

WHC Nomination Documentation

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SITE NAME ("TITLE") Caves of the Aggtelek Karst and Slovak Karst

DATE OF INSCRIPTION ("SUBJECT") 9/12/1995

STATE PARTY ("AUTHOR") HUNGARY and SLOVAK REPUBLIC

CRITERIA ("KEY WORDS") N (i)

DECISION OF THE WORLD HERITAGE COMMITTEE:

19th Session

The Committee inscribed the nominated property on the basis of criterion (i), considering that the site is an outstanding example of on-going geological processes and a significant geomorphic feature. The karst formations and 112 caves contain the geologic history of the last several millions of years with an unusual combination of climatic effects and paleokarst features.

The Committee requested the Centre to write to the national authorities to recommend that control is needed over surface activities such as agricultural pollution, deforestation and soil erosion that could effect the independent resources.

BRIEF DESCRIPTION:

The variety of formations and the fact that they are concentrated in a restricted area means that the 712 caves currently recognized make up a typical karstic system in a temperate zone. Because they display an extremely rare combination of tropical and glacial climatic effects, they make it possible to study geological history over tens of millions of years.

1.b. State, province or region: The Hungarian Republic, the Borsod-Abaúj-Zemplén District
The Slovak Republic, the Rožňava District and the Košice-country District

1.d Exact location: the territory extends between 48°25'00'' and 48°40'50'' northern geographical latitude and from 20°15'00'' to 21°00'00'' eastern geographical longitude

NOMINATION FOR WORLD HERITAGE LIST

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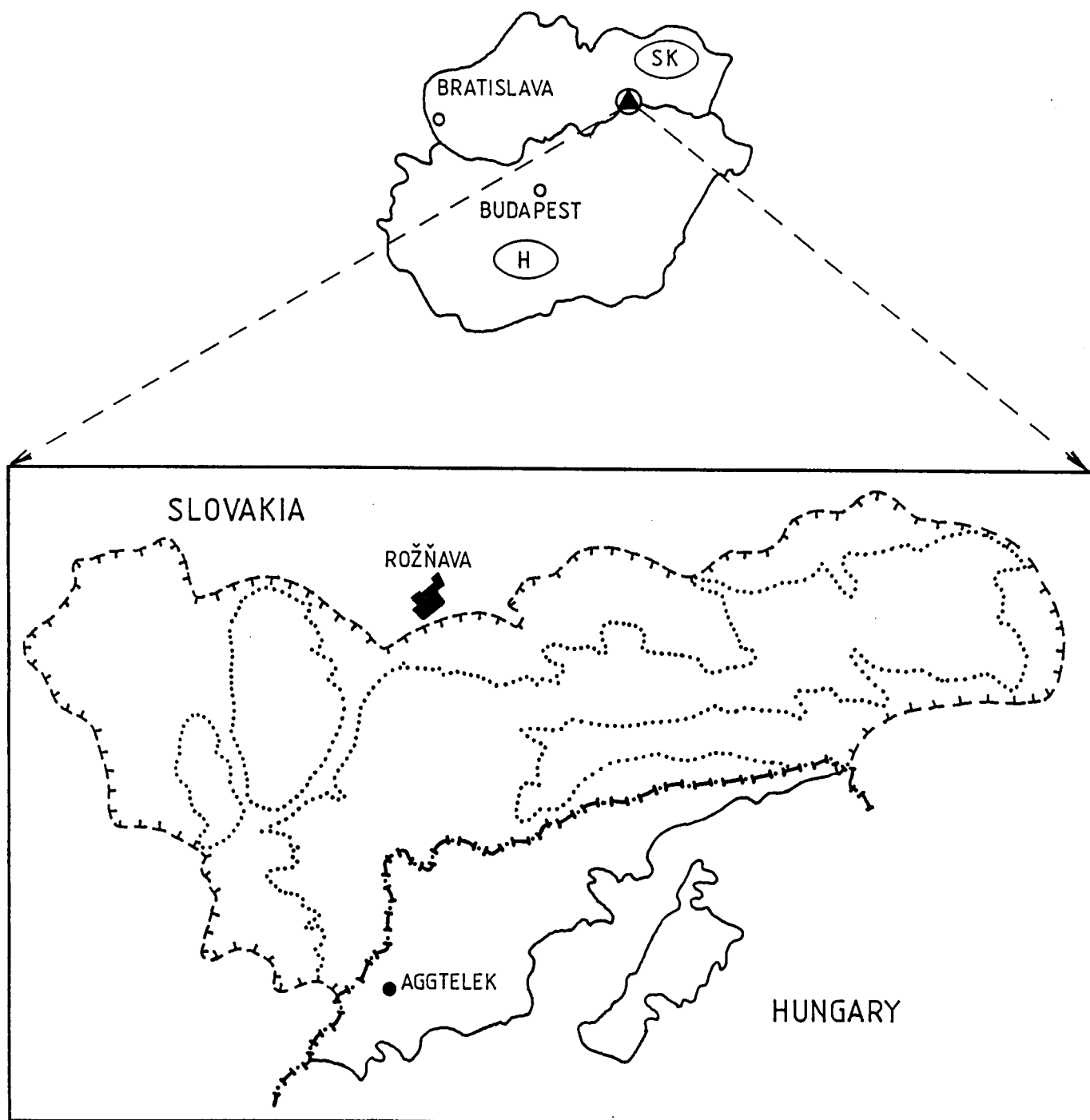
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PLAN OF THE LOCATION AND PROTECTION OF TERRITORY



———— National Park Aggtelek

..... Protected Landscape Area
Slovak Karst

- - - - - Protective zone

—•—•—•— Government border

The Hungarian Republic,
The Slovak Republic

The Hungarian Republic, the Borsod-Abaúj-Zemplén District
The Slovak Republic, the Rožňava District and the Košice-country District

CAVES OF THE AGGTELEK AND SLOVAK KARST

The Aqqtelek karst area

A-1. The Baradla-Domica Cave System

A-2. The Béke-barlang Cave

A-3. The Kossuth-barlang Cave

A-4. The Meteor-barlang Cave

A-5. The Rákóczi 1.sz. barlang Cave

A-6. The Rákóczi 2.sz. barlang Cave

A-7. The Reitek-szomboly Chasm

A-8. The Szabadság-barlang Cave

A-9. The Vass Imre-barlang Cave

A-10. The Vecsem-bükki-szomboly Chasm

The Slovak karst area

S-1. The Baradla-Domica Cave System

S-2. The Diviačia Chasm

S-3. The Drienovska Cave

S-4. The Gombasecká Cave-Silická

Radnica Ice Cave System

S-5. The Hrušovska Cave

S-6. The Jasovska Cave

S-7. The Krasnohorska Cave

S-8. The Ochtinska aragonitova Cave

S-9. The Obrovskia Chasm

S-10. The System of the Skalisty potok Cave-Kunia Chasm

S-11. The Snežna diera Cave

S-12. The Zvoniva diera Chasm

d) Exact location and indication of geographical coordinates

An area of the concentrated occurrence of the subterranean karst forms is situated in the southwestern part of East Slovakia and in northeast Hungary. A state boundary divides the area into two different parts, while larger part extending on Slovak territory. It is a case of the territory of the Aggtelek National Park, declared in 1985 and territory of the Protected Landscape Area Slovenský kras (the Slovak Karst) declared in 1973 with their border protected zones. Both these protected territories are biospheric reserves within the framework of the project M&B since 1979 and 1977 respectively.

The north bounds of the suggested area run in accordance with natural geological borderline of the karst massif and non-karstifiable rocks. The south and southwestern bounds are given by natural petering of the karst beds out and their plunge under later covering formations. In West the interest territory embraces part of The Revúcka vrchovina Mts., in which underground passages of the Ochtinská aragonitová Cave) were created. The westernmost point of the territory is located at the town Jelšava, the southernmost at Trizsa and on the northeast territory reaches up to the village Jasov.

The interest territory border runs from Jasov to Medzev, westwards through Pipitka Mt. (1225 m a.s.l.) to Krásnohorské Podhradie, then to Brzotín in the direction of the Rožňavské Bystré, Štítnik, Ochtiná to the east edge of Jelšava, turns to the southeast, passes Hucín, Gemerská Hôrka, Dlhá Ves towards Trizsa where it turns to the east and continues through Alsótelekes, up the villages Szalonna, Martonyi, Tornabarakonyi, Bódvaszilas, Tornanádaska, Turňa nad Bodvou, Drienovec and Debráď again Jasov way.

