

JASKINIE

The Caves

Nr 7

Caves in Poland

p. 4

Jaskinia Wielka Śnieżna

-the deepest cave in Poland

p. 12

Lamprechtsofen

*- Polish exploration
of the second deepest cave in the world*

p. 14

**The second Polish minus thousand in
the Tennengebirge**

p. 22

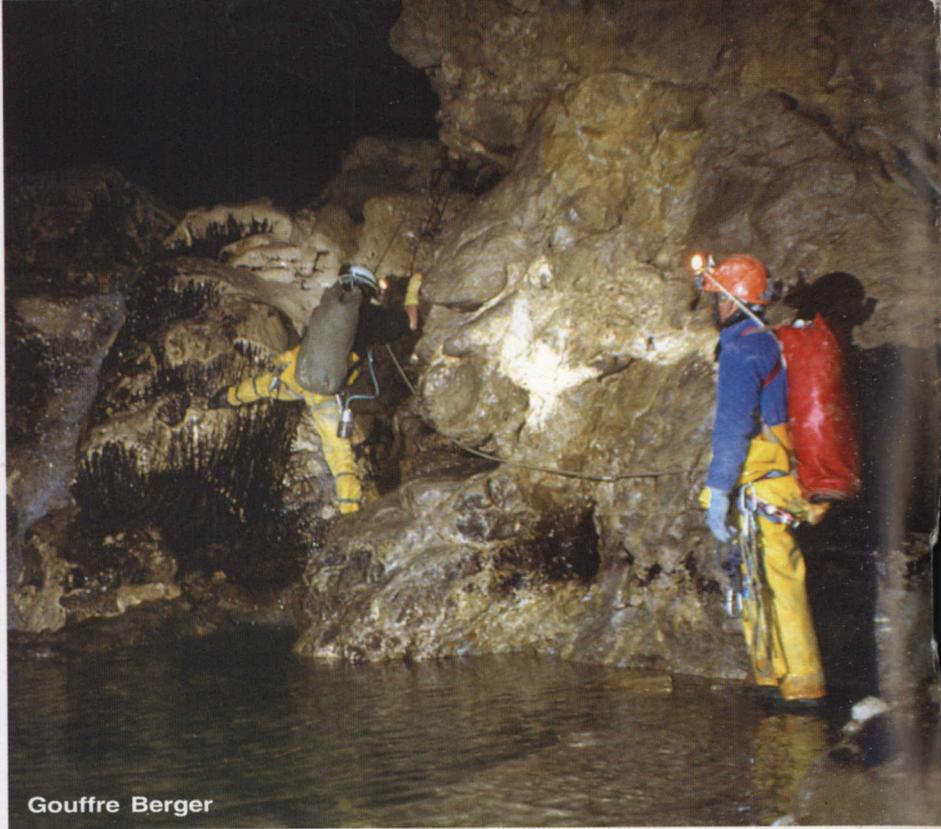
The Picos de Europa

- El Cornion

p. 28

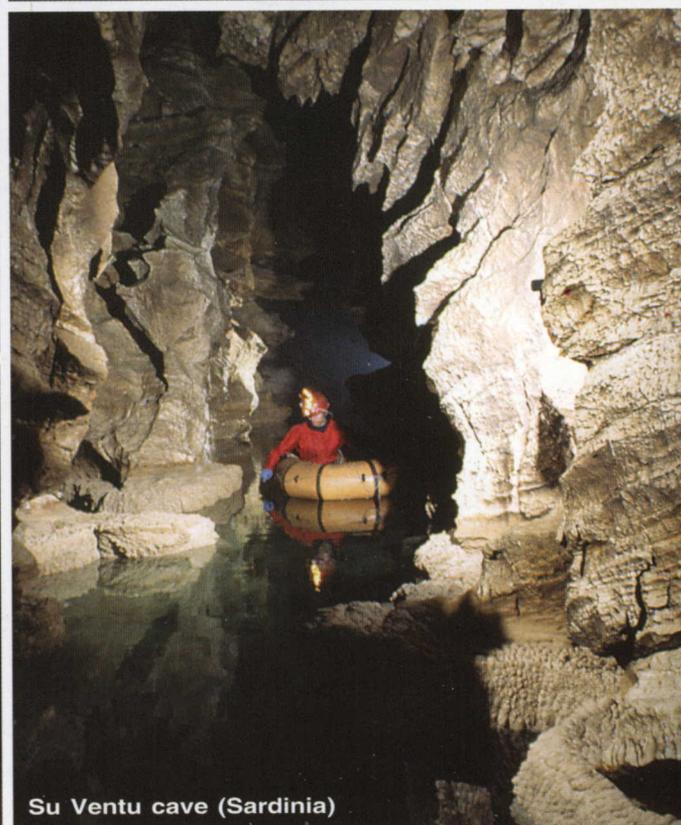
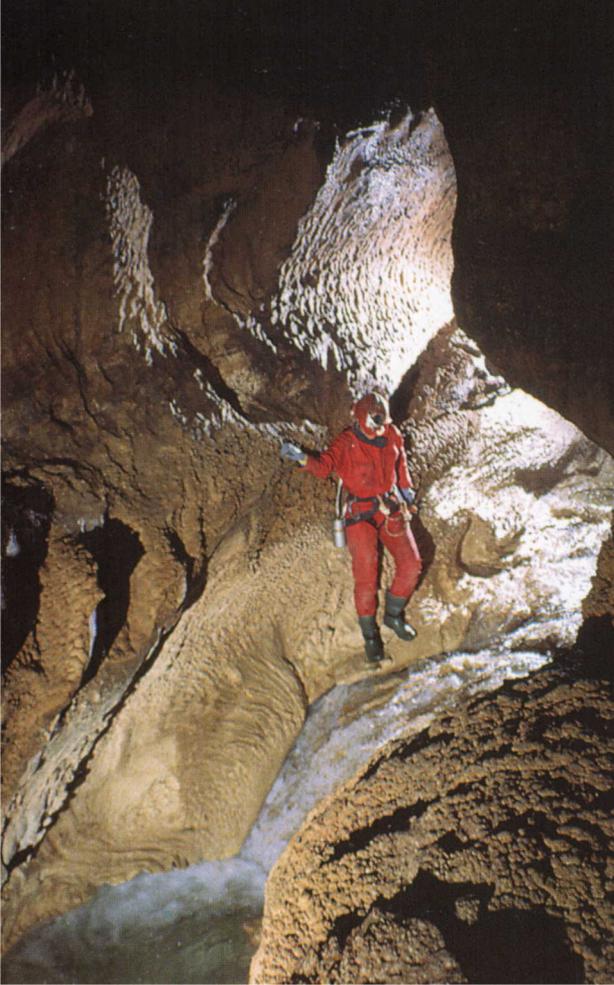


Gouffre Berger



Gouffre Berger

Su Palu cave, river called Blue Nil (Sardinia)



Su Ventu cave (Sardinia)

all photos by M. Gradzinski



Su Ventu cave (Sardinia)

JASKINIE

The Caves

KRAKÓW 1997
Number 7

Special Issue published on the occasion of 12th International Speleological Congress

Contents:

From the Editors - Jacek Dulęba, Michał Gradziński	3
Caves in Poland - Michał Gradziński	4
Caving Organizations in Poland - Agnieszka Gajewska	8
History of the Exploration and Study of Caves in Poland to 1900 - Wojciech W. Wiśniewski	9
Exploration of the Deepest Cave in Poland - Jaskinia Wielka Śnieżna - Witold Jokiel	12
Lamprechtsofen - Polish exploration of the second deepest cave in the world - Andrzej Ciszewski	14
The Göll Massif - Zbigniew Rysiecki	18
Expeditions of Sekcja Grotołazów Wrocław to Eastern Part of the Göll Massif - Wiktor Bolek	20
The Second Polish Minus Thousand in the Tennengebirge - Rajmund Kondratowicz	22
The Southern Tennengebirge - Jarosław Rogalski	24
The Steinernes Meer - A Long Way to Success - Artur Amirowicz, Maciej Tomaszek	26
The Hochkönig - Wiktor Bolek	27
The Picos de Europa El Cornion - Marek Jędrzejczak	28
Compleso del Foran del Muss - The Expeditions of KS Aven in 1995 - 1997 - Waldemar Kasprzyk, Marek Koziół, Waldemar Mucha	32
The Julian Alps - Slovenia - Lubomir Zawierucha	33
The Monti Musi '95 - Jerzy Pukowski	34
Albania - Wild and Unexplored - Marcin Koziół	35
Why Turkey? Expeditions to the Toros Dargali - Krzysztof Adamek	36
Vietnam - Krzysztof Cygan	37
Climbing in Darkness - Marcin Francuz	38

Bulletin of the Caving Commission of Polish Mountaineering Association
Published by ZRGiW AMC Kraków

Editors:

Jacek Dulęba, Michał Gradziński, Mariusz Szelerewicz (*Layout and Design*)
Associate editor: Artur Amirowicz

Editorial address:

Jacek Dulęba, ul. Kurasia 21/1, 30-603 Kraków, Poland
e-mail: zrgw_amc@kr.onet.pl

Front cover:

Studnia z Lodowymi Firankami (Pitch with ice curtains) -
Velorenenweghöhle; photo by S. Kotarba

Back cover:

Ariadnahöhle - entrance pitch; photo by A. Dajek
The Monte Canin Massif; photo by M. Gradziński

From the editors

It is our honour to present the special issue of the journal „Jaskinie”, which means caves in English. The issue is published on the occasion of 12th International Speleological Congress. The main target of the publication is to describe the main achievements of Polish caving that have been done throughout last five years.

There were many expeditions abroad. The Austrian Alps were traditionally the goal of numerous Polish expeditions (see articles by Ciszewski, Rysiecki, Bolek, Kondratowicz, Rogalski and Amirowicz). The spectacular exploration results were also yielded by expeditions to the Picos de Europa (see article by Jędrzejczak). Besides Polish cavers carried out exploration in the karst massifs of the Julian Alps (see papers by Kasprzyk et al, Zawierucha and Pukowski).

There was also some exploration activity outside Europe. In 1994 an expedition led by Tomasz K. Pryjma discovered some caves in the Sierra Juarez Oest massif (Mexico). The depth of -473.5 m was achieved in one of them. Besides it Poles carried out the exploration in Turkey (see article by Adamek) and Vietnam (see article by Cygan).

It should be mentioned that Poles also participated in international events. Małgorzata Kosior-Roemer joined the exploration of Lechugilla cave, while a five-man group of the University of Poznań took part in an expedition led by Stein-Erik Lauritzen which explored the karst massifs of the northern Norway, beyond the Arctic Circle, where several small caves were discovered.

The group of Warsaw cavers climbed out of several caves in Poland and of Sistema Cheve using alpinist techniques (see article by Francuz).

Many small groups went to large cave systems for training. In 1994 team from Katowice led by Dariusz Piętak went to Pierre Saint-Martin and Gouffre Soudet. In the same year the cavers from STJ KW Kraków led by Michał Gradziński visited Gouffre Berger in cooperation with their French friends. A Spain cave - Sistema Garma Ciega - Cellagua was the target of a group from Bielsko-Biała led by Waclaw Michalski. The expedition to Provatina organized by cavers from Żagań in the spring 1996 is also worth mentioning. Besides numerous teams chose as their target caves in Slovakia, the Czech Republic, Hungary, Romania, the Ukraine and also Sardinia.

The linking of Wielka Śnieżna with Wielka Litworowa, situated in the Czerwone Wierchy massif of the Western Tatra Mts., was the most spectacular exploration achievement in Poland. The total vertical extent of Wielka Śnieżna, the deepest system in Poland, was extended to 814 m (+7, -807) (see article by Jokiel).

One can find inside this issue, besides the above mentioned articles concerning Polish achievements, the articles discussing the structure and the history of Polish caving (see papers by Gajewska and Wiśniewski). Moreover, the paper by Michał Gradziński characterizes the distribution of caves in Poland and the latest exploration results.

J. Dulęba, M. Gradziński

CAVES IN POLAND

Michał Gradziński
STJ KW Kraków

There are more than 2500 known caves in Poland. They are of karst and non karst (pseudokarst) origin. The former are developed in karst rocks mainly in limestones and dolomites, rarely in gypsum and marbles and exceptionally in rock salt. Although the karstified rocks are widely distributed, the outcrops are rather small and occupy only about 2.5 % of the country area (i.e. about 8000 km²). The rest are overlain by loose Cainozoic age deposits. The non karst caves are developed mainly in various sandstones.

The Polish caves are arranged in seven main regions which are characterized below.

The Western Tatra Mountains (Tatry Zachodnie)

The Tatra is the only mountains of Alpine type morphology which occurs in Poland. They occupy the area of 785 km² (in Poland only 175 km²). The karst rock (limestones and dolomites of Triassic, Jurassic and Cretaceous age) build mainly the Western part of the Tatra range. They occur on the area of 50 km². This area is practically the only region in Poland where large and deep caves are encountered. Because of that the everyday activity of

Polish cavers, both exploration and training is concentrated in this area.

Now more than 650 caves are known in the Western Tatra Mountains. The total length of these caves exceed 100 km. The highest peaks built up of karst rock are higher than 2000 m and the main karst springs are situated at the level of about 1000 m. The majority of caves are located in the following areas: slopes of Bobrowiec, Kominiarski Wierch, the Czerwone Wierchy massif, Giewont, Kalcaka Turnia and Kopa Magury. The most of the longest and deepest caves are situated in the Czerwone Wierchy massif.

Recent years brought some new cave explorations in that area. All the significant achievements were the outcome of long, sometimes lasting for many years, conceptual and field work. The most spectacular was linking of Wielka Śnieżna (the Czerwone Wierchy massif) with Wielka Litworowa (see article by Jokiel). The total length of the cave exceed 18 000 m. Other team from Sopot explored a new series called „Przemkowe Partie” in Wielka Śnieżna. Apart from that other exploration in the same cave was done. The last exploration was the discovery of a long series near the lowest entrance of the cave.

It was done by Warsaw cavers led by Stefan Stefański in February of 1997.

Another interesting discovery was the linking of Jaskinia Nad Dachem cave with Ptasia Studnia cave (the Czerwone Wierchy massif) done in 1991 by cavers from Nowy Sącz led by Anna Antkiewicz. Other exploration in the same cave was done by the same team. The length of Ptasia Studnia cave increased to about 5900 m. Important success was achieved in Studnia w Kazalnicy Miętusiej cave (the Czerwone Wierchy massif). In the winter of 1996 the team from Zakopane led by Krzysztof Dudziński passed through a squeeze situated at the depth of 34 m. The squeeze had been attacked since the 1960's by various teams. The vertical extent of the cave was increased from -34 m to 235 m (- 199; + 36). There were also other significant though smaller finds in a number of Tatra caves (i.e. Kozia, Ptasia Studnia, Śnieżna Studnia - all situated in the Czerwone Wierchy massif and Bańdzioch Kominiarski - situated in Kominiarski Wierch).

The intensification of diving activity in the caves of the Tatra Mts. should also be mentioned. A dive in the terminal sump of Śnieżna Studnia (1994) deepened the cave to - 715 m (the vertical extent reached 752 m). In 1996 Wiktor Bolek set up the Polish record of depth diving -50 m in a sump situated at the bottom of the Ciasne Kominy series in Jaskinia Miętusia. He thus extended the cave depth from -245 m to -258; the vertical extent being now 280 m. Another sump was dived through in the same cave by Krzysztof Starnawski who discovered a small series beyond. In November 1996 Krzysztof Starnawski with the assistance of Stefan Stefański explored a new big sump series in Kasprowa Niżna cave. They started to dive from already known, but still having been unexplored, IV sump and dived through two new sumps. The first is 330 m long and -22 m deep, and the second 167 m long and -26 m deep. The next, VII sump, remains still unexplored.

All Tatra caves are situated in the Tatrzański National Park and caving activities is strictly limited by the authorities. Only six caves are open for tourists. For visiting other caves special permission is demanded.



Distribution of caves in Poland; the caves mentioned in text: 1. Jaskinia w Ociemnem, 2. Jaskinia w Trzech Kopcach, 3. Diabła Dziura w Bukowcu, 4. Kryształowe Groty in Wieliczka salt mine, 5. caves in lead-zinc mines near Olkusz, 6. Jasknia Wierna, 7. Jaskinia Studnisko, 8. Jaskinia Skorocicka, 9. Chelosiowa Jama, 10. Jaskinia raj, 11. Jaskinia Niedźwiedzia, 12. Szczelina Wojcieszowska, 13. caves near Inowrocław, 14. caves near Gdańsk

photo by M. Gradziński



A phreatic passage in Jaskinia Wodna Pod Pisaną cave, small cave in the Kościeliska valley



photo by M. Gradziński

The Czerwone Wierchy massif seen from the entrance to Jaskinia Miętusia Wyżnia

THE DEEPEST CAVES IN THE TATRA MTS.

Cave	Location	Length
Jaskinia Wielka Śnieżna	Czerwone Wierchy, Małolączniak	ca. 18 000 m
Jaskinia Wysoka - Za Siedmiu Progami	Czerwone Wierchy, Ciemniak	11 660 m
Jaskinia Miętusia	Czerwone Wierchy, Dolina Miętusia	10 450 m
Jaskinia Bańdzioch Kominiarski	Kominiarski Wierch	9 550 m
Śnieżna Studnia	Czerwone Wierchy, Małolączniak	ca. 6 600 m
Jaskinia Czarna	Czerwone Wierchy, Dolina Kościeliska	ca. 6 500 m
Ptasia Studnia	Czerwone Wierchy, Kozi Grzbiet	ca. 5 900 m
Jaskinia Zimna	Czerwone Wierchy, Dolina Kościeliska	4 250 m
Jaskinia Kozia	Czerwone Wierchy, Kozi Grzbiet	3 520 m
Jaskinia Kasprowa Niżnia	Kopa Magury Dolina Kasprowa	ca. 2925 m

**The Pieniny Klippen Belt
(Pieniński pas skałkowy)**

In this area resistant Mesozoic limestones build up isolated klippen surrounded by non-karst rocks. There are about 50 caves in this area. Although all the caves are situated in limestones the majority of them are of non-karst (pseudokarst) origin. The longest cave is Jaskinia w Ociemnym, which is 196 m long and 47.5 m deep.

**The Beskidy Mts.
(Beskidy)**

The Beskidy Mts. are built of Cretaceous-Paleogene flysch-type sandstones and mudstones. There are known more than 350 caves, but all of them are of non-karst (pseudokarst) origin and are situated in sandstones. They developed due to slope processes, mainly landslides. The longest cave is Jaskinia w Trzech Kopcach (850 m) (the Beskid Śląski Mts.) and the deepest is Diabła Dziura w Bukowcu (-42 m) (the Pogórze Rożnowskie hills).

THE LONGEST CAVES IN THE TATRA MTS.

Cave	Location	Vertical extent
Jaskinia Wielka Śnieżna	Czerwone Wierchy, Małolączniak	814 m (- 807; + 7)
Śnieżna Studnia	Czerwone Wierchy, Małolączniak	763 m (- 726; + 37)
Jaskinia Bańdzioch Kominiarski	Kominiarski Wierch	562 m (- 546; + 16)
Jaskinia Wysoka - Za Siedmiu Progami	Czerwone Wierchy, Ciemniak	435 m (- 288; + 147)
Jaskinia Kozia	Czerwone Wierchy, Kozi Grzbiet	389 m (- 376; + 13)
Ptasia Studnia	Czerwone Wierchy, Kozi Grzbiet	379 m (- 352; + 27)
Jaskinia Czarna	Czerwone Wierchy, Dolina Kościeliska	304 m (- 242; + 42)
Jaskinia Miętusia	Czerwone Wierchy, Dolina Miętusia	263 m (- 241; + 22)
Studnia w Kazalnicy	Czerwone Wierchy, Dolina Miętusia	215 m (- 199; + 16)
Jaskinia Zimna	Czerwone Wierchy, Dolina Kościeliska	176 m (- 16 m, + 160)

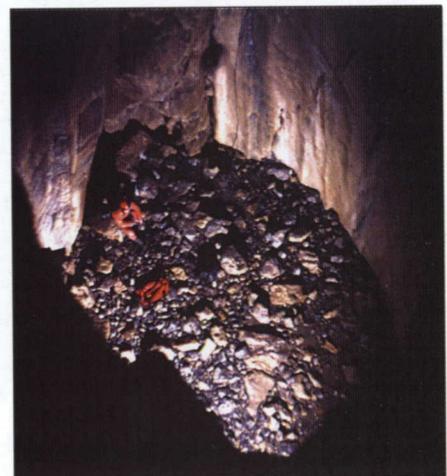
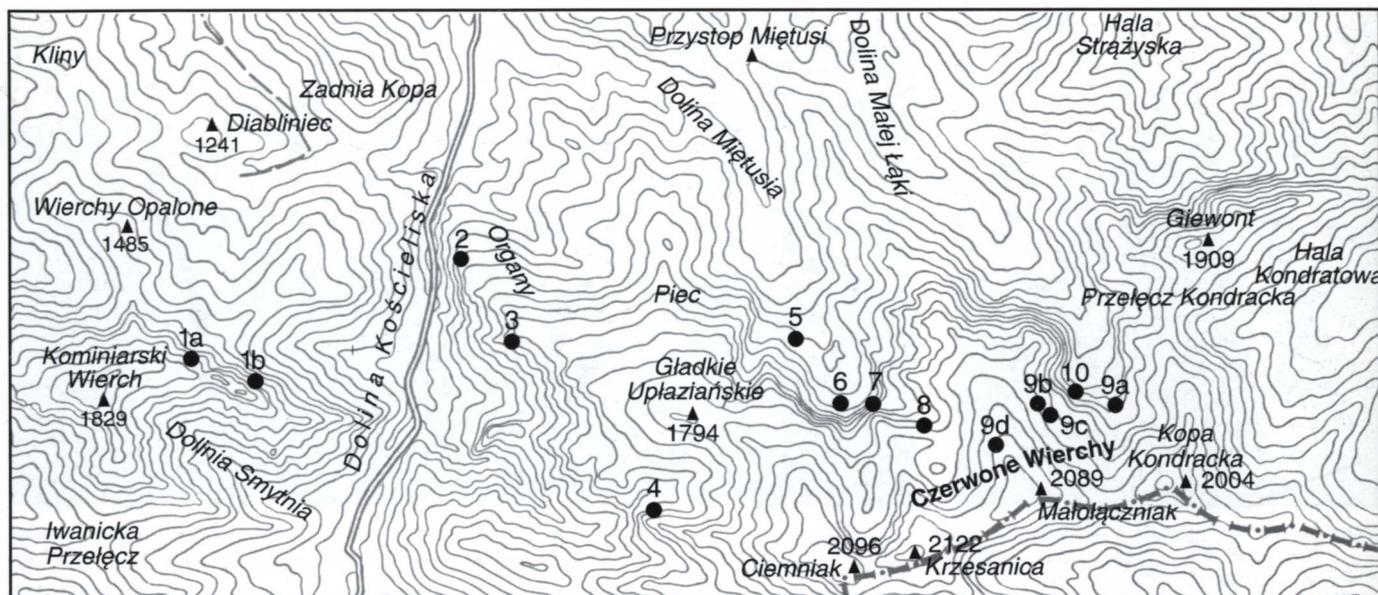


photo by M. Tomaszek

The bottom of one of the deepest pitches in the Tatras - Studnia Taty (Tata pitch) in Ptasia Studnia



Distribution of the deepest and longest caves in the Western Tatra Mts.: 1. a, b - Bańdzioch Kominiarski, 2. Jaskinia Zimna, 3. Jaskinia Czarna, 4. Jaskinia Wysoka-Za Siedmiu Progami, 5. Jaskinia Miętusia, 6. Studnia w Kazalnicy Miętusiej, 7. Ptasia Studnia-Lodowa Litworowa, 8. Jaskinia Kozia, 9 Jaskinia Wielka Śnieżna: a. Śnieżna, b. Nad Kotlinami, c. Jasny Aven, d. Wielka Litworowa, 10. Śnieżna Studnia.

The Kraków - Wieluń Upland (Wyżyna Krakowsko-Wieluńska)

This is the largest karst region in Poland. It occupies about 2500 km². Nowadays there are more than 1500 known caves in this area. Almost all of them are developed in Upper Jurassic limestones. Only a few are situated in Lower Carboniferous limestones and Middle Triassic limestones and dolomites. Jaskinia Wierna, which was explored in 1990 is the longest cave in the Kraków - Wieluń Upland. It is about 1020 m long. The caves of this area are mainly horizontally developed, the deepest is Jaskinia Studnisko -83 m deep. Some caves are situated inside protected areas (i.e. the Ojcowski National Park and Jurassic Landscape Parks). The access to these caves requires special permission. Five caves are open for tourists and four of them are lit by electricity.

The Świętokrzyskie Mts. (Góry Świętokrzyskie)

In recent years the most significant exploration success outside the Tatra Mts. took place in this area. It was the linking of Chelosiowa Jama with Jaskinia Jaworznicka in spring 1996. The new system, developed in Devonian limestone, is 3670 m long. Although the system is now at the ninth place on the list of the longest Polish caves, other of 140 caves occurring in this area are rather small. Only two of them are longer than 100 m. The most known is Raj cave, famous for well developed speleothems. This cave is open for tourists and equipped with electricity.

The Nida river basin (Niecka Nidziańska)

It is the only one of non carbonate karst areas in Poland. Almost all of 50 caves situated in this region are developed in Miocene deposits, mainly in gypsum and only subordinately in kalkarenites. The longest is Jaskinia Skorocicka (about 190 m).

The Sudety Mts. (Sudety)

Most of karst caves in the Sudety Mts. are developed in Precambrian and Palaeozoic marbles. Apart from them some karst caves are situated in Permian limestones. Other caves, these of non karst origin, occur in granites and sandstones. There are known more than 70 caves in the described mountains. The famous one is Jaskinia Niedźwiedzia, which is the longest (2230 m) in the Sudety Mts. The upper part of this cave is open for tourists. The deepest cave of this area is Szczelina Wojcieszowska with vertical extent 112 m (+19, -93).

Other caves in Poland

Some caves in Poland are situated outside of the above characterized regions. Two caves are developed in Pleistocene sands near Gdańsk in northern Poland. Other small caves, which represent probably exhumed fossil karst, are known from Jurassic limestones quarries near Inowrocław in central Poland. A few caves were discovered during mining the zinc-lead

ores in the Olkusz area north-west of Kraków. These caves are developed in Middle Triassic dolomites. Similarly small caves in Miocene rock salt in famous Wieliczka mine (south of Kraków) were discovered during mining. These caves are called Kryształowe Groty (Crystal Caverns) due to the halite crystals occurring on their walls.

