



Czech Speleological Society 2001-2004





Fatima Cave in Hormoz salt diapir, Iran.
Photo by: T. Svoboda, M. Filippi



Passage in White Foam Cave, Iran.
Photo by: T. Svoboda, M. Filippi



Speleothems in To-Ha Cave, Riviera Maya, Quintana Roo, Mexico, Photo by: by Radek Husák
Front page: New Sloup Corridor, Amaterska Cave, Czech Republic. Photo by: Zdeněk Motyčka



Czech Speleological Society



2001—2004



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Dear Colleagues

I am very pleased and it is a big honour for me, that on following pages we are able to inform you on activities of members of the Czech Speleological Society in the period since the last 13th International Congress of Speleology 2001 in Brasilia DF, Brazil.

The principal part of our activity have been carried out in caving clubs, associated in our Society, which represents the predominant majority if all caver of the Czech Republic. We have been exploring the each part of our small country, however rich in karst and pseudokarst forms. We follow more than 200 years long history, full of work of our predecessors. This activity is focused in the first part of the volume.

The second part deals with the principal discoveries and researchers carried out on domestic localities. They are described in more detail. The third part is devoted to the most important discoveries and expeditions abroad organized by Czech cavers, or in which our cavers took dominant part. The organization of such expeditions represents task for more caving clubs or for whole Society; some of them represent really prolonged international projects

At the end we would like to inform you on idea to host the 16th International Congress of Speleology 2013 in the Czech Republic, in the hearth of new Europe, in the country full of hospitality and natural beauties. We express our will to welcome you on the occasion of the World-largest caving forum - to welcome you in the Moravian Karst, our largest karst region full of history, - to welcome you in city of Brno, traditional location of International Fares, - to welcome you in 2013. Join us in Brno 2013!

Allow me to wish you good luck in your endeavour in pushing of boundaries of unknown.

▲ **Zdeněk MOTYČKA**

President of the Czech Speleological Society



Report on the activity of the Czech Speleological Society in 2001–2004



The Czech Speleological Society (CSS) joined together 66 caving clubs with 1,233 members on November 9, 2004, i.e. to the date of the last Assembly General. More 15 people held the statute of the individual member (not registered in any caving club).

The CSS Bureau

President :: Michal PIŠKULA

Vice-President :: Zdeněk MOTYČKA

Members :: Pavel Bosák, Radko Tásler, Jan Vít, Oldřich Štos, Mojmír Záviška

▼ The preparation of the new CSS constitution, internal regulations and safety guidelines for speleological activity belonged to the main tasks of the CSS Bureau. The new system of membership evidence was set up. Annual meeting – the *Speleofórum* – was regularly organized. The IIIrd National Speleological Congress took place in 2004. New web pages - www.speleo.cz - were installed. The CSS Bureau established and managed below-listed working commissions and the system of Speleological Rescue Service.

Commission on Speleotherapy

Commission President :: Pavel Slavík

▼ Suitability for speleotherapy was assessed in the Výpustek Cave (Moravian Karst) for Clinic of Pulmonary Diseases of University Hospital in Brno-Bohunice. The preliminary measurements were focused on physical parameters of cave atmosphere, level of radon and its daughter products and presence of heavy metals. It was stated that the speleotherapeutical procedures can be performed in the cave but only after some adaptations. Before the start of speleotherapy itself, one year long monitoring and one year long experimental operation should be performed.



Photo from archive of the CSS

Cave-Diving Commission

Commission President ::: Jan Sirotek

▼ The Commission has been compiling and actualizing the list of all cave divers organized within the CSS. It collects all data concerning achieved qualifications and experiences from individual diving sites. The list is to full disposal of Cave Rescue Service for the case of emergency in flooded environment. The Commission set up the internet conference *cavediver@pandora.cz* which has been serving for information exchange. On *www.speleo.cz/cavediving/* web pages were constructed to present cave diving within the CSS. The Commission prepared safety and training guidelines. Theoretical part of the Course of cave diving was organized in 2003 and 2004 in village of Rudice (Moravian Karst).

Commission on Pseudokarst

Commission President ::: Josef Wagner

▼ The main task of the Commission (sandstone pseudokarst) was focused on co-ordination and co-operation of CSS activities with pseudokarst theme, organization of international events, workshops and conferences, information of caving clubs and information on activity in pseudokarst areas. In the co-operation with the CSS Bureau the Commission prepared materials to publication, like proceedings from different activities. The project "*Slope deformations in the Czech Republic*" started in co-

operation with Czech Geological Survey, Brno branch as the reaction to slope processes initiated by floods in 1997. The research in West Carpathian pseudokarst caves (sites of Vaculov, Kopce, and Kobylská) was included to the project, too. The grant project *“Research of sediments in Polomené hory and Labské pískovce”* was successfully finished with exploration of more than 30 rocky abbris. The finale conference in village of Dolní Věstonice terminated the grant in 2001. Following international activities were organized:

▼ July 9 to 27, 2001: National Park of České Švýcarsko, village of Vysoká Lípa – archaeological and Quaternary geological research of sandstone abbris in canyon of Kamenice River.

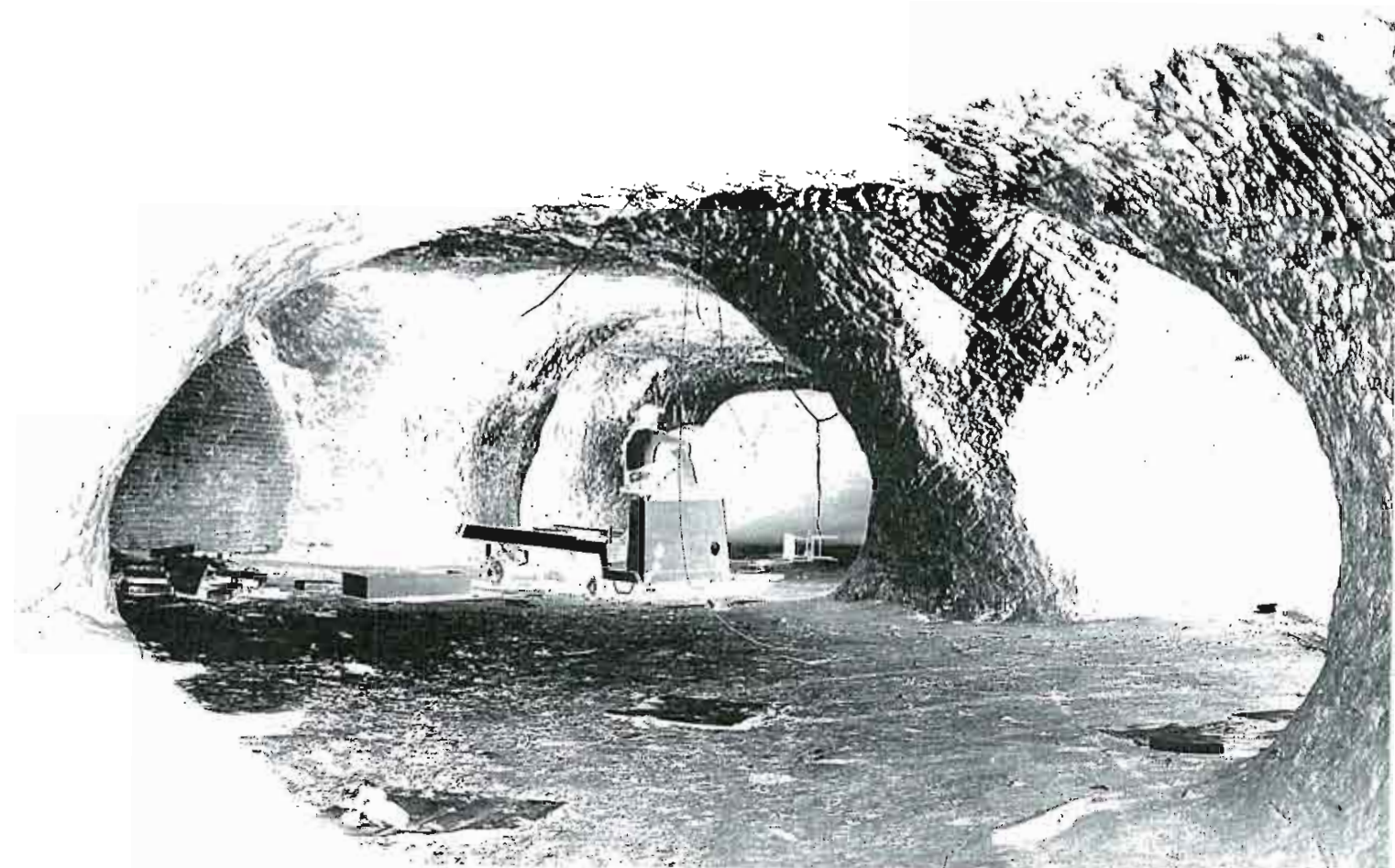
▼ September 14 to 16, 2001: Landscape Protected Area of Kokořínsko – international symposium *“Ironstones”*.

▼ September 26 to 29, 2001: Landscape Protected Area of Broumovsko – symposium *“Recorded geofactor sites on Cretaceous rocks of the Police Upland”*.

▼ November 28 to 29, 2001 Dolní Věstonice – symposium *„The last hunters – foragers of North Bohemia”*, closing event of grant project from 1998–2001.

▼ April 1 to 3, 2004: Hutisko-Solanec, Beskydy Mts. – international symposium *„Slope deformations and pseudokarst”*.

▼ May 26 to 29, 2004: 8th International Symposium on Pseudokarst 2004, Teplý vrch, Slovakia, workshop *“Speleoarchaeology and Quaternary geology of sandstone abbris and caves in region of Česká Lípa”*; workshop *“Evidence and documentation of carvings and relieves in rocks of pseudokarst regions”*



Cave Rescue Service

Head ::: Roman Šebela

▼ The activity of the Cave Rescue Service (CRS) has been focused especially on: Prevention and education in the field of security during the caving activity: training days with the aim to train caving techniques under the supervision of experienced instructors, symposia focused to the first aid at accidents in underground, technical and material assistance at setting of equipment in caving sites with high frequency of visits, etc. Provision of qualified assistance at accidents in caves and other underground sites.

The CSS CRS is organized in four stations: 1. Czech Karst, 2. Pilsen, 3. Moravian Karst, and 4. North Moravia. It is composed of 45 CSS members. The CSS CRS is the active member of the integrated rescue service of the Czech Republic, and organize the training in caves for specialists of Fire Brigades focused especially to cave rescue.

The central training days of all stations are regularly organized on annual basis (2001 in Moravian Karst, 2002 in Slovakia – Nízke Tatry Mts., 2003 in North Moravia, and 2004 in Moravian Karst) with the aim to train team co-ordination of all members and complex rescue operations.

Activity at accidents

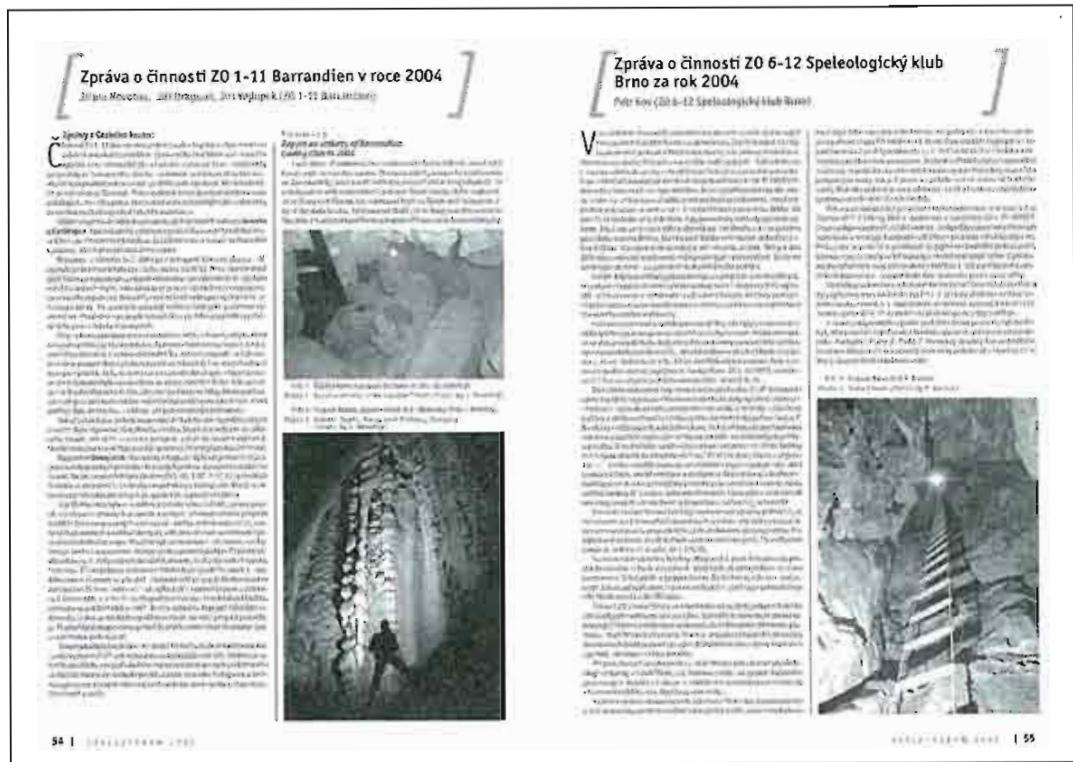
▼ January 28 to 31, 2002 – 5 members of the CSS CRS took part in cave rescue operations in Rákoczi Cave (Hungary). They actively help in successful rescue of cave diver. This event was evaluated as the best international help and acknowledged by the Golden Rescue Cross in 2002.

October 18, 2003 – during the rescue training died Mr. Robert Židlický, the CRS member, in abandoned Zálužná mine.

December 27 to 28, 2004 – the CRS successfully helped to 4 cavers from the Nová Rasovna Cave (Moravian Karst) endangered by flood of the Bílá Voda Creek, which closed the entrance parts of the cave. The action proved perfect co-ordination of all components of Czech Integrated Rescue System.



Logo of the Cave Rescue Service of the CSS



Pages from *Speleofórum* 2005

Publication activity

Speleofórum, ISSN: 1211-8397

- ▼ Proceedings of annual caver meeting “*Speleofórum*” were printed as follows: *Speleofórum* 2001, vol. 20, *Speleofórum* 2002, vol. 21, *Speleofórum* 2003, vol. 22, *Speleofórum* 2004, vol. 23

Speleo, ISSN: 1213-4724

- ▼ Information bulletin of the CSS “*Speleo*” was published as follows: *Speleo* (Praha), No. 33, 2001, *Speleo* (Praha), No. 34, 2002, *Speleo* (Praha), No. 35, 2002, *Speleo* (Praha), No. 36, 2002, *Speleo* (Praha), No. 37, 2003, *Speleo* (Praha), No. 38, 2003, *Speleo* (Praha), No. 39, 2004, *Speleo* (Praha), No. 40, 2004, *Speleo* (Praha), No. 41, 2005

Edition of the *Library of the CSS*

- ▼ (Knih. Čes. speleol. Spol., Praha) continued by following volumes:
 Vol. 37, 2002: Jiří ADAMOVIČ and Václav CÍLEK (Eds.): Pseudokrasový sborník svazek 2, Železivce (Pseudokarst proceedings, vol. 2, Ironstones)
 Vol. 38, 2002: Jiří ADAMOVIČ and Václav CÍLEK (Eds.): Železivce české křídlové pánve – Katalog vybraných významných geologických lokalit pískovcových oblastí (Ironstones of the Czech Cretaceous Basin – Catalogue of selected important geological sites of sandstone areas).

▲ Jiřina NOVOTNÁ



Short reports on activities of caving clubs

Caving clubs are numbered according to regional division of the Czech Republic valid at the moment of the CSS establishment (1978): 1 = Central Bohemia and Prague, 2 = South Bohemia, 3 = West Bohemia, 4 = North Bohemia, 5 = East Bohemia, 6 = South Moravia, 7 = North Moravia. Abbreviation ZO means principal organization (= caving club).

ZO 1-01 Český kras

▼ Members organized several excursions to the Czech Karst and visited Classical Karst in Slovenia (Sežana) and caves and shafts of Jura Mts. in France.

ZO 1-02 Tetín

▼ Members worked in on several sites in the Czech Karst (excavations in Plší, Portálová, Terasová, and Propadlá caves). The Zdenina Cave with the length of 58 and depth of 9 m was surveyed in active Kruhový Quarry near village of Srbsko. Survey activities have continued in Kavčí and Modrý quarries (Czech Karst) and in ponor near Jaštierčie Lake (Slovakia). The exploration and registration of karst forms started in the Classical Karst of Slovenia in region of Temnice village. Caving club participated on exploration of the Silica Plateau (Slovak Karst, Slovakia) performed by local caving club (Badizer). Members participated on expeditions to New Zealand, Lofersschacht (Austria), Provatina and Epos shafts (Greece,) and Abisso di Monte Novegno (Italy).

ZO 1-04 Zlatý kůň

▼ The club discovered, explored and surveyed some caves in the Czech Karst (Austrálie, Elektrifikační, Malá Panama, Prostřelená, Lucie caves), some of them being blasted out in active quarries. In co-operation with Administration of Koněprusy Show Caves, the exploration in Vánoční Caves has continued.

ZO 1-05 Geospeleos

▼ Members discovered and explored about 225 m of hardly accessible new spaces in pseudokarst resurgence cave Bartošova pec (Cretaceous of North Bohemia). They excavated in following caves in the Czech Karst, i.e. Arnika, Palachova propast, Arnoldka caves. Documentation of karst forms was performed in abandoned quarries of Americas (Czech Karst). Members took part in research of cave sediments in the Czech and Moravian Karst (Czech Republic), Slovakia and Slovenia. They monitored water levels in selected caves of the Czech Republic and took part in exploration of some Slovak caves (e.g., Cave of Mrtvých netopierov, cave diving in Skalický Creek) and Moravian caves (Lopač Cave in the Moravian Karst). Club organized 2 expeditions to Romania, one to Croatia (discovery and survey of Pigeon Cave on Gargos Island). One club member took part in expedition to Iran, with the survey of the 2nd and 5th longest World caves in salt (Tří naháčů and Ghár-e Daneshyu caves) and other 20 caves in rock salt. Members took part in numerous other international activities, e.g. expedition to Lofersschacht in 2003, Canin Speleoproject, cave diving expedition Sardinia in 2003.