The territory extends between 48°25'30'' and 48°40'50'' northern geographical latitude and from 20°15'00'' to 21°00'00'' of eastern geographical longitude. Its extreme dimensions are 50 km length from East to West and 22 km width from North to South. Protected area without border protected zone encompasses 558 kilometres square. The highest point in the protected area is Matesova skala Mt. (925 m a.s.l.) on the Borčanska planina Plateau (border protected zone attains altitude 1225 m on peak Pipitka). The lowest point lies on the eastern slope of the Plateau Dolný vrch on 171 m above sea level.

e) Maps and plans

List of the attached maps and plans:

1. Map of the occurrence of the karst forms 1 : 100 000
2. The Domica Cave (ground plan and situation)
3. The Diviačia Chasm (vertical section)
4. The Gombasecká Cave (ground plan)
5. The Silická Ľadnica Ice Cave (ground plan and side elevation)
6. The Hrušovská Cave (ground plan)
7. The Jasovská Cave (lengthwise section)
8. The Ochtinská aragonitová Cave (ground plan, section)
9. The Kunia Chasm (ground plan and side elevation)
10. The Skalistý potok Cave (side elevation)
11. The Zvonivá diera Chasm (ground plan and sections)

2. Juridical data

a) ownership

State is the owner of the proposed heritage.

b) Legal status

The territory consists of the National Park Aggtelek proclaimed on January 1, 1985 and the Protected Landscape Area Slovak Karst proclaimed by the Decree of the Ministry of Culture No 110/1973 on August 31, 1973 on the basis of the Act on the Protection of the Nature No. 1/1955 Zb. Karst Protected Nature Phenomenas were until now declared on the territory of the Protected Landscape Area Slovak Karst by the following legal regulations:

1. Amendment of the Ministry of Culture of the Slovak Socialist Republic (MC SSR) of December 28, 1972, No. 9279/1972 - OP on the declaration the Domica Cave Protected Nature Phenomenon
2. Amendment of MC SSR of December 28, 1972 No. 9284/1972 - OP on the declaration the Ardovská Cave Protected Nature Phenomenon
3. Amendment of MC SSR of December 28, 1972 No. 9283/1972 - OP on the Declaration the Milada Cave Protected Nature Phenomenon
4. Amendment of MC SSR of December 28, 1972 No. 9280/1972 - OP on the declaration the Gombasecka Cave Protected Nature Phenomenon
5. Amendment of MC SSR of December 12, 1972 No. 9281/1972 - OP on the declaration the Krásnohorská Cave Protected Nature Phenomenon
6. Amendment of MC SSR of September 30, 1982 No. 6174/1982-32 on the declaration Brázda Chasm Protected Nature Phenomenon
7. Amendment of MC SSR of March 31, 1986 No. 2916/1986 - 32 on the declaration the Diviačia Chasm Protected Nature Phenomenon
8. Amendment of MC SSR of September 30, 1982 No. 6176/1982-32 on the declaration the Silická Ľadnica Ice Cave Protected Natural Phenomenon
9. Amendment of MC SSR of December 28, 1972 No. 9282/1972 - OP on the declaration the Ochtinská aragonitová Cave Protected Natural Phenomenon
10. Amendment of MC SSR of December 28, 1972 No. 9286/1972 - OP on the declaration The Jasovská Cave Protected Natural Phenomenon

In addition to these regulations a protection of other karst underground phenomenas is guaranteed by amendments on the declarations of the State Nature Reserve, on the territories of which those are located. For example the some famous caves protected by this way are listed:

The Hrušovská Cave, the Kostrová Cave, the Kráľovská Cave, the Zbojnická Cave, the Šingliarova Cave and the Drienovecká Cave. These natural karst phenomena are protected by amendments on the declarations of the State Nature Reserves:

11. Amendment of MC SSR of January 31, 1986 No.457/1986-32 on the declaration the Zádielska tiesňava Gorge State Nature Reserve
12. Amendment of MC SSR of April 30, 1984 No. 56/1984-32 on the declaration the Hrušovská lesostep Steppe-Forest State Nature Reserve
13. Amendment of MC SSR of June 30, 1981 No. 3245/1981-32 on the declaration the Sokolia skala Mt. State Nature Reserve
14. Amendment of MC SSR of June 30, 1981 No. 3246/1981-32 on the declaration the Gerlachovské skaly Mt. State Nature Reserve
15. Amendment of the Ministry for the Environment of the Slovak Republic of March 23, 1993 No. 83/1993 Z.z. on the declaration of the State Nature Reserves (The Palanta Mt. State Nature Reserve too)

c) Responsible national agency

Ministerstvo životného prostredia Slovenskej republiky, (Ministry for the Environment of the Slovak Republic), Hlboká 2 812 35 Bratislava

d) Collaborating national agencies and organizations

1. Slovenská agentúra životného prostredia, (Slovak Agency for the Environment), Tajovského 28, 975 90 Banská Bystrica
2. Slovenská speleologická spoločnosť, (Slovak Speleological Society), Hodžova 11, 031 01 Liptovský Mikuláš
3. Slovenské múzeum ochrany prírody a jaskyniarstva, (Slovak Museum for the Nature Protection and Caving), Školská 4, 031 01 Liptovský Mikuláš
4. Správa slovenských jaskýň, (Administration of the Slovak Caves), Hodžova 11, 031 01 Liptovský Mikuláš
5. Okresný úrad životného prostredia, (District Office for the Environment), Námestie 1, mája 1, 048 80 Rožňava

3. Identification

a) History

In historical era there was no interest in the caves for a long time, hence first mentions on them we find relatively lately. First written mentions of the caves on this territory are found only in the mid-16th century. In 1718 Georg Buchholtz, Junior (1688-1737) described The Silická ľadnica Ice Cave visited him in 1704 in his letter. In 1725 he explored, described and surveyed together with Pál Lányi a cave at Aggtelek.

The Silická ľadnica Ice Cave is referred in Matej Bel's (1684-1749) report *Hungariae antiquae et novae prodromus*, issued in 1723. The above mentioned author published the report with description of Silická ľadnica (the Silická Ice Cave) in a London's periodical. Jacob Buchholtz (1696-1754) published his findings from a journey in 1752, when he made references to a cave near the village Gombasek besides the Silická ľadnica Ice Cave. English natural scientist Robert Townson described a cave at Aggtelek and the Silická ľadnica Ice Cave in 1797 year. Karl Gottlieb von Windisch (1725-1783) mentioned the Silická ľadnica Ice Cave and the Malá ľadnica Cave near the village Silická Brezová quite in detail in his work

from 1780.

Count Domonkos Teleki (1773-1798) described dripstone decoration of a cave at Aggtelek and the Silická Ľadnica Ice Cave. Important knowledge of the Baradla Cave at Aggtelek and cave near the Smradľavé jazierko Lake was published in the years 1806-1808 by Ladislav Bohuslav Bartolomeides. Ján Čapkovič (1780-1847) published in 1821 a work, in which the Silická Ľadnica Ice Cave was described too. This cave was described also by Carl von Sze-pesházy (1780-1829) and J.C. von Thiele in 1825.

Elek Fényes (1807-1876) mentioned the Zádielska Cave and the Silická Ľadnica Ice Cave in his description of Hungary of 1847. János Hunfalvy (1820-1888) pointed in his work of 1863 to the fact that on the territory of the Slovak Karst were located many caves, of which the most important were the Silická Ľadnica Ice Cave, a cave at Aggtelek, the Jasovská and Zá-dielska Caves. The same author detailed the Baradla Cave and a cave near the Smradľavé jazierko Lake in 1867. Pál Balogh (1794-1865) published a broad paper on the Baradla Cave in 1820. The works of Imre Vass (1790-1863) stood a great contribution to investigation of the karst, when he carried out first exact survey of the cave at Aggtelek and in 1825 gave its very broad and accurate description.

The Jasovská Cave was accessened to the public as the first cave in Slovakia in 1846. Hungarian natural scientist Antal Kiss occupied himself with investigation of the caves in the east part of the Slovak Karst, especially the Jasovská Cave. Important French mineralogist Francois Sulpice Beudant (1787-1850) was concerned with various aspects of the development of the ice in the Silická Ľadnica Ice Cave. Austrian geographer Adolf A. Schmidl (1802-1863) published an extensive description of the Aggtelek Cave and Silická Ice Cave in 1856.

The beginnings of systematic research of caves were to some degree associated with the activities of members of the Hungarian Historical Society, of which namely baron Jenő Nyári gained remarkable results. Albert Scholtz wrote on karst forms in 1888. He mentioned the caves near Hačava, Hrhov, the Marci's Cave, the Čertova diera Chasm, the Snežná diera Cave, and caves in the slopes of the Havrania skala Mt.. K. Siegmeth devoted time to the forms in the Slovak Karst in 1891. A year later E.J. Terlanday pursued genesis of the ice in the Silická Ľadnica Ice Cave.

Gábor Strömpl (1885-1945) was charged with survey of the Slovak Karst area on assignment of the Caves Research Commission attached to the Hungarian geological Society. This author published the results in a form of the index in which he stated seventy seven various karst openings. In 1916 Tivadar Kormos (1881-1946) explored the Jasovská Cave. The Caves Research Commission established in 1910 began to systematically organize a research of the caves in presented karst region until the post - World War I period. In years 1923-1932 the Section for the East Slovakian Karst Research was functioned in Košice and explored caves on the Jasovska plateau in eastern Slovak karst. In 1933 the most important speleological organization became the Scientific Karst Commission attached to the Club of the Czechoslovak Tourists. In 1944 the Caving Division of the Club of the Slovak Tourists and Skiers was established. One of its founders Vojtech Benický gained recognition for development of caving in the concerned area. An advantageous addition to the Slovak speleology was a pass of the Act on the Protection of the Nature in 1955. One year later the Advisory Committee for the questions of the Caving and Karst Phenomena attached to the Commissioners for Education and Science was established. In 1969 the Slovak Speleological So-

ciety was established, which up to the present day participate to a large extent in exploring and protection of the caves of the territory.

b) Description and
Inventory

Caves as nonrecurrent, rare nature creations was originated in complicated natural processes in the karst rocks. Territories, on which the National Park Aggtelek and the Protected Landscape Area Slovak Karst are located, are built of the rocks with specific properties described in appendices 3.1.-3.4. detailly.