Acknowledgments

The morphometric data of cave mentioned in the text were derived from many sources. Some of them have already been published in the eight volumes of inventory of Polish caves. Six of them were edited by J. Grodzicki and describe some of the Tatra caves, the other two - Świętokrzyskie Mts. caves (edited by J. Urban) and the Sudety caves (edited by M. Pulina). The publications by A. Amiowicz, J. Baryła, K. Dziubek & M. Gradziński on caves in the Pieniny National Park, by M. Szelerewicz & A. Górny on caves in the Cracow - Wieluń Upland, by G. Klessek on the Beskidy caves, by W.W. Wiśniewski, by R.M. Kardaś, as well as by M. Tomaszek were also used. The geological data about distribution of karst features in Poland were based on the articles by J. Głazek, T. Dąbrowski & R. Gradziński (1972), as well as by J. Głazek, R. Gradziński & M. Pulina (1982). I was also provided with some personal information by A. Antkiewicz (about Ptasia Studnia cave) and G. Albrzykowski (about Śnieżna Studnia cave) who are gratefully acknowledged.



photo by M. Gradziński

Koziarnia gorge in the Ojców National Park, entrances to Jaskinia Niedostępna are visible in the rock cliff

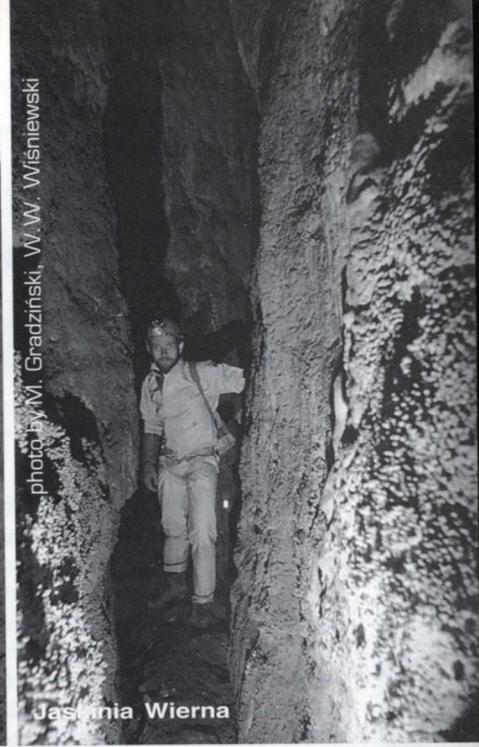


photo by M. Gradziński, W.W. Wisniewski

Jaskinia Wierna

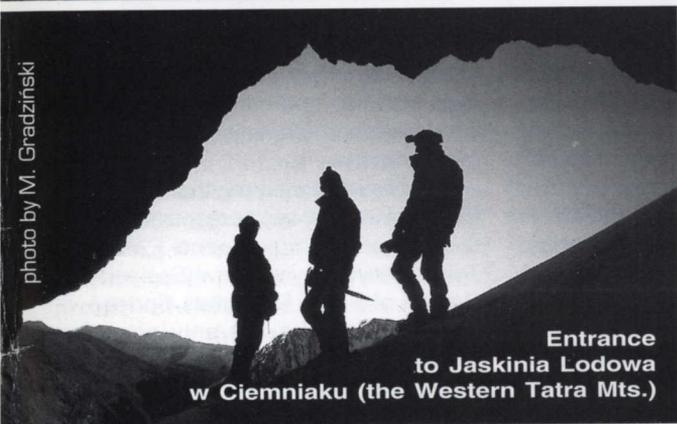


photo by M. Gradziński

Entrance to Jaskinia Lodowa w Ciemniaku (the Western Tatra Mts.)



photo by P. Plachta

Jaskinia Czarna

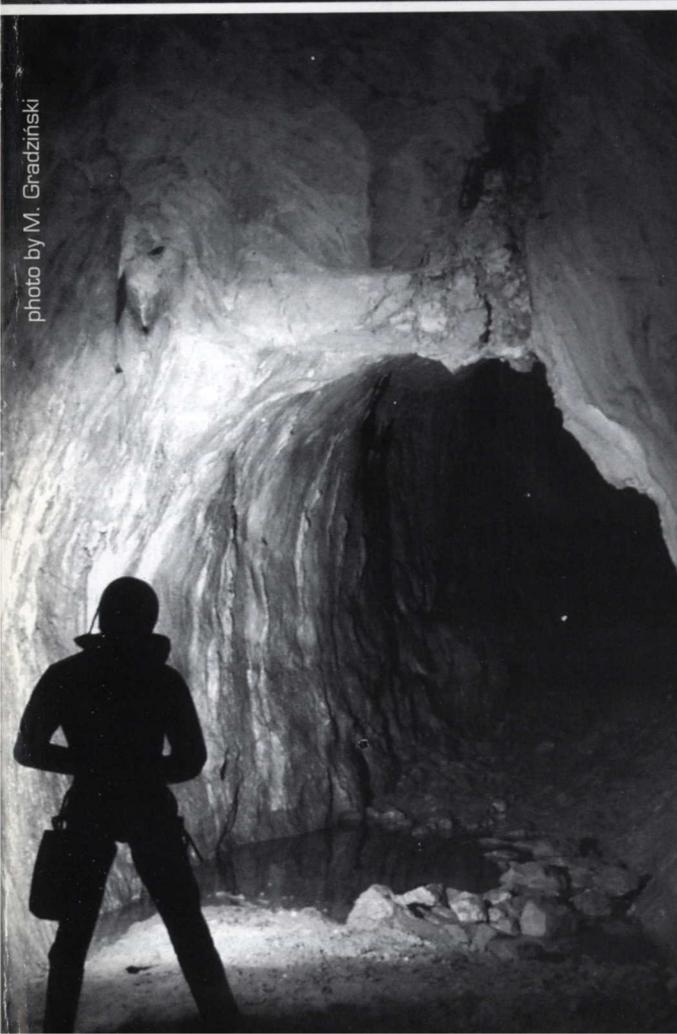


photo by M. Gradziński

Jaskinia Czarna

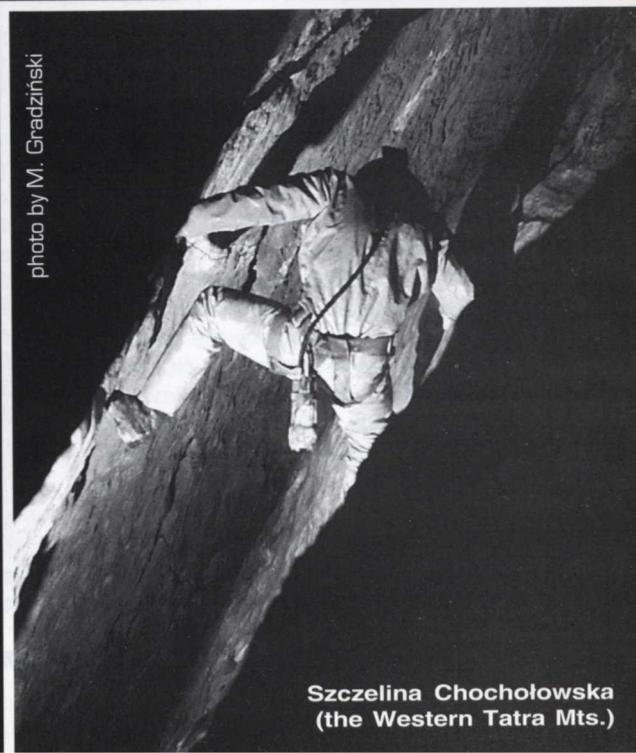


photo by M. Gradziński

Szczelina Chochołowska (the Western Tatra Mts.)

Caving organizations in Poland

Agnieszka Gajewska
Speleoklub Warszawski

Poland is primarily a flat and lowland country. The percentage share of mountains compared to alpine countries is very low so the interest in mountains and the potential for exploration are not as good as in case of Austria, France or Italy. Speleology itself in Poland is also not a widespread branch of science, sport discipline or a form of recreation.

The start of cave exploration goes back far in the history, however as a conscious science or exploration of subterranean passages started at the end of the 19th century. The first initial stage of intensification began in the nineteen twenties, but the major development did not come till the fifties. At that time a large amount of clubs were created and majority of karst areas in Poland were well explored. When that happened Polish cavers directed their attention towards other karst regions around the world and this yielded major achievements in cave exploration outside Poland with majority of the attention directed towards the Alps. Unfortunately due to financial and organizational difficulties Polish cavers rarely went outside Europe.

Some people are interested in caving just as a pure recreation, others prefer vertical caving, cave climbing, cave diving, cave photography. Moreover, what many cavers value most, is exploration in Poland and in foreign countries.

Everybody interested may become a caver in Poland. All one has to do is: be over 18 years old, be in good health condition, and finish a caving training course. During the training students learn the techniques of vertical caving, the safety rules in mountains during winter and summer, basic climbing skills and general knowledge in geology, topography, cartography and first aid. After finishing the course the graduates receive caving licence which allows them to receive cave entry permits from local authorities and National Park officials.

Polish cavers are associated in caving clubs. In order to become a member you need not have a caving licence, but just being a member is not sufficient enough to go freely caving. The number of people in the clubs may be

anything from few to over two hundred. Being a member does not oblige anybody to active caving and is only a way of being associated with the caving community. The exact number of clubs members is not known because it changes every year, the closest estimate would be around 800 people in 22 caving clubs. Some clubs exist for over forty years and others are very young. Every year one new club is created and in the same time one stops to exist or becomes inactive.

Climbing and caving clubs in Poland are united in the Polish Mountaineering Association (PZA), which is the member of the UIAA and the UIS. The PZA is represented by a management board which is elected every three years by the representatives of all the member clubs. The primary function of the PZA is the representation of the interests of the movement, setting the overall guidelines for caving and climbing activities in Polish mountains, supervising the training and safety. The PZA also had funds available which are used to support initiatives such as expeditions, training seminars, and

bulletins. Despite financing available from the PZA the main way in which the clubs fund their activities are membership dues.

Within the PZA there is a Caving Commission which is also represented by the Management Board which is elected by the representatives of member clubs. Its main objectives are representing the caving community and defending its interests on the PZA forum, training the caving instructors, coordinating the inter club activities and maintaining relations with Polish and international speleological organizations.

It is worth mentioning that besides the PZA, which is the sport organization, there is Sekcja Speleologiczna Polskiego Towarzystwa Przyrodników (Speleological Section of Polish Naturalists Society). Its members can be not only scientists researching karst and speleological problems but all people who are interested in this questions. Some caving clubs associating mainly students as their members (e.g. Akademicki Klub Grotołazów AGH) are united in Federacja Akademickich Klubów Speleologicznych (FAKS).

Addresses of the Polish caving organizations

Polski Związek Alpinizmu (Polish Mountaineering Association)

Komisja Tatarnictwa Jaskiniowego (Caving Commission), ul. Ciołka 17, 01-445 Warszawa

Sekcja Tatarnictwa Jaskiniowego KW Kraków, ul. Długa 34/8, 31-146 Kraków ◆ **Sekcja Tatarnictwa Jaskiniowego KW Warszawa**, ul. Chelmska 31/22, 00-724 Warszawa, tel. (22) 41-47-27 ◆ **Speleoklub Częstochowa** c/o Marcin Zamorski, ul. Witosa 5/17, 42-200 Częstochowa, tel. (34)62-67-50 ◆ **Speleoklub Warszawski**, ul. Bartoszką 2/40, 00-710 Warszawa, tel. (22)42-20-49 ◆ **Akademicki Klub Grotołazów AGH**, ul. Gramatyka 8a, 30-071 Kraków ◆ **Speleoklub Tatrzański**, ul. Sabały 4, 34-500 Zakopane ◆ **Sądecki Klub Tatarnictwa Jaskiniowego** c/o Anna Antkiewicz, ul. Szujskiego 11B, 33-300 Nowy Sącz, tel. (18)43-85-27 ◆ **Tarnogórski Klub Tatarnictwa Jaskiniowego** c/o Grzegorz Matusik, ul. Szwedzka 8a/6, 42-612 Tarnowskie Góry, tel. (32)185-10-07 (office) ◆ **Speleoklub Dąbrowa Górnicza**, ul. Majakowskiego 9, 41-300 Dąbrowa Górnicza, tel. (32) 162-27-30 ◆ **Sekcja Grotołazów Wrocław** c/o Olgierd Jokiel, ul. Petreca 9/8, 53-443 Wrocław ◆ **Wielkopolski Klub Tatarnictwa Jaskiniowego**, os. Pod Lipami 15/48, 61-638 Poznań, tel. (61) 23-11-92 ◆ **Klub Tatarnictwa Jaskiniowego** ◆ **Speleoklub Bielsko-Biała**, ul. 11 Listopada 10, 43-300 Bielsko-Biała, tel. (33) 12-65-66 ◆ **Klub Speleologiczny „Aven” Sosnowiec** c/o Waldemar Mucha, ul. Radockiego 218/10, 40-645 Katowice ◆ **Speleoklub „Boby” Żagań**, ul. Rynek 11 p.o. box 90, 68-100 Żagań ◆ **Krakowski Klub Tatarnictwa Jaskiniowego**, ul. Kurasia boczna 1/1, 30-603 Kraków ◆ **Katowicki Klub Speleologiczny** c/o Marian Zagórny, ul. Wróblewskiego 73/54, 41-106 Siemianowice Śląskie, tel. (32)12-84-795 ◆ **Speleoklub Gliwice**, ul. Paderewskiego 1/17, 41-710 Ruda Śląska ◆ **Speleoklub Wrocław**, ul. Pochyła 16/6, 50-012 Wrocław ◆ **Speleoklub Świętokrzyski**, ul. Mickiewicza 1/14, 25-352 Kielce ◆ **Speleoklub Olkusz**, Rynek 19, 32-300 Olkusz, tel./fax (35) 43-42-27 ◆ **Sopocki Klub Tatarnictwa Jaskiniowego PTTK**, ul. Podjazd 1, 81-805 Sopot ◆ **Speleoklub „Gawra” Gorzów Wielkopolski**, ul. Wyszyńskiego 12, 66-400 Gorzów Wielkopolski, tel. (601) 75-56-67

Though cave bearing areas constitute only a minor part of Polish territory and the caves, as a rule, are not very big ones, Poland has a long tradition of cave exploration and study.



Early archeological works in Jaskinia Maszycka. Etching by T. Adjukiewicz from 1883.

Unfortunately, the history of speleology in Poland is little known abroad, as is shown by the fundamental study „History of Cave Science (to 1900)” by Trevor R. Shaw (1992), where Poland is mentioned only once („underground rivers noted 1721”). This essay presents an outline of the history of cave studies in Poland¹ to 1900, similarly as in the Show’s study.

Caves in the highland belt of south Poland (Kraków-Wieluń Upland, Nida River Basin, Świętokrzyskie Mountains, Podolia) provided a favourable habitat for early humans. Traces of Palaeolithic man have been hitherto found in more than 50 caves on the Kraków-Wieluń Upland. The oldest ones, 120,000 years old, were found in Jaskinia Ciemna near Kraków. Jaskinia Raj (Świętokrzyskie Mountains) with its traces of inhabitation 50,000 years ago is the northernmost Middle Palaeolithic site in Europe. An Upper Palaeolithic industry has been named Jerzmanowice industry after findings in a cave near Kraków. In Podolia Neolithic men penetrated quite deep into caves. In Jaskinia Werteba burials were found as far as 350 m from the entrance. It is to be noted that artifacts found in this cave were so beautiful that the site was referred to as the „Pompeii on the Dnester”.

Even in the caves of the remote parts of the Pieniny mountains people dwelled during the Palaeolithic and Neolithic Periods. Artifacts belonging to the Palaeolithic Aurignac stage were found in the Aksamitka cave, while in Jaskinia w Oblazowej, the only multilayered archaeological site in the whole Carpathians, the world’s oldest boomerang was found, dated by ¹⁴C method at 18,200 BP.

History of the exploration and study of caves in Poland to 1900

Wojciech W. Wiśniewski

The caves in the highland belt of south Poland were visited and used in Roman times too. Also in Medieval times and later throughout ages (in fact till 1950s) hundreds of caves provided shelter for population of this region during invasions and wars, so frequent in the history of Poland. The scale of this phenomenon is demonstrated by the information that one of the Podolian caves provided shelter for up to 15 000 people! Written reports prove that the hiding was not always safe. It happened that people hidden in remote parts of caves were killed by smoke when the invaders set fires at the entrances (in 1648 among others). Several caves in the Kraków-Wieluń Upland were incorporated by castles; one of the castles - Olsztyn (German - Hohler Stein) - even took his name from a cave.

The area of the Świętokrzyskie Mountains is an ancient mining and metallurgical centre, hence exploration and study of local caves was being undertaken there for centuries. Flint was exploited in underground mines in Jurassic limestone as early as Neolithic Period, while native copper and galenite, whose deposits are of karstic nature, were mined since at least 14th century. The ancient miners not only visited the caves, they also locally used them as access routes to the ores, and later transformed them into mine galleries.

Polish caves belong to the world’s earliest mentioned caves. The oldest written note about a Polish cave comes from ca. 1190. It says about Smocza Jama beneath the Wawel royal castle in Kraków. The same cave is mentioned in two texts from 13th century and one from the early 14th century. The next mention of a cave in Poland is a document from 1320 which defines the boundaries of a newly established village and mentions a cave in Czorsztyń (the Pieniny Mountains).

The Jan Długosz’s famous chronicle appeared in the middle of 15th century. Besides Smocza Jama it also describes a karst lake in Roztocze, from which water periodically „soaks with a great noise into a nearby rocky mountain, through underground and

hidden narrow openings” and it mentions an underground course of one of the nearby rivers.

An unusual court document from 1543 instructs owners of two properties in Podolia to jointly keep in good shape ladders which secure access to a cave which served as a shelter for local population.

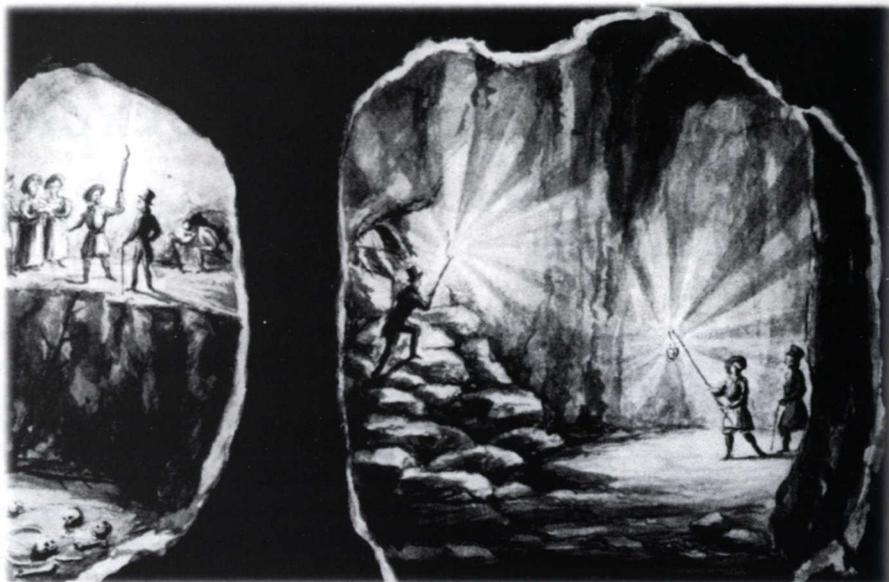
The first cave picture from Poland was published in 1544. It presents, besides the legendary dragon, the entrance to Smocza Jama (Dragon’s Hole). This is the only cave illustrated in „Kosmographie oder Beschreibung aller Länder”. The work had more than 40 editions and it could contribute to the widespread knowledge of this cave all over Europe, as since that time the cave is repeatedly mentioned in European literature as a well known curiosity, also for the wine shop established in it because of its cool air (the cave is mentioned among others by M. Zeiller 1647, A. Cellarius 1659). In 1565 a king of Poland ordered to wall some of its galleries to keep water from the nearby river off.

Even caves in the Tatra Mountains, despite the difficult access, have been visited by man for a long time. The entrance parts could provide shelter for hunters already in Middle Ages and for shepherds later. The deeper parts had to be visited first by ore prospectors and miners who began exploitation late in 14th century or even earlier. The caves provided an insight into the geological structure underground, and hematite concretions were mined from the walls of one cave. The deeper parts of caves were also visited by locals in search for „stone milk” (moonmilk) used for medication. They used tree trunks to climb walls and pitches. The oldest dated traces of visitors to caves in the Tatra (engraved inscriptions) are from the middle of 16th century. In 17th century some caves in the Beskidy Mountains also attracted ore prospectors (1643 among others).

The first written reports on caves in the Tatra are included in the so called „spiski” - a kind of handwritten guidebooks to the mountains. The most extensive of them is dated at ca. 1630. It

includes descriptions of access routes to many caves, extensive descriptions of their interiors, especially speleothems and methods of passing difficult fragments of the caves. The use of ropes for passing vertical sections is already mentioned there. Another „spisek” tells about using rope ladders, which should be attached to a stump laid horizontally across the pitch head. It should be stressed that the ore prospectors not only kept cave locations secret but even covered cave entrances with rocks and soil, hence many of these caves still remain unknown.

The caves of the Tatra and Pieniny were not only a source of the „rock milk” for medicine of that time but also of cave bear bones, considered then to be „dragon’s bones”. The best known place from where to obtain both medications was the cave called then Mleczna Dziura (Milky Hole), today’s Aksamitka. This attracted the attention of Johann Paterson Hain, court doctor of the Polish king, coming from Polish part of Prussia and working at that time in Spisz as a physician. He sent specimens of bones from this cave to Warsaw, to the son of his protector, the Spisz governor, Marshall J. S. Lubomirski. Hain studied the cave personally in April 1672. The soft moonmilk, because of its small specific weight, he called „white nothing” (Album Nihil). The results of these studies he presented in two letters published in 1672 in Wrocław. He described the bones as „dragon bones”. Their drawings were so accurate than J. Rosenmuller and G. L. Cuvier at the beginning of 19th century were able to ascertain on them that the bones belonged to *Ursus spalaeus*. A plan of this



Visitors in Królewska cave in Ojców in the first half of 19th century. Note a tree trunk as a substitute of a ladder in the left. Drawing by T.B. Stachowicz from ca. 1835.

cave was drawn in 1672 by Hain’s friend, father Waclaw, a Piar and the rector of a gymnasium in Warsaw; this is the oldest known Polish cave plan and one of the oldest in the world.

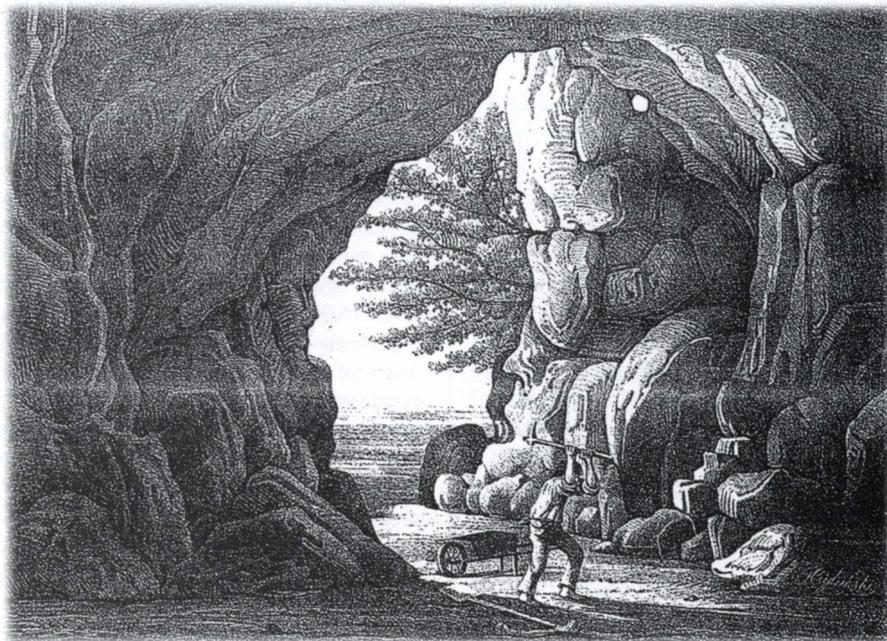
Caves of Podolia were also described in that time (for instance 1675, 1683), and one of the caves was a visited curiosity. In 1680s stone staircase was built in its entrance gallery. The cave’s popularity is confirmed by the record of a senator’s visit (he had a narrow escape from fatality while he was lost within the cave).

The first printed detailed description in Polish of a cave appeared in 1691. The chapter „The Close Underground World” presents two caves from Ojców (Łokietka and Ciemna). The former was then called Królewska (Royal) as it was

being shown to Polish kings when they visited the area as a great curiosity.

The first written reports of visits to the non-karstic caves in the Beskidy Mountains come from the beginnings of 18th century. Something later, from 1720 are the first mentions of caves in the Sudetes („Silesia Subterranea”), and in 1742 appeared the first printed note about caves in the Tatra, which mentions a widely known cave with bones of ancient animals.

Two volumes of an extensive work by G. Rączyński „Historia Naturalis Curiosa Regni Poloniae” - a kind of a physiographic encyclopedia of Poland - appeared in 1721 and 1736. It includes information on underground water courses, karst lakes and more than twenty caves, including Smocza Jama, Ciemna, Aksamitka, caves of the Cergowa Mountain, and it mentions more than ten caves from Podolia. The information from this work was later repeated by many Polish and foreign authors (for example F. E. Brückmann, 1739). The caves became known even abroad. For example Aksamitka, famous in Poland for its „dragon’s bones” was visited in 1751 by an Austrian scientific commission. Caves in the Świętokrzyskie Mountains were also shown to important persons. In 1778 one of them was visited by J. P. Carosi, the royal mine supervisor, who published an account in 1781 and 1785. The Ojców caves were at that time already famous and visits to them were quite popular. One of them was visited, with the whole court, by the last king of Poland, Stanisław August Poniatowski. The first plan of an area with the course of a cave shown on it comes from 1790 (Smocza Jama).