ZO 1-06 Speleologický klub Praha

▼ The main locality is in Chlum Quarry (Czech Karst) in Srbské, Netopýří, and Fialová caves. Srbské and Netopýří caves were interconnected after years of excavations. New survey of Srbské Caves was finished. Karst forms were documented in vicinity of abandoned Amerika quarries and on the right bank of the Berounka River. The members participated on explorations in Canin Plateau (Julian Alps, Slovenia), in Wielka Snieżna Cave (Vysoké Tatry Mts., Poland), Lofersschacht (Austria), Dolný vrch Plateau (Slovak Karst, Slovakia), on hydrological monitoring in Jánská Valley (Nízke Tatry Mts., Slovakia) and Hučiaca karst spring (foots of the Plešivec Plateau, Slovakia).

ZO 1-08 Speleoklub Týnčany

▼ The club has been operating in the Týnčany Karst (Central Bohemia), especially in following caves: Týnčanská Arnika, Beznadějná, Divišova, Velikonoční, Jarnika, and Dvořáková. New cave was discovered explored and surveyed in that area (Kočičí zámek). Annual census of bats is the traditional activity, too.

ZO 1-10 Speleoquanaut

▼ The club has been specializing on cave diving. Its members worked in numerous localities abroad and home (e.g., Moravian Karst). Members has collaborating on exploration of the cave system of Skalický Creek (Slovakia) for a long time, especially on exploration of cave section behind the 22nd sump and in the rising part of the system. They participated on exploration and survey of sumps in other Slovak caves: Moldavská, Zúgó, Bezodná

řadnica, Milada. Tracing test was performed in Cave of Zlomísk proving the connection with Hlboka Cave, here also detailed exploration and survey was finished.

ZO 1-11 Barrandien

▼ Members have concentrated to exploration of caves in the Czech Karst. Nad Kačákem Cave: excavations of fill continued, newly discovered spaces in the upper level were surveyed, terminal points were located at the surface by radio-wave method. Jarnice Cave: continuation was subsequently discovered and interesting speleothems located (helictites, metres long spaghetti, etc.). Annual expeditions to Dolný vrch Plateau (Slovak Karst, Slovakia, and Hungary) were regularly organized. The monograph on caves and shafts of the Dolný vrch was published. Members took part in expeditions to Lofersschacht (Austria), Canin Plateau (Slovenia) and Bohemia Cave (New Zealand).

ZO 2-01 Chýnovská jeskyně

▼ Members participated on removal of excavated material deposited during opening to tourist inside the Chýnovská Show Cave. Several tens of metres of new galleries were discovered. The cave-diving exploration in flooded part of the caves was renewed. Members are interested also in exploration of historical underground, too. Abandoned Úraz mine: complete documentation and pumping of flooded part were finished. The shaft is 14 m long and the length of upper level is 120 m and of the lower one is 50 m. In Josef Gallery (Ratibořské Hory): survey of accessible parts was finished. State Castle of Kámen: renewal of explorations from 1984, old water well 18 m deep filled with material was discovered.

ZO 2-02 Šumava

▼ New spaces were discovered in Jiříčkova and Drabí díra caves (vicinity of Volyně city) and new 40 m were discovered in Cave on Vápenný vrch. Members participated on exploration of abandoned mines in the Rudolfov mine district and on documentation of rests after mining activity in the Pelhřimov mine district. Cave-diving exploration of flooded abandoned Paště gold mines (Kašperské Hory and vicinity) was performed, as well as in karst near Ledec nad Sázavou city (flooded parts of Pod Šeptouchovem Cave). Two new caves were discovered in Sušice-Horažďovice belt of metamorphosed limestones (Pod Radvánkou and Pod Pumperkem).

ZO 3-05 Permoníci

▼ The activity was focused on monitoring and documentation of abandoned mines in the Karlovy Vary and Pilsen regions. The members of the CSS CRS participated on training activities and on collaboration with Fire Brigade Rescue. Club members took part in expedition Aggtelek 2003 (Hungary).

ZO 4-01 Liberec

▼ Excavations were performed in Ještěd Karst, namely in following caves: Hanychovská, Malá Basa, Velká Basa, Loupežnická, Rokytky, and Nedobytná. The third level of the Nedobytná Cave was discovered in 2004 with 22 m of new galleries (total cave length is now 99 m and depth is 16.5 m). The research of bats has continued in the whole region of interest. Members took part in expedition to Slovak Karst (Slovakia).

ZO 4-03 Labské pískovce

▼ The activity has been focused on exploration and survey of Middle Ages mining of bituminous coal, iron ores, silver and sandstone pseudokarst in the region of České stře-dohoří Mts., Labské pískovce, Lužické hory Mts., and České Švýcarsko. Carvings and relieves were documented in Stříbrné stěny near village of Hřensko. Accessible parts of water adit were explored and surveyed in Monastery of St. Laurent and Loretta in city of Rumburk.

ZO 4-04 Agricola

▼ Members worked in abandoned mine of Himmelfürst und Kreuzstollen in the Krušné hory Mts. and participated on construction of the Museum of polymetallic and silver-bearing ores in village of Mikulov.

ZO 5-01 Bozkov

▼ Excavations have continued in Bozkov Dolomite Show Caves. During water pumping there, spacious room was discovered, developed in 2 levels. Exploration in following caves also continued: Poniklá, Propad in Železný Brod-Popluzí (Na Poušti) and in quarry near village of Kněžice. Documentation and exploration of complex of abandoned mines for sand represents another traditional activity. Meteorological and hydrological monitoring continued on the Králický Sněžník Mt. on Czech-Polish border. Glaciospeleological expeditions are organized to Spitsbergen with the aim of monitoring of changes of glaciers. New cave (Tony) was discovered on Werenskiöld Glacier. The cave bottom is entrenched to the underlying rock. Exploration of the Torell Glacier continued. Biospeleological research started here.

ZO 5-02 Albeřice

▼ Club explores caves in eastern part of the Krkonoše Mts., e.g. long-lasting monitoring of water level and bat census in the Albeřická Cave. Abandoned Kovárna Mine (Obří důl) was open to tourists. Members systematically investigated and located localities with traces of mining activity and karst forms and summarised their databases. Club organized annual expeditions to Julian Alps (Slovenia). It organized also 2 expe-

ditions to Bohemia Cave in New Zealand (region of Mt. Owen), where 600 m of new galleries were discovered and surveyed. The interconnection with Plukovníkův omyl Cave was not successful.

ZO 5-03 Broumov

▼ General exploration and evidence of until unknown pseudokarst cave and forms was performed in Cretaceous sandstones of Adršpašsko-teplické skály, Czech part of the Stolové hory, Broumovské stěny. Survey has continued in Broumovské stěny, Ostaš and Kočičí skály. In geodetic network of Ostaš-Hejšovina was maintained and detailed gravimetric measurements were made in all point of that net. Members participated on activity of Commission on Pseudokarst both of the CSS and the UIS, collaborated with numerous professional organizations home and abroad (Poland, Germany, Slovakia, Hungary) on problems of sandstone pseudokarst, biospeleology, Quaternary geology, geotechnical engineering, geodesy. They organized several symposia on pseudokarst. Publication activity was also important.

ZO 5-05 Trias

▼ Bat census is regularly performed in Podolská and Páterova caves (Železné hory Mts.). Occurrence of karst forms has been monitored in large active quarry. Club deals also with exploration of abandoned mines in the Kutná Hora mining district. Complete map was finished for the Museum Mine. New galleries were discovered here. Survey and mineralogical activities also continued. Field exploration of sinkholes was performed on locality of loess pseudokarst at Miskovice village and near Vrchlica Dam; investigation of cave fill in Miskovická Cave continued. Members dealing with cave diving took part in expedition to Florida (USA) and south-western France and co-operated on cleaning of Lower Lake in the Macocha Abyss (Moravian Karst) and on its connection with Čtyřcítka Cave.

ZO 5-07 Antroherpon

▼ The club activity is specialized on biological research in caves and shafts of the Czech Republic, in Slovakia, Hungary, Slovenia, Croatia, and Bosnia and Herzegovina. Biologists dealt especially with species from groups of Pseudoscorpiones, Coleoptera, and Isopoda. The detailed collaboration started with the Administration of Bükk National Park (Hungary). V j. Vjetrenica (j. Herzegovina, Popovo polje) New species and genera of highly specialised water beetle *Nauticiella stygivaga* (Coleoptera: Leioididae) was described from Vjetrenica Cave (Popovo polje, Bosnia and Herzegovina). Two new species for Czech fauna were found in the Hranice Karst: *Atheta spelaea* and *Chthonius heterodactylus*. Volcanic caves were studied on Tenerife Island and new cave beetle species from gen.

Seracamaurops was found in Orjen Mts. (Monte Negro). Survey of pseudokarst caves was finished in volcanoclastics of Slovakia (Ostôžky, Polana, Krupina Plateau, and South Slovak Basin). New type of pseudokarst caves of biogenic origin was studied in Slovakia and Hungary.

ZO 6-01 Býčí skála

▼ The principal working place in the Býčí skála Cave (Moravian Karst). Long-lasting excavation of cave fills by digging and mining by water under pressure continued in different sites within the cave. Several tens of metres of new galleries were discovered.

ZO 6-02 Vratíkovský kras

▼ Members are dealing especially with exploration in abandoned mines for palaeo-karst iron ores in village of Vratíkov and research of the Mojetín Karst (near city of Boskovice). Club organized expedition to the Classical Karst near city of Nova Gorica and participated on exploration of karst near village of Temnica (Slovenia).

ZO 6-04 Rudice

▼ Cave-diving exploration took part in the inflow of Stará řeka and in resurgence of the 2nd sump behind the Chodba vzdechů Passage in the Rudické propadání Cave without any important results. Explorations in newly discovered Krchůvek Doline continued. Five members actively work in the CSS CRS. Some members participated on Canin expedition to Slovenian Julian Alps, explorations in Humpleau Cave (Romania) and Crete 2002 project.

ZO 6-05 Křtinské údolí

▼ Members collaborated on bat census; they started survey of surface in surroundings of Mariánská, Nová Drátenická, and Stará Drátenická caves. Entrances were reconstructed in Jestřábka, Kanibalka, and Stará Drátenická caves. Excavations continued in Javorka Cave, where 40 m long gallery was dug out in direction to Na Lazech Doline. Pumping test was performed in Nová Drátenická Cave, with opening of 30 m long palaeo-corridor of the Křtiny Creek.

ZO 6-06 Vilémovická

▼ Safety entrance to Stará Vilémovická Cave was erected under support of the Administration of Landscape Protected Area of the Moravian Karst. Attempts to pump out the terminal sump in the Daňkův žlíbek Cave were not successful. In Lampoša site, entrance shaft collapsed and the cave is not more accessible.

ZO 6-07 Tišnovský kras

▼ Club operates on sites on the Květnice Hill at Tišnov city. Excavations continued in the Králova Cave (also with zoological and mineralogical sampling), Jezevčí Cave, Pod splavem Cave and Úžínová Cave. Karst spring of Vinšova vyvěračka was pumped out to the depth of 20 m. Winter census of bats was carried out in caves and artificial galleries in the Květnice Hill. Tectonics was studied in old part of the Králova Cave. Popularisation activity was also on the program.

ZO 6-08 Dagmar

▼ Excavation of cave fill continued in Dagmar and V Jedlích caves. Křížovy Caves were inspected.

ZO 6-09 Labyrint

▼ Cave-diving club collaborates with other caving clubs on numerous sites at home and abroad. After five years of intensive exploration in Punkevní Show Caves, the 130 m long and 34 m deep connection of Lower Lake in Macocha Abyss and Čtyřicítka Cave was found on April 10, 2004. Explorations in depths mostly over 50 m were carried out in Stovka Cave. The distance of 555 m and depth of 53 m was achieved here. The continuation is blocked by narrow profiles of underwater passages. Members took part in explorations in the Amatérská Cave (Moravian Karst). Two members participated on cave-diving expedition to Yucatan Peninsula (Mexico).

ZO 6-10 Hluboký závrť

▼ The opening of doline No. H-18 Mamrdova díra has continued since 1997. The cave is 118 m long and 59.5 m deep. The opening of doline in Na Hedvábné depression enabled to enter several tens of metres of free spaces.

ZO 6-11 Královopolská

▼ The club has been interesting in southern part of the Moravia Karst, especially in catchment area of Říčka River with well-known Ochozská Cave. The research was focused to tracing tests to solve the problem of horizontal drainage of the Hostěnice ponnors towards Říčka resurgence area and mining area of the Mokrý Quarry. The origin of waters in the Malčina Cave was described by hydrochemical and hydrobiological methods. Smaller excavations were carried out in the Ochozská Cave. Automatic registration of dripping in that cave helped to solution of problems of infiltration waters, their circulation, and chemical composition, intensity of karst processes and influence of soil cover to precipitation infiltration.

20 6-12 Speleologický klub Brno

▼ Club co-operated with the management of Mokrá quarries on documentation and registration of karst forms. Fragments of the Mokrá palaeo-cave in the length of 370 m contain Lower Miocene faunas. The length of surveyed passages in the Mechový závrt Cave is 276.3 m (Moravian Karst). Exploration in newly discovered parts of the Liščí díry Cave continued. The cave belongs to the system of Na Turoldu Cave (South Moravian Karst). 70 m long and 20 m deep cave in loess pseudokarst was discovered near village of Dolní Věstonice (South Moravia). Club collaborates on explorations in the Tišnov Karst (Central Moravia) and in several caves in Slovakia (Zlomísk, Netopýří, Mieru, and Havran Shaft). Members localized several underground tunnels from the World War II near village of Tvarožná (vicinity of Brno city), which served as shelters.

20 6-13 Jihomoravský kras

▼ The Na Turoldu Cave became the 13th show cave in the Czech Republic. Club helped on opening to tourist, which officially took part on October 30, 2003. The exploration and survey of the Liščí díra Cave has continued. On October 2002 the cave was connected with the Na Turoldu Cave, with the total length of passages of about 1,500 m. The system represents the longest cave system of West Carpathians in the Czech Republic. New 35 m long Damoklova Cave was discovered in 2003 after digging in the upper quarry of the Turol Hill. Caves in loess pseudokarst near Mikulov city were explored near Bulhary village. Cave is partly artificial, rests after sand extraction.

20 6-14 Suchý žleb

▼ Club intensively worked in Svážná studna Cave, where, after 14 years of excavations, 400 m of passages with water stream were discovered in 2003. The terminal sump is situated in the depth of 70 m. In 2004, another 180 m of passages were discovered. Cave was surveyed and documented, and dangerous sites were secured. Club organized expeditions to Monte Negro. In Orjen Mts. they discovered and surveyed Kozí Cave (250 m deep). In Dragalsko polje, together with French cavers, continued in exploration of Magdalena jama Cave (300 m deep and 1 km long) and they found water sumps in Melina Shaft in the depth of about 200 m under the pole surface. High above the pole bottom, new caves were found. They terminated by collapses or narrow passages in depths not reaching 100 m .

20 6-15 Holštejnská

▼ Club has been actively excavated cave fills from completely sediment-filled caves of Holštejnská and Nezaměstnaných (northern part of the Moravian Karst). It operated also in Stará Rasovna and Nová Rasovna caves. In Nová Rasovna Cave, the work con-

centrated to the collapse at the end of Vaňousův River-bed in the Lipovec Gallery. New passage – Cave of Primeval Symbols – was discovered in the length of about 400 m. Cave is nicely decorated. Several chimneys were explored, too. Explorations in Havran Shaft and Ohnište Cave (Nízke Tatry Mts., Slovakia) continued. New explorations in Smrekovica and Balkónik caves started in the same region. Two members took part in cave-diving expedition to Dalovica Cave (Pecina nad Vrazjim Firovima) in Monte Negro. Club organized expedition to Lea Ori Mts. in Greece.

ZO 6-16 Tartaros

▼ Excavation of sediments by water under pressure in the Lopač Shaft continued (northern part of the Moravian Karst). Chimney, leading to active river in places accessible only to divers, was opened. Operations continued and more than 200 m long-river cave passages were discovered descending by cascades to the depth of 70 m. The penetration was stopped by sump, nearly vertical shaft 27 m deep. In Cave in the Lipovec Quarry, the entrance was secured. Excavations continued in caves in Velká dohoda Quarry, Manželský Doline, Vintoky, and in the Krasovský Ponor, where narrow vertical fissure with the depth of 15 m was penetrated. Club organized several expeditions to the Slovak Karst, especially to the Silica Plateau.

ZO 6-17 Topas

▼ Sediments were excavated from U čtyř vchodů, Spodní Suchdolská caves and from the Cave No. 51, where 60 m of new passages were discovered. Outflow sump in the depth of 18 m was cleaned by pumps in the Horní Suchdolský Ponor. It allowed entering 560 m of new galleries and 21 m deep shaft (Suchdolské mystérium). Some members took part on expedition to Velká Klisura Cave in Kosovo, exploration in Totes Gebirge (Austria, 544 m long Coral Cave was surveyed), and expedition Velebit 2001. In co-operation with Slovak and Venezuelan cavers, club organized expedition to quartzite karst in Guyana Upland (Venezuela), where 2.4 km long Cave of Crystal Eyes was discovered, explored and surveyed. In 2004, Cave of Charles Brewer (Chimantá Massif) was explored.

ZO 6-18 Cunicunulus

▼ Club deals with exploration of historical underground and rests after mining activity in city of Jihlava, in Stříbrné Hory (Pekelská Gallery), near villages of Štěpánov and Nedvědice (Gallery of A. Padua), near village of Lesoňovice (Jeřábek Gallery) and gallery near Smrček (length 45 m). In village of Hostěradice (Znojmo District), several kilometres long multi-level maze of galleries from the 17th Century was explored.