Those conditioned the rise of the karst landscape which has many specialities in comparison with other types of the landscape. It is at the first a strong interaction of all nature factors of the landscape (climate, relief, water, soil, vegetation) and their developmental follow up. A contingent impairment of one of those will cause reaction which will repercuss in the change of another one. That is because the karst landscape is made of soluble and permeable rocks with special relief features. The extraordinary hydrological conditions are going upon it: underground drainage, lack of the surface streams and complexity of the circulation of the underground water. To these facts the evolution of the soil and vegetation is conforming, which narrowly cohere with the relief, bedding and water.

Frequent ravining of the relief conditions a climatic differentiation and following on it differentiation of the vegetation. This way a great and fast changes of the landscape type are setting in on a small area of the land. Other important feature of the karst landscape is intensive karstification of the underground. Caves are a result of a long-term geomorphological process on the surface as well as underground. There is a narrow correlation between quality of the surface factors of the landscape and intensity of the karstic process underground.

The cave inside presents a separate environment with specific microclimatic, hydrological and biological properties, which are in sharp contrast with the surface in the vicinity of the cave. Relatively stable temperatures during the year, a high humidity of the air, a composition of the aerosol and high purity of the air are the basic properties of cave microclimate. The cave hydrology is characterized by a water percolation through fissures into a underground, an activity of the water in underground and frequent underground streams.

The existing nature conditions as well as inaccessibility of light are imposing a limitation on the life in caves. The animals occurred there are noted for the adaptations for life in the caves. This fact as well as that the caves were often settled with the Paleolithic and Neolithic Man underlines the scientific value of the caves in the suggested territory. The dripstone, aragonite or ice filling of the cave chambers constitutes most precious, unique but also most attractive on the Slovak karst. Last but not least it concentrates interest of experts and general public too.

The suggested territory is noted for very high concentration of the underground as well as surface karst forms. On the basis of the registrations performed up to this time there are kept caves and chasmes of 712, what constitutes an average concentration of 1.3 underground phenomena in one square kilometre. Of them for illustration twelve were chosen, their detail description is given below (see appendix 3.5).

c) Photographic and cinema-
tographic documentation

In appendix of this project there are:

1. black-and-white photographic pictures size 14x24 cm (authors: Slovak Museum for the Nature Protection and Caving, Liptovský Mikuláš 1994, Slovak Speleological Society, Liptovský Mikuláš 1994)
2. colour pictures size 10x15 cm (authors: The Management of the Protected Landscape Area Slovak karst, Brzotín, 1994, Slovak Speleological Society, G. Stibrányi jun., Turna nad Bodvou 1994, Administration of the Slovak Caves Liptovský Mikuláš 1994)
3. colour slides 24x35 mm (authors: Administration of the Slovak Caves, Liptovský Mikuláš 1994, Slovak Speleological Society, G. Stibrányi jun., Turna nad Bodvou 1994, Z. Hochmuth, Prešov 1994)
4. a videotape recording with the length 7 minutes (AWA Liptovský Mikuláš 1994).

A list of the photographic documentation is stated in the appendix 3.6.

d) public awareness

The caves of the Slovak Karst are known not only to the experts and those interested in speleology but as well to general public. It is in general awareness that Slovakia is rich in occurrence of the caves, mainly the dripstone ones as well as ice, or caves with the aragonite decoration. The territory of the Slovak Karst has here the uppermost task. More caves became world-renowned and constitute or considerate the unique nature phenomena of its kind.

The instructional educational films on caves and other nature riches of the Slovak Karst were generally-casted not only on local television channels but in the other countries too. A number of the karst forms became a textbook example. The Slovak Karst The Brázda Chasm (once called The Barzdaľ Chasm) is in this direction probably the most popular Slovak chasm, because it dominated almost 15 years in the first place among deepest Czechoslovak abysses. It is even marked on every school wall map and in every republic atlas of that time.

In 1973 the Slovak Karst caves were a subject of interest of the participants of the 6th International Speleological Congress which took place in this country. At this occasion the control survey were carried out in the Brázda Chasm.

Now above-mentioned surely contributes to the fact that the now easier of access Slovak Karst caves are often destination of many school tours. Caves, chasmes and other forms of the Slovak Karst are often named in all slovak encyclopaedic publications and periodicals. Instrumental in strengthening the public awareness is a popular periodical, which of no little importance now pays attention to the question of caves - journal Krásy Slovenska. Majority of the result of the research and knowledge on the Slovak Karst phenomenon is published in its, but in another already with the professional content - the annuals Slovenský kras (Acta Carsologica Slovaca) and the magazine Spravodaj SSS (News of Slovak Speleological Society).

The caves and their range of problems is known to the local population, of which many were or are directly taking part in more cave exploring actions, a results of which was in several cases a discovery of a new underground passages, although often for the price of superman effort. In the suggested territory three NGOs of voluntary cavers (members of Slovak Speleological Society) exert an activity: Speleological Club Cassovia Košice, Speleological Group of Ján Majka from Turňa nad Bodvou and Speleoclub Rožňava, which are covered in a high degree participate in educational activity, especially with the young people.

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4. State of preservation
conservation
- a) diagnosis, description and
determination the most
important features, identification of causes of
adverse condition

At the selection of localities for inclusion in the world nature treasure the scientific and cultural value of the caves was evaluated, their instructional potential as well as the representability and uniqueness of forms. Their significance was considered namely from viewpoint of geomorphological lay-out and development, scientific and cultural value of decoration as well as cultural - historical utilization of the subterranean by man. Suggested objects present specimen scientific evidence of geomorphological development of karst under the conditions of temperate climatic area.

The territory of the Slovak Karst is characterized by fully developed karst phenomenon of endo - and exokarst, which is found in development typical of the temperate climatic zone. The scientific value of this karst phenomenon lies especially in the representability of forms in all stages of geomorphological development from the elevation of the territory up to the present. An important stage of development was a relatively fast rise of the central and western part of the Slovak Karst at the end of Miocene Epoch (between Pannonia and Pontus) in consequence of which came dissection of the territory with defiles and canyon valleys. Individually is valuable canyon of the river Slaná and defiles of the Zádiel and Hájska valleys. This rising and with that linked considerable development of endokarst in vertical direction are reliably substantiated by the abysses 100 - 150 metres deep of the type aven, with characteristic vertical wall, a representative of which are namely the Zvonivá diera Chasm and the Diviaccia Chasm on Plešivecká planina (the Plešivec Plateau), the Brázda Chasm, the Veľká Žomboj Chasm and the Malá Žomboj Chasm on Silická planina (the Silica Plateau), the Snežná diera Cave, the Obrovská Chasm and others. A proceeding by stages of the rise of the east part of the Slovak Karst is demonstrated by the Kunia Chasm with a dissected morphology of passages.

From viewpoint of the karst development particularly in the younger geological periods are in particular valuable the erosive caves at the fringes of the plateaus. Many of them are multilevel, what represents development of the karst proceeding by stages, many contain a rich dripstone decoration typical in particular of the inactive parts of passages in this climatic area. Especially valuable representative of the type of caves is

about 21 km long system Domica - Baradla with the autochthonous underground current Styx. Three levels of the Domica Cave (one active, one inactive and the lowest fill with gravel) illustrate complex geomorphological development of the south fringe of the Slovak Karst. The typical representatives of the active river caves of the peripheries of the plateaus usually with a decoration of worth are the caves Gombasecká, Krásnohorská, Hrušovská, Drienovecká, Skalistý potok and inactive the Jasovská Cave with special development. Proposed locations are in more cases distinguished for a unique morphological manifestation of endokarst, above all secondary filling of the passages.

Outstanding for an extraordinary richness and diversity of sinter forms is the Domica - Baradla system with characteristic huge dripstones, sinter shields, spherulitic dripstones, cascade lakelets, interesting shapes of guano corrosion and so on. From an aesthetic point of view are in particular valuable thin long so - called plumes - hollow tubes 2-3 mm thick and up to 3 metres in length in the Gombasec Cave, excentric sinter forms of the Hrušovská Cave as well as 32,7 m long sizeable stalagmite of the Krásnohorská Cave.

We consider as individual the occurrence and development of shrubby, excentric and gravitational forms of aragonite in the Ochtinská aragonitová Cave, which despite partial devastation in the past represent an uncommon concentration of scientific and cultural-aesthetical values.