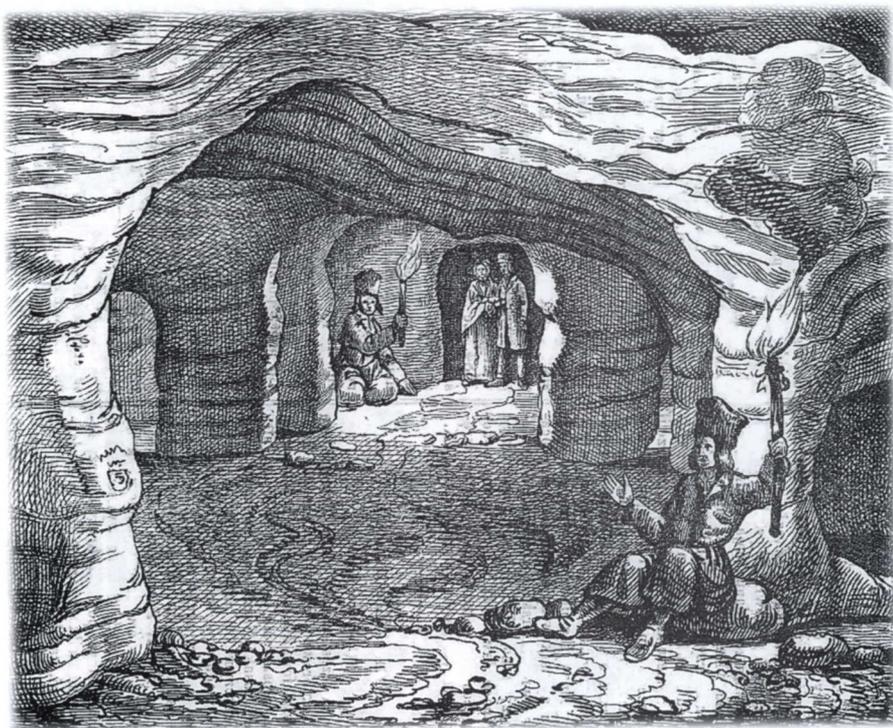
Early archaeological works in Zloty Potok cave. Etching by J. Cegielski from 1855.

The partition of Poland caused increase in visits to the Ojców caves as they were the most interesting caves available to the people in one of the partitioned provinces. The visits were so intense that special guides led people in the caves already in the first decade of the 19th century, which places them among the first cave guides in the world. The traffic of visitors was so intense that several years later the cave formations were covered with soot from candles and torches. This period witnessed a development of cave tourism also in other parts of Poland. The fashion for caves is attested by the fact that balls used to be organized in caves. The use of ropes for passing vertical fragments of caves had to be already known as a bell-like cave shaft 33 m deep was bottomed in 1845.

Also at the beginning of the century began tourist visits to the caves in the Tatra, our most interesting cave region, the only one with alpine karst and deep caves, the region that gave rise to the use of alpinistic techniques underground in Poland. In 1810s a cave with underground stream was explored by wading up to the belt in cold water. Since the beginning of the 19th century visits to some caves in the Tatra became so popular that paths were built to their entrances. The traffic was so intense that an appeal for stopping the use of torches in caves was made in 1887.

Scientific study

At the end of 18th century caves were already studied by naturalists. Geologist S. Staszic in 1789 studied the caves in Ojców, and in 1799 he visited caves in the present Slovakia and Hungary, including Demenovska Ladova and Baradla; he described his visits in 1805. Karst phenomena in Yugoslavia were observed in years 1802-1803 by A. Sapieha and his comments were published in Paris in 1808. First touristic descriptions of Polish caves come from the same time, and the first known illustration presenting a visit to a cave was made in 1807. The scientific study of caves develops since the beginning of 19th century, mainly by archaeologists and palaeontologists. In 1830 first excavations were done in one of the Podolian caves. Numerous findings come from the industrial exploitation of cave sediments (it started before 1846). The oldest work on cave fauna (bats and their parasites) dates from 1854. It was also then when protection of bats was suggested for the first time. In the 1830s and 1840s L. Zejszner, a geologist, studied caves in the Tatra and in Slovakia. He devoted to caves several chapters in his



A cave in Podolia. Woodcut from 1841. Author unknown.

monograph, published in 1852, where several tens of caves are described for the first time. In 1845 during his travel through central and southern Europe, B. Stęczyński visited and extensively described many caves in Slovakia, Hungary and Yugoslavia. Caves attracted even the people deported for patriotic activities to the Russian interior. For example, rebels from 1863, on their way to the east, visited in 1864 ice caves near Kungur (the Ural Mountains), and two deported rebels from 1863 - A. Czekanowski and J. Czernski since 1869 studied caves in east Siberia. Their work resulted in more than ten publications about caves.

Systematic palaeontological and archaeological studies began in 1871. The multifaceted studies were planned of „all caves” and in 1872 an attempt at getting funds for it was undertaken. The farther growth in popularity is shown by the fact that several years later Jagiellonian University in Kraków staged a competition for a treaty on caves. As a result A. Gruszecki published in 1878 the work „O Jaskiniach na Przestrzeni od Karpat po Bałtyk” (About Caves in the Space Between the Carpathians and the Baltic Sea), the first inventory of caves in Poland, covering more than 80 caves. In 1887 appeared the work „Podziemne Kościeliska” (Underground Kościeliska), a guide to caves of the Kościeliska Valley in the Tatra, the first work of that type in Poland.

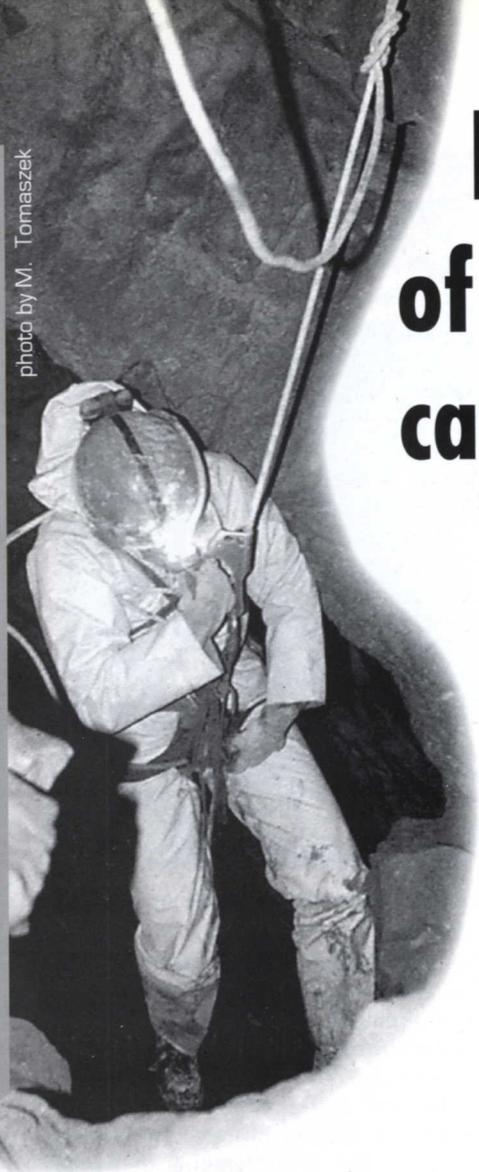
The extent of interest in caves in 19th century Poland is shown by the fact that

the bibliography of Polish speleology of this century includes more than 1500 entries (more than 250 from the first half of the century). There are numerous reports (often with drawings) of discoveries and exploration of foreign caves, not only in Europe, but also in America. The achievements of world science were also presented, providing ground for the development of speleology in Poland (both exploration and research) in the 20th century.

Wojciech W. Wiśniewski

¹ Even territories which are now outside Poland, for example Podolia, a great area of gypsum karst (over 20 000 km²), with several very long caves, including the world's longest gypsum cave - Optimisticheskaya) - which since the dawn of history till 1939 were a part of Poland. It is now behind Polish frontiers, but it should be mentioned here as it is closely connected with the history of Polish cave studies, especially from the point of view of the history of cave exploration. It was there that the longest cave in Poland was explored before the World War II - 8 km in the Kryształowa cave, and 4 km of another one were known. It is a cave from this area which is covered by the first Polish publication devoted to a single cave („Przewodnik po Jaskiniach w Krzywczu”, 1933 - „The Guidebook to the Caves in Krzywczu”) and it is also this area which is dealt with in the first specialist monograph „Kras Gipsowy Podola Pokuckiego” (1938; Gypsum Karst of the Pokutian Podolia).

Exploration of the deepest cave in Poland - Jaskinia Wielka Śnieżna



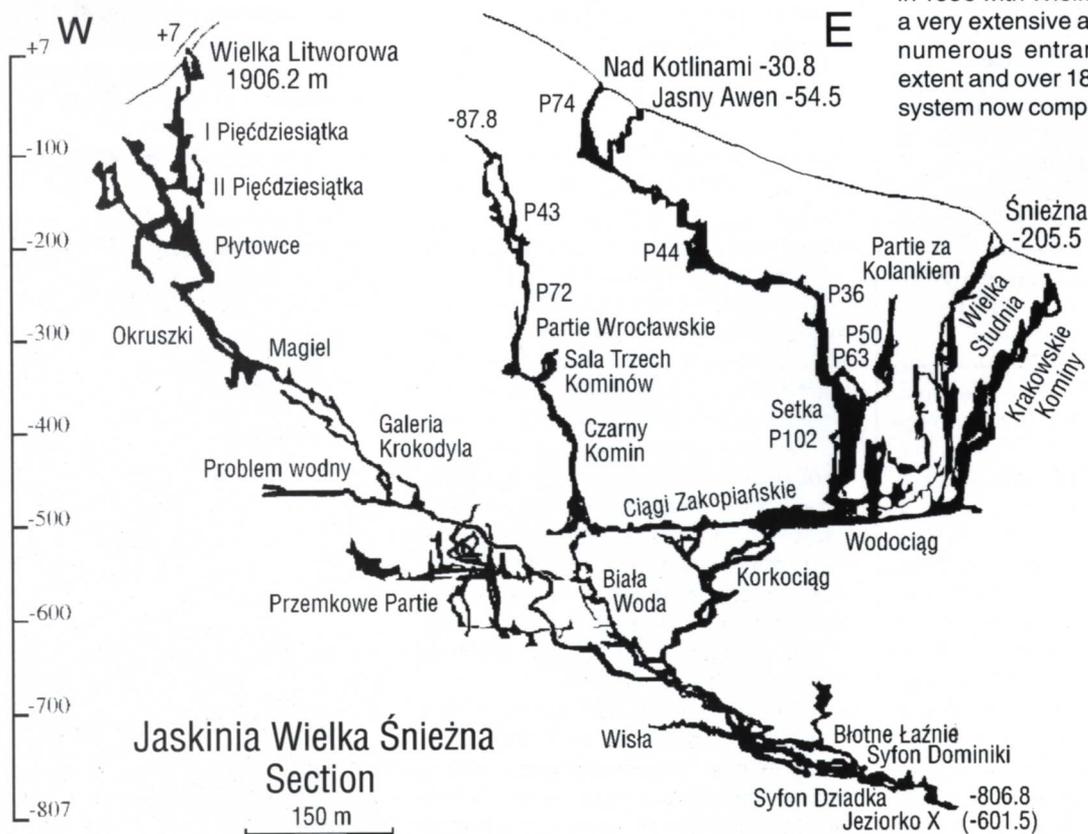
The limited surface of the karst area in the West Tatra and the intense exploration of the homeland mountains by Polish cavers resulted in a general shortage of obvious exploration targets on the surface. The era of spectacular discoveries of sizeable new caves is practically over. It does not mean that finding an entirely new cave in the Tatra is impossible. Such cases still occur, but their importance within the whole scope of caving in Poland became marginal in the recent years. The main stress is now oriented at the underground exploration of the caves known for decades, searching for new series and discovering new parts.

Several major exploration projects are now underway in the Tatra; the most important and the most advanced among them seems to be the exploration of the longest and deepest cave in Poland - Jaskinia Wielka Śnieżna. By coordination through the Tatra National Park, which covers the whole of the Polish Tatra, the work in Śnieżna is conducted by nearly all caving clubs in the country; the most persistently by cavers from Wrocław.

Śnieżna cave, discovered in 1959 for a short time occupied the sixth position on the list of the world's deepest caves. In the course of time it connected with other caves, and finally, after connecting in 1996 with Wielka Litworowa it became a very extensive alpine-type system with numerous entrances, 814 of vertical extent and over 18 km of total length. The system now comprises Jaskinia Śnieżna,

Witold Jokiel

Sekcja Grotolazów Wrocław



after compilation by P. Kulbicki

Jaskinia Nad Kotlinami, Jaskinia Jasny Awen and Jaskinia Wielka Litworowa. The first three of them are situated in the higher, western part of the Mała Łąka Valley, the last lies in the neighbouring Miętusia Valley in a hanging cirque, named Dolina Litworowa. The whole area belongs to the nest of high peaks in the main range of the Tatra - Czerwone Wierchy.

The exploration of the main series in the Jaskinia Wielka Śnieżna was ready in the sixties; this must be regarded as a success, as despite the now obvious downward direction of

Kolankiem, Syfony Krakowskie, Galeria Krokodyla and others, with a total length of more than 6 km. An effect of this typically climbing activity of cavers was the idea of getting out of deep caves by climbing, which culminated in establishing in Śnieżna the world record in underground climbing (780 m).

The idea of extending the system horizontally to the northwest, towards the insufficiently explored massifs of Krzesanica and Ciemniak was born in the 90s. The prospective leads existed in the series Galeria Krokodyla and Syfon Krakowski with a permanent flow of water greater than that in the main series of Śnieżna. Both upward going leads are located near the bottom of the cave at the depth of about 700 m. Because of the necessity of diving Syfon Krakowski was set aside and the main effort was concentrated on the exploration of Galeria Krokodyla.

This series developed in the desired direction in a series of slippery meanders, ramps and avens. It soon penetrated on the other side of the overlying lateral crest of the Małolączniak and passed on the side of another valley. This fact cherished the hopes of the original idea becoming a reality.

The difficulties encountered in Galeria Krokodyla and the great distance from the cave entrance have slowed the progress of exploration, and stimulated attempts at pushing from galeria krokodyla straight upwards in hope of finding another, more conveniently situated entrance. In consequence, the main goal was temporarily set aside and Partie Za 4 Zaciskami have been found. This hopeless fragment of the cave terminated after many efforts in a tight fissure with draught and water flow.

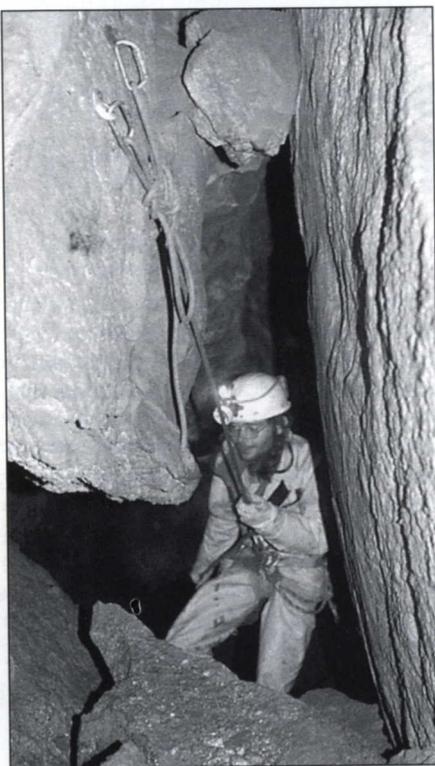
Computer compilation of cave surveys and topographic data for the area indicated that the termination of Partie Za 4 Zaciskami corresponds approximately to the final point at the bottom of another big cave - Jaskinia wielka litworowa. Also the azimuths, dips and characteristics of the final fissures on both sides matched perfectly. As a result an attempt was made at connecting the two caves, from the side of Wielka Litworowa. Water drying, smoke and acoustic tests all confirmed the connection.

Before 1996 Jaskinia Wielka Litworowa, discovered in 1962, was a separate cave, bottoming at about -350 m. Multiple attempts at passing Szczelina Magla (Squeezer Fissure) at the bottom invariably failed. No bypass was found despite exploring various branching

series. The possibility of creating a system surpassing all other Polish caves became the decisive stimulus. In 1996, after hammering through more than ten metres of the fissure cavers from Wrocław passed from Jaskinia wielka Litworowa to Partie Za 4 Zaciskami in Jaskinia Wielka Śnieżna. This connection created the biggest and deepest cave system in Poland, the first eight hundred. Galeria Krokodyla connecting the two caves is extremely difficult. Not a single sports traverse of the whole vertical distance of the system have been done yet. The connection did not terminate the work in galeria Krokodyla, but only a certain stage of it. The main lead - the voluminous horizontal phreatic series is still being explored and farther interesting discoveries are very likely.

A parallel effort is the work in Przemkowe Partie, another bifurcation of the main series in Śnieżna. Starting in an inconspicuous passage in Biała Woda, they have hitherto brought 1300 m in length and 160 m of vertical difference. Unfortunately, its exploration, as usual in Śnieżna, consists mainly of climbing up, hence it is strenuous and progresses slowly. Jaskinia Wielka Śnieżna still offer a great potential for further exploration. This is a challenge for those like and know to climb. Many invisible leads in the roofs are still waiting for their discoverers.

photo by M. Tomaszek



Jaskinia Wielka Śnieżna

exploration, the techniques and equipment used at that time, as well as psychological barriers connected with the depth and distance, controlled the progress of exploration. All obvious downward leads were pushed then.

The farther exploration, except for small series close to the main series, became a serious challenge. Pushing the cave down was only possible by diving, while the upward going ramps and chimneys required climbing. Nevertheless not all the attempts were successful. In the 70s and 80s several difficult sumps at the bottom were passed, increasing the depth, and the climbing parties discovered steep upward series; Biała Woda, Krakowskie Kominy, Partie Wrocławskie, Warszawskie Kaskady, Partie Za

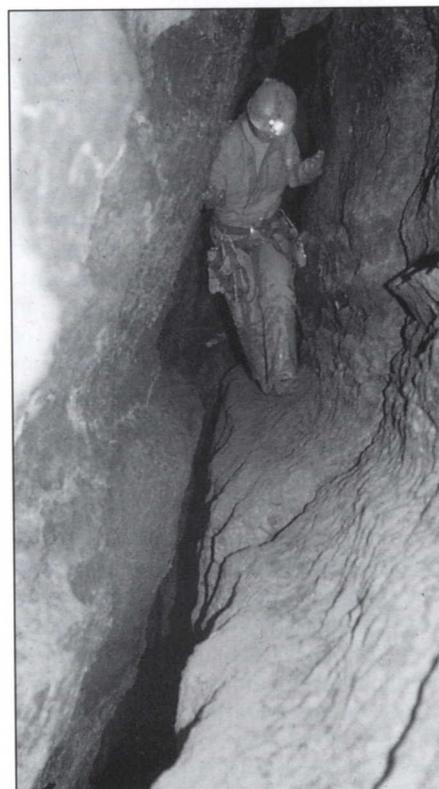
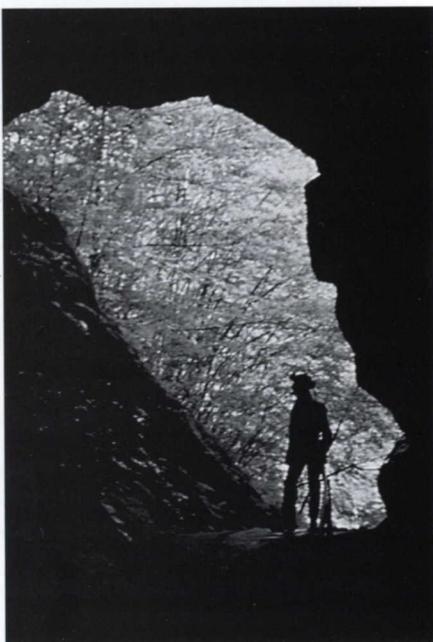


photo by M. Tomaszek

Jaskinia Wielka Śnieżna

photo by W. W. Wiśniewski



The lower entrance to Lamprechtsofen



Lamprechtsofen - Polish exploration of the second deepest cave in the world

Andrzej Ciszewski

Krakowski Klub Tatarnictwa Jaskiniowego

The year 1991 was for us the closure of 17-year long epoch in exploration of Lamprechtsofen. For many years the exploration was conducted during winter expeditions through the entrance situated near the bottom of the Salzach valley. Several branches reached elevations of about 1050 m.

Meanwhile, during successive summer expeditions we searched in Nebelsbergkar for a possible upper entrance to the system, prospecting systematically successive fragments of the cirque surface, and exploring tens of big and small caves.

In 1985 we managed to pass through the repeatedly attempted ice plug in N-132. We got quite fast then into an old vast gallery with a strong draught. Numerous deep pitches were gaping in its bottom. Advancing beneath the roof of the gallery we reached a chamber from which a series of active pitches descended to a narrow fissure at the depth of -560 m. Many leads were left on the way waiting for their turn.

During the following winter expeditions to Lampo, and summer ones to N-132, christened Verlorenenweghöhle (Lost Way Cave) the explored parts of both caves were becoming closer and closer to each other and finally their surveys began to overlap within the limits of horizontal error. In 1991 we again tackled the collapse that did not give up during the earlier expedition. It was situated at the bottom of 110 m pitch and was considered as of extremely dangerous nature. The reality was beyond

our expectations and common sense. During three successive missions from a bivouac at -270 m we managed to pass it after serious demolition works. It extended vertically for some 160 m and led to the final series of Lampo, explored by us. 1484 m of vertical distance and the world's biggest traverse. This was a conclusion of a psychologically extremely important stage of the massif exploration. Also important was that we managed to pass a zone considered impenetrable for geological reasons.

After a one year break we came back to the Leoganger Steinberge with the aim of pursuing the exploration even if it would not bring any achievements. One must not forget that the explored entrances lied at over 2150 m of altitude, where caves usually end soon after their entrances in snow plugs, inaccessible fissures or boulder chocks.

Our first goal was Vogelschacht (-774 m) lying west of N-132, explored by Group Vulcain of Lyon. The analysis of the situation in Lampo and the relief at the floor of the cirque led me to suppose that this cave should lead to the main stream draining this part of the massif, known as the Bear River, which we have met several times in Lampo, but all the times it was closed by sumps on both ends. The only chance was thus to try bypass over the young inaccessible water course. A traverse over the 137 m deep shaft in Vogelschacht at the depth of about -440 m led to a true caving Eldorado, a system of vast chambers and galleries, some of which

still remain unexplored. In one of the passages we encountered a strong draught which has led us to a great vertical fissure. We were then nearly 1500 m away horizontally and no more than 300 m vertically from Lampo and the connection seemed to be on the verge of possibility.

The subsequent expeditions encountered greater and greater difficulties connected with the tens of traverses over successive pitches which required rigging with hundreds of metres of ropes. As result a bivouac became necessary to enable effective exploration at the limits of the new series. The traverse of one kilometre of the fissure required about 1200 m of rope.

Going for a successive expedition in 1995 we thought, based on the surveys, that the connection is within our reach. So it was. After several days of straggling in omnipresent mud we managed to abseil a nearly 100 m deep shaft to the Fortuna Geschmeck series in Lampo which had been explored from below.

So after 21 years we succeeded in materializing the dream than seem impossible. Lamprechtsofen with its 1532 m vertical extent and about 42 km length was the second deepest cave system in world.

In 1992 we have also started another stage in the exploration of the massif. Prospecting in the southwestern part of Nebelsbergkar we found another promising cave labelled PL-2. Its entrance lies about 95 m above the Vogelschacht entrance.

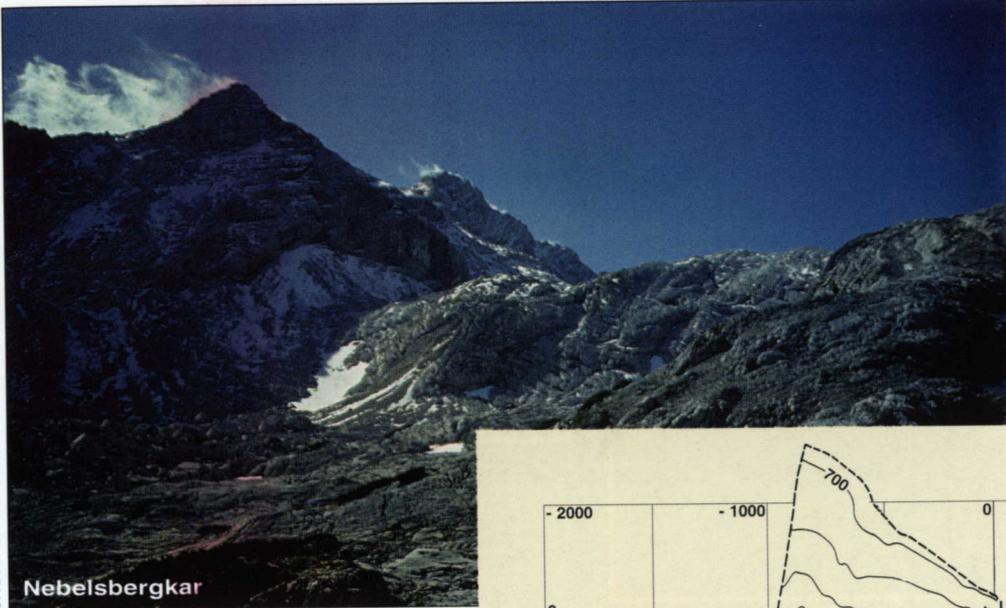


photo S. Kotarba

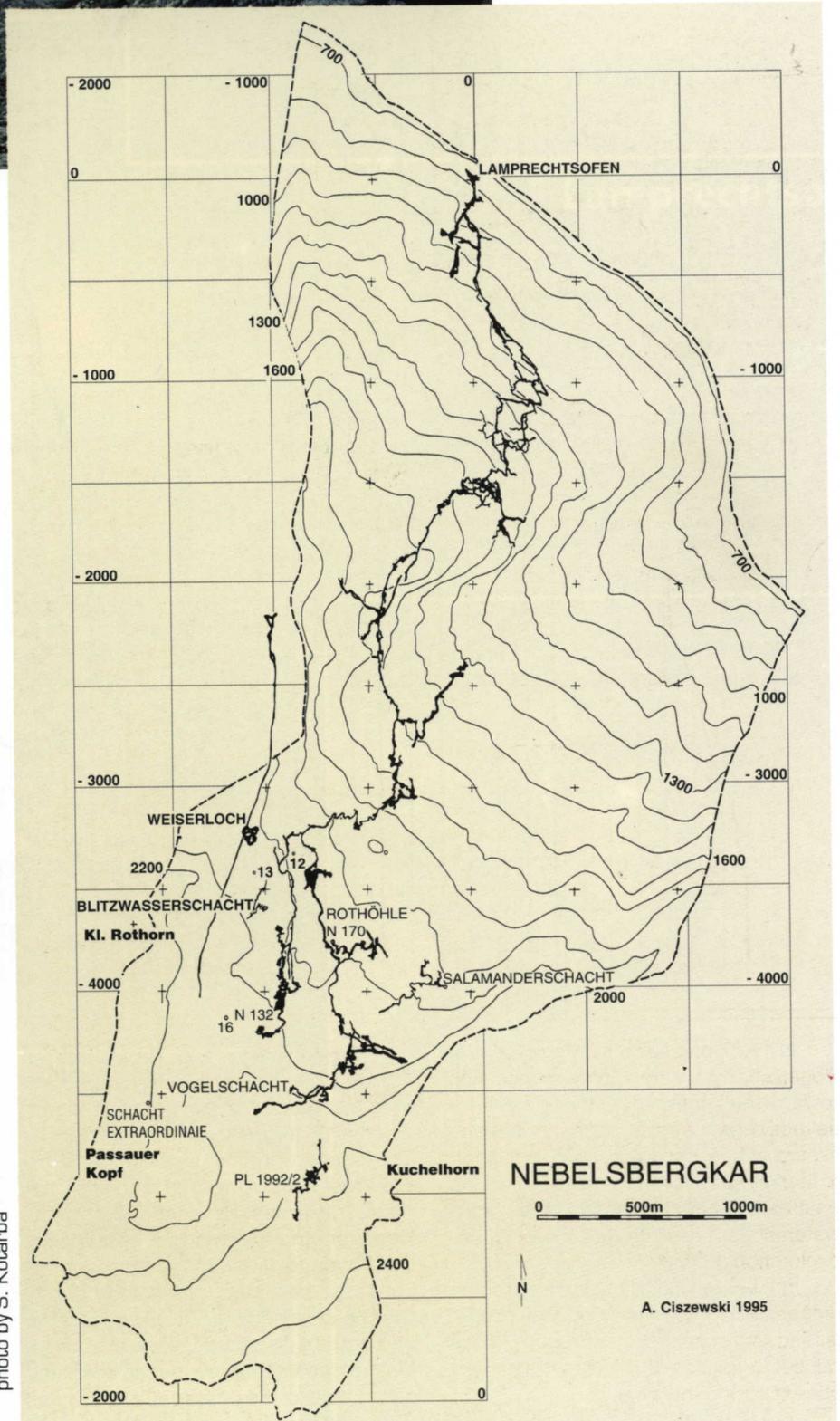
Nebelsbergkar

In 1993 we reached the depth of about 500 m in this cave and we enter a few tens of metres below the bottom into a nearly one kilometre long system of old muddy galleries with a strong draught. They are dissected by numerous otches with streams disappearing into collapses or inaccessible fissures.