ZO 6-19 Plánivý

▼ Club participates on exploration of Nová Amatérská Cave (Moravian Karst), especially on penetration of chimneys, cave-diving exploration, and excavations. New 180 m of passages along the Bílá Voda Creek were discovered by digging in site known as Chrochtado. Club worked also on other sites. In 13C Cave, chimneys were explored and cave-diving exploration was carried out. For the first time in the history of explorations, inflow sump in the direction of the Spirálka Cave was pumped. The water level was decreased in 6 m and 60 m of new galleries were opened from the 13C Cave and another 115 m from the Spirálka Cave. Galleries were surveyed. Sumps were pumped also in the cave system of Piková dáma – Spirálka and new spaces were opened. Members took part in several expeditions to Julian Alps (Slovenia). They participated on explorations on Možnica Plateau (Julian Alps), in Ohnište Cave (Nízke Tatry Mts., Slovakia) and in Nový Lopač (Moravian Karst). Club organized several expeditions to Bükk Mts. (Hungary), catchment area of Ljubljanica River (Slovenia), and areas of Sureanu and Padis (Romania).

ZO 6-20 Moravský kras

▼ The principal working place is in the Skleněné Domes in Punkevní Show Caves, where excavations in different branches continued.

ZO 6-21 Myotis

▼ Club excavated localities of Člupek (discovery of free spaces), Žďár - ponor in Doline in Brusné, Propáštka, Agris Doline (Moravian Karst). On the last site, the excavation of vertical shaft started, and after sump was passed through, 200 m of galleries were opened locally with chimneys.

ZO 6-23 Aragonit

▼ Zbrašov Aragonite Caves (show caves) in central-northern Moravia represent the principal site of interest. Club carried out some excavations in different places and removed rests of old sediment from the original opening to tourists deposited in numerous places within the cave. Cave in Temné skály was deepened to 11 m. Members participated on research of „*Identification of origin of pollution of aragonite speleothems*“. Research of meteoric and mineral waters of the Hranice Karst were carried out together with gamma-spectrometric measurements, historical studies, research of hydrothermal speleothems and geysers and diving explorations. Two members participated in expedition to Classical Karst (Temnica, Slovenia).

ZO 6-25 Pustý žleb

Monograph dealing with the Amatérská Cave was published (*“Amatérská Cave – 30 years from the discovery of the largest cave system in the Czech Republic”*). Members participated especially on exploration of the Amatérská Cave, namely on exploration of chimneys, cave diving and survey. Several hundreds metres of new passages were discovered in different parts of the system. In 2004, opening of new entrance to end parts of the Sloupský Corridor started. The new entrance to the Sloupský Corridor was opened due to complicated access to that part of the Amatérská Cave through several sumps. The terminal parts of the Amatérská Cave were connected with surface on April 2004. The shaft, 70 m deep, was then secured and stable metal ladders were erected. Cave-diving exploration in the Palm Shaft of the lower level of the Šošůvka Show Caves enabled the discovery and survey of the short middle level of the Palm Shaft. Cave-diving exploration continued also in Macocha Abyss and Stovka Cave. The members took part in expeditions to Totes Gebirge (Austria) and Padis (Romania). Detailed exploration and chimney survey was carried out in Humpleu Cave (Romania) together with survey of gigantic domes in the entrance part of the cave. Totally 3.8 km of passages were surveyed. During the cave-diving expedition to Emergence du Ressel (France), Mr. Husák and Sirotek penetrated the distance of 1,200 m with the depth over 60 m in the first sump. Sump in the Krásnohorská Cave (Slovak Karst) was passed through to distance of about 110 m with the aim of new opening of the cave and revision of discoveries from 80ties of the 20th Century. Two expeditions into Monte Negro were organized. New spaces in Djalovica Cave and new Brno Cave were discovered. Two members participated in cave-diving expeditions to Yucatan Peninsula (Mexico) with the discovery of more than 6 km of new caves.

ZO 6-26 Speleohistorický klub Brno

▼ Excavations were carried out in Novodvorský Ponor (Ponorný Hrádek) Cave (southern part of the Moravian Karst). Club co-operates on exploration of the Býčí Skála Cave and realized expedition into Slovak Karst.

ZO 6-27 při NP Podyjí

▼ Monthly monitoring of microclimate and movement of rocky blocks was carried out in Ledové sluje Caves (National Park of Podyjí, South Moravia) developed in gneisses. Members took part in the winter census of bats in the area of the National Park of Podyjí.

ZO 6-28 Babická speleologická skupina

▼ Pumping of sump in the Větrná Shaft opened new 130 m of free spaces. The cave is now 350 m long and 114 m deep. Members participated in expeditions to Nízke Tatry

Mts. (Slovakia) a to Julian Alps (Slovenia; exploration of new areas and location of entrances, exploration of KM 48 and KM 18 Windy Hammer cave on Canin Plateau and C11 and Pretty Woman cave on Možnica Plateau).

ZO 6-30 Speleologická skupina AGGA

▼ Established in 2002. Activity was focused to check of the filed and penetration to unknown caves of the Josefov Valley (Moravian Karst):

ZO 7-01 Orcus

▼ Club is specialised to sandstone pseudokarst. Members have continued in bat monitoring in hibernation places in pseudokarst caves of the Moravskoslezské Beskydy Mts., in abandoned mines in Jeseník and Oderské vrchy mining districts. Mines in Andělská hora and Tvrdkov villages were newly localised. Pseudokarst forms were explored in Moravskoslezské Beskydy Mts., e.g., in locality of Hutisko several small cavities were discovered. Excavation continued in Čertova díra Cave with discovery of 50 m long fissure passages. Digging continued also in Kněhyně Ridge in Kyklop and Žánova díra caves. In a part of the Radhošť Ridge, known as Záryje, 45 m long and 10 m deep Radegast Cave was discovered with two levels. Three smaller caves were also discovered in Lukšinec, part of Lysá hora Mt. Club organized expedition Chatyr Dagh 2002 (Crimea, Ukraine) with the aim to finalise documentation in Emine Bojir Khasar Nizhnyi Cave and to clean it after 2000 activities. About 50 samples were taken for mineralogical analyses. Several small caves were discovered during expedition Troms 2003 to region of Vassdalen in northern Norway.

7-02 Hranický kras

▼ Cave-diving club. Members counted bats in Hranická Abyss. Numerous dives were carried out in this locality of active hydrothermal karst. The most important was the utilization of robot Minirover Colombo MK II. Members co-operated on diving in the Moravian Karst.

ZO 7-03 Javoříčko

▼ After prolonged digging, Za hájovnou Cave was discovered (Javoříčko Karst). Cave is fissure-like, 50 m long and 8 m high and contains rich faunal rests and nice speleothems.

ZO 7-04 Sever

▼ Excavations were carried out in region of Na Pomezí Show Cave (North Moravia). One doline was opened here to the depth of 20 m, with the discovery of Nová Cave. The

v j. lower cave level is nicely decorated with spaghetti over 40 cm long. Excavations were performed also in Netopýrka Cave. Members participated on excavation in Za hájovnou Cave (Javoříčko).

ZO 7-05

▼ Club is the owner of the Children Speleotherapy Sanatorium with treatment of children between 3 and 15 years. The sanatorium was completely renovated. Recent activity is focused on finding of new suitable locality with the cave fulfilling the criteria of speleotherapy close to the sanatorium, i.e. in Špraněk Hill (Javoříčko Karst). Geophysical, karstological and speleological research was performed on karst localities in the close vicinity.

ZO 7-07 Ostrava

▼ Club excavated intensively the Pouťová Cave in Štramberk (North Moravia). Cave is inclined 45 m deep shaft with cross-section of 4 × 2 m .

ZO 7-08 Sovinec

▼ Bat census was carried out on Sovinec Castle (North Moravia). Original karst surface with karren was exhumed in the upper castle. Monitoring of water level in castle water well was performed. Detailed registration of old mines in surrounding of Sovinec and in the Jeseníky Mts. Explorations in fissure caves continued in Sovinec-Quarry by temperature and bat monitoring.

ZO 7-09 Estavela

▼ Excavations were carried out in Ve Hvozdecké hoře Cave near Vojtěchov village and in Rachava site near Kovářov village (Javoříčko Karst). On the Špraněk Hill, any sites with drought were not located. Documentation and registration of exokarst forms by the GPS technique continued in sites of Vzteklý žlábek, Vedmočovské sedlo and in surrounding on the National Natural Reserve of Špraněk. Members visited karst regions of Hungary, Slovenia, Croatia, and Slovakia. Ötscher Massif and surrounding of Wolfgangsee Lake were studied in detail (Austria), as well as Padis Plateau (Romania).

ZO 7-10 Hádes

▼ Club is specialized on exploration of old mines in region of Zlaté Hory and Jeseníky Mts.: shale mines near Klokočov, Odry, Čermná, Čermenský mlýn, Budišov, Svatoňovice, Staré Oldřůvky, Nové Těchonovice, and Zálužná. Survey of protected Black Hill Mine was carried out. Members visited mines for arsenic and polymetallic ores in Stolec and Złoty Stok (Poland).

ZO 7-11 Barbastellus

▼ Cave exploration continued in Cave No. 3b, where fissures with speleothems were discovered, and in Cave No. 1 (Jizbáň Hill near village of Dolečky). Club carried out both summer and winter census of bats in localities on North Moravia. Localities with bats were checked and secured for bat protection, especially locality with the highest number of hibernating bats in Šumperk District (Mařka Gallery in Bohdíkov village). In old mines at locality of Ulrichberg, 9 old galleries – hibernation place of bats – were discovered. Bat research in the Barborka Gallery was performed for Graphite Mines in Velké Vrbno.

ZO 7-13 Hajcman

▼ Club is specialized on exploration of old mines. Exploration in shaft No. 1 and No.4 continued Club is specialized on exploration of old mines in Velká Střelná (North Moravia). Black Hill Mine in village of Čermná ve Slezsku was secured and flooding of back part of the mine was controlled.

ZO 7-14 Ludmírov Štymberk

▼ Club was established in 2003. Members checked the field to find promising site for further exploration.

▲ *Compiled by Jiřina NOVOTNÁ*



The most important discoveries in the Czech Republic



Researches in the Amatérská Cave in 2000 to 2004

▼ Totally 664 m of passages were discovered and surveyed in period of 2000 – 2004 in the Labyrinth of M. Šlechta and Macošský Corridor. All together 12 chimneys were climbed up with maximum height of 50 m.

Chimney explorations

Climbing in chimneys continued. Lower part of chimneys was explored using the pole. Particular chimneys were overcome by free or technical climbing.

U Bobulí chimney was climber first. Two branches were discovered. One terminated by squeeze, but the sound communication with the main chamber of Zemních Pyramid was detected. Second one finished in the height of 33 m by narrow cracks. The exploration of the biggest fissure in the Dome of Zemních Pyramid, Chimney of Acrobats, took 9 months. The height of 50 m was achieved and horizontal 30 m long level was discovered. In the western part of the Dome, several chimneys were climbed. During the next period was several chimneys were climbed up, especially in Bezejmenný Dome (12 m) and U Vývěru Dome, without discovery of any new parts.

Explorations in the Labyrinth of M. Šlechta

About 117 m long part of main passage of the Labyrinth of M. Šlechta between the first and second entrance was surveyed at the beginning. The bottom of the Studna Pit in the outflow part of the Labyrinth was studied due to low water level. New parts with the last occurrence of the underground Punkva River in the Labyrinth were discovered in the length of 42 m.

In 2001, chimney in the Třístovková Passage in the outflow part of the Labyrinth was firstly explored. In its top, semi-sump appeared in horizontal passage. The water was pumped out of it and 10 m of narrow passage led to closed small chamber.

The next place of our interest was in the Vodovod Channel, where Koprový Chimney was explored to the height of 12 m with no further continuation. Greater success was reached in the back part of the Vodovod Channel in small chimney. Semi-sump was pumped out in about 3 hours to the depth of about 10 m. Behind it, huge echo was registered, but new parts were not reached. They were discovered only later by pumping of other sumps in frontal part of the Vodovod Channel. Behind them, Hiko Channel was discovered in length of 80 m. It is terminated by two water wells.

In 2002, Chimney above Waterfall was explored in the Core part up to 15 m. At same time, low water level allowed to penetrate 50 m of passages with chimney, which has remained still unexplored.

Explorations of south-eastern branches of the Macošský Corridor

At the beginning of 2002, branch named Chrochtadlo was explored in the Macošský Corridor near the second entrance to the Labyrinth of M. Šlechta. The main aim of exploration was the discovery of unknown inflow section of the Bílá Voda Creek. After digging out sediments and some flowstones, a narrow passage terminating by 17 m deep shaft was discovered, where the Bílá Voda Creek was found at the bottom. The river-bed with some left-side tributaries continued downstream and terminated after 30 m in the outlet sump. The inflow part continued upstream by 90 m. Chimney above the inflow sump led to phreatic channel, which continued down to further part of the Bílá Voda Creek, named the Aqualung. It is flooded active stream bed terminating by sump. Three other chimneys were explored here without find of any continuation.

The principal direction of this system is similar to that of the Macošský Corridor, but situated at the lower, active level. The inflow part communicates with the Crematorium. The connection of Chrochtadlo and Crematorium was found in summer of 2003 thanks to extreme low water level. This subsystem fixed on the Bílá Voda Creek attained the length of 1 km. The outlet sump drains new discoveries to unknown parts of the Šolimoova mísa. The connection with the Labyrinth of M. Šlechta has been still unknown. The total length of Chrochtadlo part is about 180 m.

At the beginning of 2003, another branch opposite to the first entrance to the Labyrinth of M. Šlechta was explored. We expected penetration behind outflow sump of Chrochtadlo and the discovery of further part of the Bílá Voda Creek. This 30 m long phreatic channel named the TNO normally terminates by semi-sump. The first attempt to pass through the semi-sump at decreased water level led to 10 m long flooded narrow passage, Casket. Chimney was found there. Semi-sump was pumped during the next exploration. Two cavers passed the Casket and created life ladder for climbing up the chimney. Narrow channel slightly going down through several pits was discovered at the top. Channel led to bigger blind chamber with traced of drainage down to collapse. Continuation of works was stopped here due to extremely high difficulty of access. The total length of the TNO is more than 70 m.

Explorations in branches of the Punkva River

One south-eastern branch was explored. This part, named the Cow, is characteristic by low passages with clay sediments. Most of it is flooded during high level of the Punkva River. Yperite Chimney was discovered in back part of the Last Dome. It was climbed up by free climbing to the height of 17 m, where inaccessible narrow passage continued.

NOVÁ AMATÉRSKÁ CAVE riverbed of Bílá Voda Creek

Krematorium, Chrochtadlo

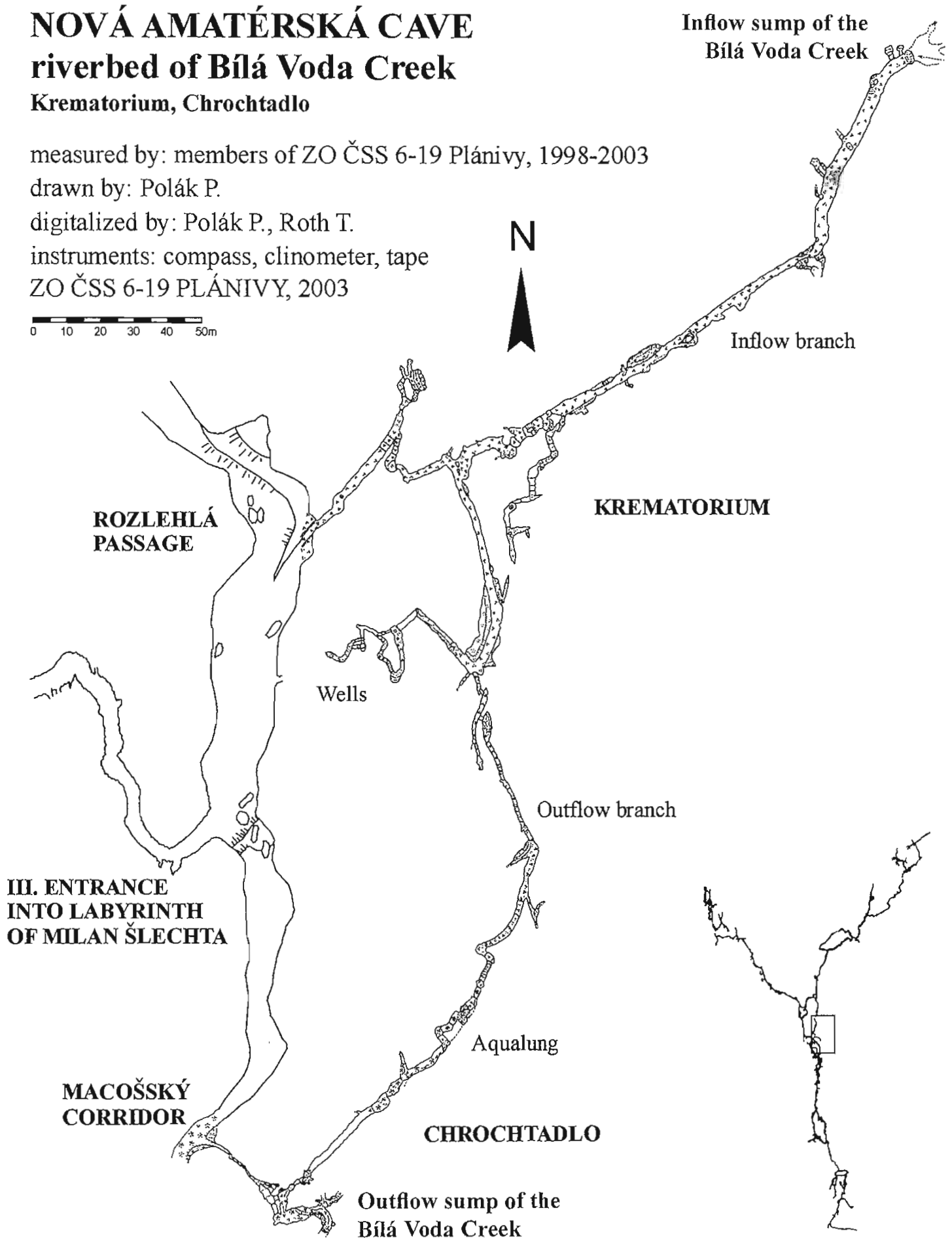
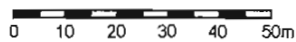
measured by: members of ZO ČSS 6-19 Plánivý, 1998-2003

drawn by: Polák P.

digitalized by: Polák P., Roth T.

instruments: compass, clinometer, tape

ZO ČSS 6-19 PLÁNIVÝ, 2003



This system represents one of tributaries of the Punkva River. Total length of the Cow is about 75 m.