The occurrence of ice filling through the all year in the Silická Ľadnica Ice Cave is as well an important object of nature wealth of the area. The ice decoration in the impressive environment of tumbled sizable cave passage with a static pattern of air flow demonstrates a development of forms during the past 2000 years (dated by the archaeological findings in the deeper parts of underground passages).

The propounded localities represent a valuable evidence of a character of prehistoric cultures and of the way of utilization of caves in separate stages of evolution of mankind. From the point of view to the foreground comes out importance of the Domica-Baradla system. The settlement and utilization of the chambers since the Neolithic Age is demonstrated by a plentiful gamut of archaeological findings in some cases with uniquely preserved artifacts (a Neolithic Man vessel conserved with a sinter crust). Archaeological findings are supplemented with findings of paleontological relics as are the bones of a cave bear and so on. Outstanding for its richness of the finding of the type is the Archaeological Dome in the Silická Ľadnica Ice Cave, the relics of pottery of the Bükk, Pilin and Hallstatt Cultures come from. The expansion of the Neolithic Man, his cultural level and workmanship is supported by evidence of relics of abundantly decorated ceramics in other caves (Ardovská, Jasovská cave) too. The proofs of appearances of a cult character (a cult mask from the Majda-Hrašková Cave) were found. The continuity of utilization of the cave chambers is supported by evidence not only of findings of medieval ceramics, but in some places by inscription on the cave walls (e.g. a Hussite inscription of 1447 in the Jasovská Cave, inscriptions in the Baradla Cave and Silická Ľadnica Ice Cave and so on. More caves have as well a rich history of exploration and reflect an evolution of scientific research of nature values since 18th century (exploration in the Baradla, Jasovska and Silicka Ľadnica caves).

All proposed localities are a part of the environment with fully developed karst phenomenon, which is fit to use as for that purposes of a broad research work as for the cultural-recreational as well as speleotherapeutic

activities. The localities in such scientific and of landscape highly valuable environment represent extra ordinary nature and cultural treasures of mankind.

b) History of protection
and conservation

The cave conservation even despite the fact it is a case of rare nature phenomena began to be put into practice much more lately than they were known. As the first known cave of the territory we consider the Jasov Caves because it is mentioned already in connection with the Tartar inroad even that it was made accesible only in 1843. The exploration of the underground continued graduáally, in 1825 the The Baradla Cave was discovered at Aggtelek.

A legislation leading to the conservation of the caves evolved slowly and more penetrating a protection of the karst phenomena became implemented only after the establishment of the Czechoslovak Republic in 1918. On December, 1921 a decree became valid issued by a Minister of the Czechoslovak Republic with a given power of attorney for executive of Slovakia No. 31-1921/10873 - prez. On the Protection of the Prehistoric and Nature Relics. By the above mentioned decree it was forbidden spontaneously enter the caves. To another legal measures applied to the protection of the karst phenomena belong Hungarian district statutes on the nature sights protection. The Ministry of Education and Nation Culture in Prague amended by the decision No. 81040/25-II/4 of July 29., 1925, and by subsequent regulations a declaration the Jasov Caves Reservation with an area of about 200 ha.

To the more important documents of the inter-war period which involve as well the karst phenomena protection pertains a Summons of the Ministry of Education and Nation Culture to Cooperation in Registration and Protection of the Nature Monuments (decree No. 143547 - V of December 31, 1933, On the Protection of the Nature Monuments). The decree appeals to protect the nature, understand its regularities and publishes a list of the protected areas. To the additional rulings on the caves protection are included the decrees and edicts of the authorized committee, which are relevant to the declaring of the protected areas and Nature monuments. By amendment No. 184548/1949-VII/2 of October 26, 1949, the Committee for Education, Sciences and Arts all caves were declared as protected nature monuments with the obligation to the owner and all public care for them, prevent their damage and destroying.

After the establishment of specialized organization of the state nature conservation in 1951 this one as well established a protection of the karst phenomena. From a view of their protection among the most important conditions are included an issue of the amendments on the declaration of the state nature reserve Jasov (1954). The karst phenomena and areas protection obtained more definite law appearance in 1955 by passing the Act of SNR (the Slovak National Council) No. 1/1955 published in the Law Gazette on October 18, 1955, on the state nature conservancy. According to that the set categories of the protected parts of nature relate to the karst phenomena as a matter of fact. The act definitely classified a caving in the sphere of the state nature conservancy. From a viewpoint of the karst phenomena protection this act provides definite conditions of protection, prohibitions and limitations. The caves in the interpretation of this ruling are being declared as protected nature phenomena by the central state authority.

In 1969 the organization is founded - the Administration of the Slovak

Caves - for ensuring a care for the accessible caves and karst phenomena. In last period the central organization (The Slovak Agency for the Environmental) for nature protection and conservation was established. In a follow-up to ensuring a protection of the other parts of nature gradually the caves and karst phenomena were declared as protected.

On August 23, 1994 the bill of Act on Nature and Landscape Preservation was passed. In this law all caves on territory of the Slovak republic was declared as the nature monuments protected by state (it will come into force on January 1, 1995).

c) means for preservation
and conservation

The Slovak Karst caves as a specific geosystem and part of its inorganic nature are conforming to the valid regulations on the nature conservation protected on the one hand as a component of a protected landscape area or a state nature reserve, and on the other hand as a protected nature phenomenon. In addition the characteristic filling, for example an aragonite is protected as a mineralogical kind.

The protection of caves apart from the nature conservation organizations has to become a constituent of work of the amateur spelaeologists as well. Arranging for the protection of caves cannot fall behind the progress of their exploration. Today's utilization of caves in travel and health services can be filled out in the future with until now unknown possibilities resulting from the scientific knowledge this still mysterious underground world.

In conservation of the subterranean passages of accessible caves to a decisive extent participates the Administration of Slovak Caves. From the standpoint of enhancement of influence of protection it will be further necessary:

- make more accurate terms of reference, make more satisfactory the cooperation of the authorities and nature conservation organization on the one hand and of the Administration of the Slovak Caves on the other hand
- further to the general change of the rule of law amend as well legislation of nature conservation on all levels
- put in compliance an institute of ownership with the regulations on nature conservation in its interest
- make up the conditions for lasting relations among voluntary speleological organizations and authorities of conservancy leading to more intensive arranging for the karst forms protection, particularly the underground ones.

d) management plans

The general advance of civilization and economic activity of man as well as with that connected utilization of the nature environment infringed as well the karst landscape and this way the caves in its underground as well. Under the protection of a cave cannot be understood only protection of the proper cave area and territory next above it. A cave and its nature pattern is under the influence of a larger territory, which affects its development. That is why the protection of caves and its directing must start from this fact. At that, there is a different situation at ensuring the karst phenomena protection those open to the public and those inaccessible.

The protection of caves and its managing in this sense is ensured also by function of the Management of the Protected Landscape Area - Biospheric Reserve Slovak Karst, which activity is performed on the foundation of the action plan of the biospheric reserves approved at the operational

meeting of the Minister of Environment by resolution No. 69 of April 23, 1993, and following from it materials, above all the long term programme of conservation and advancement of the Protected Landscape Area - Biospheric Reserve Slovak Karst, which is reflected in the year plans of work.

The fact which in a decisive proportion affects on the ensuring of a further protection of the karst phenomena is newly establishment of specialized organization with nationwide range, which activity is concentrated on the protection of accessible and those which are now being made easier to access caves and on their safe and tolerable utilization.

Innovated statute of the organization - the Administration Innovated Statute of Slovak Caves was issued by Minister of Environment of the Slovak Republic with an effect as from May 15, 1994. The Administration carries out information services, monitoring documentographical, educational, instructional, guide, publicity and research tasks in its terms of reference. Besides that it carries out a care for accessible caves, maintenance of the space and facilities necessary for their operation. The mission of the Administration and its conception in the section of karst protection is elaborated in greater detail in appendix 4.1.; 4.2.

The protection of the underground passages not made accessible and its management are closely linked with ensuring the protection of surface karst forms, at that some task harmonizes here an amateur speleologic activity, too. Towards it to the detriment of a thing was not given necessary respect. It is inevitable to do everything in order that at least to the protection of caves is given the same attention as to the research and works of exploration. When performing appropriate research works it is a must to observe the principles of protection and avoid damaging the caves and surface forms as well.

That is why in the frame of the project GESCIA, put out for tender by the Speleological Club Cassovia and with a view to the systematic approach to the protection of subterranean karst phenomena in the eastern part of the Slovak Karst a solution of particular conservation measures is assumed. All the procedures will be coordinated with the Management of Protected Landscape Area - Biospheric Reserve (appendix 4.3) Gradually an extension of the project to the rest karst territories is presupposed.

5. Justification for inclusion on the World

Proposed nature heritage is an example of development of a unique karst geosystem with the elements of uncommon beauty. Conforming to the article 2 of Convention it can be considered a group of nature phenomena made up of physical and biological formations, which have from the aesthetic or scientific standpoint an extraordinary world value.

