Solotvino salt mine"; clinical medical studies; hematological, biochemical, microbiological, immunological humoral or cellular studies on laboratory animals with experimentally induced pathology, as well as on the groups of patients with bronchial asthma and various chronic inflammatory and allergic respiratory diseases or on patients post burns of the airways and skin, indicate the presence and outstanding quality of medical therapeutic factors in the underground galleries of both salt mines and presence marked therapeutic effect on laboratory animals in experiment and on human patients with mentioned pathologies not only in case of prevention but as well as for treatment and medical rehabilitation.

2. In both mentioned Solotvino allergology hospitals and especially in SI "Ukrainian Allergic Hospital Ministry of Health of Ukraine" were formed well known countrywide and worldwide specialists in the fields of speleotherapy, pneumology, allergology, immunology and other, and also scientists - professors,

PhD, candidates in science, lecturers and assistants in institutes and universities. Based on previous experience, the training of healthcare professionals and scientific researchers in the above mentioned fields is in progress.

3. SI “Ukrainian Allergic Hospital Ministry of Health of Ukraine” and Zakarpatya Regional Allergy Hospital have necessary buildings, utilities and communications systems, water, heating, electricity to the surface and are equipped with specific medical equipment, mostly modern.

Decision of the Board of the Permanent Commission on Speleotherapy / Commission permanente de spéléothérapie (PCS / CPS) of UIS (ICSU member and UNESCO consultant member category B-C) and Working Group of PCS / CPS “Speleotherapy in salt mines and salt chambers” Decision from October 23, 2013:

1. For the speleotherapy scientific excellence (use of salt mines underground galleries Nr. 8 and Nr. 9 for medical purposes) and for the quality of medical assistance, including prevention, speleotherapeutic treatment and specific physical therapy as well as when necessary medication for patients with allergic and inflammatory chronic respiratory diseases (bronchial asthma, chronic bronchitis, chronic obstructive pulmonary disease et al.), is given Quality Certificate in Field of Speleotherapy by the Permanent Commission of Speleotherapy / Commission permanente de spéléothérapie - UIS to the collectives of SI “Ukrainian Allergic Hospital Ministry of Health of Ukraine” and Zakarpatya Regional Allergy Hospital from Solotvino, District Tyachiv, Zakarpatya (Transcarpathian) region, Ukraine.

2. Based on the results presented in the sessions of the respective scientific event Program, taking into account the discussions and the evaluation of these results, the Board of Permanent Commission of Speleotherapy / Commission permanente de spéléothérapie - UIS and Working Group “Speleotherapy in salt mines and salt chambers” of PCS/CPS-UIS sustain the Decision of the Scientific-Practical Conference with International Participation “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Zakarpatya (Transcarpathian) region”, which took place in Solotvino, October 22-23, 2013, alongside with the relaunching and development of speleotherapy into underground salt massif in the town of Solotvino, District Tyachiv, Zakarpatya (Transcarpathian) region, Ukraine.

- The decision on the technology to be used for restore the underground sections of speleotherapy or for the opening of new galleries useable for underground speleotherapeutic treatment, in the end, is to be taken by authorized from Ukraine institutions.

- In order to relaunch speleotherapy in salt massifs / Rock Salt Deposits of Solotvino town, District Tyachiv, Zakarpatya (Transcarpathian) region there are specialists in medical and related fields, two operational hospitals (SI “Ukrainian Allergic Hospital Ministry of Health of Ukraine” and Zakarpatya Regional Allergy Hospital) with utilities, and medical experts in related fields and also specific equipment.

President PCS / CPS – UIS,
MSRll, Dr.b., Ph.D. Iuri Simionca

Vice-President PCS / CPS – UIS,
Ph.D., M.D. Jaroslav Chonka, Chairman of Working Group “Speleotherapy in salt mines and salt chambers”

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2. Resolution of First Kiev International Scientific Conference “Scientific and methodological Foundations of medical geology”, 17-18 April 2013 (Ukraine) / Рішення Першої київської міжнародної наукової конференції «НАУКОВІ ТА МЕТОДОЛОГІЧНІ ОСНОВИ МЕДИЧНОЇ ГЕОЛОГІЇ» 17-18 квітня 2013 р., м. Київ, Україна - <http://training.tutkovsky.com/no-vyny/print:page,1,319-rishennya-pershoyi-kiyivskoyi-mizhnarodnoyi-naukovoyi-konferenciyi-naukovi-ta-metodologichni-osnovi-medichnoyi-geologiyi.html>

3. First information of the International Scientific-Practical Conference “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region”. The conference will be held in the hotel resort complex “Speleocentr”, village of Solotvino in October 22-23, 2013 (Attached PDF).

4. The Program of International Scientific-Practical Conference “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region”, October 22-23, 2013, Solotvino, Ukraine (The original attached in Ukrainian language - PDF).

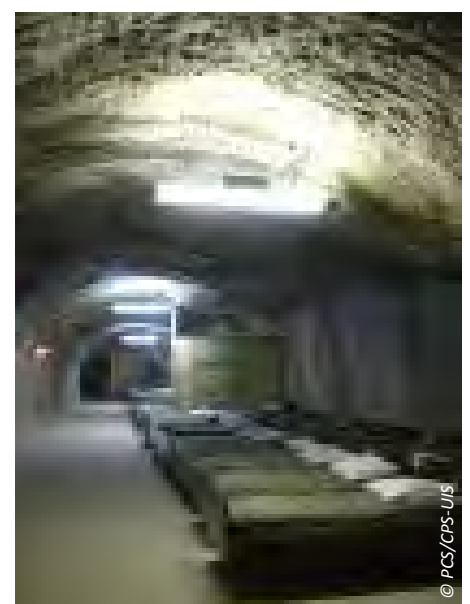
5. Resolution of the International Scientific-Practical Conference “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region”, October 22-23, 2013, Solotvino, Ukraine (The original in Ukrainian language is available in <http://media0.webgarden.com/files/media0:5284cb5551c69.pdf.upl/Binder1.pdf>).

6. <http://media1.webgarden.com/files/media1:52e103f6a7910.pdf.upl/Resolution%20Solotvino.pdf>

7. <http://www.speleotherapycommission.webgarden.com/menu/news/possibility-of-speleotherapy-in/decision-of-the-board-of-the>

8. Working Meeting of Board of the “Permanent Commission on Speleotherapy / Commission Permanente de Speleotherapie – UIS“(PCS/CPS-UIS) and PCS /CPS Working Group “Speleotherapy in Salt Mi-

nes and Salt Chamber” at the Scientific-Practical Conference with International Participation “Perspective of Speleotherapy Recovery and Salt Extraction Based on Rock Salt Deposits in the village of Solotvino, Tyachiv district, Transcarpathian region”, Solotvino, October 23, 15.00 – 16.00, 2013. “REGARDING THE STATUS AND DEVELOPMENT OF SPELEOTHERAPY IN SOLOTVINO SALT MASIF (Tyachiv District, Zakarpatya Region, Ukraine)”.



Past Underground Speleotherapy Sections in Salt Mines Nr8 and 9 of Ukrainian Allergic Hospital (Health Ministry of Ukraine) and Allergic Regional Hospital, Solotvino, Ukraine,

Union Internationale de Spéléologie - UIS



REPORT OF THE UIS MISSION OF EXPERTISE IN THREE SHOW CAVES AT THE REQUEST OF HIS EXCELLENCY THE MINISTER OF TOURISM OF LEBANON

Arrigo CIGNA, Jean-Pierre BARTHOLEYNS, José Ayrton LABEGALINI
 Union Internationale de Spéléologie
 9 - 14 JUNE 2014

Photos by José Ayrton LABEGALINI

I. INTRODUCTION

Lebanon has one of the most beautiful show caves in the world: Jeita. Such a majestic but fragile world patrimony, many thousands of years old, must be kept for future generations in its natural state.

This cave—and the other caves visited during this mission—must be protected and special care must be paid by the show caves' management, local and foreign visitors, as well as other public organizations and individuals (e.g. relevant governmental ministries, public administrations, municipalities, and politicians charged with the development of the environment, conservation of nature, underground waters, prevention of pollution, planning of roads and tourism). The careful vigilance of local and foreign cavers is also necessary because without them these caves would be still unknown.

II. WHY A UIS MISSION OF EXPERTISE?

Since its origin in 1965, the UIS (Union Internationale de Spéléologie) has had strong ties with the Lebanese speleological community when the Lebanese cavers representing their country participated in the foundation of the Union and the Union's first Secretary General was Lebanese. This year the UIS was approached by the Spéléo-Club du Liban on a joint initiative they launched with the Lebanese Ministry of Tourism and the manager of Jeita Cave concerning the protection of Jeita and other Lebanese show caves.

His Excellency, the Minister of Tourism Mr. Michel Pharaon, invited two experts from the UIS for a five-day visit to Lebanon to investigate Jeita and two other caves: Qadisha and Rihane. His Excellency, Mr. Pharaon, requested the UIS prepare an expert report that details means to further protect these caves.