Sloupský Corridor

Already in 1999, explorations behind the 1st sump of the Sloupský Corridor were renewed. This part has been known since 1989, but explorations were stopped due to poor access behind the sumps. After the renewal of activities, totally 14 expeditions took place. The 5th to 7th sumps were passed through, which shortened the distance between the Amatérská Cave and Sloupsko-šošůvské Show Caves to only several metres. The 8th sump at the end of Šošůvecká Branch and outflow sump (the 9th) from the 2nd sump were studied simultaneously by divers. Do Žlebu Passage and Vintocká Branch were found as right-side tributaries. The second one is important in relation to Sloupské Vintoky Cave. Calcite Dome with unique decoration was found at its end.

Our main effort was directed to opening of parts behind the 4th sump. The easiest way seemed to open shaft from the surface to one of chimneys in the back part of the Vintocké Branch. All chimneys were therefore explored. The highest point, only 10 m below the surface was climbed in chimney above the Dome of Bezpečnostních směrnic. Unfortunately gas pipeline is situated there. Another chimney led to 20 m below the surface. The place was located on the surface by the use of radio-wave method. In the spring time of 2003, after obtaining all necessary permissions the mining of shaft started. The opening in the length of 8 m was mined using blasting materials. Here, the fragment of great river passage filled by sediments was found at the approximate altitude of the upper level of the Šošůvecké Caves. The passage was filled by partly lithified sediments to the depth of 21 m, were shaft reached chimney with radio-apparatus. The shaft opening lasted 12 months and another 8 months we spent by securing it by concrete and by installation of steel leathers. This enabled the continuation in exploration of part of the Amatérská Cave, which started on December 2004.

Cave-diving explorations

Underground Punkva River. In the frame of renewed cave-diving explorations of the Amatérská Cave, the underground flow of the Punkva River was inspected. Cord was installed in the known parts among Podzemní vývěř Punkvy, Zadní jezero and Tůň Babických kovozeďelců. All spaces were surveyed and only after the exploration started in upstream direction of the Punkva River. Free level was found at 350 m of the sump and two cave-divers (Mr. Mokřý and Sirotek) emerged in Čokoládovna. Chimney above the water level was not accessible. The sump probably continues down about 20 m in front of Čokoládovna. Here, the depth of 35 m in a shaft (Studna Hřbitovního kvítí) is blocked by low profile of passage. The sump between Čokoládovna and Podzemní vývěř Punkvy represents with 570 m the longest sump in Czech caves.

The exploration continued from the Šolimova mísa by discovery of 120 m of upstream continuation of narrow passage filled with sediments, which substantially decreased the visibility (Passage of Orange Darkness). Exploration was stopped here. Survey indicates the distance of about 20 m between Čokoládovna and Kakaovna.

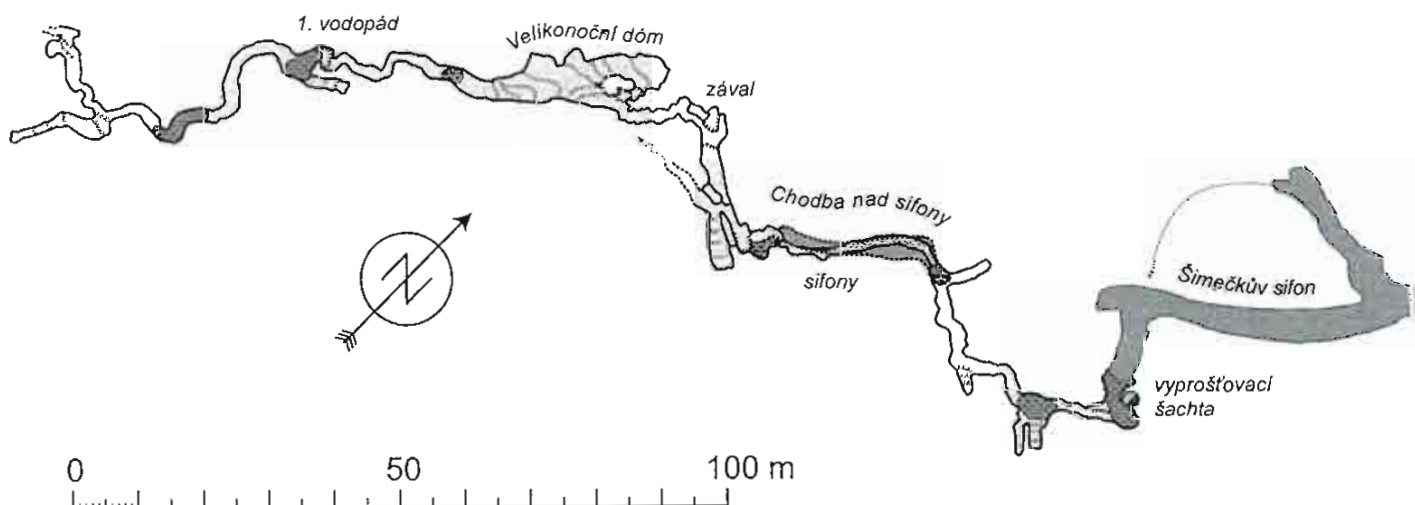
The exploration of the beginning of the Předmacošský Sump took place at the turn of 2004 and 2005. Extremely low water level allowed the penetration without diving. One chimney above water level led after 150 m by upper passage back to water level.

Konstantní přítok. The last diving exploration was carried out in the Konstantní přítok (Constant inflow). Three dives were necessary to reinstall the cord up to Velký Dome, where previous exploration stopped in 80ties of the 20th Century. Narrow fissure continuing to free passage was found in a depth of 37 m. In comparison to situation in 80ties, when visibility was about 30 m, the recent visibility substantially decreased to 3–8 m.

▲ **Petr POLÁK & Jan SIROTEK**

Lopač 2000 – 2004

▼ Speleological exploration has continued in ponor cave of Lopač (Moravian Karst). The explorations follow the underground stream of the Lopač Creek. New excavations started in small passage offering the possibility to overcome two sumps, which prevent to reach work-place in the terminal collapse. The small passage with diameter of about two square metres was completely choked by sediments. In 2000, the attempt to pump out the sumps was carried out. In co-operation with divers, the pipe was set up from pumps behind sumps. The resting several cubic metres nevertheless rested not pum-



ped owing to technical problems with pumps and tubes. On the other hand, two work in small passage above sumps was more successful. Using pressure water, sediments were disintegrated, pumped out and 42 m were cleaned. The passage, according to our idea, terminated in small hall at the terminal collapse of the Lopač Cave.

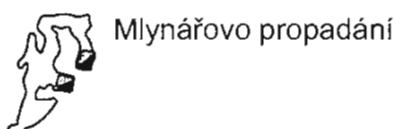
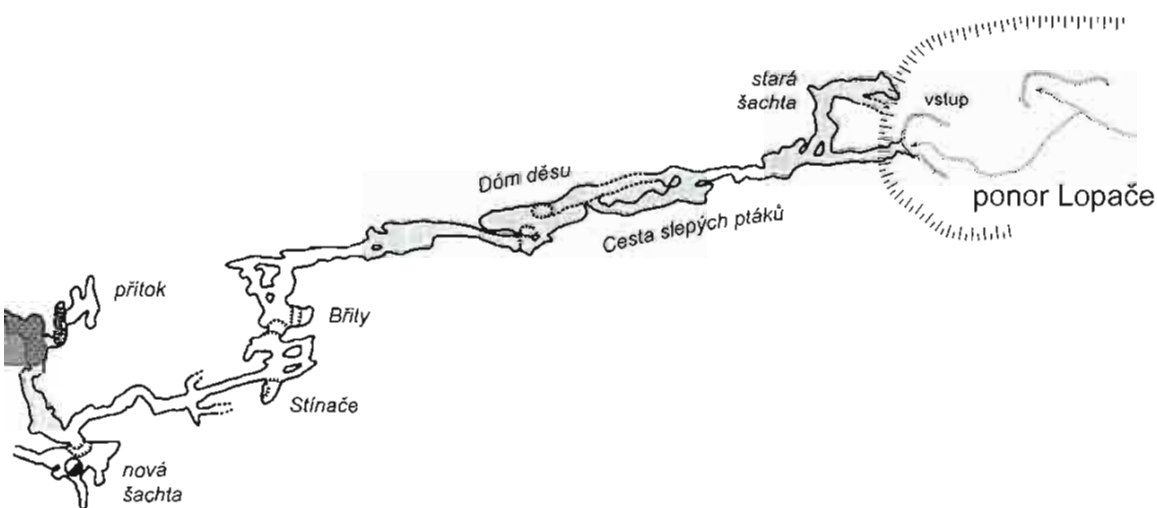
Those operations allowed continuation of the exploration inside the collapse. After several working actions, the collapse was passed through, and secured. Small hall (25×7×7 m) with several chimneys was discovered; it was named Velikonoční (Easter) Dome according to the date of discovery. About 250 m long sequence of canyon-like and meandering passages with two waterfalls was discovered from the dome. The Lopač Creek outflows through 30 m deep sump. New discoveries were surveyed.

In 2002–2003, exploration of chimney was carried out, as well as excavations on interesting sites, and subsidiary survey. Fluvial sediments and geology of Devonian limestones were studied and documented. Cave divers studied the outflow sump, but they were not successful to overcome it.

The course of the Lopač Cave was traced on the surface and the precise position was stated using the radio-wave method. This allowed drilling of a borehole with diameter of 115 mm to the depth of 40 m. Hole was situated between both waterfalls in the cave. The borehole mouth was secured. The borehole served for water pumping and for electric and telephone lines. After two weeks of preparations, the water pumping started on June 2004 and lasted 8 days. Water was pumped from the depth of 75 to 95 m. Nevertheless, the sump was not pumped out completely. Therefore, the speleological exploration has continued.

The situation with expected optimistic situation is expressed on the figure. The course of pumping test is on the graph. The graph clearly expresses interruptions in pumping due to technical problems with 7 pumps and with manipulation with tubes.

▲ Dušan Hypr



Results of speleological explorations in the southern part of the Moravian Karst until 2004

▼ The southern part of the Moravian Karst is situated to the south of the Křtiny Valley up to city of Brno. It consists of Ochozské Plateaus, which are subdivided to smaller units of Babice, Skalka, Kouty, Držice, Mokrá-Hostěnice and Hády plateaus. Nine smaller karst regions can be specified in this region (see the map): near Adamov and Babice nad Svitavou (District of Brno-suburbs), Křtiny and Březina (Blansko District), Nový Dvůr, Ochoz, Hostěnice, Mokrá and Líšeň (District of Brno-suburbs). Nevertheless, the speleological exploration is active only in some of them.

Křtinský Karst

This particularly interesting karst region with sinking stream of the Křtinský Creek is situated along the border of the central and southern parts of the Moravian Karst. Although the part of the area hydrologically belongs to the central part of the Moravian Karst, the southern part of the Křtinský Creek is connected with drainage of the Babice Plateau. New knowledge was obtained in the Nová Drátenická Cave, where cavers from Křtinské údolí Caving Club pumped the Sump of Dr. Burkharda behind the Mramorová Passage. They discovered spacious new caves with flood inflow tributary of the Křtinský Creek and two sumps. In the Výpustek Cave, Babická Passage is in the centre of the interest. Pumping of the Křtinský Creek in place known as Otevřená skála opened smaller sump-like passages filled with sediments.

Babický Karst

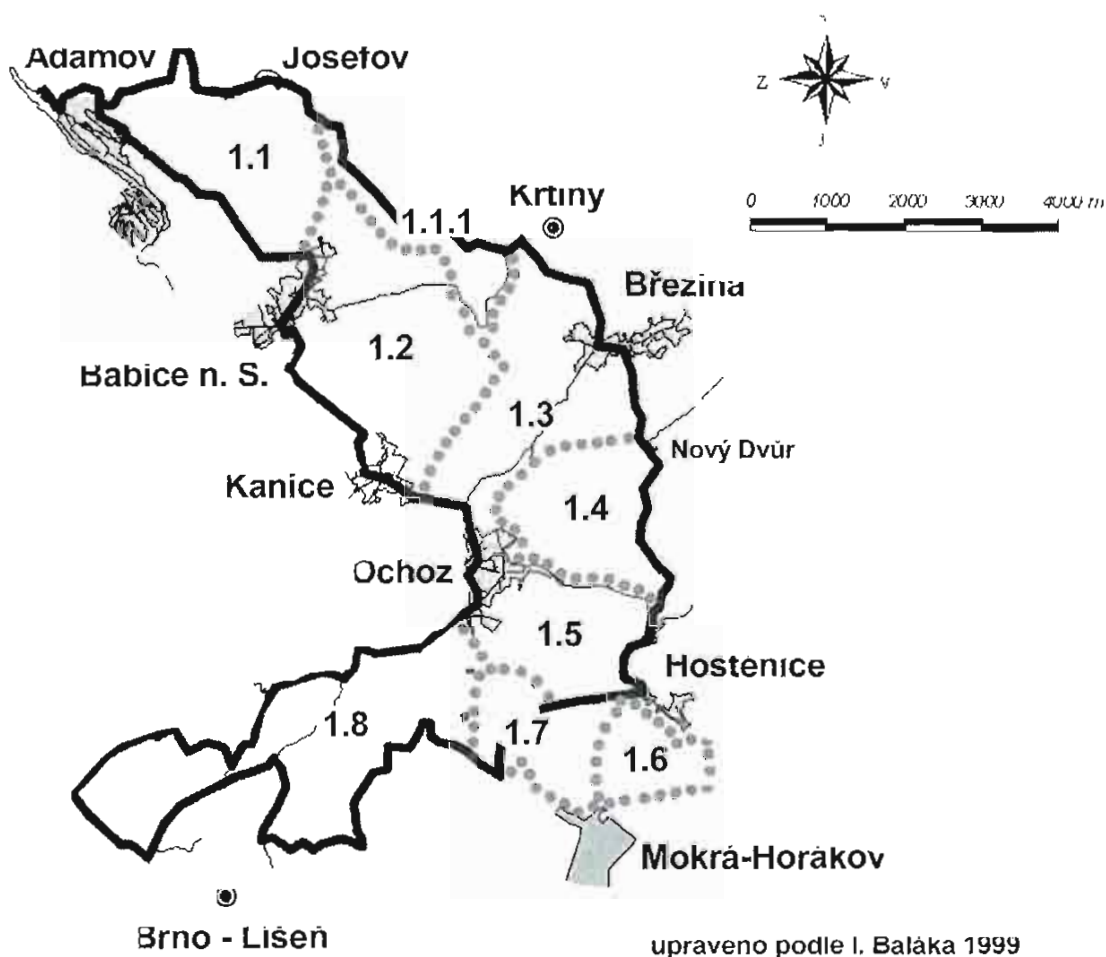
Karst of Babice Plateau is situated among villages of Křtiny, Březina, Ochoz, Kanice and Babice n. Svitavou. Its altitude with 509 m a.s.l. is the highest within the southern part of the Moravian Karst. Babice Plateau is drained towards the Křtinské Valley to cave system connected to ponors of the Křtinský Creek. Smaller karst springs are situated also in Svitava Valley near village of Kanice at the border with the Březina Karst. It is supposed, that the palaeo-drainage was directed also to the Březina Valley, as indicated by several palaeo-resurgences (Knechtův lom, Pod hřebenáčem, Tereza) and fragments of karst valleys on the surface (Kamenný žlíbek, Kanické žleby).

The caving activity has been maintained by Babice Speleological Club. In 1960 only 8 caves were known in this territory (Záskalčí), in 2004 active exploration was carried out on 11 sites, e.g. Dvanáctka, Sedma and Větrná propast caves, which were opened by digging in dolines. Some caves contain higher level of carbon dioxide. Větrná propast Cave is the biggest one with 350 m of passages and depth of 114 m. The cave consists of two branches – vertical section connected with base level and subhorizontal sump-like passages with unknown outflow routes, which are probably connected with caves of the Křtinský Creek.

Březinský Karst

This karst region is situated near village of Březina at the border of the central and southern parts of the Moravian Karst. The exploration has been carried out by Caving club of Speleologický klub Brno. This area is characterized by palaeokarstic nature of most of forms (17 caves), with some rejuvenated or recent forms like karren and episodic ponors of flood waters of the Březinský Creek. Malý lesík Cave is the largest in the area with the length of 330 m and depth of 30 m. It is huge palaeo-ponor filled with Tertiary sediments, which is still flooded by waters from close Březinský Creek. Another pro-

MORAVSKÝ KRAS - JIH



Map 1. Moravian Karst – southern part. General division of the region to smaller karst areas.

1.1 – Josefovsko-adamovský Karst; 1.1.1 – křtinský Karst; 1.2 – Babický Karst; 1.3 – Březinský Karst; 1.4 – Novodvorský Karst; 1.5 – Ochozský Karst; 1.6 – Hostěnický Karst; 1.7 – Mokerský Karst; 1.8 – Hádecko-líšeňský Karst.

missing area is situated in small cave system of Tereza-Na Technice. It was discovered in 1911 and partly disturbed by quarry in 1953. The cave system was prolonged by digging to about 70 m. Passages have fluvial character of outflow cave.