All the caves, chasmes as well as the other karst forms are constituents of one geomorphological unit the Slovak Karst and its southern continuation in Hungary. Therefore they belong to the same physical-geographical formation, to the same biogeographical area, just as the ecosystems are of the same type. Suggested nature heritage is propounded to include in the list of the world heritage in accordance with the Convention in virtue of the criteria: iii) and partially as well iv)

The nature heritage suggested for inclusion in the world heritage is made up of the remarkable subterranean cave systems with a unique and unrepeating sinter and aragonite decoration.

The underground cave systems as well as karst surface are also an important and significant place of natural occurrence of the surviving

endangered species of animals of great scientific value. In addition to it subterranean chambers have a major speleoarchaeological significance.

From the caves of the territory is known so far the highest stalagmite in the world with a height of 32,7m, the only cave with an aragonite decoration in this country, abyss with an ice filling, which is a unique phenomenon in the Middle Europe area considering its height above the sea level. We can register here an occurrence of caves from a juvenile stage (the Gombasecka Cave) to the aged stage (the Silická ľadnica Ice Cave), various kinds of sinter decoration as are 2-3 m long plumes or drums, shields and pagoda-like stalagmites etc. The cave system Baradla-Domica is the second longest in this country.

Suggested nature heritage complies with the demand of integrity, for one thing the territory of concentrated occurrence of caves includes too the national park and the protected landscape area, in which besides endokarst occur as well all forms of surface karst. Besides this represents an area with a decisive influence on retention and preservation of endokarst.

ii) evaluation of the property's present state of preservation as compared with similar properties elsewhere

Today's in the protection of suggested nature heritage is given by the valid legislative rulings. An object of the protection is the protected parts of nature : protected landscape area, state nature reserves, protected finding places and protected nature phenomena. The kind and intensity of the special protection of protected areas is categorized accordingly the importance of the particular territory.

Direction and supervision in the field of the state protection of nature performs the Ministry for the Environment of the Slovak Republic.

On the territory of the Slovak Karst essentially occur all the karst forms characteristic of the karst of moderate climatic zone. Diversity of forms and its nature values rank this territory among the largest and most known karst territories of central Europe.

iii) indications as to the authenticity of the property

The integrity of caves is taken care of by a legal protection as well as by plans of maintenance and the Plan of the Protected Landscape Area - Biospheric Reserve Slovak Karst. In order to enhance effectivity of contemporary legal protection an innovation is proposed of the legislative norms which regulate legal conditions of the protection of underground and surface karst forms with consideration of possible modifications of state administration and self-government structure.

Signet

Full Name: Akademik Juraj Hraško
Title: Minister for Environment of Slovak Republic

Date: 12th September 1994

Appendix

Additional texts to the separate parts of the suggestion

1. to part 3
 - 3.1. Geological structure
 - 3.2. Geomorphological characteristic
typological division of the relief
forms of relief in the karst
caves and abysses
 - 3.3. Surface and subterranean water
 - 3.4. Karst as specific nature environment
caves and man
cave fauna
 - 3.5. Characteristics of the selected caves
 - S-1 The Domica-Baradla Cave System
 - S-2 The Diviačia Chasm
 - S-3 The Drienovská Cave
 - S-4 The Gombasecká Cave-Silická Ľadnica Ice Cave System
 - S-5 The Hrušovská Cave
 - S-6 The Jasovská Cave
 - S-7 The Krásnohorská Cave
 - S-8 The Ochtinská aragonitová Cave
 - S-9 The Obrovská Chasm
 - S-10 The System of the Skalný potok Cave-Kunia Chasm
 - S-11 The Snežná jama Cave
 - S-12 The Zvonivá jama Chasm
 - 3.6. List of black-and-white and colour photographic pictures and slides
2. to part 4
 - 4.1. Mission of The Administration of The Slovak Caves
 - 4.2. Draft of The Administration of The Slovak Caves in field of the karst protection
 - 4.3. Project GESCIA of NGO Speleoclub Cassovia on protection of subterranean karst phenomena

Appendix to Part 3.

3.1. Geological structure

The genesis of this unique territory was a subsequence of the fact, that about 205 - 225 million years ago (in the Middle and Upper Trias) on a large carbonate shelf sedimented sizable carbonate complexes of reef and lagoon limestones with a height over 2 km, which were in a form of cover (of Silica) transported to the area of today's Slovak and Aggtelek Karsts, where they conditioned a rise of various karst phenomena on their features.

Until recently the structure of Slovak Karst was considered as the most simple in the frame of Západné Karpaty (the Western Carpathians) when its Mesozoic was according to the then assumption regarded as a cover of Paleozoic of Spišskogemerská rudohorie Mts. Today is the Slovak Karst thought as one of the areas with a complex geological structure, because by contemporary knowledge five tectonic units participate in it. The other four tectonic units besides the mentioned Silica Nappe come from the paleogeographic zones neighbouring with a carbonate platform:

of a slope before reef, oceanic slope (tethydic) oceanic mobile range and opposite declivity of oceanic trench. The rocks of these ranges are in the Slovak Karst on surface represented in a much smaller extent than rocks of the Silica Nappe and so they were escaping from attention for a long time. That is because the Silický príkrov cover overlaps them on a larger part, but as well because a significant part of rocks of the ranges was during the collisional closing of the oceanic range in the Middle and Upper Jurassic Period pulled in the depths and melted there.

In the Slovak Karst and in closely adjacent territory we single out following tectonic units, which only until recently were generally considered as paleoalpines but today an opinion of their largely mladokimerský vek (the Late Kimer Age) begins to prevail:

1. Silicicum
2. Gemericum
3. Bôrka Nappe)
4. Meliaticum
5. Turnaicum

The Silicicum is represented only by the nappe of Silica which constitutes an extensive horizontal or subhorizontally laid nappe body, broken up during displacement or after shifting an a series of partial structures and blocks.

Many parts were removed by erosion and denudation and this way mainly the Jurassic horizon are preserved only rudimentarily. The largest distribution reach the sediments of the middle and lower Triassic Period. Since it is a case of rootless nappe, its original paleozoic bedding is unknown. On the facial side it is very well compared with the Schneeber and Murzalphine nappe of the Juvavicum in the Northern Limestone Alps.

The Silica Nappe builds as well the Aggtelek Karst with this difference in facial filling that there are more pelagic facies (much larger distribution of the Hallstatt and Zlambaš facies and limestone).

Gemicum reaches the territory on surface only by its southern margins. So far it is not clear if it is in depth under other units represented to the south of the Rožnava Fault.

The Bôrka Nappe is a case of the numerous, in places isolated, elsewhere more or less continuons occurrences in comparison to its surroundings

relatively higher metamorphic young Paleozoic - Mesozoic sequences. Their common characteristic feature is an alpine metamorphosis on conditions of medium and higher pressure at a relatively low geothermal gradient. Ranked here are the cases of occurrence on the northern slopes of the Jasovská Plateau between Jasov and Hačava, in the central part of Zádielska dolina (the Zádiel Valley), in the northern vicinity of Bôrka and Lúčka, a minor occurrence on the eastern slope of the castle hill Krásna Hôrka and more extensive occurrences outside the territory.

Meliaticum. The tectonic unit consists of the fragments coming from the oceanic and paraoceanic mobile zone between the shelf of Europe and Shelf of Apúlia. This mobile zone, known as well under the name the Meliatic Ocean rose by reefing and spreading during the period from Pelson to Karn and ceased in the time of collision in the Upper Jurassic Period. Characteristic of it is a sedimentation of the deep-water sediments (pelagic, often radiolariatic limestones, radiolarites, silicious pellics, black slates, turbidites). The sedimentation in the time of reefing was accompanied with submarine volcanic activity.

Turaicum forms a rootless nappe, compounded of more partial units, which emerge on the lower level of the Nappe of Silica. According to the original definition only the Triassic and Jurassic rocks were known of it, recently the Paleozoic rocks of the Brusnícka anticline were ranked to it. These are well comparable with Paleozoic rocks of the Szendrő range of hills.

The Upper Cretaceous (senon) sediments are known only of the no great occurrences in the middle of the Triassic rocks of Silický príkrov (the Silica Nappe), be it clicked between two partial structures (the Kampanské light limestones in the Miglinc Valley), or as a filling in the caverns in the Wetterstein limestones in the Gombasec fault.

The Cenozoic (Tertiary and Quaternary) sediments (with exclusion of the plateau areas) overlap the above mentioned paleoalpine tectonic units, especially in the Rimavská, Rožňavská and Moldavská Basins. Their sedimentation began already in the Eocene Epoch, known conglomerates of Drieňov are of the Oligocene Epoch. In the Miocene Epoch in the peripheral parts dominate the conglomerates, sandstones, breccias, and lime stones, in deeper parts, clays. The neogene sedimentation ends with gravels, sands and multi-colour clays of the Poltár strata.

Of the Quaternary sediments on the karst plateaus dominate the sediments connected with the processes of a creation of a karst, weathering, declivity modelling and transport, in the river valleys and basins prevail processes and sediments connected with erosion and accumulative activity of rivers and brooks. Typical of the Slovak Karst plateaus is a development of cave sediments, relict crusts of weathering - eluvial slopes of deluvial sediments.