The UIS Bureau received the request, responded positively, and sent two experts: Dr. Arrigo Cigna (UIS past-President and Secretary General) and Jean-Pierre Bartholeyns (UIS Adjunct Secretary and President of the UIS Department of Karst Protection). A third UIS expert, José Labegalini (UIS past-President), came at his own expense to optimize the team's efforts in providing the Lebanese Government an effective technical evaluation.

Union Internationale de Spéléologie - UIS

The UIS has witnessed and encouraged excellent relationships between show cave managing boards and public authorities with local speleologists around the world. Such win-win relationships help to promote tourist attractions, public awareness, and protection of national karst assets. We hope that our Mission of Expertise in Lebanon will encourage Lebanese stakeholders to work together for the sake of preserving their natural patrimony.

III. DISCLAIMER

Discussions in this report of materials, equipment, products, or instruments produced by any firm are not endorsements but examples of items that may also be purchased from other firms. The user bears the responsibility of identifying which specific items have the characteristics which are best for the user's needs.

IV. JEITA CAVE

Visited on 10 and 11 June 2014.

General remarks

Jeita Cave, with its wonderful upper cave and its lower underground river is surely one of the most beautiful caves in the world. This great but fragile patrimony must absolutely be kept in its natural state for future generations.

The whole cave, both sections open and closed to tourists, deserves the protection and care of everyone involved. First, government ministries, administrations, municipalities, and politicians. They develop regulations, policies, and plans for sustainable development of the environment, conservation of nature, protection of underground waters, prevention of pollution, and planning of roads and tourism, all which should be designed to protect the cave and the areas that may impact the cave. Second, the cave's management and NGOs, which carry out those regulations, policies, and plans, and which monitor the condition of the cave and surrounding areas daily. Third, the visitors to the cave and residents of the surrounding area who, when educated about the value of the cave, take extra care when visiting and in their activities near the cave, and support the above governmental and management authorities. In addition, the UIS recognizes the local speleologists who discover such natural jewels and promoted their study and protection for the good of the Lebanese nation.

Recommendations

1. Microclimatological monitoring system: An important show cave like Jeita, which receives several hundred thousand visitors every year, has to be equipped with a modern microclimatological monitoring system able to record the cave's environment conditions. The resulting records should be saved for future investigations and to evaluate natural and artificial changes in the cave. They will be a significant asset for the cave's management, scientific research, and assurance to public authorities that their policies are met.

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Jeita Cave has an upper and lower level. The upper level is a hydrologically low-energy system dominated by drip water and airflow processes. The lower level contains a hydrologically active, high energy underground river. Changes in the river do not directly affect the upper levels, but do affect airflow, humidity, and the general microclimatological of the upper levels. Therefore, microclimatological monitoring is not suggested for the lower level. However, we advise continued monitoring of electrical conductivity, water levels, and other parameters of the river as conducted by the water purifying water station and to have those results available to the Jeita Cave monitoring network.

An adequate microclimatological monitoring system will measure continuously (each 6 hours) at least temperature, humidity, and CO₂ concentrations in Jeita Cave. In addition to their scientific and management value, the results will be of public interest and should be published on the cave's internet website.

One of the most important uses of the microclimatological monitoring will be to test the effectiveness of the door seals, which have been renovated and in place in the artificial tunnel entrance of the upper cave since some months¹. The recommended monitoring network, discussed in detail in the appendix, consists of four (4) stations:

- a. Outside, at the entrance of the tunnel that leads to the upper gallery;
- b. Inside, at the natural cave entrance to the upper gallery;
- c. In the middle of the length of the tour trail, where the descriptive panels are installed, or at the end of the trail.
- d. Beyond the end of the trail at the stone quarry for the old steps.

At present the measurement of temperature and relative humidity only is recommended while few spot measurements of CO₂ by a Dräger detector, which is quite economical, could give an indication if there is large variation of the concentration. In case of the presence of such large increases more sophisticated detectors (infrared system) could be implemented.

2. Doors of upper Jeita Cave: Visitor access to upper Jeita Cave is through an artificial tunnel. It is crucial that this artificial entrance remain sealed by door that allow as little air circulation as possible and to minimize impacts on the cave's interior. The current doors may serve this purpose but need to be maintained, upgraded, and submitted to a heavy-duty careful maintenance program to avoid possible failures. In no case should both sets of doors be open at the same time.

In addition, a couple of **air curtain doors** (such as those used in supermarkets) could be installed in the tunnel. Such devices consist of a fan installed in the side of the tunnel blowing air from the ceiling and recovering it through a grid and filter in the floor. In this way the visitors have an "air shower" which washes small particles from them, decreasing the problem of lint deposited inside the cave. This "air curtain" will also reduce the airflow through the tunnel, enhancing the effect of the doors.

3. Protection zones above the cave: Construction without adequate measures (karstic areas) to protect the cave, as well as the dumping of trash by trucks (sometimes belonging to the local municipality and/or private; see picture), will change the flow of water into the cave and degrade the

¹ The artificial access tunnel to the upper gallery was excavated and opened in 1969. To protect the cave, the tunnel was sealed throughout the war, from 1975 to 1982. After a few weeks of opening to the public, the tunnel was sealed again until 1990 when it was opened to serve as a munitions depot. Public access to the cave was re-established in 1993.

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quality of the water, resulting in damage to the cave environment, its speleothems, and possibly to the health of people drinking water from the water purification station.



Photo of discharge of water used from some constructions in the upper valley of the cave.

Debris that is dumped on the foothills of the valley is unstable and may create landslides after heavy storms. Construction and other activities could cause a collapse of the cave's ceiling where the rock overburden is relatively thin.



Photo of a municipal truck dumping trash in the valley near the cave.

Therefore, the relevant ministries, municipalities, public administrations and authorities should collaborate with the cave's management and speleologists to identify the areas from which water enters the cave. These areas should be designated as protective zones, to protect the cave's environment and groundwater, with strict regulations on what activities may and may not occur in those zones.

4. Cave trails: The trails inside the cave are in good order. In some places below the surface of the trails the iron in the concrete has rusted, resulting in small cracks. Such iron, if still structurally stable, should be chemically treated to transform the iron oxide into a stable compound and then covered again with concrete.



Photo of an area below a trail where the iron has rusted, resulting in damage to the concrete.

We suggest the use of adequate floor-washing machines (or even dry-cleaning), instead of limit the flow of the water (even eliminate) used for washing the pathways on the underlying formations.

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5. Speleothems: Avoid spraying water on speleothems. The process of speleothem development is complicated, with exchanges of water and carbon dioxide that cannot be artificially created; spraying water could damage the speleothems.

Similarly, rimstone pools (i.e. gours) in the upper cave should not be filled with water pumped from the underlying Jeita River. The natural source of the water in those pools deposits calcite to create the rimstone dams. However, water in the river is dissolving limestone and calcite, and will slowly dissolve and destroy the rimstone dams and pools. Aesthetically, we recommend leaving the pools empty when they dry naturally. This cave area would then have different equally beautiful aspects at different times of the year.

The presence of coins in the cave's pools is a source of pollution, and should be prohibited.

6. Safety on boats: In order to best assure the safety of the visitors, each boat in the lower cave should include ropes and a floatation vest for each visitor. The vests should be worn or be easily available in case of an emergency.

7. Iron handrails: The lateral protection of the stairways and trails are made of painted iron (not stainless steel). The upper bars, which serve as handrails, are covered with adhesive yellow tape to protect the hands of visitors from the rust. In some areas this tape is damaged. To improve the cave's appearance, the covering of all handrails in the cave should be checked and repaired; any broken tape on the floor should be removed.



Photo of damaged yellow tape on a handrail that needs repair.

8. Surface attractions at Jeita Cave: We noticed very good management of the surface facilities by the show cave personnel (parking, ticketing, cable cars, etc.). Nevertheless, we have a few comments that would improve surface conditions.

First, the access road to Jeita Cave clearly lacks maintenance and is dangerous in some places. Efforts should be spent in order to improve this road and provide safety for the visiting busses and cars.

The cages with animals between Jeita Cave's two entrances are not in line with the current attitude regarding the geological aspects and nature of a karstic feature like Jeita Cave. They could be conveniently substituted by panels with nice pictures describing the cave fauna, such as insects and bats, and fossil animals, such as cave bears, lions, etc. Public awareness of the fragile environment of caves and their formation could also be promoted there. Hence, the magnificent Jeita Cave would also become educational, leaving a bigger impact on the visitors of all ages and cultures.

9. Management: Management of the cave will be improved by implementation of the *Recommended Management Guidelines for Show Caves* (see appendix).

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V. RIHANE CAVE

Visited on 12 June 2014.

General remarks

This is a small cave located in a remote area that could be developed into a show cave. We found the local people very motivated to support such a development.

Special remarks

1. This cave is located in a region without an important tourist attraction. On the other hand, it is situated in a quiet area with vistas of a relaxing landscape. Its development for tourism could improve the local economy through restaurants and handicraft shops of local products.

2. The already existing facilities must be maintained. They could be conveniently modified in the future.

2.1. The access road and other facilities provide a suitable entrance hall built with local stone.

2.2. The concrete structure at the entrance of the cave, once covered with local stone, would be quite acceptable from an aesthetic point of view. Such a facility could be used for ticket counters, toilets, souvenirs shops, and a small cafeteria looking on the nice view on the valley.