The recent state of knowledge indicates that the Březinský Karst has developed in 5 levels of horizontal drainage since Tertiary. Fragments of outflow caves from the Babická Plateau are known in right bank of the Březinské Valley. In its left bank, entrances to outflow systems are connected with resurgences in the Říčka Valley.

Novodvorský Karst

Small karst area is represented by the Skalka Plateau near village of Nový Dvůr is situated to the south and southeast of the Březinské Valley between Novodvorské Valley and village of Ochoz. About 8 caves are known here and another 2 caves were mined out by the quarry. Caves are small and their genesis is still unknown. They are studied by caves from the Speleohistorický klub Brno. They concentrated to the Novodvorský Ponor above the Novodvorský Creek. Ponorný Hrádek Cave, 45 m long, was finally found after long-lasting digging. Subhorizontal erosion channel descends to the depth of 18 m, where sump-like passages prevail. Periodic Zurčící Inflow is situated in the depth of 17 m. It continues by narrow passages to the Skalní Creek. Carbon dioxide content oscillates in dependence to outer air pressure in different periods of the year. There are another workplaces situated in the south-eastern part of the area: e.g., Zub Doline was opened by digging with the discovery of the Soví komín Cave in 2004 (24 m long and 12.5 m deep). Surface and underground karst forms were registered, surveyed and fixed by the GPS. Collected data indicate the existence of still unknown cave system connected with the Novohradský Creek presumably drained towards the Říčka Valley.

Ochozský Karst

The karst area near village of Ochoz is represented by the rests of the Kouty Plateau with the Hora massif. The Hora is cut, at altitude of 398 m a.s.l., by shallow saddle. Lysá hora Hill with karst springs belong to this region, too. The most important cave in this area is the Ochozská Cave in the Držice Plateau, 1,750 m long. It consists of sump parts and huge meandering passages rich in speleothems. The cave is often flooded by the Hostěnický Creek during higher water levels. The area has very special hydrology, with estavella. The possible continuation of the cave is recently solved by the opening of the Hynštova ventarola and by exploration of nearby Cave in V Mechový závrt.

The region is drained by sinking waters of the Říčka River, Hostěnický and Ochozský creeks. The youngest caves connected to the Říčka River are represented by the system of cave below Svaté schody (Malčina, Švédův stůl, Netopýrka caves). Here some excavations have been taken place. The region has been studied by members of Královopolská Caving Club, who try to solve the regime of karst collectors and its application for future caving activities.

Mokerský Karst

Members of Speleoklub Brno started in 1997 the salvage exploration and research of karst forms in the mining area of Mokrý quarries. About 51 karst forms have been registered in quarries during last 7 years. The most important is the Mokerská Cave, nearly 370 m long with up to 25 m canyon-like passages. The cave represents the rest of extensive palaeo-system draining the area in the geological past. Some other, but smaller forms have been registered, which were probably genetically connected with the system in different times. Some cave fill contains early Cainozoic faunas.

In 1999, the opening of the Mechový Doline started. The locality is situated between two prominent caves – Pekárna and Ochozská. Dig shaft opened in the depth of 4 m into open vertical spaces with small erosion horizons and more than 10 m high chimneys. In the depth of 20 m, mouths of two shaft-like branches were opened. They terminated in the depth of 45 m by horizontal passages. The high carbon dioxide concentration is typical for the cave. Its content was artificially decreased by the electric ventilator. The V Mechovém závrtu Cave belongs with its length of about 300 m to the longest caves in the southern part of the Moravian Karst, and in the catchment areas of the Hostěnický Creek and Říčka River it represents the deepest cave at all. The position of the V Mechovém závrtu Cave, stratigraphically between levels of the Mokrská and Pekárna caves, helped in understanding of evolution of the karst landscape.

▲ *Petr Kos*



The most important discoveries abroad



Tepuy – four expeditions and discoveries of the largest quartzite caves in the World

▼ The largest caves in the World in the quartzite were found in Venezuela Guyana Highland – Cueva Ojos de Cristal (Roraima tepuy) with 4 km of passages and Cueva Charles Brewer (Chimantá tepuy) with 4,482 m. Both caves, phreatic in origin, have developed during the last about 2 Ga. Cueva Charles Brewer contains gigantic domes. There are special speleothems built by opal, which precipitation was accelerated by blue-green algae and diatoms.

Location

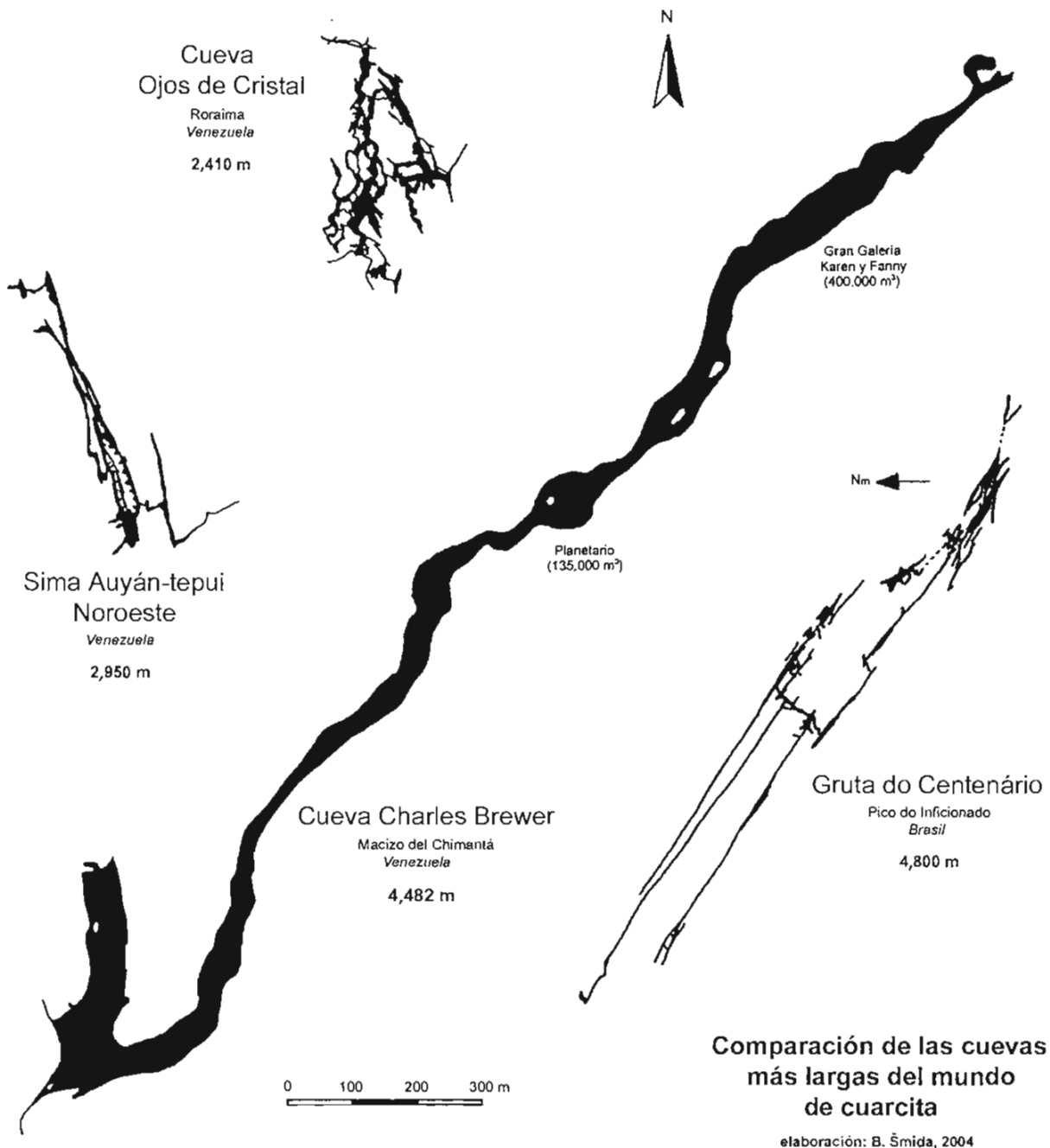
Members of the CSS and the Slovak Speleological Society (SSS) started the exploration of quartzite karst in the Venezuelan part of the Guyana Highland in 2002 to 2005.

The Guyana Shield is built by Proterozoic sediments, i.e. by well-sorted quartz sandstones overlying Precambrian granites. During subsequent 2 Ga, erosion processes carved morphologically complex inselbergs and isolated towers – tepuis. The area of the Guyana Highland is nearly 1 million of square km. It is limited by the Orinoco River in the north and Amazon River in the south. It belongs to three states – Brasilia, Venezuela and Guyana.

Cueva Ojos de Cristal

The extensive labyrinth of horizontal passages was found by chance during the first expedition in 2002. The system is situated in the southern part of the Roraima Inselberg. New cave obtained name – Cueva Ojos de Cristal (Cave of Crystal Eyes). The system of ponor caves is formed by phreatic tubes now in the vadose regime. Similar cave has been known neither in Roraima, nor on other inselbergs of the Guyana Highland. Known cave – Sima Aonda on Auyán-tepuy – has different geological evolution and is formed by fissure-like passages and shafts. The discovery of Cueva Ojos de Cristal represented the revolution in exploration of quartzite karsts.

Therefore in 2003 we organized expedition only to Roraima. Our effort to joint representatives of Venezuelan speleology known to us was not successful for unknown reasons. Totally 2.4 km of passages were surveyed in Cueva Ojos de Cristal. Other about 20 caves, shafts and fissures were found and partly surveyed. They represented the task of our next expedition.



▲ *Comparison of Cueva Charles Brewer with other quartzite caves*

It was organized in March 2005, and besides the SSS members, also members of the Comité de Espeleología de la Sociedad Venezolana de Ciencias Naturales (SVCN) were present. We interconnected Cueva del Hotel Guacharo and Ojos de Cristal to the system with the total length of 4 km. Our data proved false information of the Sociedad Venezolana de Espeleología (SVE), which can be found in internet (length of 6 to 10 km). This length probably resulted from misinterpretation of data from our publication "*Expedition Roraima 2003*" and included the total length of all surveyed caves, which were never interconnected. We have to note, that there exists no map originally surveyed by the SVE.



Cueva Charles Brewer

As the reflection of our results in Venezuela quartzite karst, in 2004 we were contacted by the prominent Venezuelan scientist and caver, specialist on the Guyana Highland, Mr. Charles Brewer-Carías. He located huge opening of resurgence cave in Chimantá Massif and penetrated it only to the distance of 1 km with some of his colleagues. Therefore the aim of our joint CSS and SSS expedition in 2004 was to finish the exploration of that cave. The cave obtained the name of Cueva Charles Brewer.

Cueva Charles Brewer represents the old outflow channel, which was active already before the origin of inselbergs. Recent river enters the underground through tectonic fissures. Its discharge of about $0.5 \text{ m}^3 \cdot \text{s}^{-1}$ increases after rains up to several cubic metres, forming long lakes and sumps inside the cave. The rise and fall of water level in the cave during rains is sudden making exploration dangerous.

Underground spaces are gigantic. The average width of passages is quite constant and reached up to 50 m. Galleries are 10 to 20 m high. In some places, domes up to 100 m and 40 m high developed. Karen y Fanny Gallery in the distance of 3 km from cave entrance represents by volume one of ten hugest underground cavities of the World. There are developed several domes with volumes over hundreds of thousands of cubic metres. The total length of the cave is now 4,482 m.

Next expedition had scientific aims – mineralogical, geological and biological research in Cueva Charles Brewer and its surroundings. We found morphologically variable speleothems formed exclusively by cryptocrystalline silica. They formed from condensation of oversaturated aerosol, rarely from drip water. Microorganisms took always part in speleothem formation. Opal stalactites and stalagmites represent unique findings in the upper parts of the Karen y Fanny Dome; their length is up to 1 m. Speleothems grew over old spider nets from cave air forming very special forms as spiders try to renew their nets. Besides the water condensation from air moisture and aerosols produced by waterfalls, the cave air circulation under relatively high temperature (about 15°C) and evaporation contribute to speleothem growth (antigravitational growth was observed, too).

Higher hydrologically quiet levels of the cave contain both “spider speleothems” and huge white balls – “Champignones” with diameter up to half metre. They resemble monomilk coatings in European limestone caves. On their growth, blue-green algae and siliceous organisms (probably diatoms) participate. Diatoms are covered by siliceous shell (frustula) composed of silica polymerised with water. Its crystalline structure is similar to opal, as indicated by microprobe and X-ray analysis. The resulting organogenic silicate is similar to diatomite, it is porous and light (200 to $900 \text{ kg} \cdot \text{m}^{-3}$), therefore “Champignones” are swimming in the water.

▲ **Marek Audy & Branislav Šmida**

Exploration of underwater caves of the Riviera Maya, Mexico 2003 – 2005

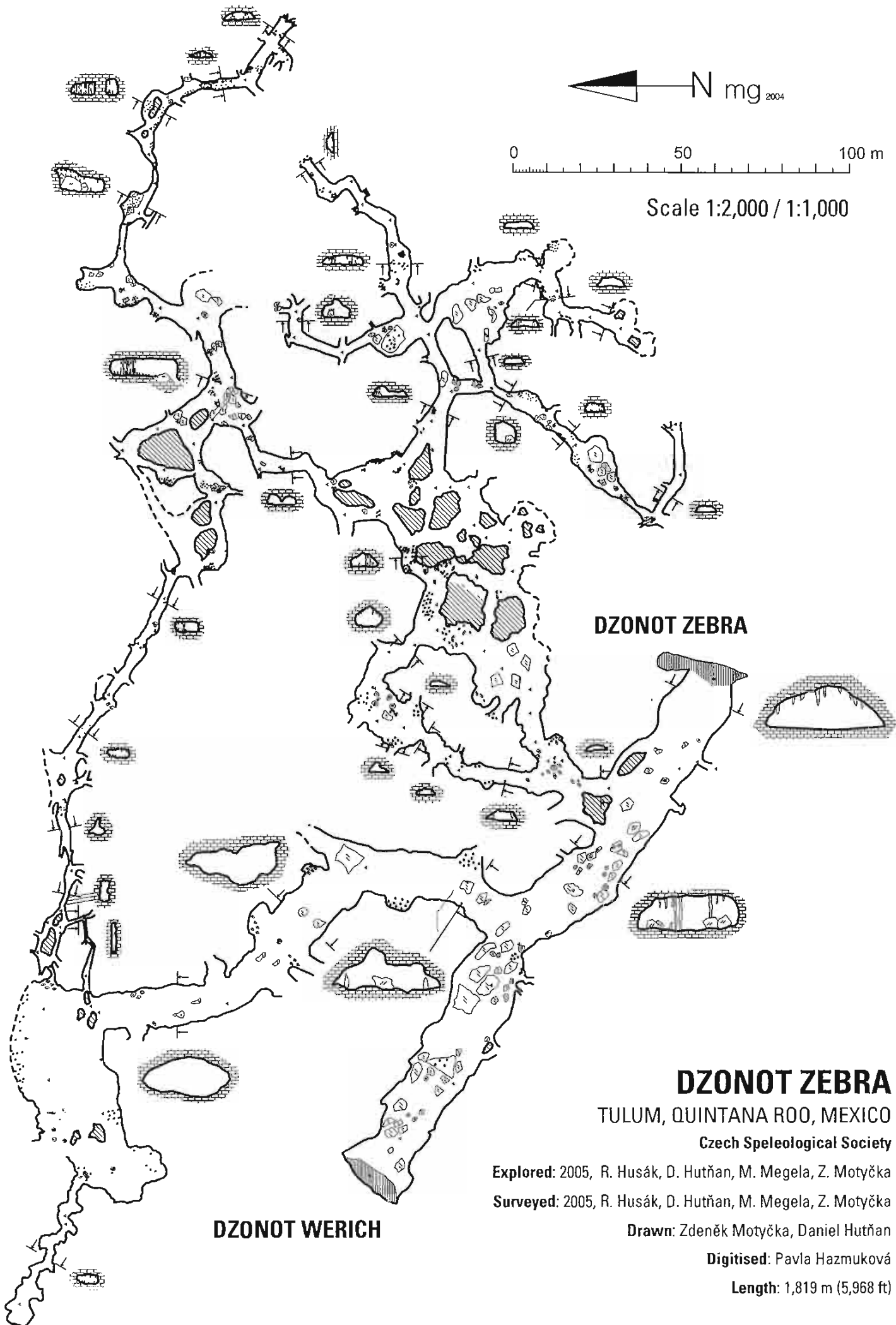
▼ Totally 6,860 m of new underwater cave corridors was discovered and surveyed by Czech and Slovak cave divers in Riviera Maya up to now.

Riviera Maya represents a part of the eastern Caribbean coast of Yucatan Peninsula (Mexico) in Quintana Roo State. The area built by pure Palaeocene to Pliocene carbonates covers about 190,000 km². Uplift of peninsula in Pleistocene predisposed karst platform to dynamic speleogenesis. Rich rains penetrated through porous host rock and created shallow cave systems draining water towards the sea. Quaternary glacial-related sea-level changes caused the erosion enlargement of existing caves, development of speleothems and collapses of cave roofs resulting in formation of cenotes. At about 18,000 years B.P. the sea started to rise to the present level and these caves were flooded.

Today the surface is absolutely flat, covered with a jungle. There are no rivers, only lagunas and cenotes. Lagunas are big lakes, while cenotes can be small, often hidden behind the rocks. At the seaside, there are calets where fresh water flows to the ocean. They serve as favourite tourist destination thanks to the attractive location. Cenotes and caves constitute really unique ecosystem. Hundreds of animal species have been described in the last 100 years.

The first bigger cave system of Nohoch Nach Chich was discovered in 1986 by the team of Mike Madden. It represents the beginning of the invasion of divers and many other cenotes and kilometres of corridors were discovered. At the present, there are more than 140 cave systems where 580 km of underwater cave corridors were discovered. System of Ox Bel Ha is the longest submerged cave system in the world with 134 km of corridors. The exploration of cenotes has continues up to now by many projects. One of them resulted in the second longest submerged cave system of the world named Sac Aktun. The members of the SAET (Sak Aktun exploration team) led by Robert Schmittner and Steave Boegards prolonged this system to present length of 77,183 m. In 1990, the Quintana Roo Speleological Survey was established by Jim Coke to collect all dates about caves in Riviera Maya.