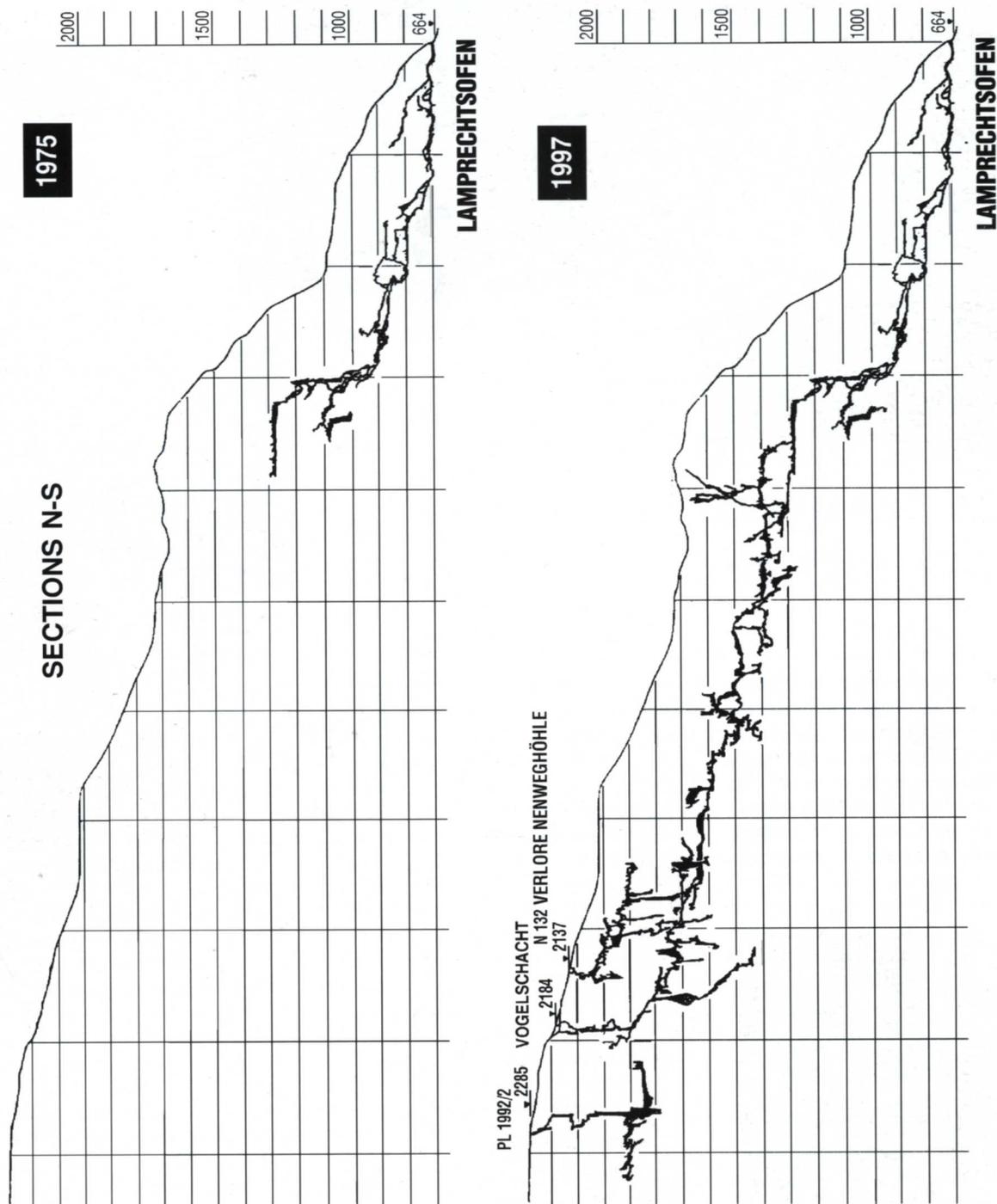


photo by S. Kotarba

Small lakes in Nebelsbergkar



THE NORTHERN CALCAREOUS ALPS



Two sections of Lamprechtsofen showing the progress in exploration – the above one from 1975, the lower one from 1995

In 1995, parallel to the exploration in Vogelschacht we try to find an extension toward the north. After trying hard for several days we enter a tight northbound fissure with a strong draught. However, to our utmost surprise, we are moving upstream. Finally we get into a hall with a waterfall from near its roof. So ends our exploration in PL-2.

In 1996 we only managed to do some prospection for several days in the cirque, finding more promising entrances. They will be, together with PL-2 to the goal of our expedition this year.

The perspectives of the exploration are still looking attractive. Nebelsbergkar rises to about 2400 m in its western part, and the highest entrances are at 2380 m. The area is very poorly investigated, partly covered with perennial snows, rock debris, dissected with hundreds of clefts. However, what we found in PL-2 supports our hopes for finding a continuation of Lampo to the highest parts of the cirque. One must remember, however, that the exploration becomes more and more difficult and tiresome because of the narrowness of the passages and fissures

in the caves explored there. The key problem may be crossing of the cirque situated south of Vogelschacht. If this would be done, there would have appeared a chance for a next stage of exploration and an attempt at extending the system as far as the southern order of Nebelsbergkar. This would take many years and a lot of enthusiasm, persistence and consequence on the part of the members of the successive expeditions. It seems worth of it, as there are few places in Europe where the lower entrance of cave lies at the altitude of 664 m.

photo by W.W. Wiśniewski

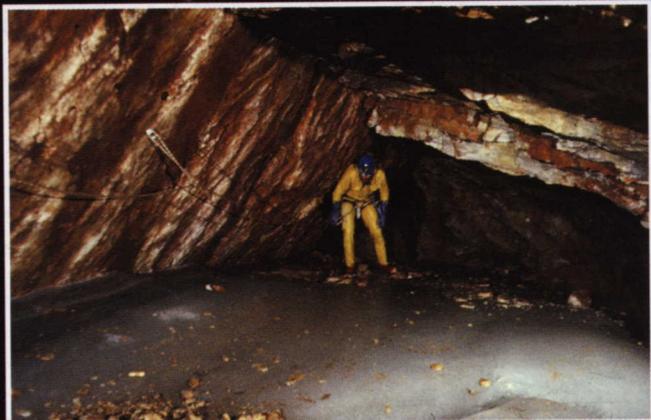


The author near the Verlorenenweghle entrance

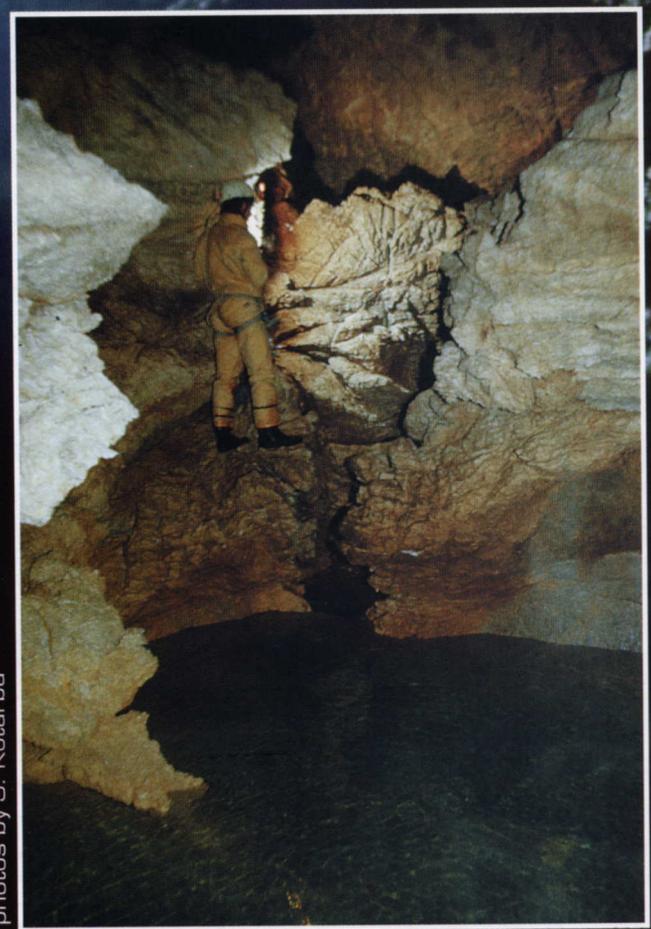


photos by S. Kotarba

Lamprechtsofen



photos by S. Kotarba



photos by S. Kotarba

The Göll massif

Zbigniew Rysiecki
Katowicki Klub Speleologiczny

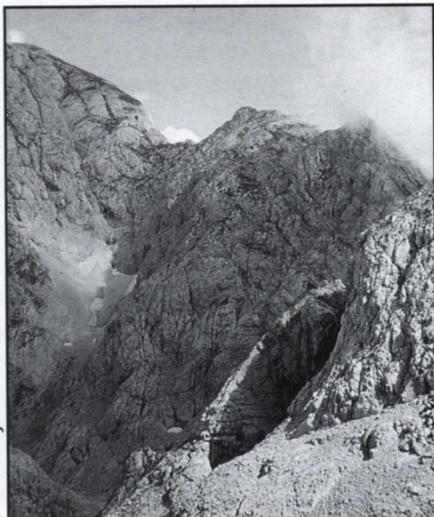
The eastern arm of the Göll massif is one of those areas in the Salzburger Calcareous Alps where Polish cavers have significantly contributed to the exploration.

95 percent of the area are very steep slopes, difficult for access. The massif is built mainly of thick-bedded Triassic limestones of enormous thickness. The massif is densely fractured, its tectonics are complex, with a plenty of faults. The massif is drained of water generally along its length, parallel to the surrounding valleys, and most of the waters pour out at the Schwarzbachfall resurgence at the altitude of 560 m. The resurgence lies at the northeast termination of the massif and it discharges 500 liters per second on average, and up to 17 cubic metres per second during flood. The steep slopes of the massif for many years were the reason of the low degree of its exploration by cavers.

Only 20 caves situated in easily accessible places were known here before 1960. The breakthrough occurred in the early 1960s when Austrian cavers, inspired and led by the legendary figure of Walter Klappacher, started the exploration of Gruberhornhöhle. The difficulties of this cave, especially the exceptionally lofty access route, were the experience which determined the new possibilities of the exploration in the massif. It was Gruberhornhöhle, one of the world's deepest caves of the time, that attracted Polish cavers.

Since 1970 Polish expeditions participated in the exploration in the massif, most of them led by Christian Parma since

photo by K. Dubiel

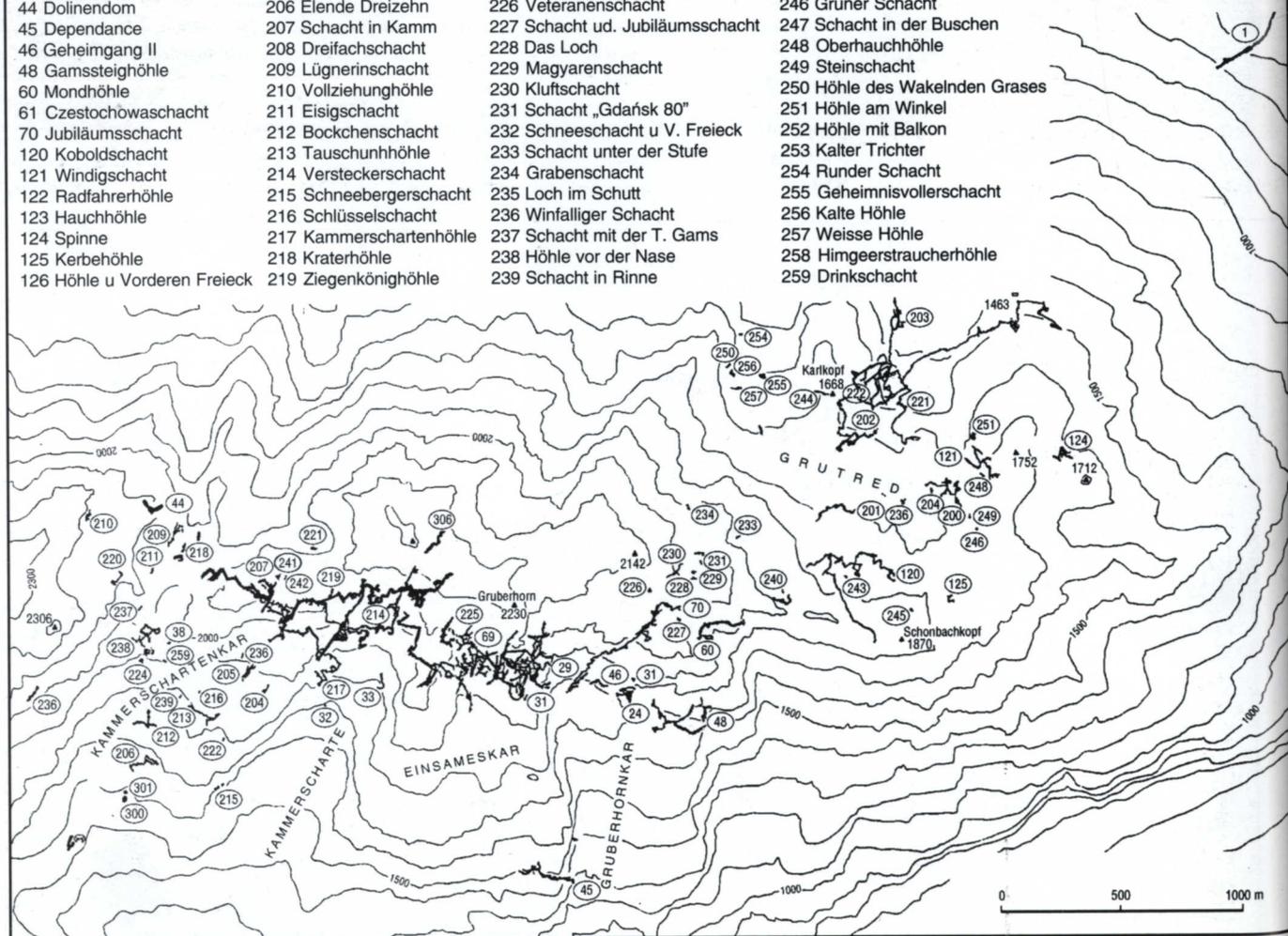


Slopes above the Hochscharte pass

The area is an east-west elongated crest, some 8 km long and about 3 km wide at its base. Deeply carved valleys on its sides descend to an altitude of 500 m, reaching the Salzach river's first-order valley, while the highest peaks attain 2300 m in altitude. About

- | | | | |
|------------------------------|--------------------------|----------------------------------|--------------------------------|
| 1 Schwarzbachfall | 200 Eisseehöhle | 220 Hammerschacht | 240 Rote Kluft |
| 24 Sakristei | 201 Sesamtür | 221 Dichterschacht | 241 Graue Überraschung |
| 29 Gruberhornhöhle | 202 Schacht in Klippe | 222 Kleineschacht | 242 Höhle mit Aussicht |
| 32 Kalt Windloch | 203 Silberlocknerxchacht | 223 Schartenschacht | 243 Mittlere Höhle |
| 33 Dreieckloch | 204 Siebenhöhle | 224 Schartenraum | 244 Gemenschlafzimmer |
| 38 Hochschartenhöhle | 205 Graue Ritze | 225 Zwillingsschacht | 245 Schönbachschacht |
| 44 Dolinendom | 206 Elende Dreizehn | 226 Veteranenschacht | 246 Grüner Schacht |
| 45 Dependance | 207 Schacht in Kamm | 227 Schacht ud. Jubiläumsschacht | 247 Schacht in der Buschen |
| 46 Geheimgang II | 208 Dreifachschacht | 228 Das Loch | 248 Oberhauchhöhle |
| 48 Gamssteighöhle | 209 Lügnerinschacht | 229 Magyarenschacht | 249 Steinschacht |
| 60 Mondhöhle | 210 Vollziehunghöhle | 230 Kluftschacht | 250 Höhle des Wakelnden Grases |
| 61 Czesochówaschacht | 211 Eisigschacht | 231 Schacht „Gdańsk 80” | 251 Höhle am Winkel |
| 70 Jubiläumsschacht | 212 Bockchenschacht | 232 Schneeschacht u V. Freieck | 252 Höhle mit Balkon |
| 120 Koboldschacht | 213 Tauschunhöhle | 233 Schacht unter der Stufe | 253 Kalter Trichter |
| 121 Windigschacht | 214 Versteckerschacht | 234 Grabenschacht | 254 Runder Schacht |
| 122 Radfahrerhöhle | 215 Schneebergerschacht | 235 Loch im Schutt | 255 Geheimnisvollerschacht |
| 123 Hauchhöhle | 216 Schlüsselschacht | 236 Winfalliger Schacht | 256 Kalte Höhle |
| 124 Spinne | 217 Kammerschartenhöhle | 237 Schacht mit der T. Gams | 257 Weisse Höhle |
| 125 Kerbehöhle | 218 Kraterhöhle | 238 Höhle vor der Nase | 258 Himgeerstraucherhöhle |
| 126 Höhle u Vorderen Freieck | 219 Ziegenkönighöhle | 239 Schacht in Rinne | 259 Drinkschacht |

Map of the explored area



THE NORTHERN CALCAREOUS ALPS

Expeditions of Sekcja Grotolazów Wrocław to Eastern part of the Göll massif

Wiktor Bolek
Sekcja Grotolazów Wrocław

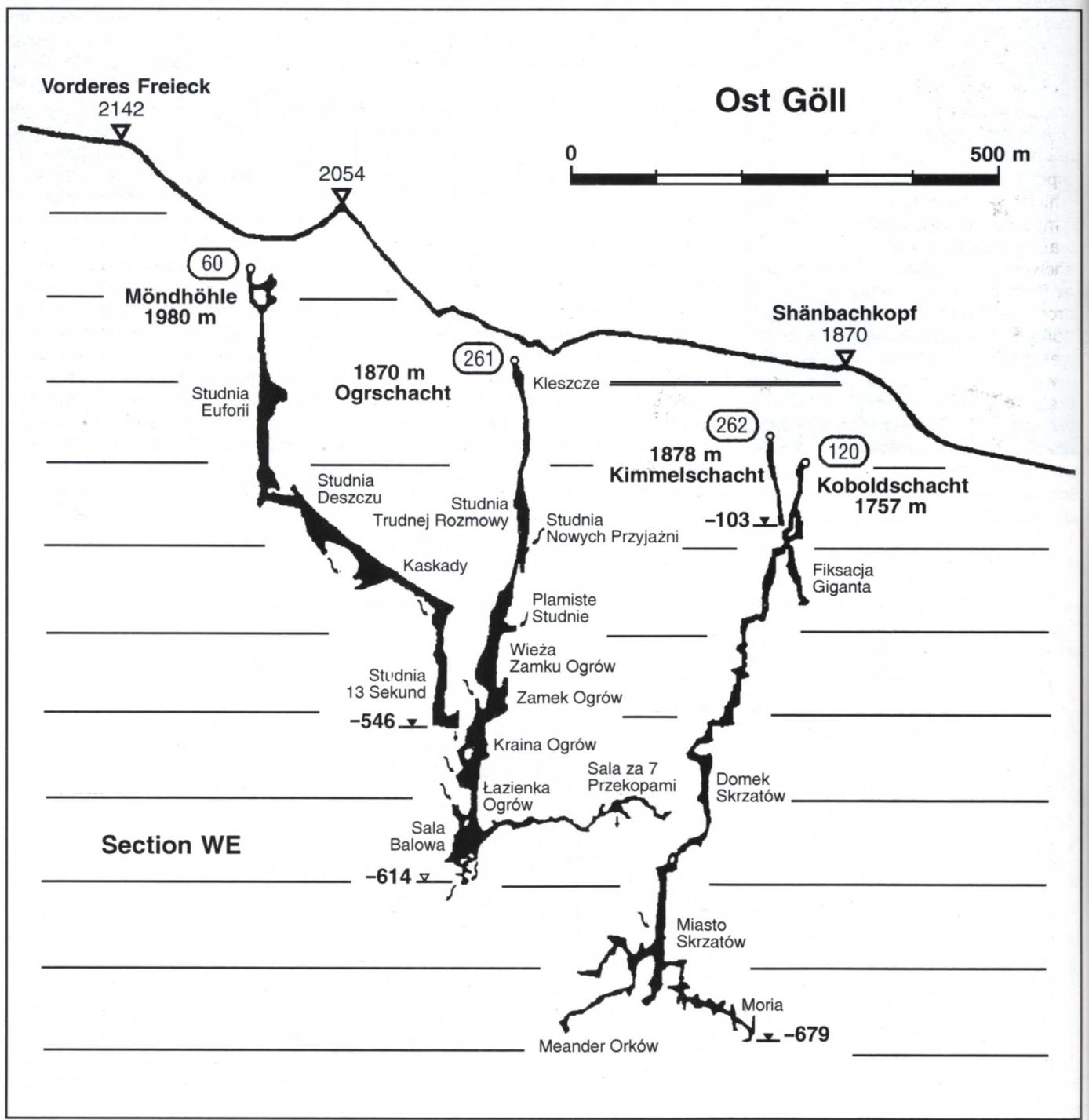
The Göll is one of the massifs of the Salzburger limestone Alps (Austria). It is not very large, only 57 km², but quite high - the highest peak Hoher Göll is 2522 m. The surrounding valleys are deep. It makes this massif very steep and the access to the main ridge is restricted only to few routes. On contrary to other

limestone massifs in this region, there is no characteristic plateau. The Göll consists of almost one ridge.

Polish cavers have been present in the Göll for almost 30 years. In 70's and 80's the central part of southern slopes was explored. In that time some significant results were obtained: Jubiläumsschacht -

1173 m, Gruberhornhöhle - 784 m, Mondhöhle - 546 m.

The eastern part of the Göll remained virtually virgin until 1990. This part is accessible from north by the only tourist route in the whole massif. First three expeditions (1990-92) were organised by Katowicki Klub Speolo-



giczny of Katowice (Upper Silesia, Poland). Grutred-höhlensystem -823 m and Koboldschacht -677 m were discovered. The exploration of the second one was not finished then. In fact it was very difficult due to long, narrow and therefore exhausting meanders, which were split by deep vertical pitches.

The exploration in this cave was undertaken once again by Sekcja Grotofazów Wrocław (Lower Silesia, Poland) in August 1995. Twenty people participated in this expedition. The bivouac in the cave was set up at the bottom of 100 m deep pitch - Koboldhaus at -600 m level. It was fully supplied after two weeks of painful transports. This shows the scale of the problem. We started to explore a side, horizontal corridor - quite roomy and comfortable - according to the standards of this cave. It was called Elephant-Run Yard. In the middle of this passage we climbed up a rapid R14 and entered a next passage, which continued to the south. It was almost horizontal and from time to time it was crossed by vertical pitches with showers of water. Pitches were too narrow at their bottoms to allow any further progress. We had to move on along the horizontal passage (Moria). The air flow was our guide. We moved over 400 m towards south and passed underground the main ridge of the massif. We stopped the exploration, because the supplies on the bivouac were exhausted.

Simultaneously we were checking several entrances on the surface. In one of them, numbered W7, we were very successful. We had to remove a big boulder at -20 m by pulley system. And there was a sequence of vertical pits. We arrived at -550 without any major obstacle

and the cave did not finish. It was called Ogrschacht.