3.2 Geomorphological characteristics

The centre of the territory is Slovenský kras (the Slovak Karst) with subunits the Jelšavský Karst, Koniarska planina (the Koniarska Plateau), Plešivská Plateau, Silická Plateau, Horný vrch (the Upper Hill), Zádielska Plateau, Jasovská Plateau, Dolný vrch (the Lower Hill) and Turnianska kotlina (the Turnianska Basin).

The Slovak Karst consists of a system of plateaus divided by deep canyon - like valleys of the river Slaná and Štítnik and Zádielska tiesňava (the Zádiel Gorge) and Hájska tiesňava (the Háj Gorge). In the eastern part of the Slovak Karst the turnianska Basin separates a plateau of Horný vrch (the Upper Hill) and Dolný vrch (the Lower Hill). In the north the Slovak Karst is separated from individual subunits of Slovenské rudohorie (the Slovak Ore Mountains) by a conspicuous furrow in the section between Štítnik and Honce, which after interruption by Rožnavská Kotlina (the Rožnavská Basin) continues further eastward through Drnava, Kováčová and Bôrka. In the south west and east the Slovak karst borders with the Rimanská and Košická Basins. The table lands of the karst plateaus are like fans bowed towards the basins and to the south east, south and southwest their heights above sea level scale down. The highest altitude above sea level the Slovak Karst attains at Matesova skala (the Matesova Rock, 925 m), which is located on the Borčianska Plateau. The Plešivská Plateau attains atop Štít 851 m. The lowest laid plateaus is the Koniar Plateau which at Veterník attains 610 m and Dolný vrch (the Lower Hill), which attains at Parlovský vrch (the Paul's Hill) 611 m.

The relative height differences among the table lands of plateaus and the bottoms of canyon-like valleys decrease as well from north to south. In the northwest part of the Plešivská Plateau and in the northwest part of the Silická Plateau they reach 400-460 m/km². The highest relative elevation in the Slovak Karst is in the southern part of Horný vrch (the Upper Hill), where the relative altitude differences in the Hrhov area overtop as many as 500 m/km². The southern parts of Plešivská Plateau and southwestern parts of Silická Plateau come up over the bottoms of valleys only 250-350 m. The table lands of the karst plateaus are only a little dissected. The dominant part of the table lands has relative altitude breakup 31-100 m/km². The highest density have the karst depressions on the Plešivská and Silická Plateaus, that is over 25 negative forms of relief on one square kilometre. The lowest density have fluviokarst table lands in the northern part of the Plešivská Plateau, in the western part of Horný vrch (the Upper Hill) and in the northeast part of the Zádielska Plateau. With only a small horizontal breakup are generally marked platforms of the Zádiel and Jasov Plateau.

Gradients of descent on the karst platforms attain a value mostly from 0° to 10° and only on places of conic hills reach gradients 10 - 20 in some places up to 30 degrees. The slopes of plateaus fall steeply to the canyons, passes and the Rožnavská and Turnianska Basins. Inclination is usually higher than 30°. In the upper parts under the edges of platforms they have often character of hills with vertical walls. On the lower parts the slopes reach 20 - 30°.

Turnianska Basin forming an elongated depression between the Upper and Lower Hills has along the stream Turna a character of a plain.

More broken hilly part ties up with an alluvial cone of the Blatný Brook, with deluvial slopes especially under the Upper Hill. In the close of the Turnianska Basin a relief of highlands characteristic elevates, which attaches on the less resistant rocks of the lower Triassic Period. It forms broken slopes of Silická planina (the Silická Plateau) and partially a plateau of Dolný vrch (the Lower Hill). A system of river valleys separate them.

3.2.1 Typological division of

the relief

The following typological units can be distinguished on the basis of morphologic, genetic and morphometric properties on the territory:

The karst relief consists of two typological units of lower order, namely the plateau karst relief and subdivided karst relief. The plateau karst relief is constituted by karst plateaus with flat, slightly declinate platforms and limestone slopes of plateaus. The upland plateau platforms are relics of a formerly united levelled surface of Pannonia subdivided by deep canyonlike valleys and gorges.

The upland plateau platforms are characterized by the dominance of karst forms. In virtue of the genetic as well as morphologic and morphometric properties the partial typological units are formed up on the upland plateaus, that is to say the karst plateau platforms, fluviokarst plateau platforms and semikarstic plateau platforms.

The cones and heaps on platforms are the oldest relics of the plateau karst relief.

The limestone slopes of plateaus are mostly of erosional - denudating character, they are based on faults and separated from upland platforms by a notable terrain edge.

The relief of subdivided karst is composed of three partial units, namely the relief of structural karst and semikarst ridges, relief of exhumed karst and contact karst in basins.

The nonkarstic relief is tied up with the nonkarstic old Palaeozoic complexes, Lower Triassic substrata, Neogene sediments and Quaternary proluvial and fluvial sediments.

3.2.2 Summary of knowledge on evolution of the region

When an appraisal of the genesis of the territory is made it is possible to use as a basis similarly as in the other ranges of mountains of the Western Carpathians from the surface of Pannonia, so-called Middle Mountain Plane. The surface is the oldest levelled erosional-denudating surface. It was best conserved on the Slovak Karst limestones.

Due to the rise of the territory in the first Rhodan phase of tectonic movements a strong deep development of a karst begins as well as development of karstic depressions on the risen surface.

In the next phase of Rhodan tectonic movement a considerable rise of the territory took place, and in this way a fall of the freatic zone in the karst occurred, that is how the making of the karst in depth resumed. Subsequently a deepening of the karst depressions with karst sinkholes come about and deep abysses originated.

The tectonic raising of the territory corresponding to the Rhodan tectonic movements was interrupted by the Epeirogenetic fall of the territory probably in the Pont. The decline of the territory was differentiated, too. The most intensive declined the limestone floes in the southern and eastern part of the Slovak Karst.

In connection with the decline of the territory in the Pont a considerable differentiation of the karstic relief took place.

With the evolution of relief during the Pliocene Epoch a development of caves corresponds, too, especially in its border parts.

The Quaternary evolution of the territory was conditional on diffe-

rentiated tectonics, as well as on the climatic changes in particular in the Pleistocene Epoch. On the surface of the karst platforms during the Quaternary Period the making of the karst in depth continually went on. On the slopes of the plateaus an intensive creation of the colluvial taluses is in progress.

3.2.3 Forms of relief in karst

The karst relief is an important element of special karst geosystem, sometime termed the karstsphere. This is a horizontally and vertically very divided, interrupted anastomotic three-dimensional geosystem, forming a specific part of the physiographic sphere, which rose during the geomorphological evolution of the earth by the karstic process on the contact of the hydrosphere and other geospheres with the rocks able to produce a karst. The karstic relief rose consequently by mutual acting of the geospheres, but above all the hydrosphere with lithosphere and characteristic of it are many specific properties, following from the individual morphogenetic process, in result are characteristic groups of surface and subterranean forms (the exokarst and endokarst). Three basic groups of forms can be singled out in the Slovak Karst: Karstic, fluviokarstic and marginal karst forms.

The karstic forms in the territory constitute fissures karst sinkholes, bogazes, vales, karstic depressions, ridges and heaps.

In the places where a less pure varied layers of carbonate rocks with locations of dolomites emerge, the fluriokarstic relief evolved there. Its most characteristic forms are the dry valleys, then deadend valleys and valleys in karst.

The marginal karstic forms evolved on the contact of soluble karstic rocks with insoluble nonkarstic rocks. They form marginal karstic pits, border fields, peripheral deadend vales and deadend periglacial valleys.

The characteristic forms in the Slovak Karst relief are exhumed karstic forms and forms adhering to the subdivided karst and structurally and tectonically contingent forms of karstic relief.

3.2.4. Caves and chasmes

Part of the Slovak Karst phenomenon are the caves and abysses, which are collectively named the endokarst. They are underground karst forms, accordingly they evolved in the process of production of karst under the surface. But genetically they are closely related to the surface karstic forms - the exokarst.

According to the origin we can distinguish the primary (syngenetic) caves and secondary (epigenetic), where belong most of our caves.

Due to the different acting of the basic genetic factor the different morphological types of caves evolved. In this sense we distinguish horizontal and vertical caves and cave caverns.

The shapes and phenomena which partially repeat from the surface karst and which occur as well in the underground spaces in changed and smaller forms we regard as the miniature cave forms. They develop as a result of acting of both genetic factors - corrosion and erosion. After the occurrence in caves we distinguish small forms of cave floor, walls and ceiling.

To the first belong the erosional pots in the streams, which come into being by eforation of the nonkarstic rock fragments or by evorsion by

the current water (the Krásnohorská Cave, Drienovská Cave, the Milada Cave, Diviačia Chasm). We arrange here as well so - called eguttate pits (the Krásnohorská Cave).

The grooves and hollows in the cave walls are of corrosion or erosion origin. We classify here too the shell surface of limestones and evorsion pots of the period of so called ceiling erosion (the Krásnohorská and Drienovská caves). In the process of etching by karstic water the sharp excised cuts are being created (The Diviačia Chasm, Gombasecká Cave). The cave scrapes, or the devil's furrows or cave backstages are known from the caves Domica, Krásnohorská and Drienovská.