Several expeditions of Czech and Slovak Speleological Society to the Mexican Yucatan Peninsula have been carried out in the last two years in the co-operation with the UNAM – The Mexican National University – and the QRSS – Quintana Roo Speleological Survey. Expeditions operated in surroundings of cities of Tulum and Chemuil. The first exploration brought new discovery in Cangrejo Cenote, where 1,328 m of passages have been discovered and surveyed up to now. The most important discovery was made in Joolis Cenote. The entrance was found in 2002 and 167 m of corridors was known. During the first exploration another 180 m long continuation was discovered and surveyed. The following dives brought the discovery of huge several hundred meter long



N mg₂₀₀₄

0 50 100 m

Scale 1:2,000 / 1:1,000

DZONOT ZEBRA

TULUM, QUINTANA ROO, MEXICO

Czech Speleological Society

Explored: 2005, R. Husák, D. Hutňan, M. Megela, Z. Motyčka

Surveyed: 2005, R. Husák, D. Hutňan, M. Megela, Z. Motyčka

Drawn: Zdeněk Motyčka, Daniel Hutňan

Digitised: Pavla Hazmuková

Length: 1,819 m (5,968 ft)

DZONOT WERICH



Old Mayan ceramic pot found in Chac Ha Cave, Riviera Maya, Mexico. Photo by Radek Husak

tunnel of “Esperanza.” Within the first week more than 1,000 m of new corridors were discovered, while the second week brought the discovery of a new cenote, called Tatich. Totally 2,405m of new passages were discovered, surveyed. They were interconnected with other 3 neighbour cenotes – Polo, Hoyt, and Chu-much-cho resulting in the system 3,587 m long.

Later two new cenotes were found, 600 m far from the end of the known parts of Joolis and 200 m far from the end of Ich-Kin Cave. In the first one, Nai-Bosch Cenote, huge tunnel 200 m long was found. It leads directly to Ich-Kin Cave. The second cenote brought really big surprise. Near the wall of the spread corridor, old Mayan ceramic pot was found. Then the cavers discovered dry cavern with small island in the centre of cave lake with ruins of stone wall nearby and connected to the cave.

In other cenote, called Zebra, huge tunnel 30 m wide and 200 m long was found during the first exploration. This tunnel leads to another big cenote. Totally 1,819 m of passages were explored and surveyed.

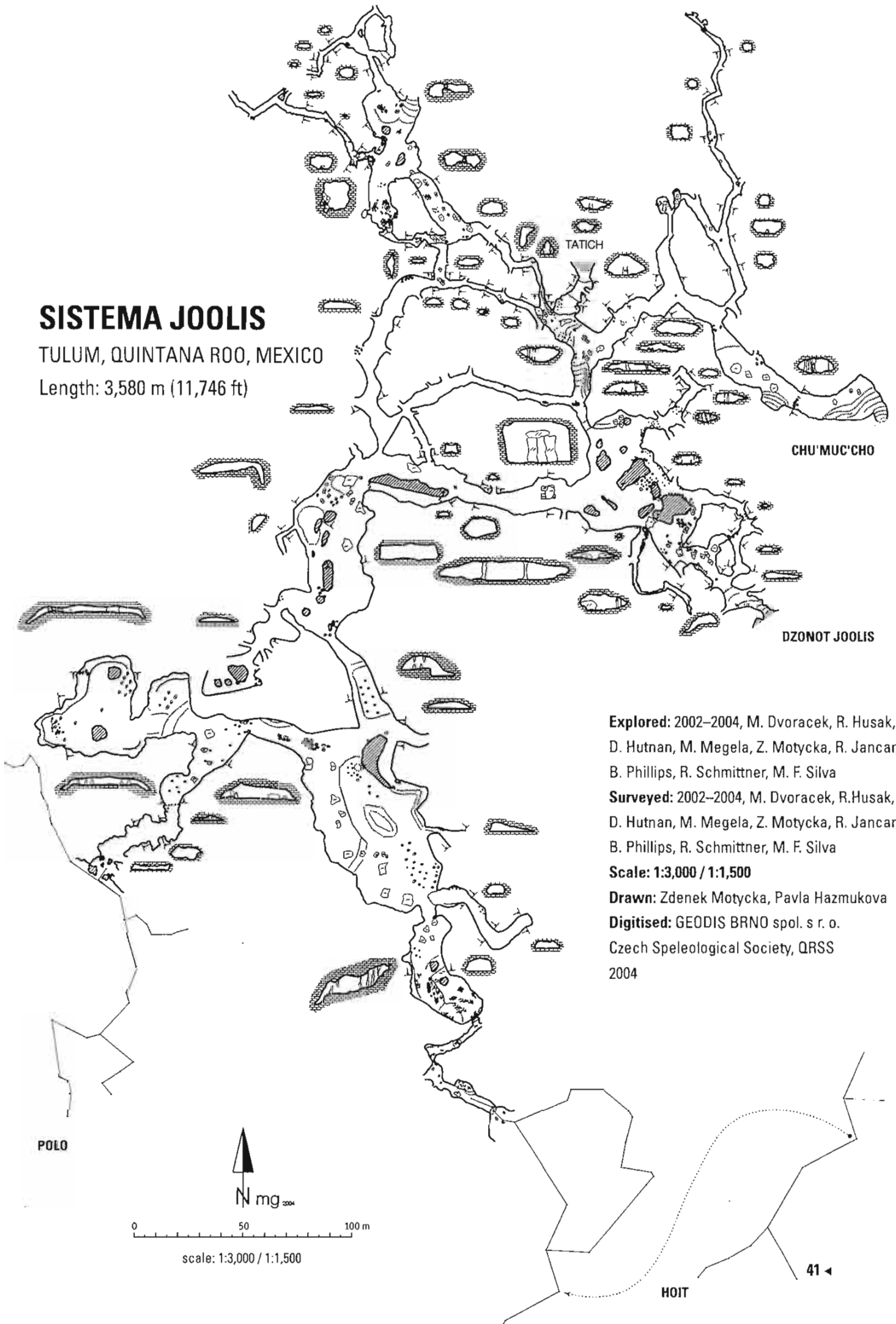
Near Tulum new Dos Locos Cenote was found, explored and surveyed with 493 m of new passages. Sampling of soils and troglobionts for research by the UNAM staff was the important part of the expeditions.

Expeditions participants: Motyčka ZDENĚK, Radoslav HUSÁK, Daniel HUTŇAN, Jan SIROTEK, Michal MEGELA, Radek JANČAR, Miroslav, DVOŘÁČEK, Mariano Fuentes SILVA.

SISTEMA JOOLIS

TULUM, QUINTANA ROO, MEXICO

Length: 3,580 m (11,746 ft)



Explored: 2002–2004, M. Dvoracek, R. Husak, D. Hutnan, M. Megela, Z. Motycka, R. Jancar, B. Phillips, R. Schmittner, M. F. Silva

Surveyed: 2002–2004, M. Dvoracek, R. Husak, D. Hutnan, M. Megela, Z. Motycka, R. Jancar, B. Phillips, R. Schmittner, M. F. Silva

Scale: 1:3,000 / 1:1,500

Drawn: Zdenek Motycka, Pavla Hazmukova

Digitised: GEODIS BRNO spol. s r. o.

Czech Speleological Society, QRSS

2004

Acknowledgements

Special thanks to all landowners from Union Pequeños Proprietarios Rurales – Crescendo Maas Chan A.C for their understanding and willing to allow us to explore new caves on their properties and all our friends – Bill PHILLIPS, Robbie SCHMITTNER, Nadia BERNI, Dave SIEFF, Roman ŠEBELA and Libor MATUŠKA for their help.

References:

- GERRARD S. (2000): *The Cenotes of the Riviera Maya*. – Rose Printing Inc. Tallahassee. USA. ISBN 0-9677412-0-3
- MOTYČKA Z. (2003): Expedition report – Yucatan 2003. – *Speleofórum 2003*. Czech Speleol. Soc. Praha.
- MOTYČKA Z. (2005): Expedition report – Yucatan 2004. – *Speleofórum 2005*. Czech Speleol. Soc. Praha.
- A Condensed Geological Chronicle of the Yucatan Platform* (online). Quintana Roo Speleol. Surv. (cit. 2004-09-15). URL: <http://www.caves.org/project/qrss/qrss.htm>
- A Condensed History of Biospeleology in Yucatan* (online). Quintana Roo Speleol. Surv. (cit. 2004-09-15). URL: <http://www.caves.org/project/qrss/qrss.htm>
- List of Long Underwater Caves in Quintana Roo Mexico* (online). Quintana Roo Speleol. Surv. (cit. 2004-09-15) URL: <http://www.caves.org/project/qrss/qrss.htm>

▲ **Zdeněk MOTYČKA**

Bohemia Cave in New Zealand

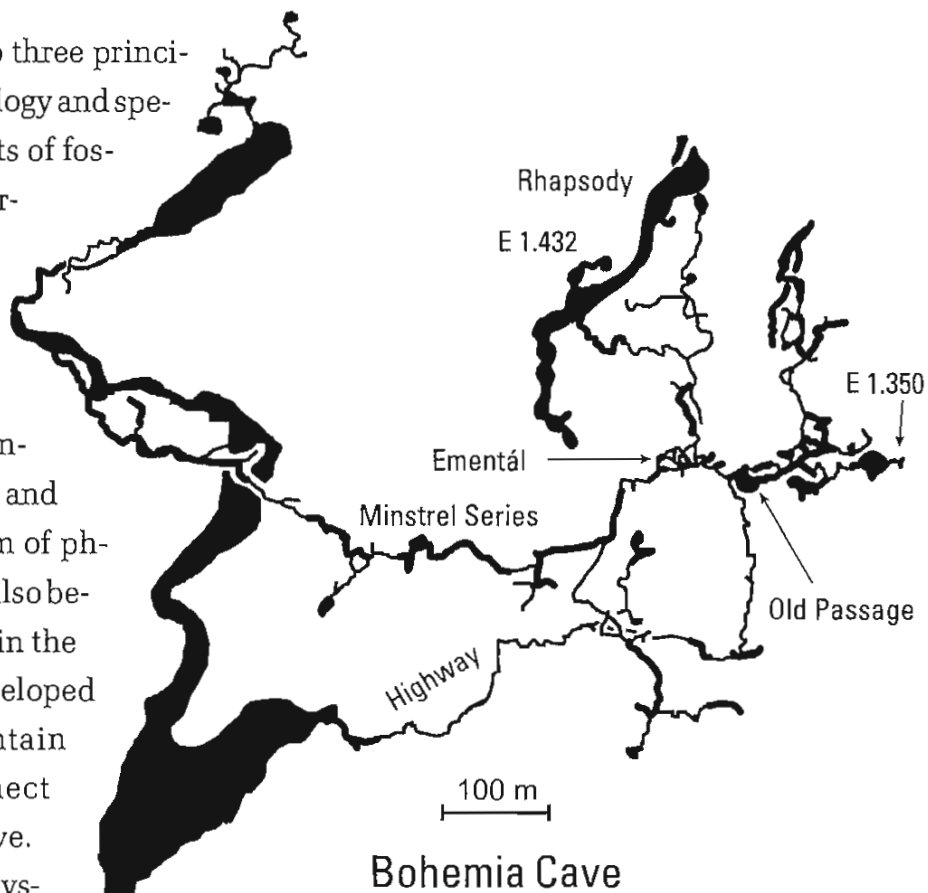
▼ Since 1990, totally 11,230 m of cave passages have been discovered. The depth of the cave is 713 m. The Bohemia Cave was discovered by the expedition of the CSS in 1990 (Tásler et al. 1991). The 2003 expedition was the fifth trip to the cave (Tásler 2000).

Location and geology

The cave is situated in the Nelson Province in the south-western part of the Southern Island. The area belongs to karst region of Mt. Owen. Lower cave entrance is situated at about 1,250 m a.s.l. and the upper entrance, the Rhapsody Cave, is at 1,432 m a.s.l. in rugged karst relief. The area is built by low-grade metamorphosed limestones and dolomitic limestones (Upper Ordovician, Mount Arthur Group). Carbonates are disharmonically folded and thrustured (Wopereis 1988). Carbonates are underlain by phyllites belonging to Pikikiruna Schist and Flora Formation.

Cave description

Cave spaces can be divided into three principal parts differing by the morphology and speleogenesis. The first part consists of fossil phreatic maze composed of narrow channels to huge tunnel-shaped passages. All cavities are developed in carbonates at about 1250 to 1300 m a.s.l. The second part is built by meanders, canyon-like passages, shafts and chimneys situated above system of phreatic passages and descending also below the level of gigantic domes in the same direction. Cavities are developed in carbonates and usually contain small water flows. They connect the first and third parts of the cave. The third part is represented by a system of gigantic domes along the inclined contact of carbonates and phyllites. The dominant posi-



tion holds the gigantic dome 810 m long, 50 to 110 m wide, and 4 to 20 m high. It represents one of the biggest underground spaces in the World. Domes are developed in underlying phyllites under the contact with carbonate rocks (Tásler and Tomášek 1999).

In the course of previous four expeditions, speleological exploration and survey geological research, chemistry of waters were solved (Havlíček and Tásler 1999) and unique aragonite speleothems were studied (Tásler, Cílek and Hercman 2001). The volume of aragonite decoration is expected at the largest in the World (Cílek and Schmelzová 2004).

Expedition in 2003

The exploration of spaces below the Ementál and Minstrel Series (see the map) represented the main task of the fifth expedition. Below the Ementál, muddy narrow passages led to lower lying water collector of Highway. The exploration was not fi-

-713 m

nished due to the lack of time and many metres remained for future connection with the Highway.

Descending and ascending passages in the Minstrel Series. Upper tunnel-like passage brought surprise in the form of rich aragonite speleothems, which is not common in this part of the Bohemia Cave. Back connection to the roof of main corridor represented the disappointment on the contrary. Lower huge gallery terminated by chimneys with measured height of 40 m; nevertheless, they continue up to unknown height. The descending part of the gallery was choked by sandy gravels in which young erosion meander finished by squeeze.

The deviation in the Minstrel Series was the most promising. Two shafts were entered from sediment-filled passages. The first one was 32 m deep and continued by meander, which terminated by squeeze (typical feature of meanders in the Bohemia Cave). The second shaft rested unexplored due to the lack of time. So its depth has been unknown.

In 2003, totally 629.8 m of discovered passages were surveyed. The cave length was prolonged to 11,230 m. The depth of 713 m did not change.

Conclusion

The exploration of side passages from the Minstrel Series unfortunately proved the hypothesis, those subhorizontal phreatic passages of Old Passage and Minstrel Series developed exclusively in N-S direction. Passages situated to the west or north-west did were not developed. Nevertheless, other cave system in huge limestone ridge cannot be excluded.

References:

- CÍLEK V., SCHMELZOVÁ R. (2004): Ochtinská aragonitová jeskyně v slovenském, evropském a světovém kontextu. – *Slovenský kras*, XLII: 89-98. Liptovský Mikuláš.
- HAVLÍČEK D., TÁSLER R. (1999): Chemie krasových vod v systému jeskyně Bohemia (Mt. Owen, Nový Zéland). – *II. národní speleologický kongres - abstrakta*: 7-10. Čes. speleol. Spol. Praha.
- TÁSLER R. et al. (1991): Owen 90 - New Zealand (expediční zpráva). – Čes. speleol. Spol. Albeřice. Trutnov.
- TÁSLER R., TOMÁŠEK J. (1999): Geologie obřích dómů jeskyně Bohemia na Novém Zélandu. – *II. národní speleologický kongres - abstrakta*: 36-39. Čes. speleol. Spol. Praha.
- TÁSLER R. (2000): Výpravy do krasové oblasti Owen na Novém Zélandu v číslech. – *Speleo (Praha)*, 30: 13-14.
- TÁSLER R., CÍLEK V., HERCMAN H. (2001): Speleothem decoration of giant domes in Bohemia Cave (New Zealand). – *Cave Karst Sci.*, 28, 3: 113-120.
- WOPEREIS P. (1988): Geology of the Southern Part of Mt. Owen. - *N.Z. Speleol. Soc. Bull.*, 8, 144-145: 134-140. Waitomo.

▲ Radko TÁSLER

Mt. Canin, Češka jama – Brezno pod Velbom

▼ In the period of 2001 to 2004, cavers discovered and explored Brezno pod Velbom Shaft (Mt. Canin, Julian Alps, Slovenia), which is 850 m deep. It contains the huge entrance vertical shaft, 501 m deep, which is the deepest in the World.