2.3. The existing trail in the cave is conveniently placed and allows a suitable view of the speleothems, which are nicely preserved.

2.4. A lighting system already exists. Its small size and the short time of operation do not seem to give problems with lampenflora at the moment. Nevertheless, it can be improved in order to eliminate any risk in the future.

3. It is possible to extend the tourist trail. A careful clearing of the left side of the final gallery with the existing trail would allow access to two rooms (10m x 5m) decorated with beautiful speleothems, perhaps the nicest sections of the cave. Explosives should not be used to gain access to these rooms. Expansion cement (see appendix) and the assistance of speleologists are safer for the cave.

4. Temperature measurements outside and inside the cave confirm that the artificial widening of the entrance has not changed the original cave temperature.

Recommendations

1. Visitor Information Center: The entrance artificial hall may easily provide space for a small booth for providing information to the visitors. Public awareness about the importance of this cave and caves in general could be promoted with information on the cave, its ancient speleothems, fragile environment that require respect and protection, origin, geology, history of discovery, and development.

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In the entrance hall there is space to install a tourist center of information as well as some exposition about the cave and its thousands year old formation.

2. Septic tank and WC: A septic tank for toilets should be installed in the vicinity of the Visitor Center building but at an elevation lower than that of the cave. Otherwise, the effluent released by the septic tank would percolate into and pollute the cave.

3. Entrance door: The sheet in the left side of the entrance door at minimum should be substituted by horizontal bars, 20 cm wide, to leave access for the bats and other living species that live in the cave. Otherwise, the cave's eco-environment will deteriorate.



All the entrances doors, in the hall and in the tunnel, should be substituted by doors with horizontal bars 20 cm wide.

4. Trails and handrails: The trails are raised above the cave floor by a structure of iron and concrete. Unfortunately, the iron is easily corroded by humidity and water flowing in the cave during wet periods. The structure could be left as it is until it is unsafe to use. Once the iron is too severely damaged, the entire trail could be removed and substituted by a concrete trail placed directly on the natural floor, with the advantage of avoiding a low space for visitors who, in some places, must be careful to avoid stalactites. In this case, the handrails should be substituted by plastic ones, which are not damaged by humidity, are light, and can be easily worked.



Photo of the underside of part of the trail, showing the structural steel in an advanced state of oxidation.

5. Reuse of broken speleothems: Pieces of broken speleothems were reused in the cave to create walls in narrow passages. Others were used to replace natural speleothems, in which case care is needed to not put them in inverted positions. The position of these speleothems should be checked for correct orientation. Incorrectly oriented speleothems gives wrong information to visitors and demonstrates an embarrassing low knowledge of caves by the cave's managers.

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Photo of a stalactite incorrectly oriented like a stalagmite next to a trail.

6. Lamps: Lamps should be directed toward speleothems and walls without being visible to visitors when entering and exiting the cave. Only white light (colour temperature 4000 K) should be used and LED lights should be used to substitute out-of-use lamps. To avoid the development of lampenflora, the lamps should be switched on only when necessary and placed not too close to speleothems and walls.



Many lamps would be replaced to a better positions, as this one installed on the floor of the passage, as well as their colour temperature should be standardized as white light (preferably 4000 K).

7. Cleaning: Graffiti was found in the cave in four different places. It should be carefully removed with nylon or stainless steel brushes and water sprayers. Care is necessary, especially if stainless steel brushes are used, to avoid grooves and marks.



All graffiti in the cave should be removed from speleothems, rocks, and walls.

8. Speleological exploration: The hill above the cave and the end of the cave should be examined for a possible secondary entrance. If one is found, the tour could be changed into one starting at the present entrance and exiting from the new entrance. If this is done, it is crucial that the new entrance include two air-tight doors as described for Jeita Cave. Further speleological investigation on the surface, searches of possible new underground branches, and the taking of good photographs in the cave should be undertaken by local Lebanese speleologists.

9. Microclimatological monitoring system: In order to control the environmental conditions inside the cave, temperature and humidity measurements should be made once a day and maintained to make sure that the cave conditions are not affected by access to the public. We recommend the installation of a simple monitoring network, consisting of two stations:

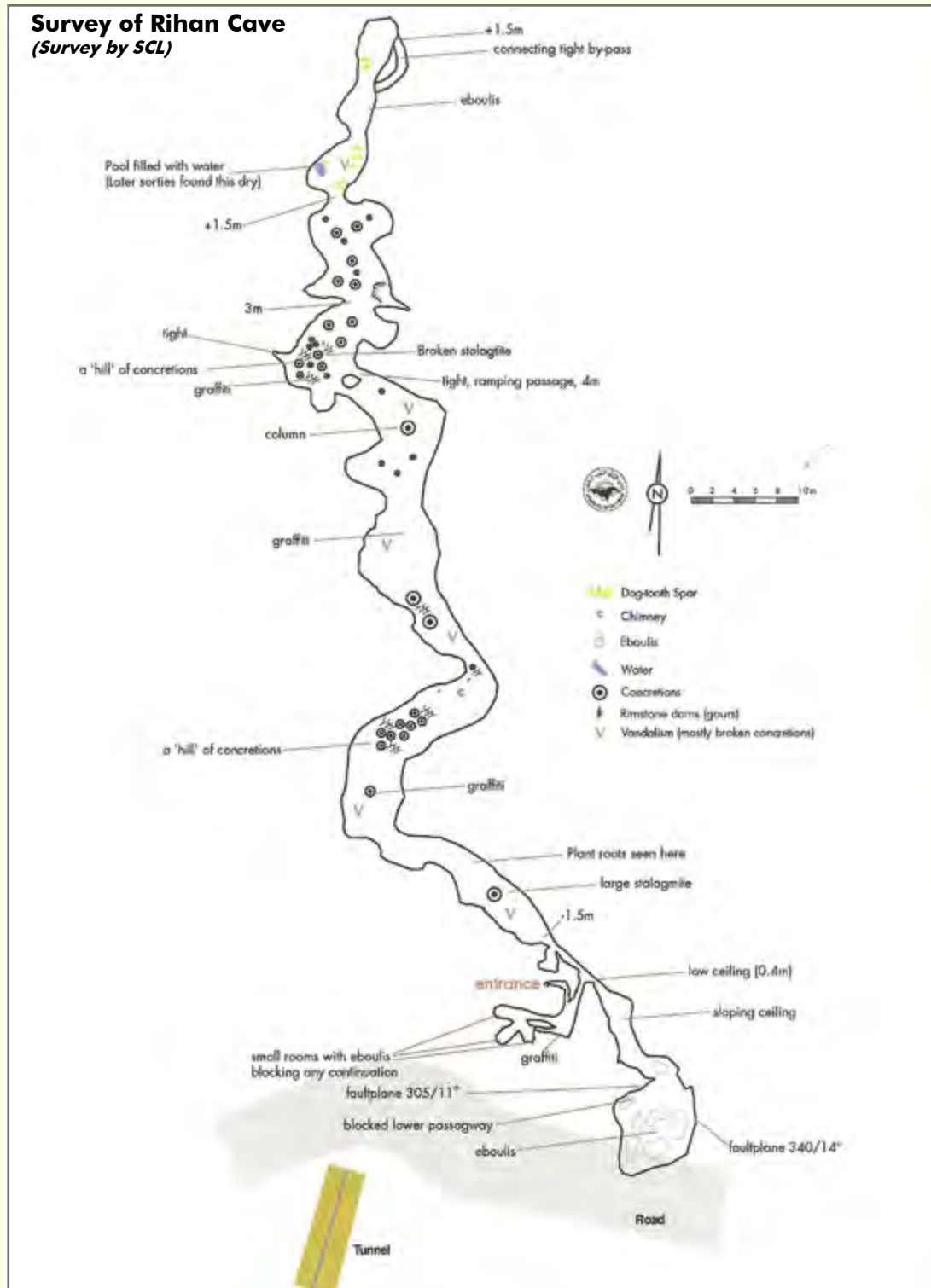
- 1 – Outside, at the cave's entrance.
- 2 – Inside, midway along the length of the trail.

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10. Management: Management of the cave will be improved by implementation of the *Recommended Management Guidelines for Show Caves* (see appendix).

11. Map

Survey of Rihane Cave by the SCL (Spéléo Club du Liban).



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IV. QADISHA CAVE

Visited on 13 June 2014.

General remark

This cave has a notable tourist interest justifying its development as a regional show cave. The cave, as well as the whole valley and the nearby cedar forest, are listed as UNESCO World Heritage sites.

Special remarks

1. The cave is located in a large, beautiful, and quiet valley.
2. The path to the cave meanders almost horizontally along the valley wall through fragrant and floral vegetation, and offers visitors stunning views that overlook the surrounding mountains, Qadisha valley, and even the Mediterranean Sea.

Recommendations

1. **General Recommendation:** A maximum respect of the natural site must be kept and without any development that may threaten it. Cableway installation or widening the access path for small cars—even if electric—is strongly not recommended.
2. **Cave Access Path:** The 800-m long, open access path to the cave entrance should be kept only for pedestrians. In some places handrails should be provided for safety.