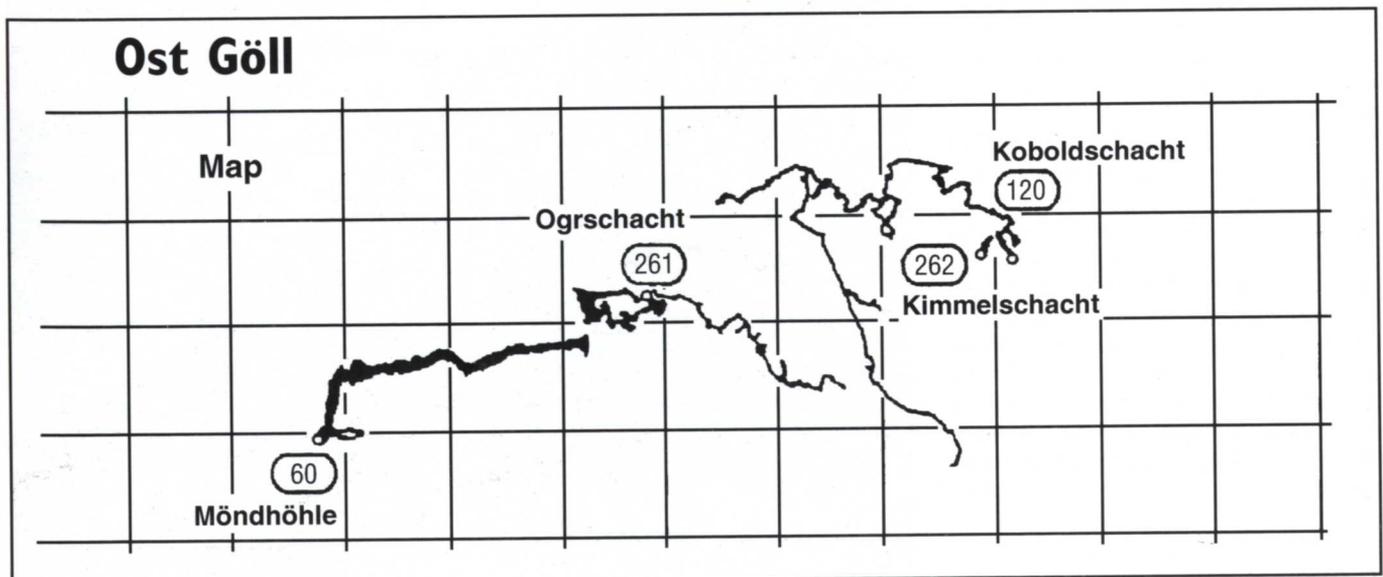
The expedition planned for 1996 seemed to be very exciting. When the plans were drawn it seemed that a connection with Mondhöhle was quite possible. The entrance of this second cave was placed some 100 m higher. It has not been explored since 70's, because of an ice choke at the entrance. Therefore Ogrschacht was to be the main target.

Only 8 people took part in this expedition due to difficulties with the permission from the Austrian authorities. At the beginning of the expedition, while the cave was still being rigged we checked side pitches at -400 m level. The progress there was not very promising and we abandoned these problems. Further investigation after the expedition proved, that this area was the closest to Mondhöhle. Our mistake was that all planes had not been prepared accurately enough before the expedition.

The bivouac was set at -580 m at the bottom of Ogr's Bath P72. The sequence of pitches ended there. The bottom was filled with boulders. We managed to descent between them to the present deepest point in the cave - 614 m. There the space became too narrow to progress any further. Then we started to explore a slope which started upwards from bivouac. After 40 m high climb we entered a horizontal, dry passage which went due to the east. The main obstacle in progression was the narrowness, in places where the floor of dry mud was close to the ceiling. We had to dig through. A strong air flow indicated large spaces beyond. We made seven such „dig-through”. The most exhausting was the third one. It required 14 hours of work. In the Hall Beyond 7 „Dig-through” the

passage became broad once again. We climbed an overhanging rapid R12 and stopped over two pitches. When we drew the new corridors on the plan, it turned out that we were closer and closer to the other cave - Koboldschacht. We were 200 m above the southern horizontal passage (Moria) discovered in 1995. The horizontal difference was 100 m. We prepared for the last bivouac during this expedition. The connection seemed to be very easy. We would descend those pits and arrive in Moria. After a painful transport of equipment through the dig points we explored both of them. The left one ended after 30 meters, the right one went into too narrow meander, which headed after all in the wrong direction. Would this expedition be in vain? In the last moment we managed to get through the narrow fissure in the middle of the corridor. After a dozen of meters we entered a meander which looked very similar to the formations found in Koboldschacht. But at least it was much broader. We were astonished, that it went up towards Koboldschacht (eastwards). During this last assault we were not prepared to climb and did not have enough time to transport necessary equipment. So we had to give up in the front of the next difficult rapid. This would be the problem for the next expedition.

The eastern part of the Göll massif seems to be promising once again. Three deep caves are placed close to each other - just under the main ridge. The connection would make a system over 900 m deep. And there would still be a possibility to explore at the bottom - in Koboldschacht. Thanks to the connection to Ogrschacht the route to this point would be much easier. The horrible meanders in the main part of Koboldschacht would be bypassed.



The second Polish minus thousand in the Tennengebirge

Rajmund Kondratowicz
Speleoklub „Bobyry” Żagań

Speleoklub Bobry from Żagań has been active in the Tennengebirge massif in Austria for 17 years already. It is there that we had our greatest achievements: Höllenhöhle - P-14 (-455 m), Meanderhöhle - P-4 (-1029 m), several tens of smaller caves, the recently explored



A tent near the entrance to Bleikogelhöhle

Bleikogelhöhle - P-35 (-1010 m). 1996 was the year of the 30th anniversary of our club foundation. Our special reason for satisfaction in the anniversary year was the two successful expeditions - Vietnam'96 in April and Austria '96 in August.

From 26th July to 11th August 1996 our club went on a surveying trip to the Tennengebirge Ost. At a request of cavers from Salzburg we planned to tag the entrances of the caves we had explored in this area. But, as the Austrians had not prepared the tags, we decided to spend the planned two weeks on doing some lacking surveys and pushing some leads left over after our earlier trips. Leads are not in short supply in the Tennen. Moreover, the exploration targets were in the same caves where the surveys were pending, that is in Czerwony Pająk (Red Spider) - P-19 and Bleikogelhöhle - P-35. We had enough equipment and ropes deposited in Laufener hut.



The Tennialpe valley

There was not much to survey: a gallery from the window behind a tyrolean traverse in the terminal shaft in Red Spider and the allegedly 100 m-deep shaft and some lateral branches in P-35.

Having come to Abtenau on July 27th, for two days we transported tackle to the Laufener hut - our base camp. When we decided to explore, the surveying trip turned into a pushing one; we began activity in the mountains or, better say, inside the mountains. On 29th July we went with Robert to survey and push in Red Spider equipped with a 70 m rope. Having surveyed the branch after the tyrolean traverse we started abseiling to a pitch which opens from it. By tossing stones we estimated the depth at no more than 20 m, hence we did not expect a great discovery. We were more

interested in having a look at the window from which a noticeable stream was pouring out. Having descended the shaft we found a fissure going sideways and soon passing into a bell-shaped shaft. An abseil to the end of our 70 m rope still did not permit us to see the bottom. Meanwhile, the intriguing stream pouring from the window made us think of a possible connection with P-13. Everything seemed to indicate that the shaft in P-19 lies 200 m beneath the shaft P-13.

On the same day the other part of the team went to P-35. Marcin, Tomek and Rafał rigged to -280 m, Daniel and Jacek to -450 m and they searched at this level. Krzysiek and Zbyszek were searching in the Mokre Kaskady (Wet Cascades) which branch from the main cave at -250 m. Only one team were lucky. Daniel



The P-19 cave (Czerwony Pająk) entrance

kicked off boulders choked in a fissure. An exposed crawl, when cleared from stones, gave way to a series of seven cascades spiralling down for 50 m. After rigging and abseiling they stood at the head of a vast shaft with a stone bridge. However, they had no more rope and they had to go back to the hut.

On hearing the news we had quickly measured the ropes (more than 1150 m) and fell into the trance of exploration. On 30th of July Tomek, Marcin and Robert attained -600 m on a great ledge in the shaft with the stone bridge. Rafał and I surveyed from -300 m to -550 m. 31st July - a storm in the mountains, so we stayed in the camp and only in the afternoon we went walking over the mountains. 1st August - Jacek and Daniel explored the Wiecznych Kursantów (Enduring Trainees) shaft to its bottom (-650) and a short, clear-washed meander with a stream (17 hours in the cave). Marcin went down to Abtenau to buy food and bring the remaining ropes from the car. Rafał and I were climbing on the northern face of Hochkarfelder Kogel, while Krzysiek and Robert abseiled to the bottom of the shaft discovered a few days ago in Red Spider.

This cave continues in a narrow passage and we will certainly come back there. Now we have to move the whole tackle to P-35. On the evening of the same day Zbyszek and Tomek went to set a bivouac, go to the exploration limit and push on. However, water that suddenly appeared after the night storm in the cascades at -460 made them return. The same happened to Jacek and Daniel. We had met them all at the entrance when going with Rafał for our turn of exploration and we came back to the camp together.

We had done the right thing, as in the afternoon it rained again. We threw a party in the hut. On 3th August the weather was still unfavourable. Zbyszek and Krzysiek came back to Poland for their jobs. The 4th of August we set off for a pushing trip again. The shafts and vast spaces brought about a rapid increase in the explored depth of the cave. I continued with Marcin the survey from -550 and exploration from -650 to -750 (28 hours in action including a bivouac). We have run out of ropes above a next vast shaft. 5th August Tomek and Rafał (18 hours) abseiled the shaft - 750 (40 m) and went down over scare to a head of a great shaft at -810 m. 6th August. Jacek and Daniel had rerigged a part of the cave in order to free some ropes and attempted to explore the last shaft. Unfortunately, they had used the unlucky 70m rope from Red Spider and Jacek was dangling at its end without seeing the bottom or having a contact with the walls.

A stone tossed from the head of the shaft was falling down for 9-10 seconds. The other people went down to Abtenau for food and wood. We also said good bye to Robert who had to go back to Poland. We were left only six and the cave was still going on. On 7th August four of us went to explore, while Jacek and Daniel left the cave from the bivouac, after more than 30 hours spent underground.

We took the remaining ropes in hope they will suffice to get to the „thousand” which we were instinctively feeling. At the limit of exploration we found spits placed by the earlier team - the way was open. 140 m down the shaft named Piast, 8 x 23 m in cross-section, then enormous phreatic ramps descending at 30°, a shaft of 11 m and again phreatic tubes with a thick layer of mud. The sediment indicated proximity of the bottom. There it was. The stream, flowing on the bottom of a gully, disappeared suddenly in a sump. This is the lowest known point in P-35. Now what we have to do is to pack the tackle and return. We made deposits, took out the tackle, including the bivouac, and on 9th of August we finished our activity in the mountains.

During the evening in the hut we „computed” the cave, and threw out an international party. The calculations gave -1020,5 m, and after a correction later in Żagań -1011,3 m. P-35 Bleikogelhöhle is technically very easy. This is indicated even by the times shown above. When rigged it may be done to the bottom and up in 15 hours easily (descent of 2 people - some 3 hours). To rig it we used more than 1100 m of ropes, because P-35 is a system of great shafts and cascades. At -930 in the Piast shaft there is a great ledge of jammed blocks, behind which we could see only darkness. We will surely come back there as this may be a chance for making the cave deeper.

The success is due to: Krzysiek Cygan, Marcin Furtak, Rajmund Kondratowicz - the leader, Tomek Kuźnicki, Zbyszek Lapunow, Daniel Oleksy, Robert Świętek, Jacek Wiśniowski, Rafał Wójcik and to our sponsors HURTPOL, T.U. WARTA and KOMINEX from Żagań.



M. Furtak and R. Kondratowicz (right) near the entrance to Bleikogelhöhle

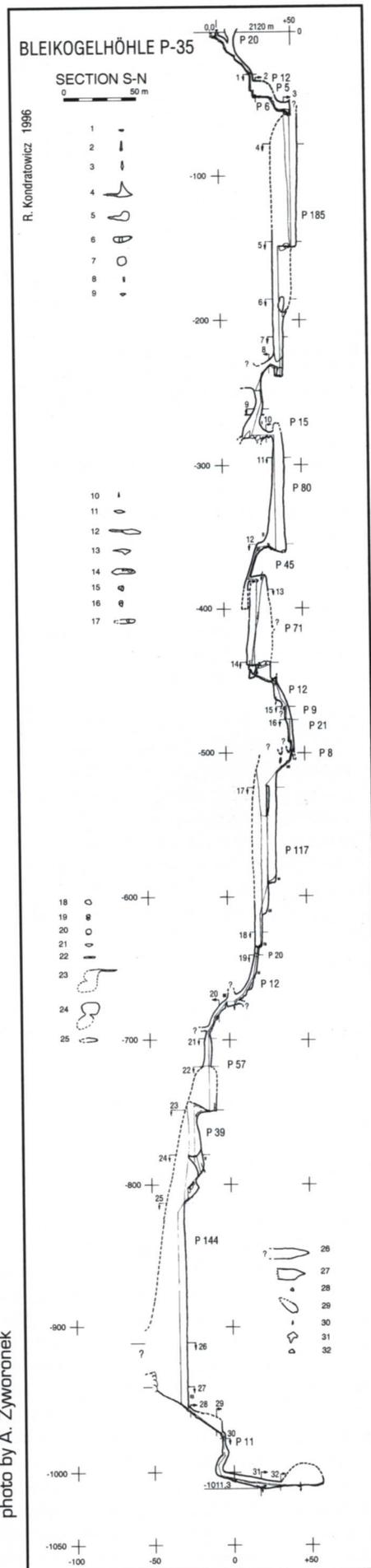


photo by A. Zyworonek

The Southern Tennengebirge

Jarosław Rogalski

Akademicki Klub Grotolazów

The Tennengebirge is one of the massifs in the Salzburger Alps. It is the biggest karst plateau in this part of the Alps, high up to 2100 - 2300 m. It is a gigantic white desert of limestone rubble, grooved by karst hollows. In the Tennengebirge there are a few deep and big cave systems already explored as for example: Eisriesenwelt, Schwer-Höhlen-system, Cosanostraloch-Berger-Platteneck Höhle. However, when we look at the location of these caves, we can see that the majority of them are at the rim of this plateau. The middle part of this big, karst sponge is still waiting for recognition. The hydrologic conditions show that the best way to get there is from the southern part of the massif.

The task of this paper is to present the activities of a Polish group of cavers of „FAKS” in the southern rim of the Tennengebirge, in the region of the peaks Kemetstein and Wermutschneid. The reason why we decided to explore there is in short presented above.

Krzysztof Makowski organized two expeditions in 1985 and 1988; it was the first period of this exploration. They penetrated the regions of Kemetstein and the blind valley Tiefenkar. At once it was obvious that the caves found below the rim of the plateau were those with the biggest chance of getting down the massif. Above this border, the ubiquitous rubble choked every slit. There were found a few entrances in the southern flank of the Tennengebirge. Three caves were chosen for systematic exploration: Ariadnahöhle, the Grosse Kemetsteinhöhle (already known) and the Schnee Maria Hhle.

The entrance to Ariadnahöhle is situated in the western flank of the Tiefenkar valley, at 2030 m. The initial parts are like in any alpine cave - a narrow meander with many pitches. 200 m below something completely new begins. The steep series drops into vast passages which develop horizontally. This level of huge halls and passages (between 1600 and 1900 m), so characteristic for the Salzburger Alps, is known in slang of Polish speleologists as „Gangi”. We found it also in this cave, and this parts were called this name - „Gangi”! They are decorated by wonderful dripstones, basins of cave pearls and little lakes surrounded by fabulous calcareous flowstones. In the first period of exploration we concentrated on finding the way down. So we left the fabulous passages „Gangi” and continued down just along the big underground stream, by passing through pitches and meanders. More or less 700 m below the surface, below the huge pitch „P. 80” the series divided into two mud

passages. The first one led to the depth - 724 m and the way was stopped by mud siphons. The second one dropped into the passages made by the river and also stopped at the depth - 738 m. The exploration was finished in front of the next narrow cascade.

Grosse Kemetsteinhöhle is well known to tourists - it is a big tunnel with two entrances piercing the rock of Kemetstein. Here, in one of the side passages we managed to get down through the ice into the lower parts. The cave appeared to have a lot of passages on different levels. The explored series are 3 km long and are up to 150 m deep. Their character is identical as the „Gangi” in the Ariadnahöhle. Unfortunately, the exploration could not continue because of silt and heaps of rubble, which choked passages to the ceiling. So we gave up

the exploration in this cave.

Schnee Maria Höhle is the highest situated cave (2147 m), it lies practically just at the rim of the plateau. At the very entrance we found very narrow and fragile parts which were very difficult to go by. In 1985 we managed to pass by the first bottom at the - 50 m. During the next exploration it was a rule - we got to the choked bottom, which we had to pass by narrow and brittle corridors above. In this way we got to - 500 m, where the cave changed into very narrow meander. At the end of it there is a new pitch, but it had to wait till the next exploration. Definitely we ended our activity at - 600 m, with plans for the future.

During the expedition in 1988 it was made a film - „Below the Alps” (Pod podszewką Alp) - for the Polish Television.



Ariadnahöhle, „Gangi”



Kemeststein, view from the north

photo by A. Dajek

photo by A. Dajek

II

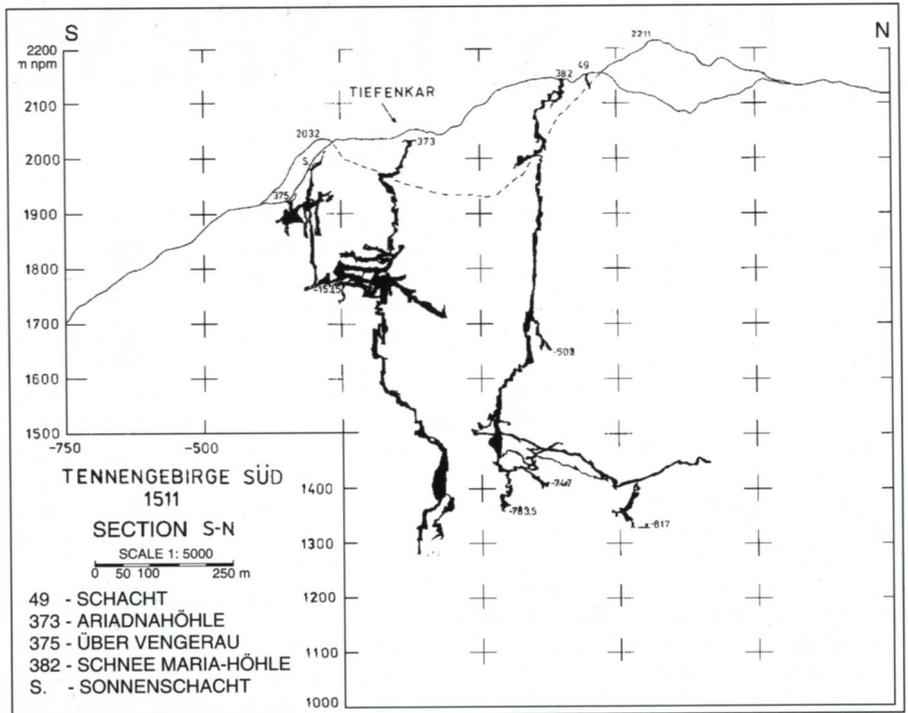
We had to wait 6 years for the next expedition. During this time a lot of speleologists passed through „FAKS”. That is why in 1994 we arrived in the Kemetstain region as a completely new group led by me. From this time on, the Polish speleologists have come here every year. These expeditions decided that the most important thing is to resolve the problems left by Krzysztof Makowski.

In Ariadnahöhle we tried to explore down. We removed the heaps of rubble above the last cascade, we widened a slit and went 15 m down. Here the cave ended definitly with an inaccessible fissure - at the depth of - 753 m. So we decided to explore the cave in the „Gangi”. We discovered new parts of this series, stretching towards Grosse Kemetsteinhöhle. We concentrated on finding the link between these two caves and on finding the continuation of „Gangi”.

Because of the exploration of „Gangi” I should mention the discoveries in Über Wengerau Höhle. It is quite small, one kilometre long cave which axis is a big, old passage on the level of 1900 m. In the very close vicinity of Ariadnahöhle there are also two caves which have passages very similar to „Gangi”: The Grosse Kemetsteinhöhle and the Über Wengerau Höhle. In the first one they are situated from 1930 m to 1790 m, in the second one they were found on the level of 1900 m. So without much risk we can suppose the genetic link of formation of these caves. These discovered parts belong to the same cave system, on the same level of siphons. They all have a well defined multi-level configuration developed during slight lowering of the erosional base. At least partial discovery of this system is still a very interesting challenge in the Southern Tennenengebirge.

The most important effect of the exploration in this region has been achieved in Schnee Maria Höhle. At the depth of - 700 m the cave leads to horizontal, tube-like passages, which stretch in the northwards. The system of these tubes ends 200 m below the rim of the plateau in the north. Unfortunately, the series at this depth was choked by mud. Now, we explored in slanting but dry „Meander of Heavy Boots” at the depth of - 800 m. Up till now it continues down. The exploration of water series of this cave, like in the Ariadnahöhle, have not given interesting results. The first stream we left in the narrow fissure at the depth - 503 m, the second one - at - 783,5 m, the third one - at - 817 m.

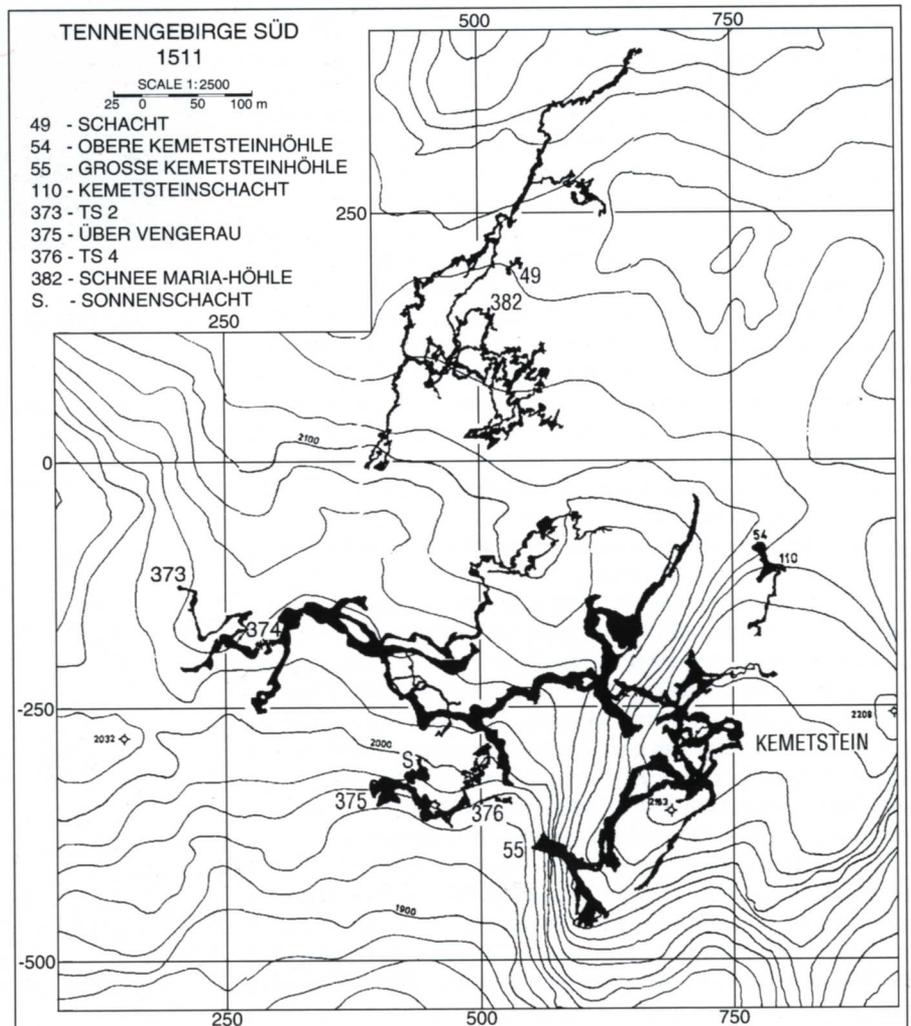
Up till now, the FAKS expeditions explored more than 12 km new passages in the Southern Tennenengebirge. Two



caves - Ariadnahöhle i Schnee Maria Höhle are more than 4 km long and 700 m deep. This year we are preparing a new expedition which, we hope, will

bring a lot of new spectacular discoveries in this region.

Translated by Marta Salamon



THE STEINERNES MEER

- a long way to success

Artur Amirowicz, Maciej Tomaszek
STS KW Kraków

The cavers of STJ KW Kraków became interested in the Steinernes Meer in the late eighties, after a series of unsuccessful expeditions to the Hagengebirge. We looked across the valley and there, in the distance, was what looked like a promised land - the Sea of Stones. But we were yet to learn that reality, as always, is much harsher than dreams.

The Steinernes Meer is one of the largest limestone massifs in the Salzburger Alps. Its plateau has some 200 km² and is situated at the average height of 2100 m. The best access route leads from the south in the Saalfelden - Maria Alm area. The massif is cut by the German - Austrian border, but nowadays this is not an obstacle.

The first expedition in 1988 was of a reconnaissance character. Two areas were selected for closer inspection - the first one situated on the eastern slopes of the ridge stretching northwards of Breithorn to Weissbachscharte; the second on the north side of a pass between Grasskopf and Leiterkopf. The results of the expedition showed that the second area is much more promising though definitely less accessible. It takes about four hours of tiring walk across the rugged plateau to reach it from Riemannhaus, the last outpost of civilization.

Four other expeditions, in 1989, 1990, 1992 and 1996, were organized to explore the area. The bivouac was set up in the so-called „Kultur - Biwak“, a spacious though uncomfortable cavern in the eastern wall of Wildalmrotenkopf. The remoteness of the area and the scarcity of inhabitable place in the bivouac cave limited the team size and the length of our stay in the mountains. Thus on each occasion there were no more than five cavers and the length of the exploration activity never exceeded two weeks. We had to do as much as possible under such restrictions and, as it turned out, the progress was inevitably slow.

The expedition in 1989 had as its main goal the thorough surface exploration of the area situated between Grasskopf, Leiterkopf and Hohegger. Several small caves were surveyed, the deepest, GK-1 (discovered in 1988) was -72 m. One promising entrance, marked as GK-2, with strong air draught, was left open. It was the principal target for 1990. The cave ended very soon at -77 m, but this disappointment was quickly forgotten as a new discovery turned our whole attention to another cave - GK-3. Its entrance is situated close to the pass dividing Grasskopf from Leiterkopf, in a steep rock gully, at the altitude of 2318 m. In 1990 the cave was surveyed to -242 m at the bottom of a series of pitches. Three large side meanders were left open - two branching off at -200 m and one at -120 m.

The exploration activity in 1992 was concentrated exclusively on GK-3. We began with the improvement of protection in pitches as bolts were used somewhat sparingly in 1990. Then the most spacious meander was explored but it ended disappointingly at -274 m with a small silted syphon. The next side meander terminated at -250 m with a squeeze which we were unable either to penetrate or to widen. The last chance remained at -120 m, in another meander with a small stream. Lack of time allowed us to reach only -160 m, but the problem was still left open.