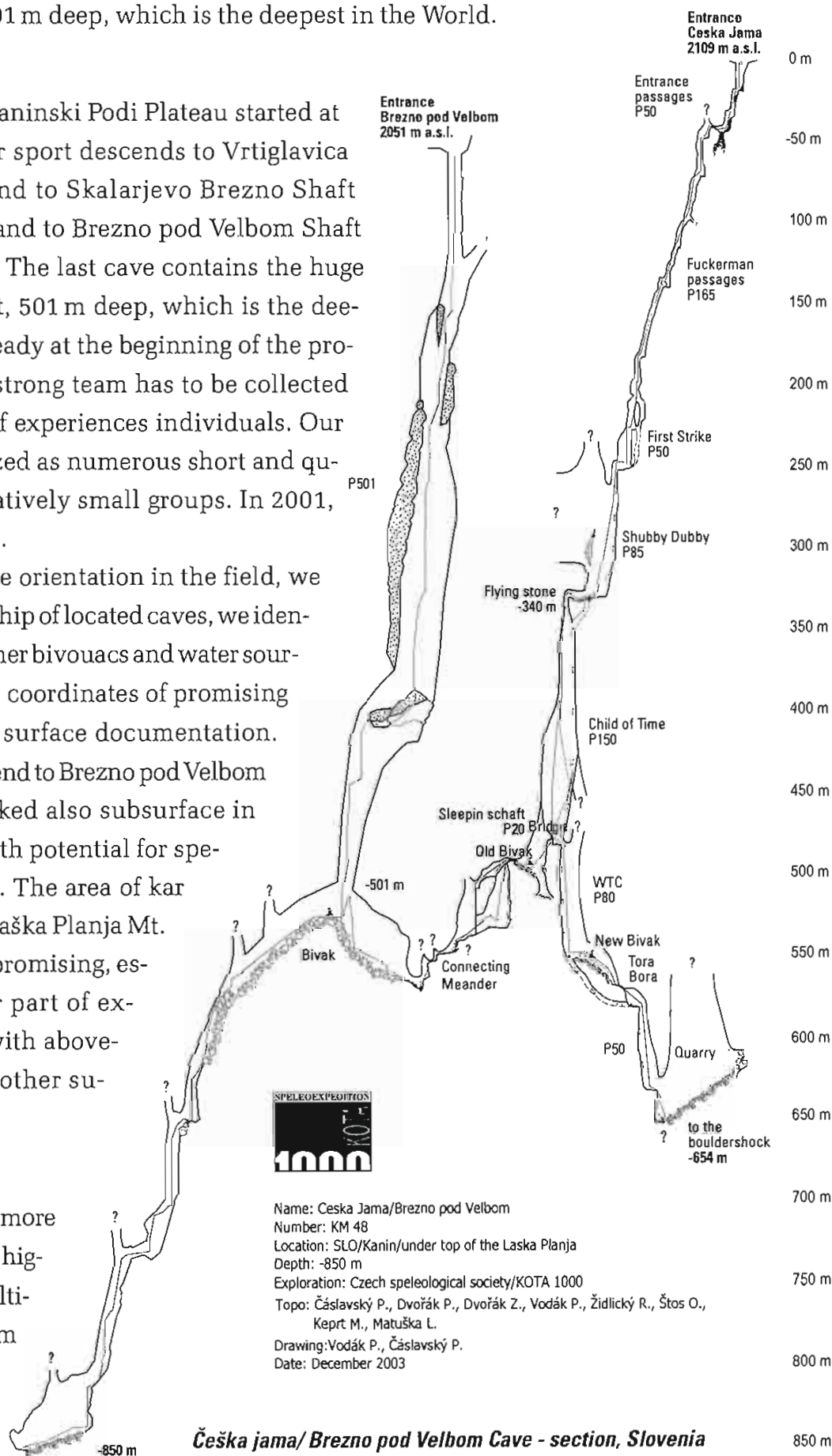
2000–2001

Our activities in the Kaninski Podi Plateau started at the occasion of winter sport descends to Vrtiglavica Shaft (643 m deep) and to Skalarjevo Brezno Shaft (911 m deep) in 2000 and to Brezno pod Velbom Shaft (850 m deep) in 2001. The last cave contains the huge entrance vertical shaft, 501 m deep, which is the deepest in the World. Already at the beginning of the project it was clear, that strong team has to be collected with the dominance of experiences individuals. Our activities were organized as numerous short and quick expeditions of relatively small groups. In 2001, four such trips existed.

We started with the orientation in the field, we compared the relationship of located caves, we identified locations of summer bivouacs and water sources, we stated the GPS coordinates of promising sites and we finished surface documentation. During the winter descend to Brezno pod Velbom Shaft (Velb), we checked also subsurface in pre-selected places with potential for speleological exploration. The area of kar below the summit of Laška Planja Mt. seems to us as highly promising, especially in the lower part of expressive depression with above-mentioned cave and other suspicious forms.

2002

In January, we located more than 20 entrances in the highest part of the kar at altitudes of 2150 to 2300 m



a.s.l. KM 15 Windy Hammer Cave seems to be the only promising with strong drought in the entrance part. After penetration of entrance narrow part at 2150 m a.s.l., we entered slightly declining narrow passage, which continued by 3 m high step. At its bottom, big block choked the continuation. Strong draught was promising. We destructed the block and we continued by low horizontal passage to another step (2 m). It continued by small dome with sediments and decoration. After penetration of another narrow place we entered the bottom of blocked pit from the side window. Following traces of water drainage in the bottom, we passed through the collapse and after 10 m of crawling we faced 13 m deep pit with the slight drought. The continuation terminated in scree and sediments on its bottom. The total length of passages was more than 60 m and the depth was 30 m.

In August and September 2002, we spent 14 days there. We located another 20 entrances and the reconnaissance of the kar directed us to depression with Velb Cave. It was clear that the Velb is not the only and maybe neither the most important unique place of the area. The number of crossing fissures and ice-filled shaft entrances in which we achieved the depth of more than 100 m pressed us to detailed exploration. Several days before the finish of our trip, one caver discovered fragment of unknown vertical system, which has to communicate with lower Velb Cave. Entrance to Cave No. KM48 was situated at 2109 m a.s.l. on N-S trending fissure parallel to this on which Velb is developed. The exploration stopped in the depth of 130 m in narrow inclined passage later named the Fuckermann Passages. Strong draught called us to make exploration in the future, and thrown stone fall and fall down to the depth.

2003

January 2003. To achieve some success in that area, we composed very strong working team in January (cavers from Czech, Slovakia, Poland). During 16 days, 22 people worked in area of KM48 and Velb caves simultaneously supposing the interconnection of both caves in the depth between 750 m and 850 m, i.e. up to the Velb bottom where the drought is most dispersed. First three teams focused on descend in the KM48 penetrating the entrance pit (p50), Fuckermann Passages (p165), First Strike (p50), Shubby dubby Shaft (p85). Large rocky block stopped their progress in the depth of 320 m. Block with size of $3 \times 2 \times 1.5$ m was named the Flying stone because of facing the unknown depth where thrown stone fall 11 seconds. Members of team discussed the progress. It was dangerous to continue below free block. The strategy was reevaluated. Two teams explored the descending branch of the Velb from the depth of 541 to 850 m. Number of windows were located in the pit p70 (depth of 800 m) but due to poor access, they rested unexplored. The pit p70 has opening in the depth of 750 m with the bottom in 850 m. Draught here is highly dispersed with unclear flow direction. The bottom represents the static cave and its last 40 m (p40) does not offer the continuation. Therefore the cave was cleaned, equipment was taken out and survey was finished. The main focused

was changed to the entrance to KM48. Several brave cavers equipped the Child of time pit (p50) below the hanging block. Only the view up how the block is attached to rocky massif was horrific, more thinking about the crossing the stone.... Provisional route of descends directly in flowing water offered the continuation. In the depth of 480 m on small balcony (the Bridge), the cave divided into two branches. The descent to shallower one terminated on January in 570 m with possibility of another descends. Therefore, the February trip was planned.

February 2003. Another ten days long trip opened big mysteries. The first team had to blast the Flying stone. Unfortunately, due to this activity, the rock in surroundings was damaged. This had the consequence in 5 m long fall of one caver and fall of rocky block (about 100 kg heavy). The rope was seriously damages, nevertheless no injury occurred. The exploration continued by several short steps and stopped at 570 m by narrow meander with water stream and strong draught. Another team continued from the Bridge through shaft named the WTC – World Trade Centre (p80), which is probably the nicest pit in the whole cave. The pit opened to large space, Tora Bora, which obliquely descends to the depth of 580 m into the opening of old narrow meander with water stream on the bottom. The slimmest caver passed through the meander with problems and continued by cascades some 10 m to the mouth of another deep shaft. The task for further trip was clear – to broaden the narrow meander and to continue in exploration.

April to May 2003. Four days were originally expected in light style, i.e. on skis to the entrance, 30 hours underground, ascend to cottage and back to Bovec village by funicular. Nevertheless the reality differs – it was worse. We could not use skis due to heavy wet by thin snow. Therefore material was transported on foots for 4 hours when cavers locally passed through wet snow. Bigger surprise waited for us on the bottom of entrance pit (p50). Three metres of heavy snow covered the bottom. Snow was excavated in 2 hours. After the way was free, dry and frozen. The progress was rapid through the Fuckermann Passages (p165) up to narrow place in Tora Bora (580 m), which was quickly broadened. Through small cascades we entered pit (p50), which is interrupted by balcony formed by falling stones. Another pit (p13) opened to the largest space, The Quarry with dimensions of 40×25×60 m. The Quarry is completely choked by scree, in which small stream disappears. We descended 6 m down among huge blocks into dangerous site. This huge “collapse” is inclined in 30° and it leads to small window in side upper lying space. Also the window is closed by huge blocks in the depth of 654 m. Water outflows among blocks to the depth. After more than 30 hours in underground we appeared at the surface. Funicular is out of function. With 50 kg heavy rucksack we descend on skis down to the show line.

The aim for next trip is clear. Never ending ascends with acu boring machine out of the cave, loading on solar panel represents so prolonged procedure that it led us to buy engine powered drilling rig. With its help, we will overcome the collapse in site of The

Quarry. Results of survey were process in the 3D map of Canin in notebook. Results are clear, sooner or later both caves will join, even if not immediately.

September 2003. Ten days long trip at the end of September, 10 man-strong team, new drilling machine should ensure the success in the Češka jama Shaft (-654 m). Bivouac was erected in the depth of 580 m, i.e. in Tora Bora. For better transport of material some parts in Tora Bora were enlarged. Our main activity was concentrated in narrow meander with very strong draught in the second branch behind the Sleeping Shaft in the depth of 570 m. The first team (Z. Dvořák, R. Židlický) penetrated after the whole night work the series of narrow passages to big dome. Later we discovered to big hall in the depth of 600 m in the Velb. Passed meander was 50 m long from which 20 m represents the purgatory. The transport of one specially adapted bag lasted one hour for the distance of 20 m. There is very strong draught and small stream (about 10 l.s⁻¹). Water fall through the pit (p8) into the Velb. The place was named the *Connecting Meander*.

Second half of our stay was characterized by bad weather, rain, occasional snow fall and strong wind. Water coming to the cave pushed us out of it. *Child of Time* (p150) looked like turbine and only due to safe equipment the pass through was without problems. The highly dangerous were also inclined parts of the Fuckermann Passages (p165) and balcony in the WTC (p80) in the depth of 480 m. Relatively narrow window (3×2 m) represents the only natural outflow of the main stream from the Child of Time (p150). Parts below the WTC (p80) represent therefore the trap. The way back was based rather on intuition. Selected strategy – attempt/mistake – was successful in finding of signal flags, but return to cottage was prolonged to 5 hours in snow, rain and strong wind.

2004

Four trips were organized this year. The situation started to be complicated. The huge amount of snow rested after the winter and the cave was closed by 10 m thick cork. The January trip stopped in entrance p50: 10 m of snow. June trip found situation much worse – the entrance pit was completely closed by snow. We dig only to the depth of 20 m. Trip at the end of July was more successful – we dig to the depth of 30 m thanks to high temperatures, draught and especially rain. Only August trip found cave more open; only one meter of snow rested there. The Connecting Meander in the depth of 570 m appeared to be harder problem than expected. Extremely narrow parts were enlarged in the length of 2 m and next 3 m were waiting. But the serious problems with drilling machine finished our dreams.

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We specially thank to the Jamarska zveza Slovenije, to Caving club of DZRJ Ljubljana (Mr. J. PIRNAT and G. PINTAR), and to Caving club of JD Kooper (Mr. R. STOPAR & M. DULAR).

▲ *Oldřich Štos*

NAMAK: Czech-Iranian research project in Iranian salt karst (SE Zagros Mts.)

▼ The most exciting result was the discovery and exploration of the 2nd and 5th World longest caves in salt: Tří Naháčů Cave (5,010 m), and Ghar-e Daneshyu Cave (1,909 m). Nearly 12 km of cave passages in salt have been explored and surveyed by expeditions.

In recent years, two one-month long expeditions were performed into salt karst in diapirs (salt plugs) of the SE Zagros Mountains in Islamic Republic of Iran (January 2004 and April 2005). These trips represented the continuation of the research carried out in the area already between 1997 and 2000. Beside the cavers, researchers and students of the Charles University in Prague (Czech Republic) and Shiraz University (Iran) took part in expeditions. The results of the first phase of research were published (Bosák et al. 1999; Bruthans et al. 2000, 2001). The most exciting result was the discovery and exploration of the 2nd and 5th World longest caves in salt: Tří Naháčů Cave (5,010 m), and Ghar-e Daneshyu Cave (1,909 m; see Bruthans et al. 2001).

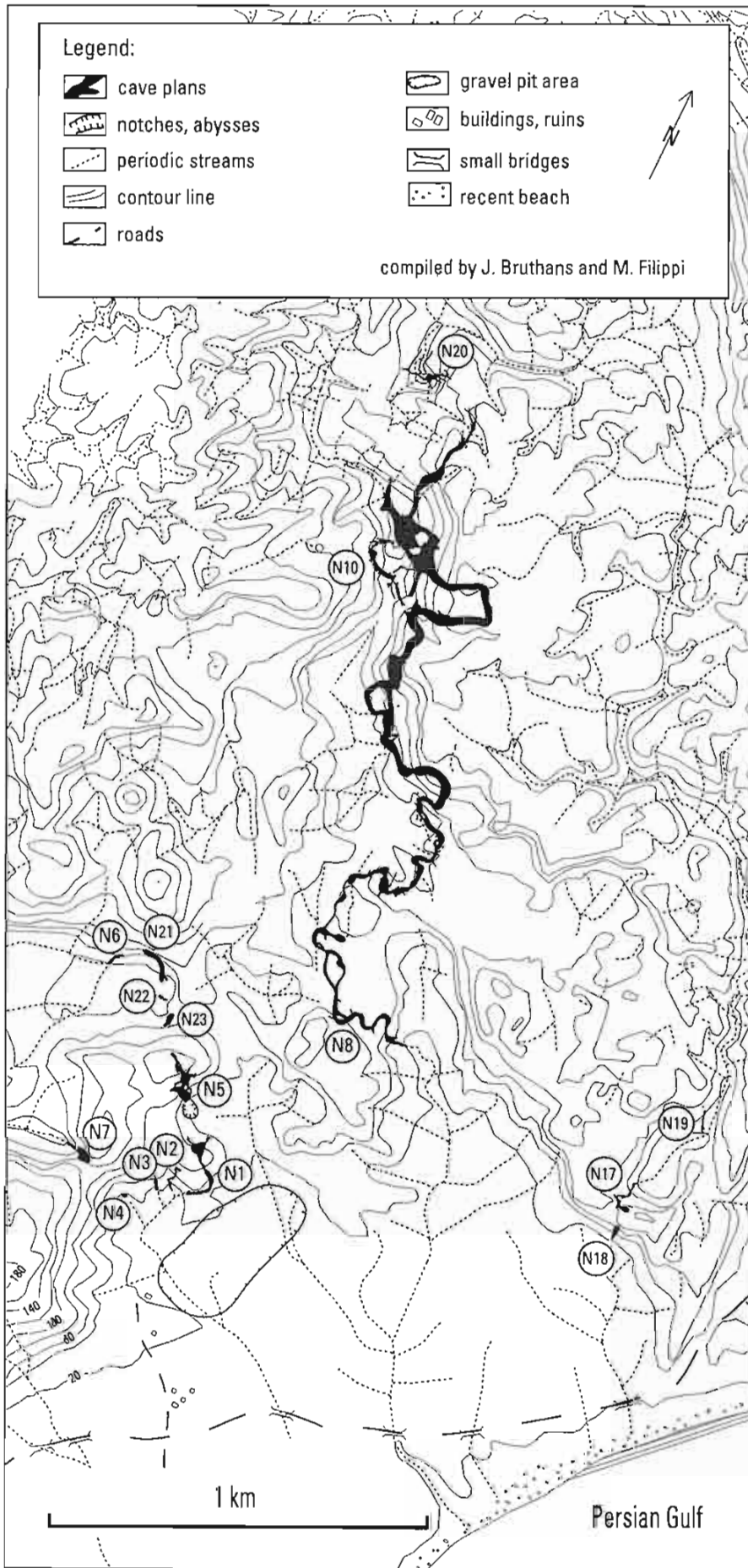
Location

The studied area is situated in the southern part of the Islamic Republic of Iran along the northern shore of the Persian Gulf. The area belongs to the south-eastern part of the Zagros Mountain Range and the Persian Gulf Platform. About 200 salt plugs have been known in the area of the Persian Gulf. The size of salt plugs usually varies between about 1 and 15 km. As tops of highly soluble rock – rock salt – form the highest summits of the landscape, in places, they have been subjects of the interest since the 17th Century. The salt is Late Proterozoic in age.

Karst forms

Karst forms are completely comparable with common type of karst in carbonate rocks. A wide variety of forms can be distinguished: karren, cylindrical solution pipes, solution dolines, solution-collapse dolines (sometimes with water at the bottom), uvala-like to polje-like depressions, blind valleys and canyon-like erosion forms, ponors and karst springs and caves (Bosák et al. 1999). The light-hole type of abysses can reach the depth up to 60 m. Caves are developed especially in the form of ideal water table caves. Old cave levels are rare in Iranian salt karst; nearly all passable caves have recent riverbeds. The older passable levels occur only up to 10 m above the recent riverbeds. On the Namakdan plug the older cave occur levels up to 100 m above recent level, but they are completely choked with sediments. The sumps are very rare in Iranian salt karst. Caves are passable from ponor to resurgence only in several cases; they mostly terminate by lowering under limit of accessibility or by choke.