This photo shows one of several places along the trail to the cave which should have handrails for increased child and adult safety.

3. **Information Signs:** Signs should be installed along the trail to the cave that would give visitors useful information about the plants and landscape.
4. **Lamps:** A lighting system already exists in the cave. Although the cave is small, with a short period of operation, the problem of lampenflora is already present. The first step in correcting this problem is to move the lamps away from the speleothems. The second and more crucial step is to redesign the cave's electrical and lighting system to eliminate or greatly reduce the actual problem.

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Lamps should be moved further from speleothems to reduce lampenflora until the lighting system can be redesigned.

5. Proposed Development Project: After careful study, we support the project proposed by Architect Johnny Tawk. It is excellent, original, respects the original development, suggests creative solutions to problems, and gives emphasis to special speleothems.

6. Microclimatological monitoring system: In order to control the environmental conditions inside the cave, temperature and humidity measurements should be made once a day and maintained to make sure that the cave conditions are not affected by access to the public. We recommend the installation of a simple monitoring network, consisting of two stations:

- 1 – Outside, at the cave's entrance.
- 2 – Inside, midway along the length of the trail.

7. Management: Management of the cave will be improved by implementation of the *Recommended Management Guidelines for Show Caves* (see appendix).

VI. APPENDIX

1. The development of show caves: New materials and methods Arrigo A. CIGNA

Proceedings 16th International Congress of Speleology, Vol.1: 215-218

This document can be downloaded from <http://www.karstportal.org/node/8370>, but it is enclosed below.

2. UIS Recommended Management Guidelines for Show Caves

UIS Department of Karst and Cave Protection

This document can be downloaded from http://uis.caves.org/index.php?option=com_content&view=article&layout=edit&id=78&Itemid=404, but it is enclosed below.

3. Lamps LED

CAVE LIGHTING

GermTec GmbH & Co. KG - Hohe Strasse 700 Geb. 5B - 35745 Herborn – Germany

Alexander Chrapko

E-mail : ac@germtec.de

Phone: +49 (0)2772 575218

Fax : +49 (0)2772 575220

Mobile : +49 171 7228201

Web : www.germtec.de and <http://www.cavelighting.com/>

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4. Plastic and other materials

Plastic materials that can be substituted for stainless steel are sold in Europe by Fibrolux GmbH, see <http://fibrolux.com/fr/footer/contact/>

Similar materials are also produced in US, see www.fibergrate.com

5. Excavation

For the widening of passages, as at the end of the Qadisha Cave, non-explosive products might be used, as found at http://www.dynacem.pl/de_ (Betonamit Non-Explosive Cracking Agent), www.nonex.it , or www.betonamit.net

4. Microclimate monitoring system

4.1. Microclimate monitoring system operation: The heart of a good monitoring system is an autonomous data logger what can be downloaded once a month to a laptop computer, is very rugged, reliable, not damaged by electric discharges due to thunderstorms, and can work well in humid cave atmospheres. ONSET, for example, has equipment with a temperature accuracy of +/- 0.5°C with a resolution of 0.1°C in a range from 0° to 50°C, and relative humidity (RH) measurements accurate to 5% to 95% RH and a resolution of 1% in the same range. Such devices often cost less than about \$200 USD.

For CO₂, the Draeger Company offers simple devices which measure atmospheric carbon dioxide concentrations by the change of colour of a detector. A cartridge is used for each measurement. The system is inexpensive and provides a general idea if CO₂ concentrations are unnaturally changing. If such changes are detected, then a continuous monitoring infrared detector system could be installed.

4.2. Monitoring system placement: The management of each cave will ensure the placement and maintenance of the monitoring system equipment. It will also take care of the data collection and maintenance of those records.

4.3. Measurement evaluation: A small group (e.g. 3 or 4 maximum) of experts, collectively recognized by Lebanese cavers and scientists, competent in cave microclimatology would analyze the data collected. This group should be used to evaluation monitoring data for all show caves in Lebanon. UIS can provide, if requested, supervision and/or equipment advice.

5. Photos

Illustrative photos of this rapport can be provided on request in high resolution.

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UIS Department of Karst and Cave Protection

RECOMMENDED MANAGEMENT GUIDELINES FOR SHOW CAVES

INTRODUCTION

The concept of establishing guidelines to be used as general parameters for good show cave management, originated during informal discussions between members of the International Show Caves Association at the time of the inaugural meeting of ISCA in Genga, Italy, in November 1990. These discussions continued over time and were first drafted for consideration at an ISCA meeting held on 17th September 2004 during the 30th Anniversary of the opening of Frasassi Cave, in Italy, to the public. The idea of creating guidelines, received strong recommendations from the UIS Department of Protection and Management at the 14th International Congress of Speleology held in Kalamos, Greece, in August 2005.

These management guidelines are the result of wide cooperation between the International Show Caves Association (ISCA), the Union Internationale de Spéléologie (UIS) and the International Union for Conservation of Nature and Natural Resources (IUCN). The intention was to create commonly accepted guidelines that all show cave managers can work toward, taking into account both the protection of the environment and socio-economical constraints. Many recommendations and suggestions have been received in the course of nearly twenty years, and therefore the document reported here can be considered as the result of an active cooperation among specialists involved in this matter.

1 DEVELOPMENT OF A WILD CAVE INTO A SHOW CAVE

The development of a show cave can be seen as a positive financial benefit to not only itself, but also the area surrounding the cave. The pursuit of these anticipated benefits can sometimes cause pressure to be applied to hasten the development of the cave.

Before a proposal to develop a wild cave into a show cave becomes a physical project, it is necessary to carry out a careful and detailed study to evaluate the benefits and risks, by taking

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into account all pertinent factors such as the access, the synergy and possible conflict with other tourism related activities in the surrounding area, the availability of funds and many other related factors. The conversion should only take place if the results of the studies are positive. A wild cave that is developed into a show cave, and is subsequently abandoned, will inevitably become unprotected and be subject to vandalism in a very short time. A well managed show cave assures the protection of the cave itself, is a source of income for the local economy and also may contribute to a number of scientific studies.

1-1 A careful study of the suitability of a cave for development, taking into account all factors influencing it, must be carried out, and must be carefully evaluated, before physical development work commences.

2 ACCESS AND PATHWAYS WITHIN CAVES

In many caves it has been found to be desirable to provide an easier access into the cave for visitors through a tunnel, or a new entrance, excavated into the cave. Such an artificial entrance could change the air circulation in the cave causing a disruption of the ecosystem. To avoid this, an air lock should be installed in any new entrance into a cave. On the other hand it must be mentioned that in some very exceptional cases a change in the air circulation could revitalize the growth of formations. A decision not to install an air lock must be only taken after a special study.

2-1 Any new access into a cave must be fitted with an efficient air lock system, such as a double set of doors, to avoid creating changes in the air circulation within the cave.

Caves are natural databases, wherein an incredible amount of information about the characteristics of the environment, and the climate of the cave, are stored. Therefore any intervention in the cave must be carried out with great care to avoid the destruction of these natural databases.

2-2 As much as possible, any development work carried out inside a cave should avoid disturbing the structure, the deposits, and the formations of the cave.

When a wild cave is developed into a show cave, pathways and other features must be installed. This invariably requires materials to be brought into the cave. These materials should have

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the least possible impact on both the aesthetics of the cave and its underground environment. Concrete is generally the closest substance to the rock that the cave is formed in, but once concrete is cast it is extremely expensive and difficult to modify or decommission. Stainless steel has the distinct advantage that it lasts for a long time and requires little, to no, maintenance but it is expensive and requires special techniques to assemble and install. Some recently developed plastic materials have the advantage of a very long life, are easy to install and are relatively easy to modify.

2-3 Only materials that are compatible with the cave, and have the least impact on the cave, should be used in a cave. Cement, concrete, stainless steel and plastics that do not emit volatile organic chemical are examples of such materials.

The environment of a cave is usually isolated from the outside and therefore the introduction of energy from the outside will change the equilibrium balance of the cave. Such changes can be caused by the release of heat from the lighting system and the visitors and also by the decay of organic material brought into the cave, which introduces other substances into the food chain of the cave ecosystem. In ice caves, the environmental characteristics are compatible with wood, which is frequently used for the construction of pathways, as it is not slippery.

2-4 Organic material, such as wood, should never be used in a cave unless it is an ice cave where, if necessary, it can be used for pathways.

3 LIGHTING

The energy balance of a cave should not be modified beyond its natural variations. Electric lighting releases both light and heat inside the cave. Therefore high efficiency lamps are preferred. Discharge lamps are efficient, as most of the energy is transformed into light, but only cold cathode lamps can be frequently switched on and off without inconvenience. Light-emitting diode (LED) lighting is also very promising. As far as possible, the electric network of a cave should be divided into zones to enable only the parts that visitors are in to be lit. Where possible a non-interruptible power supply should be provided to avoid problems for the visitors in the event of a failure of an external power supply.

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It is essential to ensure the safety of the visitors in the cave, particularly in the event of a failure of the main power supply. Emergency lighting should always be available whether it is a complete non-interruptible power supply or an emergency lighting system with an independent power supply. Local code requirements may be applicable and these may permit battery lamps or a network of LEDs or similar devices.