In the next four years there were some unsuccessful attempts to organize another expedition, but finally in 1996 an almost entirely new team went to the Steinernes Meer. The open meander led back again, through some very nasty squeezes to the syphon at -274 m, but a side passage allowed us to reach a new, more extensive series. The survey was carried out to the

depth of 340 m with the measured length of 1188 m, but the cave continues. It was explored to some -400 m where there is a large rift with the stream flowing into a syphon. But a considerable number of side passages left unexplored give good hope for further discoveries.

The expedition also found another promising cave - GK-4. At present it is 50 m deep with the length of 150 m and open for further exploration.

We plan to continue our work in the Steinernes Meer. The obvious target is of course GK-3. But the area still has considerable potential for exploration. And the expeditions to the Steinernes Meer though very difficult are really rewarding.



GK-3 cave

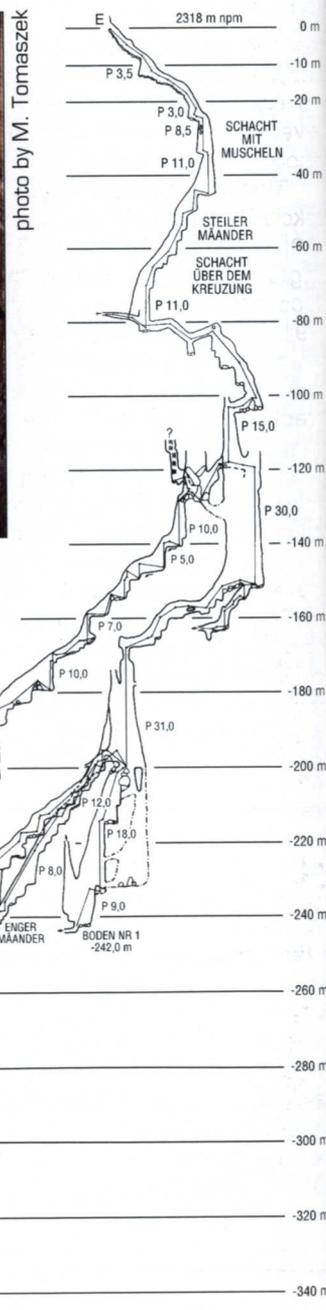


photo by M. Tomaszek

The Hochkönig

Wiktor Bolek

Sekcja Grotolazów Wrocław

The Hochkönig is the highest massif in the Sauburger Alps. The summit of the same name is at 2914 m high. The plateau is placed at the level of 2500 and is covered by glacier. The limestone layers are believed to be rather horizontal. These facts make this massif not very promising for cave exploration. However three expeditions from Poland went there. The eastern slopes are the most interesting part of the whole massif. The lapiaz is well developed there.

The first expedition was organised by Katowicki Klub Speologiczny in 1978. Krallenkanyon - the deepest cave at that time in the massif was explored then. It was 178 m deep. The exploration was stopped, because it required climbing at the end of the cave. Apart from that several avens were also discovered (about 40 - 60 m deep).

The first expedition organised by Sekcja Grotolazów Wrocław took place in 1992. We explored caves in Egglaubenkar. In one of entrances discovered during a reconnaissance in 1991, we rapidly arrived at -200 m level after descending a sequence of pitch. Two horizontal corridors run at different directions at this level. The cave was marked as SG 1/1 and no other name was given so far. A very strong wind was blowing through the horizontal system, which was a very characteristic feature of this cave. In the eastern corridor, after several squeezes and 100 m long crawling we discovered a pitch P20 called Mittenfeld Alm. At the bottom a narrow horizontal passage started again. We moved forward for about 150 m. At the end it was partly filled with mud. The air flow became even more intense. It was

blowing just under the ceiling. We tried to dig, but the wind was too freezing and the mud was too wet. We moved to the southern corridor. In the side pitch we descended to -284 m - the deepest point of 1992 expedition. This place was called Bottom of Three Slits. The horizontal passage at -200 m continued. We were stopped by a muddy squeeze, partly filled with water. The air flew through it just like in the nozzle. It took us a while to dig through. We called this place Grifon, which is an abbreviation of "dirty siphon". After Grifon we had a sequence of narrow corridors and pitches, which had to be traversed. Their bottoms offered no prospects for exploration. After 50 m of such terrain we arrived at next 'dig-through' - filled with dry mud and about 3 meter long. The stone thrown through it fell into an about 40 m deep pitch. This dig-through was called Rainworm (Dżdżownica). We went through it during the last assault on this expedition. We descended pitch P35, but the corridors at the bottom were too narrow. The main air stream went into an opening at the opposite wall.

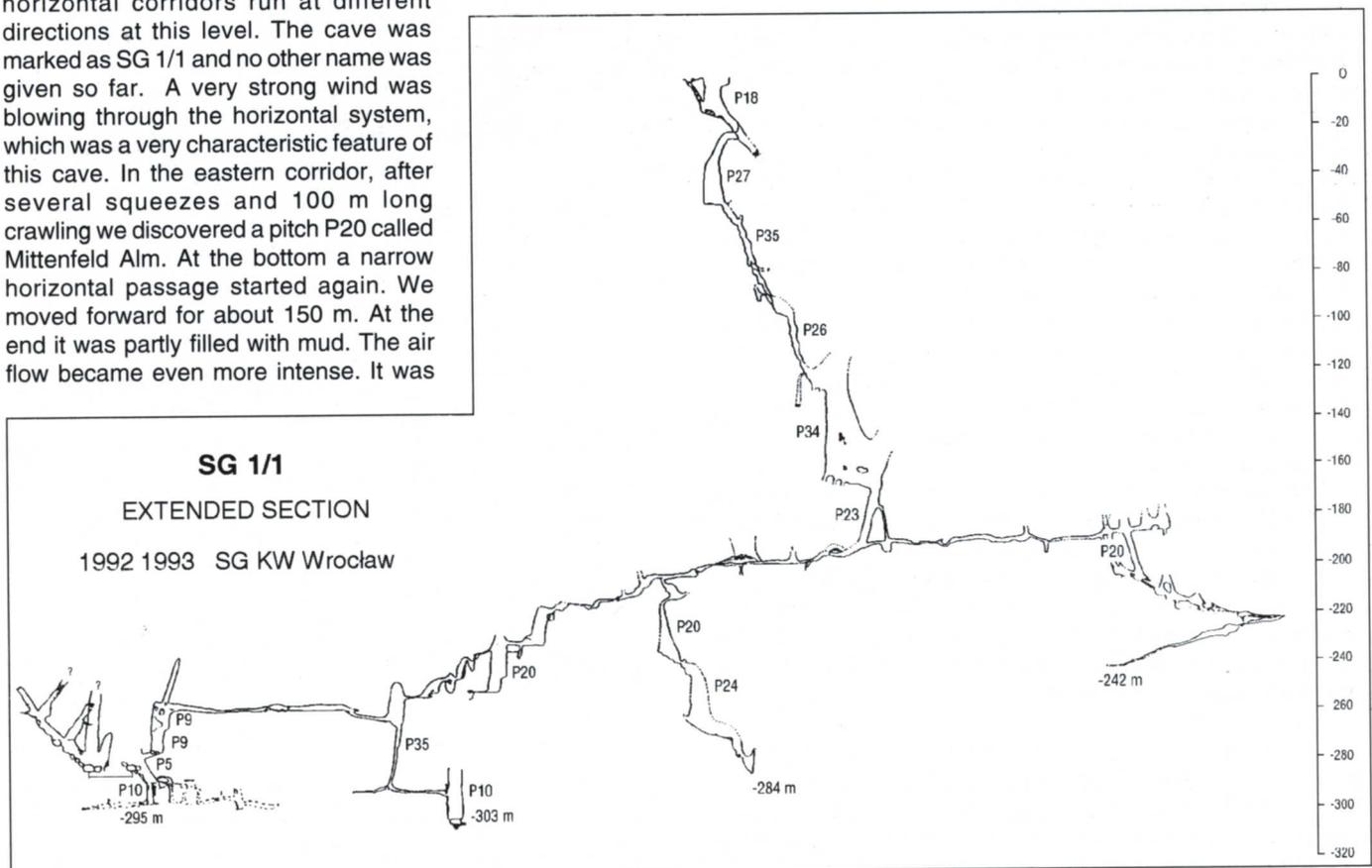
The expedition in 1993 was organised to explore this opening. We found there a horizontal narrow fissure, which moved us to big sloppy chimney with water flow. But unexpectedly the water fell into a siphon at -295 m. The air flew into a tube-like squeeze - 5 m long, which only one person could get through. We stopped exploration there. At the end of expedition we managed to get through squeezes at the bottom of P35 and reached the present deepest point in the cave at -303 m.

During two years of exploration in the Hochknig our Section discovered the deepest cave in the massif and a dozen of avens from 20 to 100 m deep. Further exploration at this part of Hochkönig became impossible, because a private owner of the area chased us out of his ground.



photo by W.W. Wisniewski

A general view westward from the Hochkönig (2941 m) towards the area explored by Wrocław cavers





The Picos de Europa

- EL CORNION

Marek Jędrzejczak
Speleoclub Wrocław

Polish cavers coming to the western massif (El Cornion) of the Picos de Europa since 1978 were assigned for exploration by Parque Nacional de la Montaña de Covadonga, through Federación Asturiana de Espeleología, an extensive area in the Asturian part of the massif. It includes the northern slopes of the Torre Santa María and Torre de los Traviesos and occupies an area of about 4.5 km². The highest point in this zone is the summit of the Torre de los Traviesos with

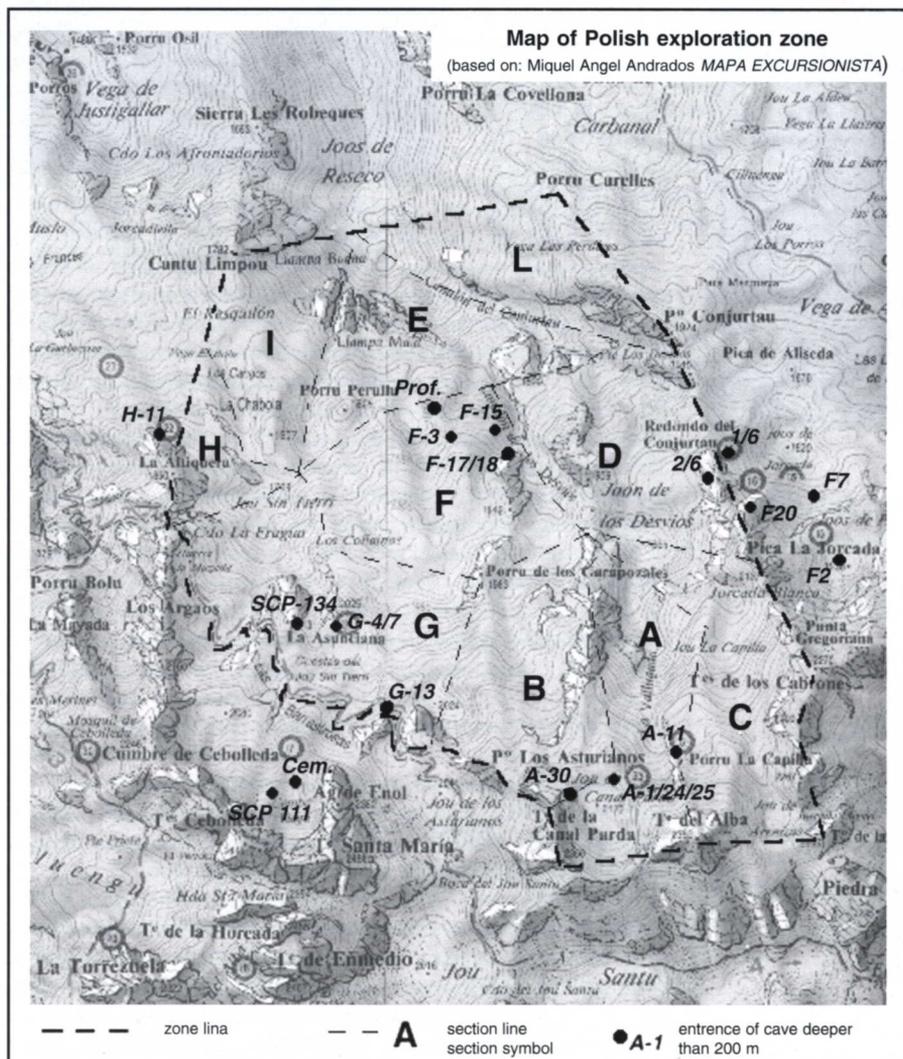
altitude 2390 m, and the lowest is the bottom of the cirque Joos de Reseco at about 1460 m.

The beginning of the exploration in this part of the El Cornion may be accepted in 1961, when cavers from Grupo de Espeleología Polifemo (GEP) made the first reconnaissance and confirmed the speleological attractiveness of the area. A year later Cueva de la Fragua was explored to the depth of 165 m.



photo by M. Chłupala

A team near F-17 cave entrance



Caves:

A-30, A-1/24/25 - Sistema del Jou de la Canal Parda (-903 m, 4401 m), A-11 - Pozo del Porru la Capilla (-863 m, 1593 m), SCP 111, Cem. - Sistema Cembaveja (-810 m), 2/6, 1/6 - Sistema Conjurtao (-655 m, 2435 m), F2, F7 - Sistema Jorcada Blanca (-594 m), F20 - Pozo del Redondo (-582m), F-17/18, F-15 - Sistema del Canal de los Desvios (-501 m, 1597 m), G-13 (-429 m, 623 m), H-11 - Sima de la Porra la Aliquera (-418 m), G-4/7 - Red de los Barrastosas (-315 m), F-3 - Sima de los Desvios (-315 m), SCP 134 (-240 m), Prof. - Sima Profunda (-204 m)

At the beginning of 1970s the area attracted the attention of French cavers from Speleo Club Orsay de Faculte (SCOF) who explored it systematically in years 1972-75. Because of the large extent of the area their activity concentrated in the western and southwestern parts. The deepest caves explored then include:

- * Sistema de la Torre de los Traviesos o de los Organos (A-1), - 416 m,
- * Red de los Barrastosas (G-7/G-4), - 315 m,
- * Sima de los Desvios (F-3), -280 m.

Another cave discovered at that time was H-11 (beyond the present limit of the area), explored in 1972 to the depth of -73 m. Two years later, in 1974, members of GEP surpassed the depth of -350 m. In the same year cavers from Grupo de Montaña Torreblanca (GMT) had discovered Sima de Cembaveja (Cem.) in an adjacent area, south of Barrastosas and near the limit of the zone; in it they attained -310 m in 1977.

In total, the members of SCOF have discovered about 50 caves by then. At the same time they began to explore another area (Ozania), more promising as they believed, and abandoned their activity in this zone.

1978 The first Polish expedition was the reconnaissance by Speleoklub Warszawski (SW) in 1978, whose participants visited, among others, Red de los Barrastosas (G-7/G-4) and Sima de los Desvios (F-3). They also prospected on the surface and marked about 30 new entrances.

1979 Since that year has began the regular activity of Speleoklub Gliwicki (SG), concentrated mainly in that part of

THE DEEPEST CAVES IN THE POLISH EXPLORATION ZONE AND ITS VICINITY

NAME	ENTRANCE SYMBOLS	DEPTH	LENGTH	HORIZONTAL EXTENT	YEAR, CLUB, RESULT
OBJECTS SITUATED IN THE POLISH ZONE					
Sistema del Jou de la Canal Parda (Pozu del Picu de los Asturianos - Sima de la Torre de los Traviesos o de los Organos)	A-30 (0) A-24 (-13) A-25 (-14) A-1 (-22)	-903 m	4401 m+ca. 450 m	760 m	1974, SCOF, -330 in A-1 1975, SCOF, -416 in A-1 1989, SKG, -265 in A-30 1991, SCW, -552 in A-30 1994, SCW, -726 in A-30 1995, SCW, connection of A-1 with A-30 1996, SCW, -903
Pozu del Porru la Capilla	A-11	-863 m	1593 m	440 m	1984, SG, -180 1986, TJC, -400 1987, SG, -863
Sistema del Canalon de los Desvios	F-18 (0) F-17 (-24) F-15 (-36)	-501 m	1597 m+ca 50 m	202 m	1994, SCW, -501 in F-17/F-18 1995, SCW, connection of F-15 with F-17/F-18
Red de los Barrastrosas	G-13	-429 m	623 m	82 m	1989, SGKWW, -429
	G-7(0) G-4(-48)	-315 m	?	145 m	1972, SCOF, -215 in G-7 1973, SCOF, -315 in G-7 and connection of G-4 with G-7
Sistema de los Desvios	F-3	-315 m	?	?	1973, shepherd, -100 1975, SCOF, -280 1980, SG, -315
	SCP 134	-240 m	?	42 m	1984, SCP, -38 1985, SCP, -157 1986, SCP and KKS, -240
Sima Profunda		-204 m	?	?	1979, SG, -188 1980, SG, -204
OBJECTS SITUATED IN NEIGHBOURING ZONES					
Sistema Cembavieja	SCP 111(0) Cem. (-107)	-810 m	?	?	1974, GMT, -100 in Cem. 1977, SEII and GEP, -310 in Cem. 1979, SEII, -550 in Cem. 1982, SEII and LUSS, -703 in Cem. 1984, SCP, -300 in SCP 111 1985, SCP, connection of SCP 111 with Cem., -810
Sistema Conjuarto	2/6(0)	-655 m	2435 m	385 m	1980-85, OUCC, -452 in 1/6 and -80 in 2/6 1986, OUCC, -655 and connection of 2/6 with 1/6
Sistema Jorcada Blanca (Poza Jorcada Blanca - Poza los Perdices)	F2 (0) F7 (-90)	-594 m		365 m	1982, OUCC, -520 in F2 1983, OUCC, -594 in F2 1984, OUCC, connection of F7 with F2
Pozu del Redondo	F20	-582 m	?	395 m	1985, OUCC, -382 1986, OUCC, -582
Sima de la Porra la Altiguera	H-11	-418 m	?	?	1972, SCOF, -73 1974, GEP, -350 1979, GEP, -418
KKS - Katowicki Klub Speleologiczny SCW - Speleoclub Wrocław SG - Speleoklub Gliwice SGKWW - Sekcja Grotolazów Klubu Wysokogórskiego Wrocław STJC - Sekcja Taternictwa Jaskiniowego Częstochowa GEP - Grupo Espeleología Polifemo, Oviedo, Spain GMT - Grupo de Montana Torreblanca, Oviedo, Spain			OUCC - Oxford University Cave Club, Oxford, UK LUSS - Lancaster University Speleological Society, Lancaster, UK SCOF - Speleo Club Orsay Faculte, Orsay, France SCP - Espeleo-Club de la Universidad Politecnica de Valencia, Valencia, Spain SEII - Seccion de Espeleología Ingenieros Industriales, Madrid, Spain		

the zone which had been little explored by SCOF. In 1979 the activity took place in the lower parts of the massif. Several caves were discovered, including Sima Profunda (-190), Sima de Nieve (-98) and Sima Cantolimpou (-76). Entrance series of Sima de los Desvios (F-3) were also searched. In Sima de Cembavieja (Cem.) members of Seccion de Espeleología Ingenieros Industriales (SEII) attain the depth of -350 m, while in Sima de la Porra la Altiguera (H-11) cavers from GEP reach -418 m.

1980 Exploration was continued in the caves discovered earlier. The results are the deepening of Sima de los Desvios from -280 to -315 m, Sima Profunda from -190 to 204 m and Sima Cantolimpou from -76 to -128 m. Also visited were Sima de la Torre de los Traviesos o de los Organos (A-1). Near the limit of the zone, on the side explored by the English, members of Oxford University Cave Club (OUCC) discovered Sima Conjuarto (1/6).

1981 For many years, because of the situation in the country, Polish teams were not coming to the Picos. Spaniards from SEII attained -550 m in Sima de Cembavieja (Cem.). This was the first so deep a cave in this part of the massif.

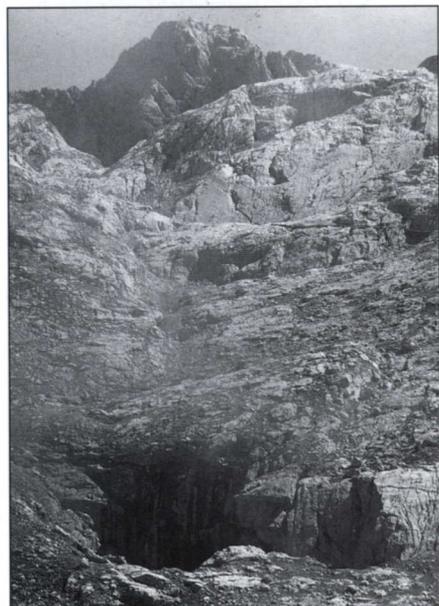
1982 In Sima de Cembavieja (Cem.) SEII and OUCC reach the final sump at the depth of -703 m. Members of OUCC descend to -520 in Poza Jorcada Blanca (F2), which lies next to the limit of the Polish zone.

1983 The English reach the final sump in Poza Jorcada Blanca (F2) at the depth of -594 m.

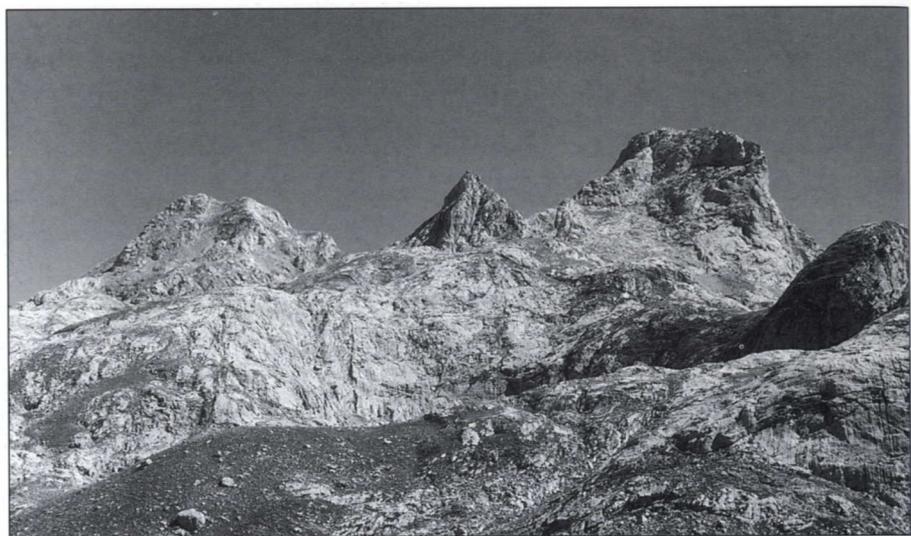
1984 After a long break Poles reappear in the Picos. Their penetration into Sima de

la Torre de los Traviesos o de los Organos, started in 1980, ends at the level attained by the French (-416 m). During the same expedition began the exploration of the virtually unknown southeastern part of the area, resulting in more than 40 new caves (including A-30), mostly shallow ones. Only A-11 (Pozu del Porru la Capilla) offers some prospects. Its exploration ended with an accident at the depth of ca. 120 m. During a violent rise in water flow Piotr Kołodziej died. After the rescue operation, the members of the expedition decided to postpone exploration and come back to Poland. The cave was explored to about -180 m. In the same year members of Speleo Club de la Universidad Politecnica de Valencia (SCP) discovered Sima Parodia (SCP) and attained in it the depth of ca. -38 m. Cavers from OUCC made a connection of Pozu los Perdices (F7) with Pozu Jorcada Blanca (F2), resulting in the Sistema Jorcada Blanca (F2/F7).

1985 The drama of the former expedition dissuaded members of SG from the next expedition to the Picos. Meanwhile, members of SCP made the connection between Sima Parodia (SCP 111) and Sima de Cembavieja (Cem.), which results in a system of a total depth



The entrance to G-8 cave



The peaks surrounding Jou de la Canal Parda

photo by R. Pasiok

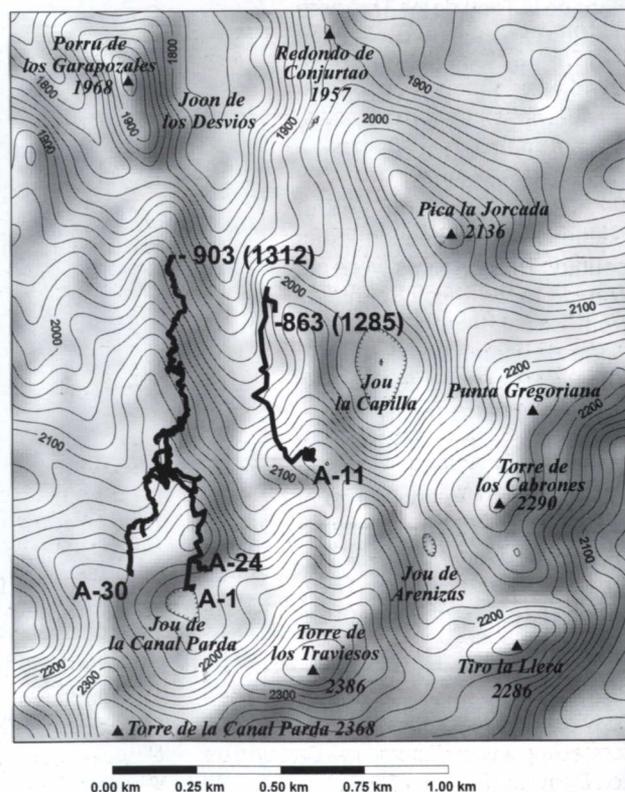
of 810 m. They also attain -157 m in SCP 134. Cavers from OUCC attain -452 in Sima Conjuarto (1/6). They also explore Pozu del Redondo (F-20) down to -382 m and 2/6 to -80 m.

1986 Continues the exploration of Pozu del Porru la Capilla (A-11), undertaken by Sekcja Tatarnictwa Jaskiniowego Częstochowa (STJC). At the depth of -400 it becomes clear that this may be another deep cave in this part of the Picos. Another Polish expedition, from Katowicki Klub Speleologiczny (KKS), acting together with the members of SCP attains, among others, the depth of -240 m in SCP 134. In the British zone, cavers from OUCC connect 2/6 with Sistema Conjuarto, resulting in Sistema Conjuarto, where they attain -655. In Pozu del Redondo (E20) they attain -582 m.

1987 Several years of exploration in Pozu del Porru La Capilla (A-11) finally brings about the long expected results. This time the success belongs to an SG expedition. They reach the final sump at -863 m.

1988 The next expedition by SG is a systematic search for new, high entrances. About one hundred new entrances were located, even in the apparently well searched zone G (among others G-13). At the same time exploration in Red de los Barrastrosas was undertaken, showing possible leads.