In agreement with the origin of the cave filling we distinguish an autochthonous or allochthonous one. To the solid allochthonous matters we rank various alluvial deposits (cave silt). In the territory are distributed leached reearth loam with high content of iron and aluminium content. Similarly settle in caves the sands and gravels coming mostly from nonkarstic areas (the caves Gombasecká, Krásnohorská, Drienovská). Further here belong the animal filling (the caves Domica, Jasovská and Ardovská), anthropic filling (the Domica cave) and phytogenic filling (the caves Domica, Gombasecká). To the fluid allochthonous matters belong in particular water (infiltrated, the cave streams, underground lakes and condensed water). Big underground lakes are in the Brzotínská or Drienovská cave. The solid autochthonous filling of caves form above all sinters. Gravitational types of sinter are the most represented forms in all our caves. The basic phenomenon is the plumelike stalactite. It attains the length up to 3 m (the Gombasec Cave). Onionlike - spherulitic phenomena are known from the Gombasec Cave and Domica Cave, thickening of the plumes dominate in the Domica, Gombasecká and Ardovská Caves. The sinter curtains occur in the Domica, Krásnohorská and Milada Caves. The most beautiful specimen of stalagmites are known in the Domica Cave, and of stalagnates - in Domica, Krásnohorská and Jasovská Caves. The classic sintered shields and drums are known from the Domica and Jasovská Cave. Overflown forms are known namely in the Domica, Jasovská and Gombasecká Caves. The eccentric forms of sinters - the helixes are known particularly in the Krásnohorská and Hrušovská Caves. The gorgeous pisolites are known in Diviačia Chasm, Zombor and Brázda Abysses. The sinter crusts, candlesticks and water - lilies are in the Domica Cave, the Diviačia Chasm and Šingliarova Cave. The sinter vessels and cascades are the most beautifully developed in the Domica Cave.

3.3 Surface and Underground Waters of Karst

Waters from the Slovak Karst territory are drained by the autochthonous rivers (these originate directly in the karst territory) and allochthonous rivers, those area of origin is located in the nonkarstic region of the adjacent mountains.

The chief allochthonous stream is the Slaná in which flow all the streams which drain the Slovak Karst territory, The Slaná River forms a river network, characteristic of it is that it is young, thus undeveloped. In the territory of the Slovak Karst it flows in a narrow and deep canyon and only short tributaries empty into it. In addition to them the Slaná River is on this portion of its stream fed by the underground tributary of karstic waters.

Of other allochthonous streams which flow across the karstic region

and are being refilled with karstic water it is necessary mention streams the Štítník and Bodva. The stream Štítník flows in the canyon between the plateaus Plešivská and Koniarska. The Bodva River has up to Medzev, where it touches the karst region and for which it is the principal drainage basin, a typical treelike river network.

In the river Bodva basin another, toward the karstic region allochthonous streams are the brooks Blatnický and Hájský. While the slants of their river - bed as until they enter the karstic region, so the portion of their stream after leaving the karstic region are comparatively small, after entering the karstic region are big, that is the reason why the brooks in canyons flow through the rapids. In the karstic environment they do not lose water, but gain some amount of karstic underground waters.

The surface river network in the karstic region is virtually absent. The atmospheric precipitations fallen on the territory of the karstic plateaus apart from the portion of the whole evaporation infiltrate, the river network is taken into underground and only in the inter - mountain basins they outflow on surface in the form of numerous springs and this way make the foundation of the antochthonous river network.

A typical antochthonous stream is the Turňa River, which rises in the slopes of Silická planina (the Silická Plateau) built of the lower Triassic sandstone - shale layers. Because these are practically impermeable, a comparatively dense river network creates here. The shape of the Turna river network is half - feathery, for that reason that on the right side it is bounded by the karstic plateau of Dolný vrch (the Lower Hill).

Another antochthonous stream is the Čremošná, which with its left side touches the north border of Horný vrch (the Upper Hill) border.

The Slovak Karst territory is subdivided to the whole series of hydrogeologic structures. Of them the most important are structures of the Plešivská and Koniarska Plateau, the Ardavská, Veľká skala (the Big Rock), Upper and Lower Hill, Hačavsko-jasovská (the structure Hačava-Jasov) and the Vysoká.

The most important drained environment are the limestones of the Middle Triassic Period. The impermeable bed-rock is made of clayey-shale rock of the Lower Triassic Period. Both rock media are a part of Silický príkrov (the Silický Nappe). Of the mantle formations the sedimentary deposits are of the importance, into them the karstic waters can infiltrate, or these rock strata can create a barrier to the waters.

The most important source of the underground waters have precipitations, which without surface outflow infiltrate into the carbonates. Of importance to the infiltration of the surface waters into the carbonates are the surface streams, flowing in the area of carbonates from nonkarstic regions and infiltrating usually in the submersions.

The movement of precipitation waters, infiltrated into the carbonate massif is influenced above all by the tectonic transgression of the carbonate massif, its change due to the karst production in progress, and by the location of an intercourse of carbonate rocks of the middle Triassic Period with a barrier of shale substrata of the lower Triassic Period against the local erosional basis.

In the hydrogeologic structures, where the contact of both rock media is on the local erosional foundation, outflow on this level in concentrated or surface springs all the karstic waters (of the Lower and Upper Hill structure), too.

In the areas, where the synclinal formation causes the contact of limesto-

nes and shales is in bigger depth, a current of underground water differentiate into the waters outflowing on the local erosional grounds, or hidden tightly under, and waters entering deeper (karstic fissures) circulation (structure the Plešivská Plateau, the Veľká skala, the Ardovská).

The interval between infiltration and outflow depends above all on the climatic characteristic of a period. During very moist periods it is short (4-6 days) and becomes longer proportionally with the duration of the period without precipitation.

Karstic water, which will not flow on the level of local erosional basis or hidden into the alluvia closely under it participate in the formation of fissure - karstic circulation in the whole carbonate massif from the intensive - karstic zone up to its shale basis. The carbonate rocks of the middle Triassic Silický recumbent fold (nappe) of hydrogeologic structures of the Plešivská Plateau, the Ardovská and Koniar separated by Quaternary and Tertiary filling of the valleys Slaná and Štítnik, form in the level under Tertiary filling of the valleys one drained environment. These waters do not have a surface outflow in the territory of the Slovak Karst, they are part of a hidden outflow. It is possible to reach them by drilling in deeper usually synclinal structures especially under Neogene filling of the river valleys. They are karstic-fissure underground waters of a deeper circulation. Karstic-fissure waters of deeper circulation gained by boring holes have when compared with the variable outflows of the shallow circulation a perpetuity even in the periods without precipitation and extremely dry. The total collectable amount of underground waters of deeper circulation will depend on the ecological impact on the underground waters of shallow circulation in the longer period.

The underground karstic water of shallow circulation, as well as karstic-fissure underground waters of deeper circulation are of Calcium bicarbonate type with an average mineralization 460-490mg/l. Waters of deeper circulation have an increased temperature (up to 18°C).

Even the utilization of the underground waters of the Slovak Karst of our days justifies to mark out the territory as an important from the water economy point of view. Of the underground waters an especially higher protection is needed for in particular the underground waters of shallow circulation. As it was proved by the tracing trials, the passage of the precipitation waters from the place of infiltration to the outflow is due to the production of karstic terrain and thus the movement often in karstic caverns or cave systems is fast, that to a considerable extent weakens, limits or in some cases excludes the self-cleaning processes.

3.4. Karst as Specific Life Environment

3.4.1. Caves and man

From the existing data on the evolution of the Slovak Karst it follows that man had a decisive role in it. Even that he has turned his attention to the surface, the caves were no exclusion. In geomorphologically characteristic Karst territory with numerous often easily accessible caves were these an effortless and safe dwelling of man since the primeval times.

The accessibility of some caves as the Domica, the Silická Ice Cave, Slaninová Cave and the Jasovská Cave influenced as early as in the Late Paleolithic Age the hunters of the Szelet, Aurignac and Gravett cultures in

the range from 36 000 to 28 000 years BC in searching for them. Some findings do not exclude even earlier settlement. The most intensive settlement occurred in the Late Stone Age - the Neolithic Age. Particularly in winter period in the Ardovská Cave, Čertová diera, the Domica Cave, the Jasovská Cave and Silická ľadnica Ice Cave) were settled the creators of so-called East (Gemér) Linear Culture, who were soon replaced by the creators of the Bükk Culture from the Middle Neolithic Period (4 130 years BC). An extraordinary scientific place in learning about the character of the Neolithic Age has the Domica Cave, which in particular during the Bükk Culture with four evolution phases was the most important cave centre. In summer time were the creators of Bükk Culture dispersed on the plateaus of the Slovak Karst. With the production of ceramics and new kinds of stone smoothed tools a new form of settled productive economy. From the Eneolithic Age are in some caves (the Maštálná Cave, the Fajka Cave) humble relics of the creators of the Baden Culture with the canescent decoration of ceramics (2200 BC).