3-1 Electric lighting should be provided in safe, well-balanced networks. The power supply should preferably be non-interruptible. Adequate emergency lighting should be available in the event of a power outage.

Lampenflora is a fairly common consequence of the introduction of an artificial light supply into a cave. Many kinds of algae, and other superior plants, may develop as a result of the introduction of artificial light. An important method to avoid the growth of green plant life is to use lamps that do not release a light spectrum that can be absorbed by chlorophyll.

3-2 Lighting should have an emission spectrum with the lowest contribution to the absorption spectrum of chlorophyll (around 440 nm and around 650 nm) to minimize lampenflora.

Another way to prevent the growth of lampenflora is the reduction of the energy reaching any surface where the plants may live. The safe distance between the lamp and the cave surface depends on the intensity of the lamp. As a rough indication, a distance of one meter should be safe. Special care should also be paid to avoid heating the formations and any rock paintings that may exist.

3-3 Lighting sources should be installed at a distance from any component of the cave to prevent the growth of lampenflora and damaging the formations and any rock paintings.

The lighting system should be installed in such a way that only the portions of the cave occupied by visitors are switched on, leaving the lighting in the portions of the cave that are not occupied switched off. This is important from the aspects of reducing the heating of the cave environment and preventing the growth of lampenflora, as well as decreasing the amount of energy required and its financial cost.

3-4 Lighting should be installed to illuminate only the portions of the cave that are occupied by visitors.

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4 FREQUENCY OF VISITS AND NUMBER OF VISITORS

The energy balance of a cave environment can be modified by the release of heat by visitors. A human being, moving in a cave, releases about 150 watts – approximately the same as a good incandescent lamp. Consequently, there is also a limit on the number of visitors that can be brought into a cave without causing an irreversible effect on the climate of the cave.

4-1 A cave visitor capacity, per a defined time period, should be determined and this capacity should not be exceeded. Visitor capacity is defined as the number of visitors to a given cave over a given time period, which does not permanently change the environmental parameters beyond their natural fluctuation range. A continuous tour, utilizing an entrance and another exit, can reduce the time that visitors spend in a cave, compared to the use of a single entrance/exit.

In addition to the normal tours for visitors, many show caves have special activities, sometimes called “adventure tours,” where visitors are provided with speleological equipment for use in wild sections of the cave. If such a practice is not properly planned, it may cause serious damage to the cave.

4-2 When visits to wild parts of a cave are arranged, they must be carefully planned. In addition to providing the participants with the necessary speleological safety equipment, the visitors must always be guided by a guide with good experience in wild caves. The pathway, where visitors are to travel along, must be clearly defined, for example with red and white tape, and the visitors should not be allowed to walk beyond this pathway. Special care must be taken to avoid any damage to the cave environment, and the parts beyond the pathway must be maintained in a clean condition.

5 PRESERVATION OF THE SURFACE ECOSYSTEM WHEN DEVELOPING BUILDINGS, PARKING, AND THE REMOVAL OF SURFACE VEGETATION AND WASTE RECOVERY

It is important that the siting of the above ground facilities, such as the buildings, parking and waste recovery, be well planned. There is a natural tendency to try and place these development features as close as possible to the cave entrance. Sometimes these features are built over the cave itself, or relevant parts of it. The hydrogeology above the cave must not be modified by any intervention such as the watertight surface of a parking area. Any change in the rainwater

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seepage into a cave can have a negative influence on the cave and the growth of its formations. Care should be exercised also when making any change to the land above the cave, including the removal of the vegetation and disturbance of the soils above the bedrock.

5-1 Any siting of buildings, parking areas, and any other intervention directly above the cave, must be avoided in order to keep the natural seepage of rainwater from the surface in its original condition.

6 MONITORING

After the environmental impact evaluation of the development, including any other study of the cave environment, it is necessary to monitor the relevant parameters to ensure that there is no deviation outside acceptable limits. Show caves should maintain a monitoring network of the cave environment to ensure that it remains within acceptable limits.

6-1 Monitoring of the cave climate should be undertaken. The air temperature, carbon dioxide, humidity, radon (if its concentration is close to or above the level prescribed by the law) and water temperature (if applicable) should be monitored. Airflow in and out of the cave could also be monitored.

When selecting scientists to undertake studies in a cave, it is very important that only scientists who have good experience with cave environments be engaged for cave related matters. Many, otherwise competent scientists, may not be fully aware of cave environments. If incorrect advice is given to the cave management, then this could result in endangerment of the cave environment. Cave science is a highly specialized field.

6-2 Specialized cave scientists should be consulted when there is a situation that warrants research in a cave.

7 CAVE MANAGERS

The managers of a show cave must never forget that the cave itself is “the golden goose” and that it must be preserved with great care. It is necessary that persons involved in the management of a show cave receive a suitable education, not only in the economic management of a show cave,

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but also about the environmental issues concerning the protection of the environment at large.

7-1 Cave managers should be competent in both the management of the economics of the show cave and its environmental protection.

8 TRAINING OF THE GUIDES

The guides in a show cave have a very important role, as they are the “connection” between the cave and the visitor. Unfortunately, in many instances the guides have not been trained properly and, notwithstanding that they are doing their best, the overall result will not be very good. It is very important that the guides receive proper instructions about the environmental aspects of the cave as well as dealing with the public. It is important that guides are skilled in tactfully avoiding entering into discussions, which can have a detrimental effect on the overall tour. The guides are the guardians of the cave and they must be ready to stop any misbehaviour by the visitors, which could endanger the cave environment.

8-1 Cave guides should be trained to correctly inform the visitors about the cave and its environment.

9 HEIGHTEN PUBLIC AWARENESS

The visitors’ impact on the environmental state of the cave can be very detrimental. It is thus essential to provide the visitors with clear and simple information on their behaviour at the time of the visit. It should appear at the entrance of each tourist cave. Use quite visible and pleasant pictograms by personalizing them with your mascot to invite them not to touch concretions, to remain on the paths, not to eat/drink/smoke, not to throw anything, not to use flashlights/not to take photographs...

9-1 Clear, pleasant and quite visible pictograms should appear at the entrance to inform the visitors about their behaviour in the cave.

Union Internationale de Spéléologie - UIS

Protection and Management of Karst, Education – oral

2013 ICS Proceedings

THE DEVELOPMENT OF SHOW CAVES: NEW MATERIALS AND METHODS

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The fundamental criteria presently adopted are the protection of the cave environment, the safety of the visitors and a correct profit from the cave management. Recent years have seen a veritable plethora of innovations and concepts relating to the best cave management, which are here pointed out. New criteria for the application of new materials and an up-to-date methodology for the best development of show caves are reported.

1. Introduction

The development of a wild cave in order to obtain an easier way started many ten thousands of years ago when our ancestors decided to use the caves for their ceremonies. Obviously at that time the main scope was to obtain a reliable result with the simplest intervention. Probably some steps carved into a steep soil are one of the earliest examples (Fig. 1). If the consequence to the environment was negligible the step life was acceptable only if their use was limited to a small number of people.



Figure 1. The prehistoric (6000–4000 years b.C.) staircase in the Grotta dei Cervi di Porto Badisco, Italy (Photo Cigna).

Similar interventions continued for a long time, but only more recently the interventions on wild caves became more relevant when the aim was the development of a cave into a show cave to be visited by a large number of persons.

Excavations, demolition of some formations, construction of pathways became widespread and the advantage for the visitors prevailed to the protection of the environment. Only in the last tens of years the protection of the environment was taken into due account to make a choice among different solutions.

This paper has the scope to describe the up-to-date solutions provided by the most advanced technology.

2. The development of a show cave

The fundamental criteria presently adopted are the protection of the cave environment, the safety of the visitors and a correct profit from the cave management. All such criteria must be taken into account otherwise the development would have very negative effects.

As David Summers (2012) stated, the worst fate that can befall a cave is for it to be developed as a show cave, then for it to fail as a business entity, and be closed. The cave becomes very vulnerable to misuse. Therefore the show cave must not be profitable for the short term, but perpetually.

The view that a show cave is a golden goose laying golden eggs implies that the goose must be properly fed and protected. This means that is necessary to having all of the knowledge and awareness regarding the physical needs of the cave to ensure that its environment is preserved and conserved.

Recent years have seen a veritable plethora of innovations and concepts relating to the best cave management, which are here pointed out.

3. Materials

3.1. Conventional materials

3.1.1. Surface infrastructures

Buildings, with the ticket office, direction, guides, souvenirs, etc., were built as close as possible to the cave entrance. The same criteria were followed for the car and bus parking, which were asphalted. Often these areas were close to the cave and, in particular, above the cave itself, with the consequence of avoiding the rainwater percolation.

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3.1.2. Pathways

The first developments of show caves had a minor impact on the environment because in general the pathways were obtained by carving some steps into the rock in order to decrease to a minimum the displacement of material into or out the cave. Also formations, mainly flowstone, were excavated to allow an easy transit of visitors.