1989 The rosy exploration prospects drew two expeditions from Poland: an SG expedition aiming at further exploration in zone A and an expedition of Sekcja Grotolazów Klubu Wysokogórskiego Wrocław (SG KWW), intending to work in zone G. The small SG expedition explores A-30 to the depth of -245 m. At the same time the big expedition of SG KWW searches zone G. They mark ten new caves of small depth, visit most known caves in the zone and confirm the open possibility of advance in Red de los Barrastrosas. The main achievement was the exploration of G-13 down to -429 m. The farther activity was arrested by the accident of Wiesław Śmigielski.



Schematic map of explored caves

photo by R. Pasiok

After a fall of fourteen metres in G-13 he had a broken rib and injured spine. A five days rescue operation terminates the work of the expedition.

1991 The regular exploration activity of SG members is continued by expeditions of Speleoclub Wrocław (SCW). A reconnaissance expedition concentrates in A-30 and it results in the extension of this cave from -245 to -552 m.

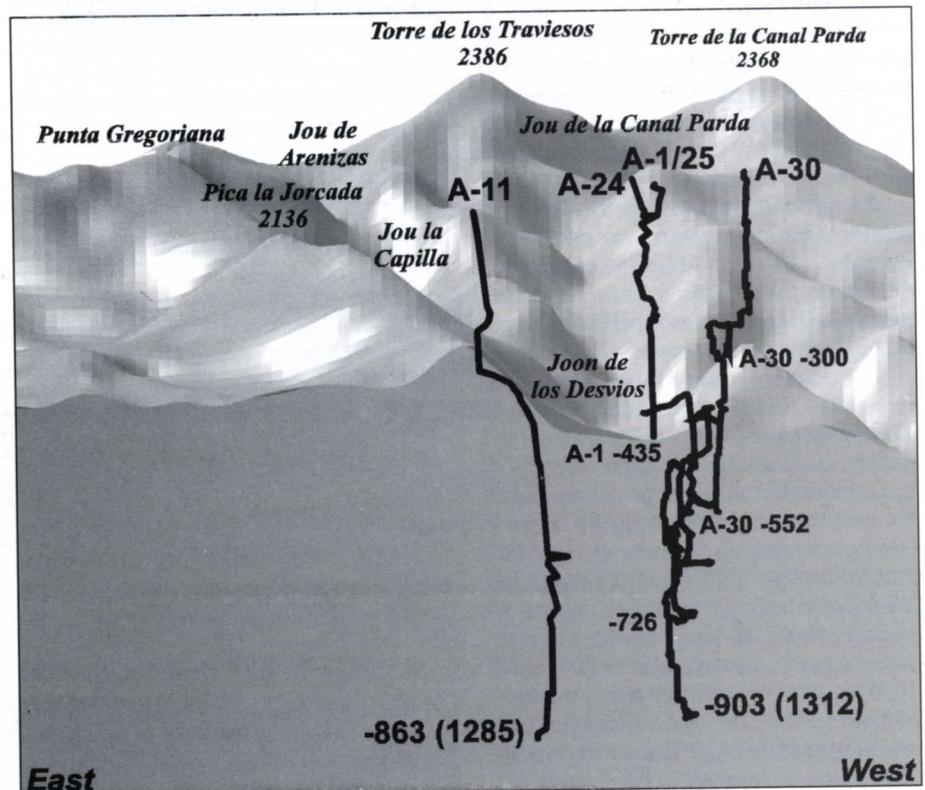
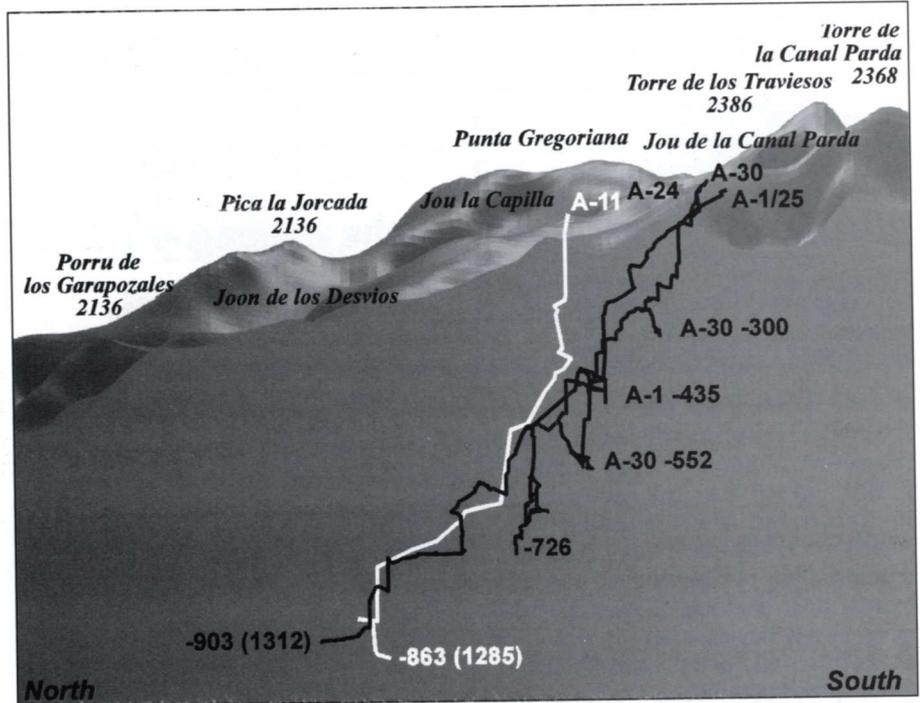
1993 The next SCW expedition continues exploration of A-30, which after the 1991 expedition was named Pozu del Picu de los Asturianos. A surface search resulted in marking several new entrances.

1994 The main goal of the SCW expedition was exploration of Pozu del Picu de los Asturianos (A-30), where they achieved -726 m. Surface prospection was continued in Jou Arenizas (C) and Canalon de Los Desvios. The former did not bring a single cave deeper than 50 m, while in the latter F-17 proved to be the entrance to a cave 477 m deep. After a subsequent connection with a higher entrance (F-18) Sistema del Canalon de Los Desvios (F-17/F-18) became 501 m deep. Also found was the entrance to F-15.

1995 Exploration of Pozu del Picu de los Asturianos (A-30) was continued parallel with the exploration of Sima de los Traviesos o de los Organos (A-1), resulting in their communication and establishing a new interesting cave system - Sistema del Jou de la Canal Parda (A-1/A-30). As usual Jou de Arenizas (C) was searched and as usual several new shallow caves were found (for instance C-7, about -70 m). Activity in Canalon de Los Desvios was also continued. Exploration in F-15 resulted in its connection with the known parts of Sistema del Canalon de Los Desvios (F-18/F-17), largely extending the system.

1996 Sistema del Jou de la Canal Parda (A-1/A-30) was deepened down to -903 m. Prospection was done for higher entrances to this system and to Pozu del Porru la Capilla (A-11). Sima de los Desvios (F-3) was searched with a view of connecting it with Sistema del Canalon de Los Desvios (F-15/F-17/F-18).

The activity of the Polish groups in the



Sections of explored caves

western massif (El Cornion) of the Picos de Europa since 1978, though irregular, brought about some results, especially in zone A. There were in all fifteen Polish expeditions organized by the following clubs: Speleoklub Warszawa (1978), Speleoklub Gliwice (1979, 80, 84, 87, 88, 89), Sekcja Tatarnictwa Jaskiniowego Częstochowa (1986), Katowicki Klub Speleologiczny (1986), Sekcja Grotołazów Klubu Wysokogórskiego Wrocław (1989) and Speleoclub Wrocław (1991, 93, 94, 95, 96).

The history of exploration, presented above, was reconstructed on the basis of so rich a material that it can not be listed here. Many facts in this material were contradictory.

Special thanks go to our friends Armando Alonso Bernardo Fernandez and Juan Jose Gonzalez Suarez from Federacion Asturiana de Espeleología and all those Spaniards thanks to whom the expeditions to the Picos will remain our best memories.



Complesso del Foran del Muss

- the expeditions of KS Aven in 1995 - 1997

Waldemar Kasprzyk, Marek Koziol, Waldemar Mucha

Klub Speleologiczny „Aven” Sosnowiec

We were encouraged to explore the Mount Canin massif in the Julian Alps by the article „Foran del Muss - utopia o futuro”, which was published by our Italian friend Mario Kraus of Club Alpinistico Triestino. It was in that article that its author put forward the suggestion that, at least, some of the already known deep caves, situated on the Foran del Muss plateau, were linked together forming the hypothetical Complesso del Foran del Muss.

For the first time we set off to explore the massif in March 1995. It was a daring enterprise as in the winter time the above area is actually not visited by Italian cavers.

As a result of the arrangements made with the Triest cavers, who had been systematically exploring the area in question for many years, we decided to carry out a search in Abisso Morning cave. Our main target was a series recently discovered by M. Kraus and G. Benedetti at the depth of 400 meters.

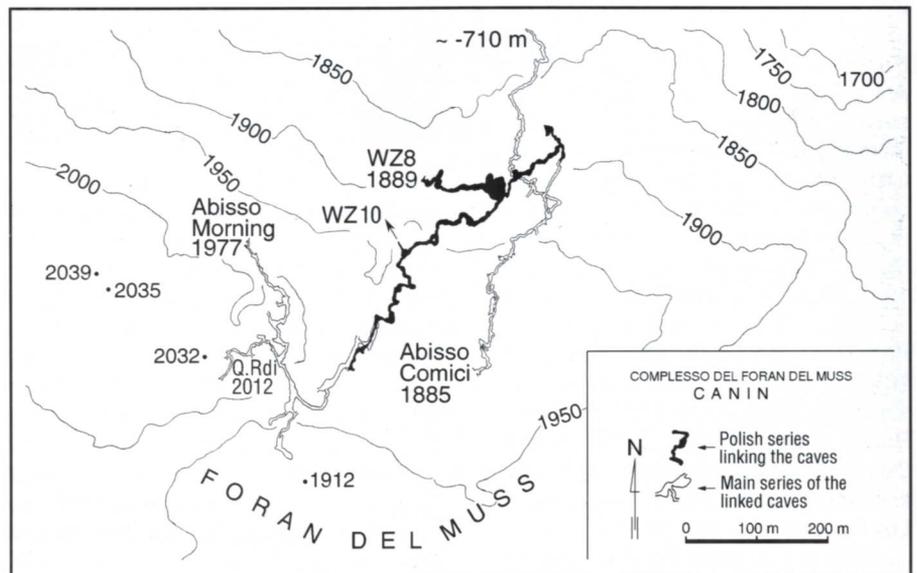
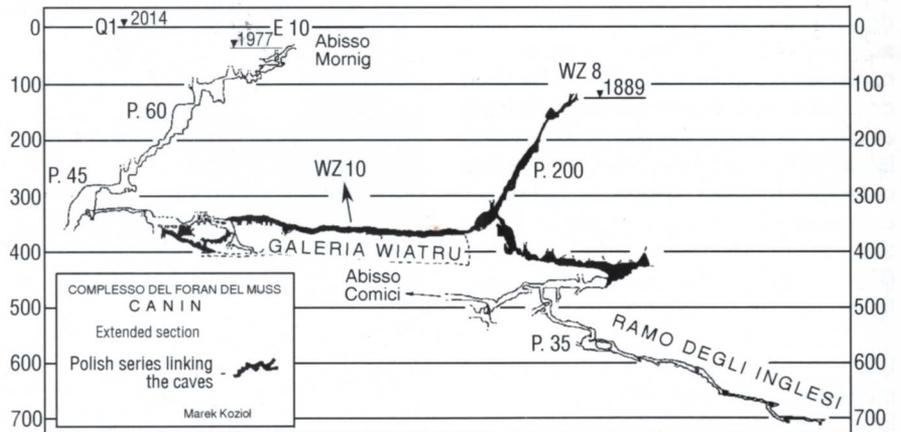
The main attainment of the first expedition, led by Waldemar Kasprzyk, was the discovery of the entrance to a new gallery, constituting the upper level of a huge meander of the length of about 0.5 km and the height reaching 50 meters. Having covered the distance of about 300 meters in the upper level of the Wind Meander, whose lower level is too narrow to go through, we unexpectedly reached the already known point in the cave WZ 10. The above point had been previously explored by the Italians who had descended there from the entrance of WZ 10. Having traversed the distance of 100 meters along the spectacular and draughty gallery, we decided to stop the climbing due to the expiry of time of our expedition. However, we managed to discover 200 m of passages situated off the place we had chosen for bivouac. Nevertheless, the fragment of the southward passage has not been explored so far.

Encouraged by such promising results, we came back to Foran del Muss four times again: in the summer of 1995, in the winter, and in the summer of 1996, as well as in February of 1997. Each of the expeditions was organized by KS AVEN of Sosnowiec. The first two expeditions

were led again by Waldemar Kasprzyk whereas the next two by Marek Koziol.

We carried on exploring the route we had chosen at the beginning. Having covered the subsequent 100 m of traverse in the Wind Meander, we reached the boulder-chock, the crossing of which opened up some new perspectives for the exploration. A twig of mountain pine found behind the boulder-chock, at the bottom of huge Richard's Chamber, made us climb a 200 m high vertical chimney. It led to the surface throughout the snow plug situated at the entrance of WZ 8 cave. As we discovered later in winter the entrance was completely obstructed.

In the upper part of the chamber a narrow entrance to a 66 m deep pit was subsequently discovered. On descending it we reached the bottom of the Wind Meander, which was behind the boulder chock. Proceeding throughout an active water passage with a few rapids, we came across a small mound which was raised by the Italian cavers who had reached this place by the climbing one of the passages of Abisso Emile Comici cave. Finding the mound proved that the two big caves: Mornig and Comici were linked. The evidence supported Mauro Kraus hypothesis that Complesso del Foran del Muss does exist.



The Julian Alps

- SLOVENIA

Lubomir Zawierucha

Speleoklub Bielsko-Biala

After a thorough examination of the water passage which linked Mornig cave with Comici cave, we concluded that the logical target of the further exploration was the Ramo degli Inglesi series. The series is located in the point where a considerable amount of water flows from Abisso Mornig cave into Abiusso Emilo Comici cave. The above series had been visited only once, long time ago, by the Italian-British team. However, due to threat of water rise, they did not manage to complete the exploration. Unfortunately, neither did we. Therefore, we still do not know what happens to the water flowing into the Ramo degli Inglesi.

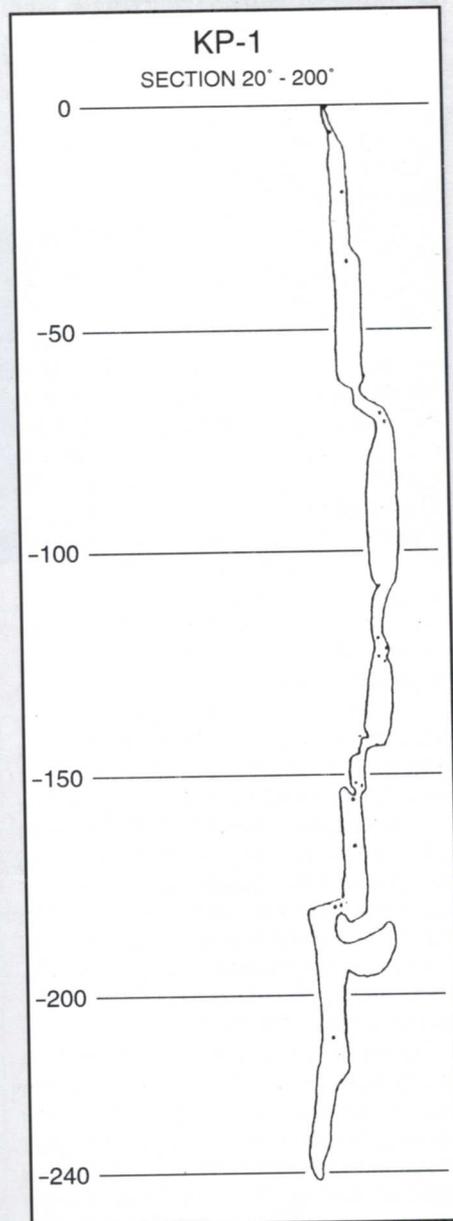
The most recent of our explorations took place in February 1997, that is in the spell of worm weather and snow melting. The water rise prevented us from reaching the end of the series we intended to explore. In spite of this, we were able to take measurements of 470 m passages in the Ramo degli Inglesi. We hope to be more succesful during our next expedition.

In the course of the expeditions we have hitherto taken we found the linkage between Abisso Emile Comici and Abiso Mornig caves which form Complesso del Foran del Muss cave system. On the whole, we discovered and measured 1462 m of new passages in the above system. Nowadays there are 15 entrances to the system, which in this respect places it in the first position in Italy.

Speleoklub Bielsko-Biala made two summer exploratory expeditions to the Julian Alps in Slovenia in 1993 and 1994. We worked in the area of Kriški Podi in the Triglav National Park. The expeditions were made possible by the assistance of Professor Jurij Kunaver from the university in Ljubljana, to whom we herewith express our sincere thanks.

Our activity was focused on the area between the peak Razor (2601 m) and Kriški Podi and its surrounding. The area is delimited on the east by the valley of Vrata, on the south by the valley of Zadnjica, on the west by the Vršič pass, and on the north by the Krnica valley.

Kriški Podi are built of massive Dachstein Limestone, up to 2000 m thick. The strata dip generally southeast. The whole massif is bound by two deep faults, one running along the line Krajnska Gora - Vršič pass -



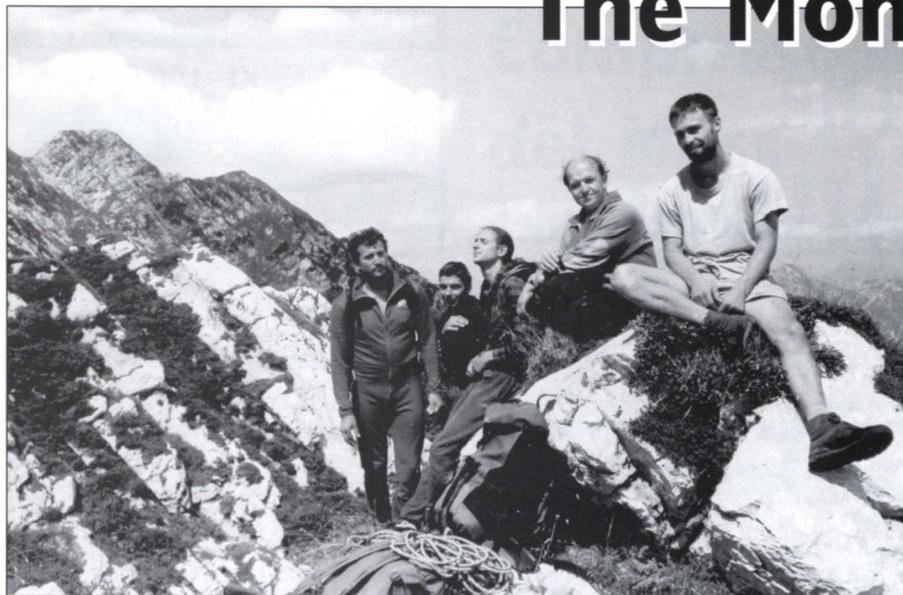
Zadnja Trenta bounds the exploration area on the west and the other one - Luknja - Zadnjica - bounds it on the east. A distinct submeridionally running fault is discernible within the area of exploration along the valley east of Razor. There is also a network of fractures perpendicular to the Luknja fault. They control the numerous depressions in the relief (rifts, clefts, hanging valleys, deeply incised passes).

The area of exploration is situated above 1900 m and it lies above the timberline. Annual precipitation exceeds 2000 mm. The whole area has typical forms of alpine karst. Vast areas are covered with lapies. Its main concentration occurs within the glacial cirque Zgornje and Srednje Kriško Jezero, Stenarjeva Planja, eastern part of the valley and below Razor, and

photo by M. Gradziński



The Monti Musi '95



A Polish team in the Monti Musi

Jerzy Pukowski

Speleoklub Bielsko-Biala

The contacts of Klub Tatarnictwa Jaskiniowego in Bielsko-Biala with Italian caving clubs date from the mid eighties when we were in Spluga della Preta, a nearly 900 m deep cave in the Venetian Alps. It should be added that we were accompanied by our colleagues from Czech caving clubs. It was due to the contacts of ORCUS club in Bohumin that we could organize another expedition to Italy.

On 9 to 19 August 1995 our team of six worked in the Monti Musi (the Julian Alps) massif situated southwest of Tarvisio in Italy, near Udine. Lubomir Zawierucha was the leader and Jerzy Ganszer, Błażej Nikiel, Michał Smoter, Paweł Wiczorek (now a member of our club) and Jerzy Pukowski, the author of this text were the members of the team. We were invited by colleagues from Gruppo Speleologico „San Giusto” of Trieste. Having visited this town we spent several hours on a naturist beach, we went to the mountains.

The Monti Musi, culminating at the altitude of 1878 m extends in the east-west direction for almost 12 km above the Resia river valley. About 15 km to the northeast rises the Monti Canin. Only ten kilometres to the north runs the motorway from Tarvisio to Udine. The difference in altitude in the massif attains 1300 m. Cave entrances occur up to 1800 m, while known resurgences lie at the altitude of about 600 m.

The working area of our expedition lies at 1500-1600 m. In immediate vicinity of our base camp was the entrance to the then deepest cave in the massif - Abisso Roberto Pahor, 485 m deep.

On the first day three of us visited with a group of Italians a 250 m deep cave X-6. The others were busy with prospection for new entrances. As a result we found 34 new caves, the biggest one was 61 m deep and 152 m long.

Though not terminated with a major success, this expedition introduced us to a new, little known in Poland, area of potential exploration. Though not bound to bring out sensational discoveries, the mountains are interesting and any caver may have here his or her „great days”, exploring a cave that in world scale would not count, but if it were in the Tatra...

along the route Dovška Vrata - Pogačnikov Dom. Commonly occur so called „kotlici” (kettles) with vertical walls and flat wide bottoms. Their depths attain ten to twenty metres, and are similar to their diameters. Their bottoms are usually covered with snow and ice. The greatest concentration of kotlici, often interconnected, is found on Kriški Podi and on the large roche mutonee which closes the valley below the Razor. Numerous are modified by dissolution grooves, often more than one hundred metres long and up to several tens of metres deep. The grooves occur mainly west of Zgornje Kriško Jezero and below the valley under the Razor and they are closely linked to the young tectonic fractures. Several open tectonic fractures, 2-3 m wide have been explored in the bottom of the valley below the Razor. They attained 30 m in depth and the degree of their solution widening is minimal.

Numerous karst depressions were found near the Razor-9 cave (the highest entrance at 2350 m). The depressions are filled with terra rossa and calcite crystals up to 20 cm long. Decaying remnants of old calcitic crusts were found in the entrance series of Razor-9. They were the only speleothems found in the caves we discovered.

There are no surface streams in the exploration area. Traces of short streams were found above Zgornje Kriško Jezero and over Srednje Kriško Jezero. Rainfall water is rapidly disappearing in ponors. Old, now blocked ponors were found in the wall above Srednje Kriško Jezero. They drained the cirque of the Zgornje Kriško

Jezero towards the south, that is to the Spodnje Kriško Jezero lying more than 100 metres lower.

No permanent waterflows were found in the discovered caves. Clays laid down by waters flowing from the deepened cirque of the Srednje Kriško Jezero were found in the deepest cave (- 240 m) KP-1 and in short lateral series at the depths of 110 m and 150 m.

The Kriški Podi area is most probably drained by a deep vertical flow to the Krajcarica resurgence which lies 2-4 km southwest of the exploration area, at the altitude of 700 m. The northern part of the valley below the Razor falls to the north with a wall several hundred metres high and the drainage in this direction is very likely. A primary drainage of the razor to the west, to the valley and resurgence of Mlinarica, cannot be ruled out. This may be indicated by the entrance series of the Razor-9 cave.

Most searched caves, regardless of the elevation of the entrance, have ice plugs, some of them checked by us to be at least 70 m deep. Among the explored caves only two may be considered deep ones (KP 1 -240 m, KP 7 -193 m). Both terminate in wide pitches with floors covered with thick layers of rocks with draught. Several caves are up to 100 m deep (R-1A, B, KP-2, DP-3). Most caves are single pitches or fractures less than 40 m deep. They usually terminate in ice plugs. It seems that the main exploration problem in this area is the strong deformation of the surface and the old ways of karstic circulation by young tectonic movements, which conceal the access to the deeper parts of the caves.

Wild and Unexplored

- Albania 1996

Marcin Koziel

Speleoklub Dąbrowa Górnicza

In August 1996 a caving trip to the Albanian Alps was organised by the Speleoklub Dąbrowa Górnicza. It aimed at surveying the new karst regions for further exploration. Our destination were the Albanian Alps in the northern part of Albania. The members of the expedition were: Przemysław Włosek, Kajetan Sławiński, Marcin Koziel (from Speleoklub Dąbrowa Górnicza) and Marian Zagórny (from Katowicki Klub Speleologiczny) under the leadership of Grzegorz Badurski.

Taking into account the uncertain situation in the former Yugoslavia we chose the longer, but probably safer route through Slovakia, Hungary, Romania, Bulgaria and Macedonia. We visited a lot of interesting places and learnt much about the queer and often incomprehensible customs and traditions of the Balkan countries. The border checkpoints alone provided us with a lot of 'fun' such as disinfection, for instance, that we greatly reduced the finances of our expedition. We would, however, like to advise anybody heading to the south of the peninsula that they should choose the route through the former Yugoslavia despite the fact that you need visas that must be paid for. It is probably less expensive and certainly shorter. (Anyone wishing to stay in Albania needs a visitor's visa that can be obtained free from the Albanian Embassy in Warsaw.) After a week long journey we reached Ohrid Lake on the border of Macedonia and Albania.

After a pleasant swim in the Macedonian resorts we were transferred into a different world on entering Albania (or Shqipëria as it is called). The nice holiday camps we used to see in Macedonia were replaced by concrete bunkers, which we saw all over Albania from that time on. The speed of our journey dwindled down due to the horrible condition of what the Albanians called 'motorways'. These were full of holes and humps that made us stop the car several times. Passing by the filthy towns and villages as well as deserted factories on the both side of the mountain road we headed towards Shkoder to the north of Tirana. Trying to escape from the clusters of people we met on our way we changed direction of our route to look for some lonely place by the sea where we could rest. Unfortunately, it turned out to be impossible as wherever we stopped the

car the 'visitors' appeared out of nowhere. The night at the sea was a trial to our nerves. We were falling asleep accompanied by the gun shots and we were woken up by the 'fishermen' fishing by means of grenades. Taught by this experience we covered the journey to Shkoder in one stage, being interrupted only by the frequent police patrols. (By the way the job of a policeman seemed to be the most popular one there.)