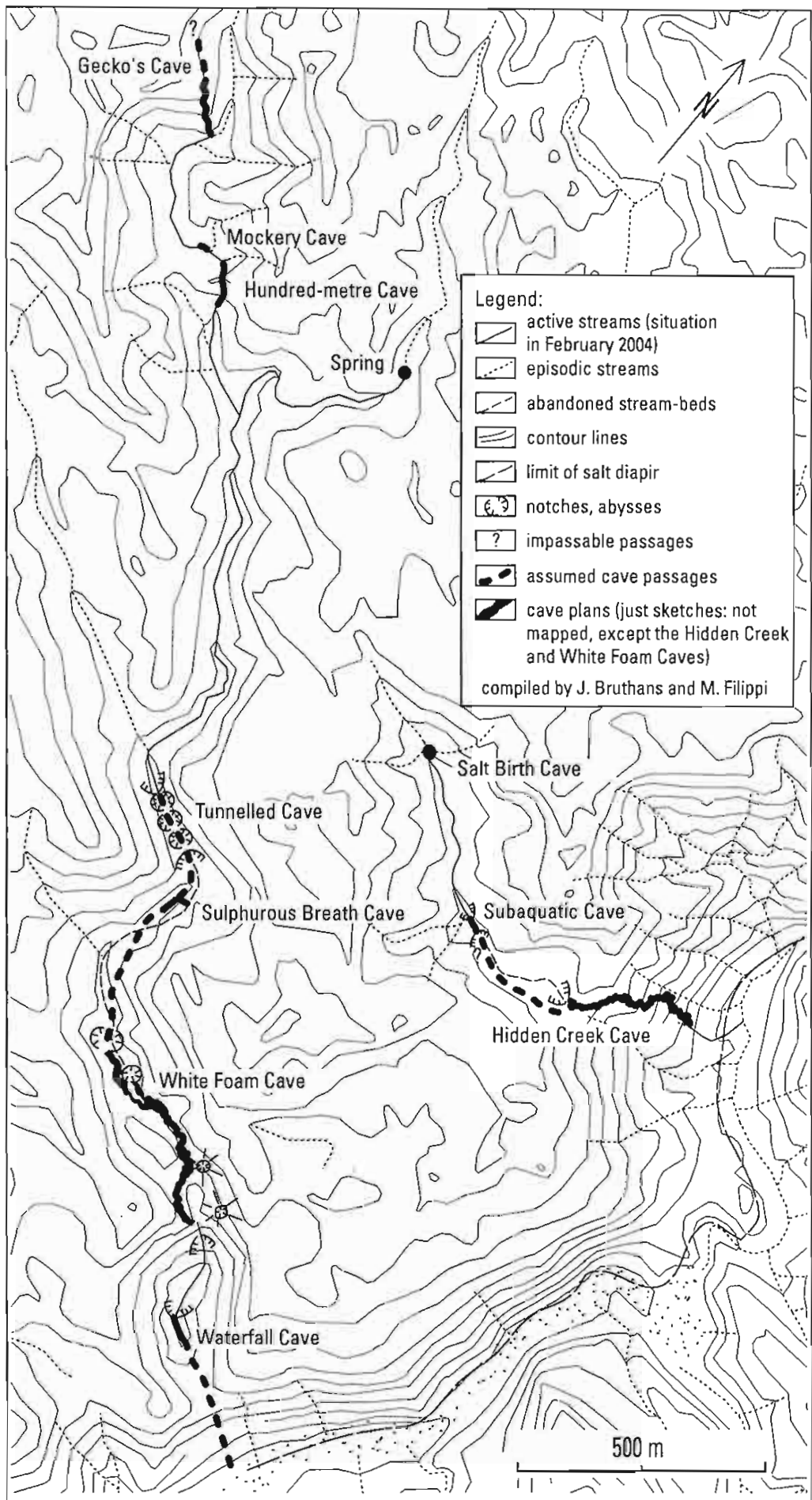
Salt speleothems occur in many different forms. Cave walls and bottom are covered by thick layer of salt crusts. Abundant curved stalactites (up to 4 m long), which look li-



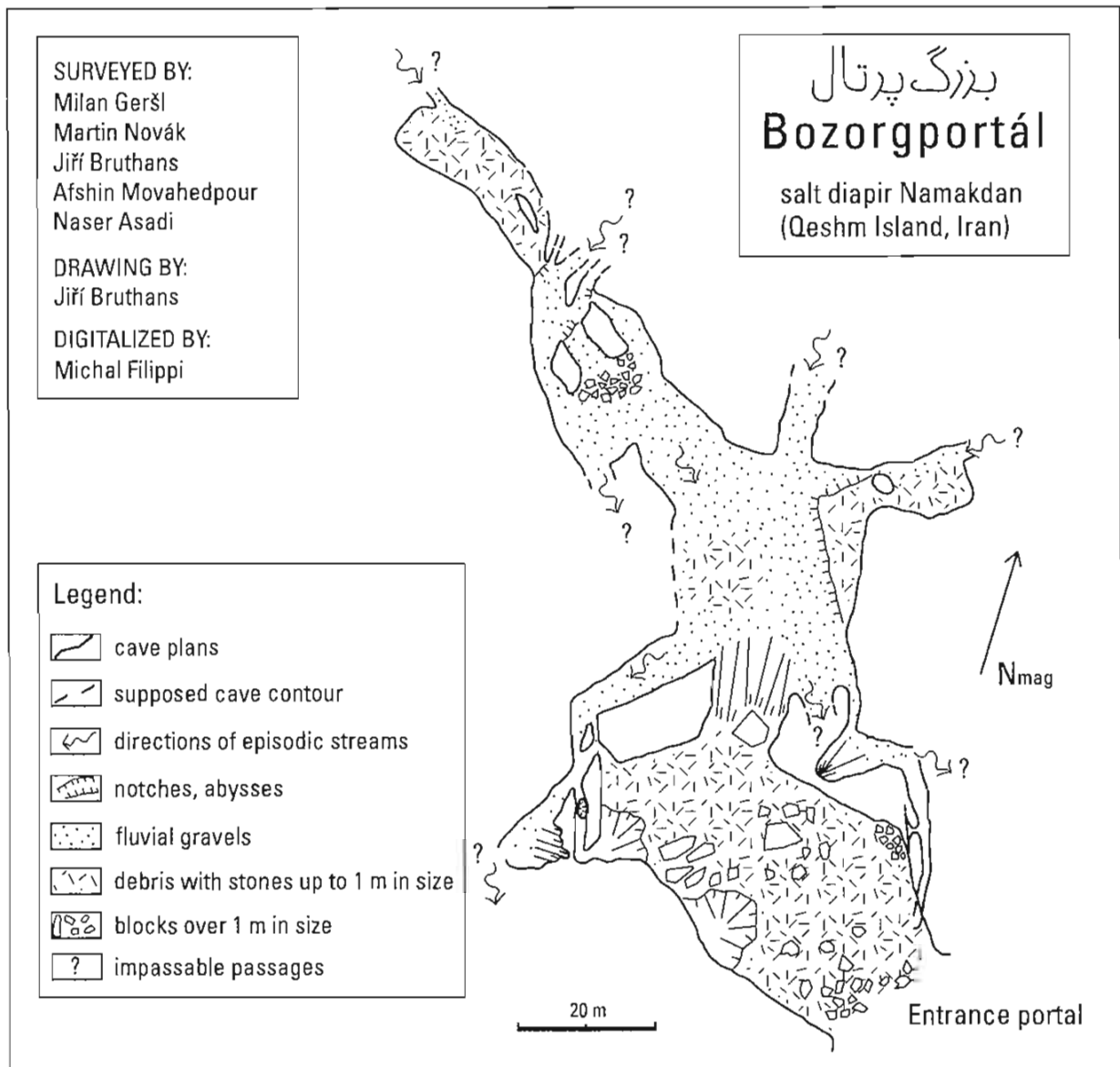
A sketch of SE Namakdan salt plug, Qeshm Island. Prepared according to topographic maps at the scale of 1:25,000, GPS measurement and out mapping.

Explanations:

- N1-Namaktunel Cave**
- N2-Water Cave**
- N3- Cave of Snow Kingdom**
- N5-Bozorgportal Cave**
- N6-Polje Cave (main entrance)**
- N7-Abyss of Strong Echo**
- N8-Tří Naháčů Cave**
- N10-Upper Entrance Cave**
- N17-U policajtů Cave**
- N18-Donkey's Cave**
- N19-Alenáš Cave**
- N20-Big Ponor Cave**
- N21 Polje Cave (second entrance)**
- N22-Short Cave**
- N23-Ruined Cave.**



A sketch of the southern part of Jahani salt plug; prepared according to topographical map of 1:25,000, personal GPS survey and our explorations.



Map of Bozorgportal Cave, Namakdan salt plug.

ke huge helictites, represent the most common type of speleothems. Straw stalactites are relatively scarce. Speleothems composed from skeletally developed crystals are common. Stalagmites are relatively rare. Up to 2 cm long and tenth of mm thick fibre-like salt hairs cover the speleothems on places.

Expeditions

The 2004 trip was focused on surface exploration of 5 selected salt plugs: Namakdan, Hormoz, Khamir, Gachin (Hormozgan Province) and Jahani (Fars Province). The members of the Czech expedition closely cooperated with researchers and students from the Shiraz University. Only few, rather small new caves were found on Namakdan, Gachin

and Khamir salt plugs. Several rather short caves were mapped on Namakdan: Bozorgportal (405 m), Alenáš (150 m). Two caves were mapped on Hormoz Island: Fatima (660 m) and Leila (400 m). The last region then visited was Jahani plug near Firuz Abbad. Most of caves are very short, choked by debris however. The only large cave discovered on this salt plug is White Foam Cave exceeding 1 km and Hidden Creek Cave (480 m). Caves on the Jahani salt plug are formed mainly by passages with meandering canyons, a feature indicating a quick uplift of the salt massif. Research was focused on the age of cave levels (radiocarbon dating) and uplift rate calculation.

During 2005 expedition, the White Foam Cave was surveyed. Intensive winter rains flushed out the crust coking the Tří Naháčů Cave, so new several hundreds of meters were discovered. Most attempts were focused on research. Retreat of the salt outcrops and cap rock denudation were measured by plastic pegs installed in 2000. The uplift rate of Namakdan and Hormoz salt plugs was calculated to about 6 mm.a-1 according to radiocarbon dating. The accessible caves started to develop about 6000 years B.P. as indicated by dating. Nearly 12 km of cave passages in salt have been explored and mapped by expeditions.

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References:

BOSAK P., BRUTHANS J., FILIPPI M., SVOBODA T., SMID J. (1999): Karst and caves in salt diapirs, SE Zagros Mts., Islamic Republic of Iran. – *Acta Carsol.*, 28/2, 2: 41-75.

Ljubljana.

BRUTHANS J., FILIPPI M., ŠMÍD J., PALATINUS L. (2001): New findings about salt karst in Zagros Mountains, Iran. – *Proceeding of Explo 2000, 4th European Caving Expedition Symposium*: 42-45. Profoundeville. Belgium.

Bruthans J., Smid J., Filippi M., Zeman O. (2000): Thickness of cap rock and other important factors affecting morphogenesis of salt karst. – *Acta Carsol.*, 29, 2: 51-64.

Ljubljana.

▲ **Jiří BRUTHANS, Michal FILIPPI, Ondřej JÄGER, Naser ASADI & Muhammad ZARE**

Abstracts of presentations on the 14th ICS Greece 2005



The antiquity of the famous Belianská Cave (Slovakia)

▼ The famous Belianská Cave on the very eastern end of the Tatra Mountains (Slovakia) is well known due to its special speleothem decoration (over 100,000 visitors per year). The entrance part of the cave was already known to the secret prospectors of treasures in the 18th century. The cave was rediscovered in 1881, managed for tourist including excavation of new entrance in 1882 and in 1896 it was lighted by electricity as one of first show caves in the former Austrian-Hungarian monarchy. The original entrance shaft is situated on the slope of Kobylí vrch Hill at 972 m a. s. l., 212 m above the Belá River. The artificial entrance lies at 890 m a. s. l. and entered to lower part of the cave. Total length of measured cave passages reaches 3,018 m and altitude difference is 170 m. The tourist path is 1,000 m long with 125 m of altitude difference. The cave is developed obliquely along the bedding planes of Middle Triassic carbonates (Pavlarčík 2002).

Till present has dominated the explanation that the Belianská Cave has developed since the Early Pleistocene (Vitásek 1929, 1931; Sekyra 1954; Droppa 1959; Wójcik 1968; Lukniš 1973). However, Vitásek and Sekyra admitted also primary Pliocene development, connected with drainage of planated surface on Kobylí vrch Hill at about 1100 m a. s. l. Nevertheless, all these authors suggested, that the cave developed due to water circulation from late Pliocene planated surface to deeply incised gorge of Belá River during Pleistocene glaciations.

However, steep development of the cave, thick silt deposits and absence of typical cave sediments (like as fluvial gravels and sands or redeposited surface deposits), as well as lack of typical speleogens (e.g., scallops showing descending flow direction; Bella and Pavlarčík 2002) are surprising. Thick fine-grained deposits and huge speleothem decoration are exceptional among the Tatra caves. The main component of clastic deposits is dolomite and in the heavy fraction of them dominate dolomite (ca 90 %) and muscovite (ca 9 %), while other very resistant minerals only about 1 % (cf. also Hlaváč et al. 2004). It suggests that the silt is derived from decomposition of local carbonate rocks. In the other Tatra caves developed beneath planation surfaces both grain sizes and mineral compositions are much more differentiated and different. The palaeomagnetic and magnetostratigraphic investigations of several sediment sections indicated 2 or 3 inverse polarized magnetozones within normal polarized one (Pruner et al. 2000). U/Th ages of speleothem covers of palaeomagnetic sections are all over the limit of the method (350 ka).

New scallop survey showed the ascending water current in the cave.

Primary origin of the Bielanská Cave could be explained by corrosion of ascending (thermomineral?) waters from deep fault-guided paths prior to the formation of late Neogene topographic features. Thus the cave can be older than 5 Ma.

References:

- BELLA P., PAVLARČIK S. (2002): Morfológia a problematika genézy Belianskej jaskyne. *Výskum, využívanie a ochrana jaskýň*, 3: 22-35. Liptovský Mikuláš.
- DROPPA A. (1959): *Belanská jaskyňa a jej kras*. – Vyd. Šport: 1-131. Bratislava.
- HLAVÁČ J., ZIMÁK J., ŠTELCL J. (2004): Jeskynní hlíny zpřístupněných jeskyní Nízkých a Belianských Tater. – *Výskum, využívanie a ochrana jaskýň*, 4: 89-94. Liptovský Mikuláš
- LUKNIŠ M. (1973): *Reliéf Vysokých Tatier a ich predpolia*. – Vyd. SAV: 1-375. Bratislava.
- PAVLARČIK S. (2002): Geologické pomery východnej časti Belianskych Tatier a ich vplyv na vývoj Belianskej jaskyne. – *Výskum, využívanie a ochrana jaskýň*, 3: 15-21. Liptovský Mikuláš.
- PRUNER P., BOSÁK P., KADLEC J., VENHODOVA D., BELLA P. (2000): Palaeomagnetický výzkum sedimentárních výplní vybraných jeskyní na Slovensku. – *Výskum, využívanie a ochrana jaskýň*, 2: 13-25. Liptovský Mikuláš.
- SEKYRA J. (1954): *Velehorský kras Belských Tater*. – Nakl. ČSAV: 1-95. Praha.
- VITÁSEK F. (1929): Stopy starých ledovců v Belských Tatrách. – *Spisy Tatranské Komise odb. Čs. Spol. Zemep. v Brne*, 3A: 3-16. Brno.
- VITÁSEK F. (1931): Fysický zeměpis Tater. – *Naše Tatry*: 15-215. Praha.
- WÓJCIK Z. (1968): Rozwój geomorfologiczny wapiennych obszarów Tatr i innych masywów krasowych Karpat Zachodnich. – *Prace Muzeum Ziemi* 13: 3-169. Warszawa.

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Phenomenon of underwater caves of Riviera Maya, Mexico

▼ Riviera Maya represents a part of the eastern Caribbean coast of Yucatan Peninsula (Mexico) in Quintana Roo State. The area built by pure Palaeocene to Pliocene carbonates covers about 190,000 km². Uplift of peninsula in Pleistocene predisposed karst platform to dynamic speleogenesis. Rich rains penetrated through porous host rock and created shallow cave systems draining water towards the sea. Quaternary glacial-related sea-level changes caused the erosion enlargement of existing caves, development of speleothems and collapses of cave roofs resulting in formation of cenotes. At about 18,000 years B.P. the sea started to rise to the present level and these caves were flooded.

Today the surface is absolutely flat, covered with a jungle. There are no rivers, only lagunas and cenotes. Lagunas are big lakes, while cenotes can be small, often hidden behind the rocks. At the seaside, there are calets where fresh water flows to the ocean. Cenotes and caves constitute really unique ecosystem. Hundreds of animal species have been described in the last 100 years.

The first bigger cave system of Nohoch Nach Chich was discovered in 1986 by the team of Mike Madden. It represents the beginning of the invasion of divers and many other cenotes and kilometres of corridors were discovered.

▲ **Zdeněk Motyčka**
Czech Speleological Society

Activities of Czech and Slovak cavers in Riviera Maya, Mexico

▼ Several expeditions of Czech and Slovak Speleological Society to the Mexican Yucatan Peninsula were organized in last two years in cooperation with the UNAM – The Mexican National University and the QRSS – Quintana Roo Speleological Survey. The area of the activities of expeditions is known as a Riviera Maya. Besides as a result of geological and climatic conditions it is a unique area with large underwater cave systems. The expeditions worked in the surroundings of the towns Tulum and Chemuil. Totally 6,860 m of new corridors was discovered and surveyed by Czech and Slovak cavers in Riviera Maya up to now. The important part of the expeditions was also sampling of soils and troglobitic animals for the research of the UNAM.

▲ **Zdeněk Motyčka**
Czech Speleological Society



Cueva Charles Brewer - Cave in quartzite,
Chimantá, Venezuela. Photo by: Marek Audy



Cueva Ojos de Cristal - Cave in quartzite,
Roraima, Venezuela. Photo by: Marek Audy



Cave in glacier, Tonydallen Walley, Spitsbergen. Photo by: Stanislav Řehák

Let's join idea to participate on the 16th International Congress of Speleology 2013 in Brno, city in the heart of new Europe, the gate to the famous Moravian Karst - unique karst area with more than 200 years old history of exploration and research.

16th International CONGRESS OF SPELEOLOGY Brno 2013, Czech Republic