A further improvement was obtained with concrete (reinforced when necessary) for steps and floor. This material has no adverse effects on the cave environment because from a chemical point of view has the same composition of limestone. The iron or steel used to reinforce the cement could sometimes cause breaks when got rusty.

The handrails in stainless steel were also a convenient solution, particularly when they were also used as pipes to provide water in different parts of the cave to wash out the pathways. The higher cost of stainless steel was justified by a lack of any maintenance also after many years of operation Cigna et al. 2000).

Sometimes zinc plated iron structures solved the problem of providing pathways in difficult situations as overcoming cave passages at a level higher than the lower floor or negotiating upwards or downwards a pothole or a big hall (Fig. 2). It must be stressed that zinc is toxic for cave fauna and therefore it is acceptable only in caves with an important water flow that assures a good dilution of any zinc release.



Figure 2. Zinc plated iron pathways in the Su Mannau Cave, Sardinia, Italy (Photo Cigna).

Occasionally only, wood was used for bridges and staircases because of its decay in a wet environment (Fig. 3). Its use in ice caves was frequently adopted because it is less slippery and the organic decay is absent in this special environment. In temperate temperature caves wood becomes an important food source altering the cave biota.

3.1.3. Lighting

The lighting candles, torches and oil lamp were successfully substituted by electric lamps in the XXth Century. Unfortunately the overall luminous efficiency of incandescent lamps is no higher than 5% the rest of the energy being released as heat. This fact implies an unwanted release of energy to the environment and a higher cost of the power supply.



Figure 3. Wooden staircase in Grotta di Trebiciano, Trieste, Italy. These staircases have been initially installed in 1894 during the investigation for providing water for Trieste. The platforms (top in the photo) were installed one century ago in pitchpine treated with copper sulfate and carbonileo (Photo Maizan/SAS).

3.2. Modern materials

3.2.1. Surface infrastructures

The siting of the above ground facilities must be well planned by avoiding that these features be built over the cave itself, or relevant parts of it. In particular any intervention such as the watertight surface of a parking area must be avoided. Any change in the rainwater seepage into a cave as well any change to the land above the cave may have a negative influence on the cave and the growth of its formations.

3.2.2. Pathways

In the last tens years new material were developed with incredible advantages with respect to the past. In particular the pathways can be built entirely with plastics. The material used for the pathways, including the railing and kickplate, are manufactured by a pultrusion process. It is a continuous molding process whereby reinforcing fibres are saturated with a liquid polymer resin and then carefully formed and pulled through a heated die to form a part.

Pultrusion results in straight constant cross section parts of virtually any shippable length. where continuous fibreglass roving and mat is covered by resin. The resin used for handrails is, e.g., isophthalic polyester and the resin used for other components is vinyl ester. Both have a low flame spread rating of 25 or less. These materials are delivered in various colours, avoiding, e.g., the brightness of the stainless steel that is not aesthetically agreeable.

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These components have about one-third the weight of steel allowing easy installation using standard circular or sabre saws. Stainless steel bolts connect the different parts. Such pathways may be easily repaired or modified to adapt to new layout if necessary.

Since the mechanical properties of these materials are very close to steel's properties it is evident the advantage because also long sections can be easily transported inside a cave, while the different parts can be easily worked out with simple instruments.

3.2.3. Lighting

Nowadays very efficient light sources have been developed. The most useful in caves are the LEDs and the cold cathode lamps (CCL). Both are characterized by a very long life of 50,000 hours and longer. The LEDs cost from 20% to 100% more than CCLs for the same results.

Table 1. Indicative comparison of the overall luminous efficiency per input power for different lamps (lm/W).

Lamp	lm/W
Incandescent (IL)	15
Light emitting diodes (LED)	45
Light emitting diodes (LED)	67

In Table 1 a comparison among the overall luminous efficiency (as lumen/watt) per input power for incandescent lamps (ILs), LEDs and CCLs.

The advantage of the new light sources is evident both for the cost of lighting and the long life of the lamps. But these new sources have specific qualities of their own. LEDs are point sources while CCLs are linear. LEDs may be chosen with different temperature colour, i.e. warm (with a red component) or cold (more white). CCLs may be produced with a negligible contribution of their emission spectrum in the regions (around 430–490 nm and 640–900 nm), which mostly contribute to the chlorophyllian process. In this way the proliferation of lampeflora is reduced.

The emergency lighting can be obtained at a very low cost with the "rope light" i.e. a flexible plastic polymer rope with lights inside that can be cut at a convenient length and placed along the pathways (Fig. 4). In particular such emergency lights can be divided into two sections distributed alternatively and connected to two different power lines in order that, in case of a failure of one section, there will always be another one in operation.

Such a kind of lighting can also supply enough light to the pathways in normal conditions, and special features only must have additional light sources.

3.2.4. Environmental monitoring

In the past a complete network to supply environmental data to a central computer was considered a best solution data to a central computer was considered a best solution to be achieved. But it was experienced that such a network might be convenient for larger caves only. The main problems being a relatively high cost (installation and maintenance) and the danger of damages due to lightning, which may discharge high tension peaks on the line connecting the sensors with the main computer.



Figure 4. The emergency lights placed along the edge of the pathway in the Grutas de Bustamante, Mexico (Photo Cigna).

A less expensive solution, which is also more robust, is obtained with a number of stations whose data are downloaded, e.g., once a month, and the elaboration is carried out in a computer outside the cave without any hardware connection.

In addition to the usual parameters (temperature, relative humidity, etc.) radon became a relevant issue due to the regulation in some countries requiring a monitoring of its concentration in air on a yearly basis. The scope is the evaluation of the yearly average dose to cave guides to be kept below a given value, otherwise this personnel would be classified as professionally exposed and implying a number of constraints for the cave managers (Cigna 2005).

The most suitable detector is the etched track detector because it is unaffected by humidity, may be kept to record the average concentration up to one year and their cost is very low. Other detectors do not comply with such characteristics and, in general, should be avoided.

4. Methods

4.1. Conventional methods

4.1.1. Pathways

In the past the layout of the passages was simply obtained on the spot according a procedure quite similar to that adopted for the staircase of Fig. 1. Later, the use of concrete and the excavation into the rock of formations required a more detailed preparation.

4.1.2. Lighting

The layout of the lighting network was often left to local electricians, resulting in a bundle of cables close to the passages, with the lamp sometimes attached to cave walls or formations.

4.2. Modern methods

4.2.1. Pathways

The design of fiberglass pathways needs a detailed survey of the strip where the pathway itself will be installed, because each element can be prepared in advance according

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the design. During the assembly of the pathway the legs require only small adjustment that can be easily obtained with sliding feet.

4.2.2. Lighting

The power supply must comply with both the country rules, which at present are in general rather severe and the aesthetic requirements. The plastic pathways may host below the platform and along the legs, pipes with the cables of the power supply. The cable network may be somewhat more complex than in the past because in general only the parts of the cave occupied by visitors should be switched on. The power supply of the emergency light should be splitted into at least two independent sections as reported above.

4.2.3. Other networks

In case of a complete network to supply environmental data to a central computer, as well as the telephone, cables run into other pipes. To improve visitors' safety, a special network enabling a guide to talk with the outside office from any point of the cave would be strongly advisable.

4.2.4. Visitors carrying capacity

As it is well known, caves may be classified into widely different energetic categories. Heaton (1986) proposed three categories: high-energy, moderate-energy, and low-energy levels. In order to avoid any permanent change in the environmental equilibrium it is necessary to avoid the introduction of energy beyond the intrinsic cave capacity. Such a constraint implies a limitation of both electric power supply for the cave lighting and the visitors' flow, i.e. the visitors carrying capacity.

This limit may be evaluated according different methods and specialists only are entrusted to carry out the whole procedure according the best choice to be applied to each local situation (e.g.: Mangin et d'Hulst 1996; Lobo et al. 2013).

5. Conclusions

The UIS Management Guidelines for Show Caves are very useful recommendations, if not a list of the least requirements, for a good development and management of a show cave. But such guidelines do not include the principle that it is imperative to keep oneself always up-to-date with the advancement of technology. But it is also important to have an open mind and not to stick to old

solutions when something new and more reliable becomes available.

Since technology is evolving so fast, it is often impossible to suggest or recommend the best solutions because in the meantime an important improvement has already occurred.

In addition to the new materials and methods reported above, any data collection might be of little or no use at all in the absence of persons who have the capacity to take advantage of the data themselves. Probably a good Scientific Committee abreast of the management is the most important tool to assure a good development of a show cave. In any case the members of such a committee must obviously have a deep competence in their specific fields of interest but also a good knowledge of the cave environment is instrumental.

Acknowledgments

The author is grateful to dr. Daniela Pani for the revision of the English text and to M. Restaino and S. Dambrosi for providing the vintage picture of the Trebiciano cave.

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2014 - 50th Anniversary

INTERNATIONAL JOURNAL OF SPELEOLOGY



By Prof. Ph.D Bogdan P. ONAC (Romania)
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I feel highly honored and privileged to write this editorial at such a remarkable moment in time for the world's premier karst and cave science outlet, the International Journal of Speleology (IJS).