Passing by the ruins of the medieval fortress on the hill we entered a comparatively big city of Shkoder. The inhabitants put us in contact with the families of the local cavers. However, the Italian expedition operating there had already involved all the speleologists from Shkoder. We were left with two young people who were familiar with the area in question. We asked them for guidance as we did not have any detailed maps. We reached the town of Koplík and there we found a mountain road leading our destination. Our well-worn Volkswagen was climbing up the road arduously being frequently overtaken by the lorries which served as buses there. Eventually we reached the village of Theth at night despite the problems we had had with the brakes and we pitched our camp there. The owners of the nearby 'hotel' ensured our safety smiling and presenting their guns. In the morning we could catch a sight of the wild and much desired landscape of the frontier mountain range.

The surrounding mountain peaks are over 2.000 m high and the highest of all, Jezerca, is 2692 m. From the bottom of the valley where we pitched our camp we could see the characteristic peak of Harap. There, at the foot of the mountain is the entrance of the famous cave in Harap. It is a quite small horizontal cave ending with a siphon. The Bulgarian cavers are said to have digged through it several times during their trips to the Albanian Alps. The cave is of interest to the Italian tourists and speleologists too.

Our camp was frequently visited by groups of inhabitants of the surrounding villages. After a few days we could not bear the company of the Albanians any longer. The camp gradually changed into a kind of market place full of the Albanian children trying to exchange anything they could for a spoon bait. We used to buy our food paying in the local currency (1 lek = 100 qindarka) or in dollars (1\$ = 100 lek). Thanks to the neverending company of our Albanian guests we began leave our camp more and more willingly to look for peace and quiet. Due to the fact that our equipment started to disappear suddenly two people had to stay in the camp guarding it. It goes without saying that it was harmful to the effectiveness of our expedition. We chose the massif of Maja

Kakis as an object of exploration for our team reduced to 3 people. As it took us almost an entire day to reach that area from our camp we explored the massif putting up temporary camps in the mountains. The effect of surface exploration was finding a lot of entrances which, however, turned out to be of no importance as we examined them closer. Since we were running out of time, we limited ourselves to mark the entrances we had explored. Climbing the unmarked mountain routes we came across the marvellous canyons and waterfalls. We also got to know a group of Czech speleologists, and celebrated that unusual meeting with a camp-fire.

After nearly two weeks of caving activity in the mountains we left Albania going through all the checkpoints again. In Tirana a moment of inattention cost us the loss of our belongings (including a camera and photos that we had taken) which we had left in the car. We could not obtain any help from the police station or from the Polish Embassy situated 50 meters away from the police station (there was not even anybody to translate our testimony). Anyone going to Albania should be very careful with money and belongings as the responsibility for possible theft is fully on a visitor's side. The further attraction on leaving Albania is the vehicle tax (5\$ per day) you are not informed about at the checkpoints or an embassy before you enter the country.

Summing up, the up-to-day isolation of Albania from the rest of the world, as well as the presence of the caves there makes that country attractive as far as exploration is concerned. Wild and beautiful mountain landscape is worth more detailed exploration involving a bigger number of cavers. Visiting and exploring of the Albanian caves is charged according to daily rates and permission can be obtained from the Department of Sports and Tourism in Tirana.

Among the most interesting caves are:
Shpella BB-30; -570 m deep
Shpella e Cilikokave; -505 m deep
Shpella e Njerzit e Lageshtires; -503 m deep, 2000 m long
Shpella e Pucit; -335 m deep, 5000 m long

Due to the changing situation in Albania, the rules concerning travelling through the country may change. For tourists climbing the unexplored and unmarked mountain routes the Albanian Alps can be an adventure of thye life time. The culture of the Balkan countries is also worth examining.

PS Please look up the Speleoklub Dąbrowa Górnicza internet page:
<http://www.iss.katowice.pl/speleo.htm>

Why Turkey?

Expeditions to the Toros Dağları

Krzysztof Adamek

Speleoklub Częstochowa

Exotic, oriental country, the existence of great virgin karstified mountains, and our aspirations to explore new regions - these were the main reasons of our involvement in Turkey. In the 1980s and 1990s the members of Speleoklub Częstochowa organized several trips to this country, all to the Toros Dağları, a huge mountain region some 1500 km long, bordering the Anatolian and Armenian highlands from the south.

Initially we acted in the Dedegol Dağları range in the eastern part of the Toros; the range was known for its Pinargozu cave, then one of the greatest caves in Turkey. Successively, in the years 1988-90, a large part of this area has been explored. Short reconnaissance trips in the Palaiz Geyik near Akseki, the Manavgat Valley and the Koprulu canyon should also be mentioned. Unfortunately, despite the significant resources invested, no major successes were achieved. Of the many entrances and shafts discovered, none has led to a remarkable depth. Plugs of snow and ice, melting only late in the summer (and not every year) were a common obstacle. Perhaps we were too fixedly attached to the Dedegol range, too firmly believing in our success there? Leaving the familiar spots we were also leaving friends whom we managed to make there.

We came back to the Toros in 1995. Basing on the news from other expeditions, British and French ones, their achievements and failures, and on the information on other areas of exploration, we decided to direct our efforts to the nearly virgin Bolkar range in the central part of the Toros Dağları. This range, similarly as Dedegol, is about 80 km long and 25 km wide. A difficult problem, as usual, was to



get detailed maps of the area. Fortunately, we obtained a fairly detailed topographic map of this area and, more importantly, a geomorphological map of the area from the Warsaw University. We were especially interested in the cirques on the northern side of the ridge and an enormous polje on the southern side, near the Yildiz peak (3134 m).

We decided to begin the exploration on the northern side, in the vicinity of the highest peak in this part of the Toros - the Megedsiz, about 3600 m in altitude. We quickly managed to set a camp in the interesting area, quite high, at about 2350 m. It was situated near one of the cirques above the end of an enormous V-shaped valley.

The abundance of entrances and shafts was a pleasant surprise. The leads found during the first outings provided us with work for the following days. In the close vicinity of the camp we found ten promising entrances. In PL 10/95, after passing several tens of metres our team found themselves on the bottom of a vast chimney. Its height was difficult to estimate, as even combined lights of several headlamps did not get to the ceiling. All at sudden we realised that our team of seven will not be able to realize as extensive an exploration as we had planned. We decided to concentrate our efforts in PL-3 and PL-5, postponing further surface penetration, which has proven wrong later on.

Both caves were down-going ones, and we were gaining depth fast in pitches of 15 to 45 metres. In PL-3 it took us a long time to clean the entrance section from hanging boulders and scree. But with increasing depth it was looking better and better. Especially impressive was a meander with snow-white calcitic walls, which we encountered at the depth of about 160 metres. Eventually we attained 190 m in PL-3 and 90 m in PL-5. Stones tossed into the next pitches were the last stage of our exploration there. Actually we even did not investigate the locations which

looked promising after our study of the geomorphological map. The formal problems, legendary with all cavers coming to Turkey, hit us too. To our astonishment, this time it was not the matter of permits for the prospection and exploration, but the alleged terrorist activity of PKK (Kurdistan Worker's Party) in the area, and the concern of the authorities about us and our safety.

Of course we did not feel in danger, but the events of the following months have shown that similar incidents are becoming, unfortunately, more and more common. Anyway, we were very kindly but firmly asked to leave the area and move to more civilized parts of this beautiful country. Even with strong feeling of unfulfillment, I think that the expedition proved to be a useful reconnaissance.

To sum up, the scarce literature, the few maps and our own experience indicate that the mountains of Turkey are a fascinating, though difficult area to explore for caves. Any activity there requires numerous permits. These may be obtained through the embassy after submitting many documents and forms, but it needs waiting for a year and one has no warranty of a positive outcome. The problem with cavers is that for an average bureaucrat the exploration of cave links with archaeology or simply search for treasures or other precious remains left by the many ancient cultures. This is what they are extremely sensitive about. There are practically no caving clubs in Turkey, and cooperation with universities and other institutions (such was our experience) rarely succeeds because their areas of interest do not match the ours. To this one must add the problems with private ownership of land and the most recent problem with terrorism. A special attention must be paid to safety, as there are no trained mountain rescue services in Turkey.

All these difficulties can not obscure the beauty of these areas and the exciting conscience that each valley may hide a virgin and possibly deepest cave. Against all difficulties we are thus thinking of the fall expedition BOLKAR 97.



photo by W. W. Wiśniewski

Vietnam

Krzysztof Cygan
Speleoklub „Boby” Żagań

Vietnam is a beautiful country plagued with wars and occupations by various nations. A closed country of unexplored spots. The Vietnamese karst may be divided into the northern, central and southern ones.

The idea of the expedition came by chance. The long planned expedition to Peru terminated in failure before it began. Civil war and fighting with the drug cartel have discouraged us finally. It was in this situation when Bernard Koisar proposed, partly joking, Vietnam, namely because he was not there yet. For me this meant the fulfilment of my dreams. In a few weeks we found out that activity of cavers in that country is practically nil, and this strengthened our determination to organize the expedition.

A group of seven left to Saigon by plain in January 1989. For seven days we were looking for contacts in the south of the country. The lack of anybody who could direct us to caves turned our attention to the north. In Hanoi, we contacted the Institute of Geology, where we finally found assistance that permitted us to begin exploration in Vietnam. The Vietnamese have indicated us the area about which they had various expectancies, both economic and military.

Kim Bai - a karst area situated west of Hanoi. The locals call it Dry Ha Long, because this area resembles so much the Ha Long Bay. The reason is mogotes, which extend over the area of many kilometres. The mountains and conical hills rise up to several hundred metres



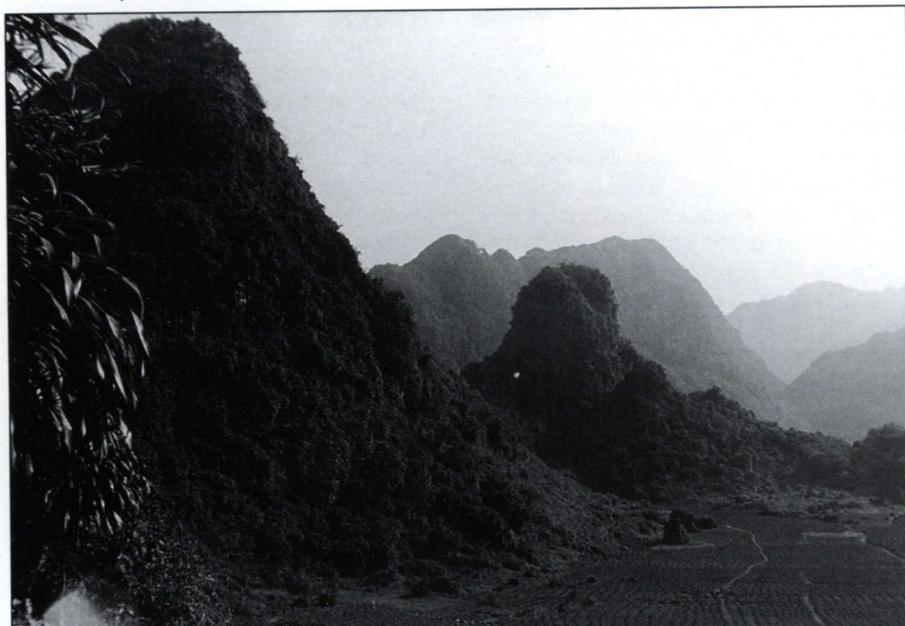
The team with Vietnamese friends

high and are surrounded by poljes in which the Vietnamese are growing rice.

We started exploring with a great verve. Equipped with ropes and dinghies we penetrated the area, in many places covered with jungle, for fourteen days. The caves we found were mostly horizontal and several hundred metres long, often with water, sometimes with streams. In one of the discovered caves the water was about 40 m deep. Our activity resulted in seven surveyed caves. The survey, passed to the Vietnamese partners, saved five years of their scheduled work. Before coming back home we sketched a plan of a future joint work. We were interested in the karst area situated northwest of Hanoi, at the altitude of some 2500 m, while our partners indicated the island Cat Ba in the Ha Long Bay as the main goal.

Unfortunately, the difficult situation in Poland during the following years ruled our expeditions. In 1992, while being in Vietnam for business, I found some time to continue the talks with the Institute of Geology. I succeeded to talk Dr Pham Khang into a reconnaissance to the Ha Long Bay. The stay of several days in the country of a thousand isles gave me an idea of the exploration perspectives in the area. It is a coastal area, islands corroded by wind, rain and sea. The caves are mostly short, transfluent ones with modest speleothems. The caves offer possibilities of archaeological discoveries and they can be adapted for tourists. It should be added that for the Vietnamese any exploration of caves is justified only if its result may be used for economic purposes.

After having come back I decided to organize another expedition. In 1995, during an expedition to Austrian caves, a group of younger colleagues convinced me to speed up on these plans. Despite many difficulties on the Vietnamese side, we managed to materialize the expedition. In March 1996 eight of us headed for Hanoi: Krzysztof Cygan, Daniel Oleksy, Robert Świątek, Marcin Furtak, Stanisław Pisarek, Marek Siarko, Adam Małachowski and Jerzy Zygmunt. We came by invitation of the Institute of Geology. Alas, the change in the political and economic status of our country changed the attitude of the Vietnamese to our activity. Oriented at profit, they no more mind the work we are doing for their Institute. This situation forced us to look for other contacts. We learnt from conversations with our colleague Dr Pham Khang that he is no more with the Institute, but as an employee of the Ministry and Department of Environment Protection, he



Tower karst in Vietnam

photo by A. Zyworonek

photo by A. Zyworonek

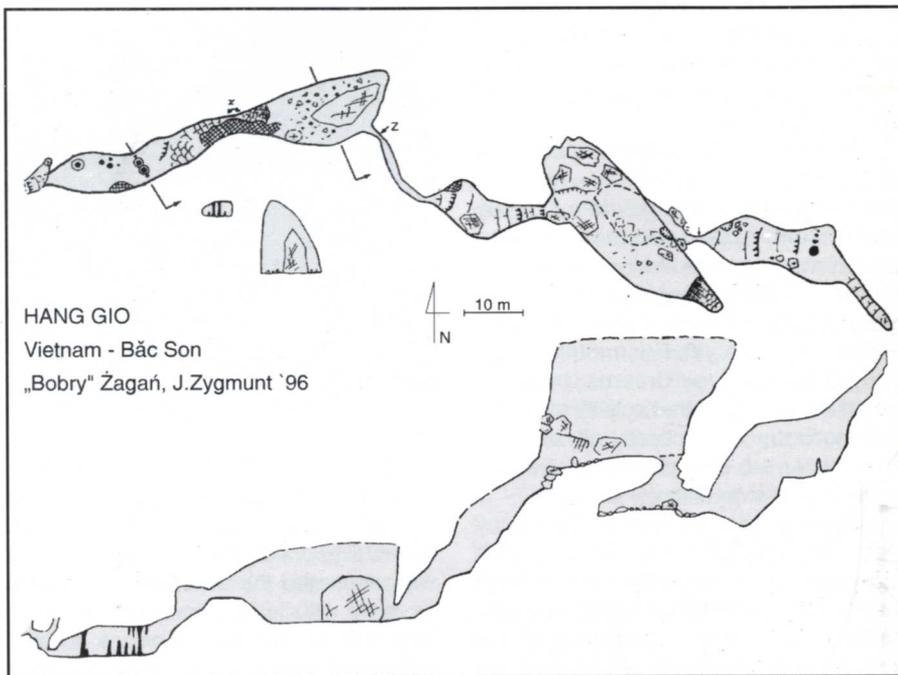
has founded a society of cave amateurs. As a honorary member of our club he helped us a lot during our stay there. The area of our activity was the vicinity of Bac Son village near Lang Son, north of Hanoi, in the border zone (8 km from the frontier with China). This area is situated at altitude of about 1000 m and it is very scenic. It is covered with a dense jungle. The caves in this area are mostly horizontal, transfluent ones.

The second area of our activity was Cao Bang, about 100 km north of Lang Son. Australians and Italians have already worked in the area before us. The explored a cave 260 m deep.

Unfortunately, because of a misunderstanding with our guides and the lack of permit from local authorities, we came back to Hanoi. From here we went to the area of the Ha Long Bay. A one-week stay on the Cat Ba island was a battle with the jungle in the area abounding in mogotes and poljes. The caves are mostly transfluent ones, up to several hundred metres long. The Vietnamese are very interested in their adaptation for commercial visits, not ever taking much concern about the surrounding nature. We made survey of six caves with several kilometres of galleries.

As a result of our talks with Dr Pham Khang we came to an agreement about the organization of an expedition into the area which interests us the most and which is situated at an altitude of about 2400 m. This area is virtually unexplored and the Vietnamese talk about it with

respect. Deep shafts are said to be there. We are planning to go for an expedition to this area in 1998. Because of difficult transport this expedition will have to take a bit longer - 2-3 months. There are prospects of exploring new areas, possibly with very deep caves.



Climbing in Darkness

Marcin Francuz
Speleoklub Warszawski

In Memoriam to Krzysztof Guzek

In December 1968 a group led by Bernard Uchmański climbed out of Wielka Śnieżna cave (-585 m), then the deepest in Poland. In those days climbing inside caves served rather exploration purposes. This event commenced a new kind of cave sport: the cave climbing.

20 years later a new Polish speleo generation started to think about this kind of sport. The most active of young Polish cave climbers included: Krzysztof Guzek (), Stefan Stefański, Tomasz K. Pryjma, Rafał Kardaś, Krzysztof Rociński, Marcin Francuz. That group gained climbing experience inside caves in such Polish caves as: Czarna (-110 m), Marmurowa (-150 m), Pod Wantą (-165 m), Miętusia (-263 m).

In January 1992 when our experience in cave climbing was sufficient we decided to climb out of the second deepest Polish cave Śnieżna Studnia (-680 m). The team consisted of Krzysztof Guzek, Stefan Stefański, Tomasz K. Pryjma and Marcin Francuz. We decided to rappel down to the bottom of the cave and then started climbing out without pre-inspection while

descending. Śnieżna Studnia cave consists of four big shafts (the deepest „Wazeliniarzy shaft” is 200 m deep) and many short pitches. The climbing lasted 216 hours. The most difficult part was encountered in the „Wazeliniarzy shaft” (A2 artificial climbing and V+ free climbing). 36 bolts were used. In the entrance shaft, the ice was 70 degrees steep and the team had to use ice climbing equipment. This achievement in Śnieżna Studnia cave became a new Polish record in cave climbing.

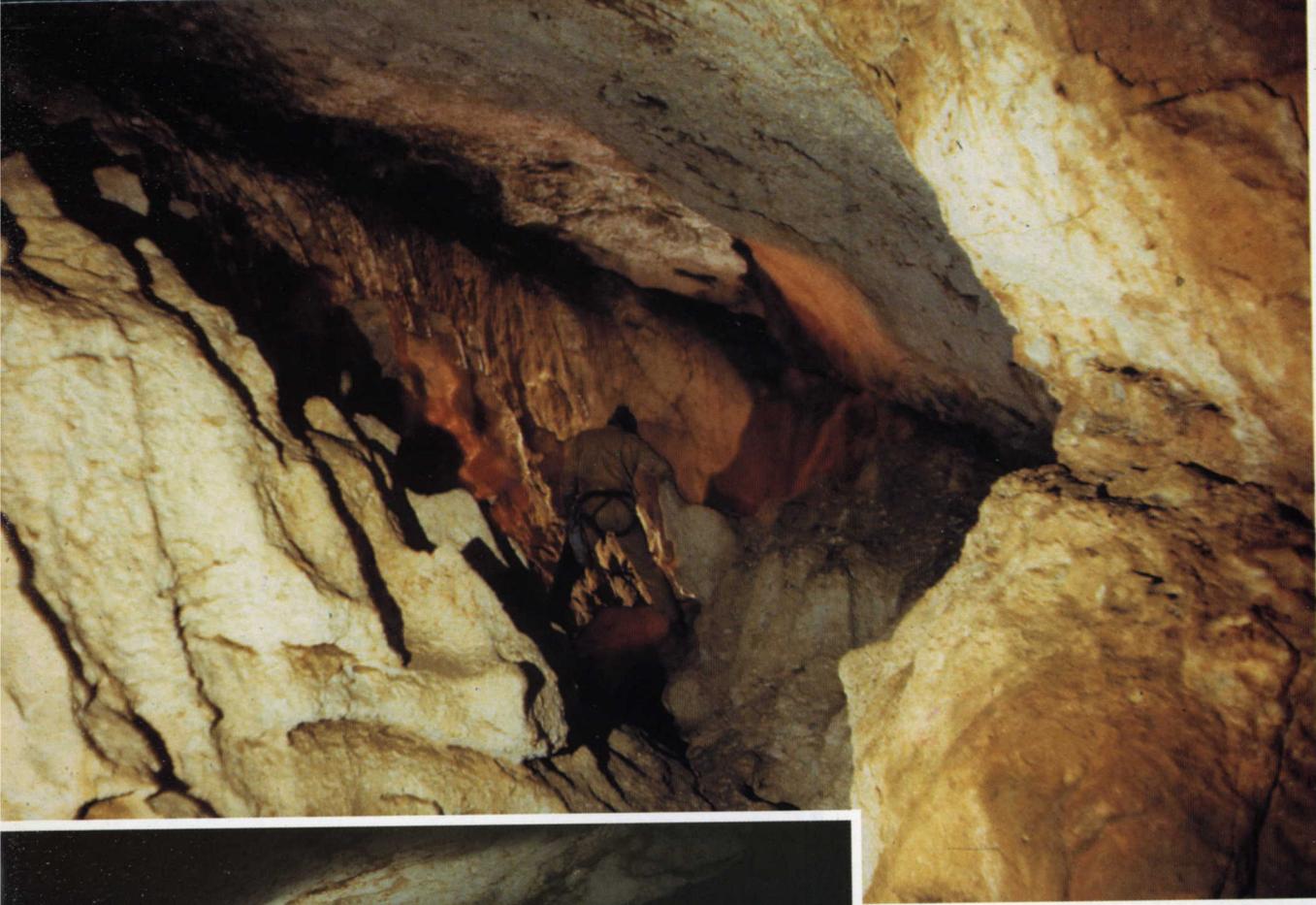
After the first positive experience in climbing a huge vertical cave our team realized that we had a big chance to start new competition in caving sport. We decided to beat our record and in December 1992 we chose to attack the deepest Polish cave - Wielka Śnieżna (-754 m). Climbing that cave, though it was 80 meters deeper, lasted only 185 hours. The difficulties amounted to V+, A3, 33 bolts. We were faced in the cave with very hard brittle rock and considerable problems with protection. Coming out of Wielka Śnieżna cave using our climbing method was the first unofficial world record in this new sport competition.

After first successes in Polish caves we took up the deepest caves of the world.

Unfortunately without Krzysztof Guzek, who died on Matterhorn in winter «93. Up till then it was him, who was the driving force of all our action and the unquestionable leader of our team. The deepest world cave - Réseau Jean Bernard (-1602 m) which we visited in winter 1993 turned out to be uninteresting in the climbing aspect. We did only the first sport descent of the entire cave from the C-37 entrance to the bottom and back (the best time was 54 h).

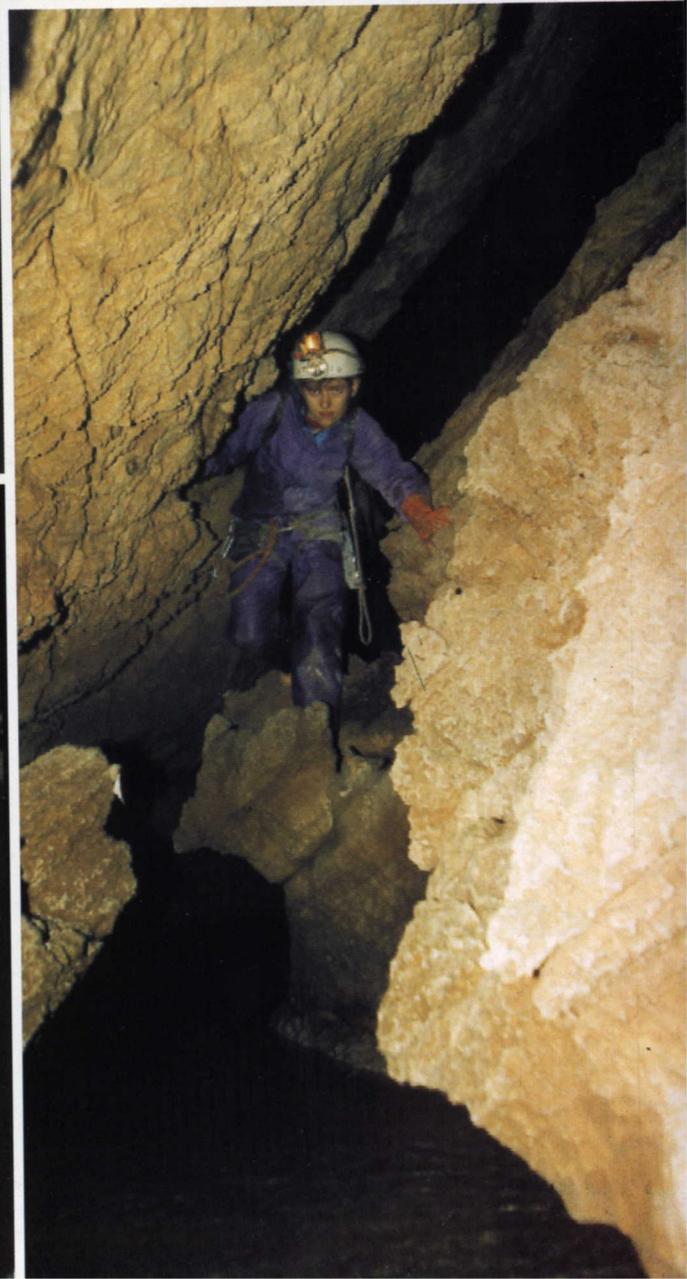
However the expedition to the deepest cave of Americas - Sistema Cheve (February - April 1994) brought the expected record achievement. In 200 hours the team consisting of Tomasz K. Pryjma, Oskar Orzechowski, Tomasz Gajda and Marcin Francuz climbed Sistema Cheve from the depth of 1215 m. Technical difficulties were IV, A2, 30 bolts. The major difficulties were faced in Sanknusen shaft (A2) - it was climbing in cascading water.

I think that this sport logically continues the traditional way of cave exploration. It allows climbing out of almost any cave using climbing equipment. I hope that similar records will be soon reported from other parts of the world.



Lamprechtsofen

all photos by S. Kotarba





Special Issue published on the occasion of 12th International Speleological Congress

JASKINIE