Since 1978, IJS represents the "voice" of the International Union of Speleology. The first chief editorial mandate was attributed to Prof. G. Claus at Florida State University in Tallahassee. By coincidence, after 50 years - time in which many great editors led IJS - the Editor-in-Chief is once again affiliated with a state university in Florida. The first volume of IJS came out in October 30, 1964, and included 19 articles mainly covering cave biology topics.

These papers were written by authors from around the world, emphasizing IJS's international coverage from the very first issue in all aspects, i.e., location of research, authorship, and readership.

The journal policy in those early years was to include papers related to all research fields involving cave and karst science. It soon grew clear to those handling IJS that because of the diversity of topics submitted to the journal, grouping biospeleology and physical speleology papers in different issues became a necessity. For several decades, the editorial board struggled to maintain a reasonable balance between these two main fields, publishing 2 to 4 issues per year. Although attention to this balance has been given throughout the past fifty years, there were times when one or the other topic prevailed. Over the last two decades, a number of other journals made their way to the top of the karst-publication pyramid.

Most of them are now publishing a mixture of papers reporting results from all karst fields, as does IJS, reinstating the initial policy of accepting all but strictly biospeleological studies, which have now their own dedicated journal.

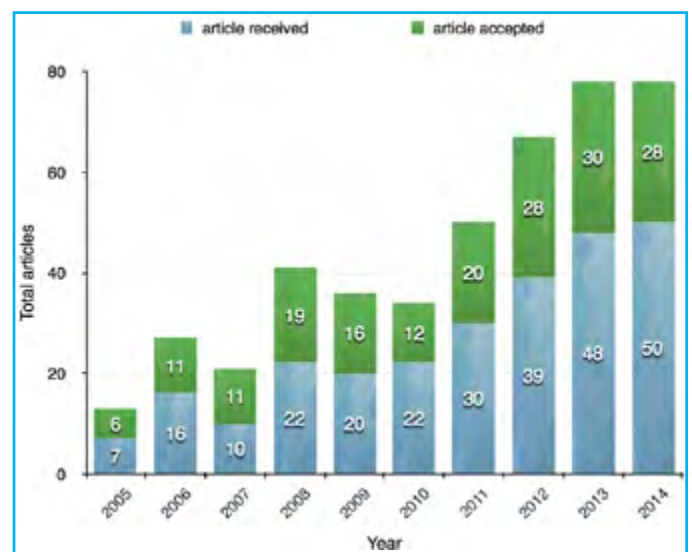
The number of papers submitted fluctuated greatly over the IJS's lifetime. If we examine the last decade in the figure below, we notice this trend as well. Over the last 6 years, the number of submissions

increased continuously, with a significant jump since 2011 when the online submission was implemented as part of the open access platform sponsored by the University of South Florida Libraries. It is always unpleasant to reject a paper behind

which authors packed a significant amount of work, but as Editor, I strive to keep the science in each and every article published in IJS at the highest level possible. Currently, the acceptance rate is 62.7%. In long run, this approach should be of benefit, especially to the karst and cave scientific community, but also to the journal itself as it will gain further recognition among other Earth Sciences journals.

IJS will try to keep current and bring its readers as many "hot" topic papers as possible. To do so, apart from regular Research Articles, we invite Review Articles and encourage contributors to submit short, highly original and significant papers for speedy dissemination as Rapid Communication articles.

To maintain the high quality of IJS, the first objective must be to retain a strong flow of extensive papers on groundbreaking theoretical and applied to-



IJS-Articles received and accepted since 2005

pics or case studies of karst research. In addition, IJS supports the publication of thematic Special Issues on significant topics in emerging areas or on key cave and karst sites.

This is an efficient way of disseminating the major research communicated during scientific meetings. The individual papers are peer-reviewed and published as soon as available in regular issues, but then labelled as part of the special issue and linked electronically.

Technology has greatly changed the field of karst/cave exploration and research. Like other fields in the earth sciences, over the last decades karst science has experienced rapid growth resulting from fast-paced and revolutionary advances of analytical facilities.

Recent developments in a suite of techniques (e.g., X-ray powder or single-crystal diffraction, inductively coupled plasma-mass spectrometry, electron microprobe, scanning electron microscopy, stable isotopes, LIDAR, DNA sequencing, etc.) give karst scientists unprecedented opportunities to advance the understanding of caves as physical, chemical, and biological environments.

This translates into more exciting new discoveries being communicated to scientists and cavers via karst-dedicated journals and other publications.

Making intelligent predictions on what one should expect (in terms of science) for the next fifty years is nearly impossible in this complex and highly diverse field of karst research.

As we enter the second half century of IJS, I expect a continuing growth of high quality papers, with many studies directed towards under-investigated cave deposits, karst features, cave microorganisms, as well as other various cave processes and products.

It is my hope that the International Journal of Speleology will remain at the forefront of publishing research papers of the highest caliber and impact in the field of karst science. A critical factor shaping the quality of papers published in IJS remains the capable work of our editorial board and our reviewers.

I would like to thank everyone who contributed their time and expertise over the past 50 years to help make IJS the journal it is today. So, Happy Birthday to IJS at its 50th anniversary and I look forward to the next 50 years, or at least part of them.

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Available at: <http://scholarcommons.usf.edu/ijs/vol43/iss3/15>



2015 - 50th Anniversary

UNION INTERNATIONALE
DE SPÉLÉOLOGIE

In 2015 the UIS will have successfully completed 50 years of international activity.

Events are being prepared to celebrate this important anniversary.

The official 50th anniversary ceremony will be held in Postojna, Slovenia, in June, where the UIS was founded in 1965, during the 4th International Congress of Speleology-ICS.

The world's speleological and scientific communities will be cordially invited to participate.



4th ICS, Postojnska jama, Congress Hall
12 Sept. 1965 - Formal opening of the congress

IN MEMORIAM

MICHEL LETRÔNE

France, 1933-2014

Par Marcel Meyssonier (France) et Jean-Pierre Bartholeyns (Belgium)

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Michel Letrône in 2006

Michel Letrône, né à Lyon, le 1er janvier 1933 est décédé le mercredi 13 mars 2014 au matin, à son domicile de Villeurbanne en France.

Il est le fondateur de l'Ecole Française de Spéléologie, membre d'honneur de la Fédération Française de Spéléologie (FFS) et le premier président de la commission Enseignement de l'Union Internationale de Spéléologie,

Michel Letrône a, entre autres, écrit un texte sur la naissance de la Commission Education de la Fédération Française de Spéléologie. Il est disponible ici: <http://speleos.org/efs-ffs.htm>.

Le 15 juin 2012, le journal "La République des Pyrénées" a publié un article à son sujet. Voyez ici: <http://www.larepubliquedespyrenees.fr/2012/06/15/une-passion-souterraine,1087441.php>

Ci-joint un de ses poèmes écrit en 1969:

Spéléologue, pourquoi ?

Pauvre spéléologue!

Comment peut-il se faire comprendre

Alors que lui-même ne sait pas ce qui lui plaît sous terre ?

Ce qui est sûr , c'est que ça lui plaît.

Il y a tant de raisons, mais quand il essaie

D'en citer quelques-unes

L'incompréhension de son interlocuteur

N'en est que plus grande.

Et si je vous disais que . . .

Les entrailles froides, noires et humides de la terre

M'attirent parce que j'aime le soleil et la nature,

Parce que, pour bien les aimer, pour bien les apprécier,

Il faut les mériter.

Quand, après une dure expédition,

Je retrouve cette nature, je respire son odeur

Que vous ne connaissez pas, je vois sa beauté

Que vous ne voyez plus: en un mot, je la comprends.

Pour aller explorer le gouffre que m'avait indiqué

Un vieux bûcheron, j'ai découvert,

Hors des routes et des sentiers,

Dans les déserts boisés du Vercors, la source fraîche,

Le sapin foudroyé, la clairière aux chanterelles,

Le repaire du renard . . .

Vous ne les avez pas vus, vous êtes passé trop vite,

Loin sur la route. Et pourquoi seriez-vous venu là ?

La carte routière indiquait un beau point de vue

"Avec parking" trois kilomètres plus loin.

Vous pourrez dire à vos amis:

"J'ai fait les Grands Goulets..."

Moi je ne pourrai rien dire,

Car ce que j'ai vu n'est pas aussi spectaculaire.

Michel Letrône, 1969

IN MEMORIAM

MICHEL LETRÔNE

France, 1933-2014

By Marcel Meyssonier (France) and Jean-Pierre Bartholeyns (Belgium)

marcel.meyssonier@ffspeleo.fr - jp.bartholeyns@gmail.com



Michel Letrône in 2012

Michel Letrône was born in Lion, France, in January 1st, 1933.

He was founder of the French School of Speleology, as well as honorary member of the French Federation of Speleology (FFS) and the first president of the Teaching Committee of the International Union of Speleology.

He died in March 13th, 2014 in the morning, in his residence of Villeurbanne, France.

Michel Letrône wrote, among other things, a text about the birth of the Speleological Education Commission of the French Federation of Speleology. This text (in french) is available at <http://speleos.org/efs-ffs.htm>.

The french newspaper "La République des Pyrénées" published an article about him on June 15, 2012. See at <http://www.larepublique-despyrenees.fr/2012/06/15/une-passion-souterraine,1087441.php>.

Beside is a poem written by him in 1969:

Caver, why ?

Poor caver!
How can it be understood
While he himself does not know what he likes
underground?
What is certain is that he likes it.
There are so many reasons, but when he tries
To name a few
Misunderstanding his interlocutor
Is all the greater.
And if I told you that ...
Cold, dark and humid bowels of the earth
Attract me because I love the sun and nature,
Because to love well, to fully appreciate,
It must be earned.
When, after a long expedition,
I found this nature, I breathe the smell
You do not know, I see its beauty
What you do not see in a word, I understand.
To explore the chasm that had told me
An old woodcutter, I discovered,
Off roads and trails,
In forest deserts of Vercors, fresh source,
The tree struck, the clearing with chanterelles,
The fox den ...
You did not see them, you have gone too fast,
Down the road. And why would you come there?
Map showed a beautiful point of view
"With parking" three kilometers away.
You can tell your friends:
"I made the Great bottlenecks ..."
I cannot say anything,
Because what I saw was not as spectacular.

Michel Letrône, 1969

IN MEMORIAM

IVAN GAMS

Slovenia, 1923-2014

By Andrej Kranjc (Slovenia)

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Ivan Gams in 2009

PROF. EMERITUS DR. IVAN GAMS Karstologist and Speleologist

Ivan Gams was born on July 5, 1923 near the town of Slovenj Gradec (Koroška - Slovenian Carinthia) and studied geography, ethnography, and national history at the Ljubljana University. Soon after the promotion and obtaining the “doctor of science” title (1959) he has been engaged as a researcher at the Karst Research Institute at Postojna.

He remained there until 1966 when he was elected as professor at the Geographical Department (Faculty of Arts, University of Ljubljana). He started with teaching the geography of karst, however besides his interest in karst studies, he was additionally engaged in various subjects of physical geography throughout the years to the end of his active life.

As the highest acknowledgment of his work he was elected a full member of the Slovenian Academy of Sciences and Arts in 1985.

For the purpose of his karst research it was of utmost importance for Ivan Gams to be able to visit underground karst as well, so already in 1951 he became an avid caver.

As everything else in his life, he took caving extremely seriously and he soon became a skilled and highly experienced caver; he was recognised as such by his fellows as well.

Ivan Gams was the first among the young generation (i.e. those active after the Second World War) of cavers who has been elected to the Board-of-Directors of the Ljubljana Caving Society (1952); this society being at the time at the forefront of the caving organisations in Slovenia, albeit one has to admit that it was also more or less the only one.

I believe it is important to stress this because the Board-of-Directors at that time being quite conservative and often rather narrow-minded meaning that for younger cavers it was inaccessible. Ivan Gams was learning fast and reached the pinnacle among the cavers very soon.

In 1958 he organized a survey of the 107 metre-deep-shaft, the deepest known of the Dolenjsko region (Lower Carniola) at that time. However, he did not only organize the expedition, he was also among the first to reach the bottom of the shaft. In 1955 Ivan Gams began to explore Triglavsko Brezno (Triglav Shaft), having the entrance at the altitude of 2.500 m; thereafter in 1961 he organized the action titled “The Bottom”, probably the greatest caving event ever performed in Slovenia.

During this week-long action 28 cavers (“sherpas” not included) with more than one tone of equipment reached the bottom of the shaft at -255 m. Just four members reached the bottom, Gams among them. However, the main interest of Ivan Gams was not reaching for glorious caving achievements, but rather collecting the data that he could thereafter use for his scientific work.

In the frame of his study of climate changes during the Pleistocene he was especially interested in ice- and high-mountain-caves. The other important topics of his cave studies included morphology of caves and speleothems.

The results of his studies are based on his meticulous data analysis and careful measurements of microclimate parameters, including those pertaining to ice and water, furthermore on gravimetric analyses and measurements of flowstone accretion rate depending on the climate conditions, etc. Upon his instigation and under his leadership the measurements of corrosion intensity by the “tablet method” started more than 50 years ago and today this method is applied all over the World.

It is also important to mention his great contributions to the knowledge of surface karst phenomena and karstification processes, where his role is known worldwide. His complete bibliography consists of over 1.200 units, among them about 700 original scientific papers, over 300 works dedicated to karst, majority of them connected directly to the speleology. Some of them could also be classified as basic publications on caves in Slovenia.

Just to mention one example of his appreciation of in-depth studies and his desire to accurately describe his research: one of his papers published in *Acta carsologica* describing the cave of Logarček has 77 pages. In his two books, *Karst* (1972) and *Karst in Slovenia* (2004), there are numerous descriptions, surveys, and photos of many caves, in fact these books could be understood as two small, but extremely important, encyclopaedias of caves of Slovenia.

His important contribution to the editorial work should not be overlooked either: he was the editor of the *Slovene Caving Manual*, he was a long-time member of the Editorial boards of the Slovene speleological bulletin “*Naše Jame*”, of the karstological journal “*Acta Carsologica*”, and of some foreign journals, including French “*Karstologia*”, to mention just one.

As an active and highly competent speleologist Ivan Gams never avoided the duties entrusted to him by many speleological and other professional organizations. I would like to mention some of his activities in the frame of former. For a decade he remained the member of the Board of the Slovene Cave Research Society. After its reorganization he became the first president of the Caving Association of Slovenia (1962).

In 1965, during the Fourth International Spe-



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Ivan Gams in 2005, after being awarded as Honorary Member of the Scientific Research Centre/Slovenian Academy of Sciences and Arts (SRC/SASA)

leological Congress (at Postojna and Ljubljana), Gams being one of the leading organizers, he was the initiator and a strong supporter for the establishment of the International Speleological Union.

Later, when his hard work in this regard came to fruition and the above mentioned International Speleological Union was established, Ivan Gams became a member of the commission dedicated to the problems related to corrosion as well as being the president of the Karst Denudation Commission of the Speleological Association of Yugoslavia.

Connected with all his achievements, it is not a surprise at all that he was the recipient of many prizes, medals and awards; among these he has obtained the Golden Medal of the Speleological Association of Slovenia, he was an Honorary Member of the Speleological Association of Yugoslavia, and as a great recognition of his lifetime work, a cave spider *Troglohyphantes gamsi* bears his name for eternity.

On Friday, March 14, Ivan Gams was buried on the Ljubljana cemetery of Žale and over the open grave the standard of the Speleological Association of Slovenia paid him homage.



IN MEMORIAM

OSVALDO MARTÍNEZ

Argentina, 1960-2014

By Oracio Costa - Grupo Espeleológico Argentino (GEA)

horaciohcosta@yahoo.com.ar



Osvaldo Martínez en Febrero de 2011, durante expedición del Grupo GEA al cerro La Barrosa - Balcarce, Buenos Ayres, Argentina.

Osvaldo Martínez in February 2011 during expedition of Group GEA to Cerro La Barrosa - Balcarce, Buenos Ayres, Argentina

Lamentamos profundamente comunicar el fallecimiento de nuestro querido amigo Osvaldo Martínez en el 7 de Septiembre de 2014 por causas naturales. El trabajo y la trayectoria de Osvaldo se caracterizó por la idoneidad y el compromiso ininterrumpido sin ansias de ninguna figuración personal.

La alegría, el humor y el arte por el que también estaba signado y nos regalaba en cada campaña y cada reunión fueron distintivos y serán irremplazables. Deja un enorme y silencioso legado para la Espeleología Argentina luego de 34 años de Espeleo.

Sin embargo y mucho más que eso, hoy se nos fue un amigo de los que están desde siempre en el centro del alma.

Un hermano de los que uno elige y tiene la suerte de ser elegido.

We deeply regret to communicate the decease of our beloved friend Osvaldo Martínez, on September 7, 2014, due to natural causes. The path and work of Osvaldo was characterized by his aptitude and uninterrupted commitment without incontrollable need of showing off.

Happiness, humor and the art for which he was touched and that he freely gifted us in every exploration and in every meeting were distinctive and without replacement. He left a great and silent legacy for the Argentinean speleology along its thirty-four years of speleology.

Nevertheless and much more than that, today a friend departs, one of those who were close to the heart. A brother of those who one selects and have the luck to be selected by him.



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Prof. Dr. Nadja ZUPAN HANA (Slovenia) in Iran

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The UIS General Assembly at the 15th ICS decided to change the annual contributions of the UIS member-countries to Euro currency, while keeping the same rates as those since 1994. The annual contributions will be as follows, starting from January 2010:

- Category A - 300 Euros
- Category B - 200 Euros
- Category C - 50 Euros

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EUR (Euros)
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Building of the Karst Research Institute in Postojna, Slovenia, where the headquarters of the UIS are.
In the detail, the bronze plaque with the emblem of the UIS affixed below the name of the institution

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UIS Bulletin, nor its editors are responsible for:

- misspellings
- wrongly written names
- incorrect articles
- typographical mistakes

Every effort possible has been made to keep all articles as close to the original version. In some cases, the editors review the structure in order to present the article in a clear and consistent manner and obvious errors are corrected if found.

We appreciate your understanding.

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