In the close of the Bronze Age the settlement intensified first by the creators of the young Bronze Age Pilin culture (1 400 - 1 150 BC) and after that with a mass settlement of the kyjatická culture (1 150 - 700 BC) which developed from the previous one. Its tribe site was probably the Silická Ice Cave, too. The chasmlike Majda - Hrašková Cave and the Babia diera had a function of antique shaft graves, with finds of masks of cult made from human skulls and other antropological finds, evidencing the offer cult cannibalism with broken and cut bones. The similar finds are from the Kostrova Cave. It is a case of finds of European importance. With the existence of supposed cult region in the territory may have a connection the human relics from the caves Ľudmila, Ardovská, Čertova diera, Oblúkova Cave, Drienovská Cave and the cave under the Muten.

The creators of the Kyjatická culture besides the perfect product made of bronze, became well-known for a production of lustre lead ware. They were settled in the open settlement, but they settled almost all horizontal caves as well, what can be related besides the function of wintering with the searching for water. The abysses of this place as not good for settlement preserved the primeral relics, human or animal remains probably only as due to a fall or a wash down, anyway these are an evidence of life in their neighbourhood.

The lasting of the Kyjatice Culture until the old Iron Age has a proof in the oldest finding of iron objects and crude iron in the Jasov Cave and the neighbouring Fajka (Pipe) Cave, but the learning of iron proceeded slowly. The evidences about its production come particularly from surface, the Vrania skala Rock is a Hallstatt site of fortified settlement. Episodical appears that was the settlement of the Celts of the Late Iron Age (La Tne, 4th - 1st century BC). La Tne relics were found in the caves Ľudmila, Ardov, Čertova diera, Silická ľadnica, Žihľavová jaskyňa and the Jasov Cave. Since the Neolithic Age, young Bronze Age and Roman Age were settled the caves Medvedia, Lipová, Kráľovská and Kostrová caves, which are situated in the Zádielska tiesňava (the Zádiel gorge). The utilization of the caves in the subsequent Roman Age (0 - 4th century AD) is proven by the finding of precious Roman coin of the Roman emperor Marcus Aurelius Antoninus (121 - 80) of the 2nd century AD. Other cave settlements of the period are as well the Fajka Cave of Jasov, Ardovská Cave, the Žihľavová Cave and the Kráľovská Cave.

Findings of the following period can be found particularly in the

open settlements. In Zbojnická Cave (the Forest Robber's Cave) better known for its Neolithic, but in particular young Bronze Age settlement we can sporadically find a jewel of the Belobrdská culture, which in the 10th and 11th century represents the origins of the Slavonic - Old Hungarian symbiosis.

The existing knowledge on the material culture of the 13th century from the caves Jasovská, Moldavská and Kráľovská do not count out the truth of the legends about their usage in the time of the Tartar inroad, and particularly about the rescue of king Bela IV. after the lost battle at Mohi-puszta. A unique is the charcoal inscription in the Jasov cave from 1452 about the victory of J. Jiskra in the battle at Lučenec and a finding of an iron lance from 15th century in the Líščia diera (Fox's Hole) cave, which maybe related with the episodic sojourn of the later Hussite soldiers. Another evidence of the use of the caves are the findings of the Lithuanian coin of Ján Kazimír from 1653 in Kráľovská Cave (the King's Cave), the chased oriental dagger from the Jasov Cave, what can have connection with the raid of the Turkish Army, the copper tenpoitura in the Žrnový previs what indicates the passage and the hiding place of the Kurucs of F. Rákoci in 17th - 18th centuries. The inscription worth mentioning is in the Silická Ice Cave saying about a visit of count A. Revitzky from the first third of the 19th century.

Some caves since autumn 1944 smuggled deserters from the Hungarian army, or became a temporary hide-out for the inhabitants during the passing of the front - line.

3.4.2. Cave fauna

The limestone territory of the Slovak Karst together with adjacent Hungarian part is the largest Karstic territory of the Western Carpathians. Its value is high not only because of the geomorphologic diversity, but thanks to rich flora and fauna. The extensive system of underground fissures and caves, south exposition, and favourable climatic conditions as well influenced evolution of remarkable cavernicolous fauna.

Its exploration in this territory began in the half of the last century and the attention was firstly centred on the largest cave - the Baradla at Aggtelek.

The water fauna of the caves is by comparison with the surface more simple and more monotonous. The animals to a large extent do not leave water nor underground, they spend all their life here, including the reproduction. Comparatively good knowledge we have on the worms of the class Oligochaeta, mollusks of the class Gastropoda, mollusks of the class Bivalvia and crustaceans (Crustacea - Amphipoda).

Oligochaeta are bound to the fine sediment deposits - sand and clay. They are in great numbers in the caves into which is a periodical wash down through the submersions (the cave Domica, Milada). As the characteristic species of the water caves can be mentioned *Stylodrilus parvus* (Hrabě et Černosvitov) and *Pelosclex velutinus* (Pierantoni). They were found in the caves Silická ľadnica, Gombasecká, Majková, Milada and Bezodná ľadnica. Seldom were found as well other species: *Rhyacodrilus falciformis* Bretschneider in the Ardoľská Cave and the Čertova diera, *Haplotaxis gordioides* (Hartmann) in the Milada Cave.

Gastropoda. Of the mollusks was found in the subterranean brooks species *Bythinella austriaca* (Fröhl) that is in the caves Silická ľadnica,

Gombasecká and Májkova Cave.

Bivalvia. Of the mollusks of the class permanently live underground *Pisidium personatum* and *P. casertanum* in the caves Domica, Silická Ľadnica and Bezodná Ľadnica.

Crustacea. Of the crustaceans a characteristic species is *Niphargus tatrensis* Wrzes, which lives in the caves Milada, Bezodná Ľadnica, Drienovská Cave, Ponorná Chasm. In two locations was found *Gammarus fossarum*, which permanently occupies Drienovská Cave (the Drienovská Cave).

Insecta. Of the insects which development is in water the larvae were found in the caves Milada and Domica.

The land fauna lives in the subterranean spaces permanently, or temporarily. Permanently inhabit a cave for example the earthworms, mites, spiders *Porrhomma*, beetles *Duvalius*, *Quedius* and some belonging to the order Diptera. Temporarily they live mostly on the walls of entrance parts above all winged insects. In addition there are bats, dipterous, butterflies etc.

Oligochaeta. The earthworms (*Lumbricidae*) and *mrlica* (*Enchytraeidae*) occupy banks of subterranean rivers, guano, horizon with fallen humus etc. They were found in the caves Domica, Brázda and Milada.

Crustacea. Of the land crustaceans occurs the most important species *Mesoniscus graniger* (Frv.), described in the first place in the Baradla cave. Other finds are from the caves Jasovská Cave, Silická Ľadnica, Domica, Čertova diera, Brázda, Drienovská, Ardovská and Hrušovská Cave.

Arachnida. Of the arachnids the inner spaces of caves are occupied by false-scorpions, spiders, scythe spiders and mites. Of the false-scorpions (*Pseudoscorpionidea*) a characteristic species *Neobisium (Blothrux) slovacum* was found and described from a cave at Brzotín. Further findings origin from the Šingliarova Cave. Of spiders live underground three species of the genus *Porrhomma* (in the caves Baradla, Brázka, Domica, Čertova diera, Drienovská Cave, Diviacká Chasm and Ponorná Chasm (Subterranean Chasm)). From Čertova diera (the Devil's Hole) a new species of mite (*Acarina*) *Oribella cavatica* (Kunst) was described. In addition they live in the charm Brázda (the Furrow) and in Hačavská Cave (the Hačava Cave) where lives another species *Poecilophysis spelaea* (Wankel) syn. *Rhagidia*, what is the first published data from Slovakia.

From the other species of a cave fauna is worth mentioning *Diplura*, *Plusiocampa spelaea* Stach. from the Ardovská Cave, a rich fauna of spring-tails (*Collembola*) from the Domica Cave, where were described two species as new: *Arrhopalites slovacicus* and *Onychiurus troglophilus*. Of the beetles (*Coleoptera*) is the most important genus *Duvalius* with the species *D. bokori bokori* (Csiki) and *D. hungaricus brzotinensis* Janák, *D. bokori gelidus* (Csiki), *D. hungaricus hungaricus* (Csiki) and *D. hungaricus sziliczensis* (Csiki), which occur in the Plešivská and Silická plateaus.

In many caves lives *Quedius mesomelimus* (Marsham) - caves Jasovská Cave, Ludmila, Kečovská Cave, Veľká Žomboj, Čertová diera. Of the flying insects deep underground can be found diptera *Trichocera maculipennis* Meigen and *T. regelationis* (L.) namely in the Brázda, Veľká Žomboj, Ponorná Chasm and elsewhere.

Of the insects which enter the caves for a shorter period is worth mentioning enter the caves for a shorter period is worth mentioning a large number of species diptera, as are *Limonia nubeculosa* (Mg.), *Tarnania fenestralis* (Mg.), *Eccoptomera obscura* (Mg.), *E. pallescens* (Mg.), *Heleomyza captiosa* (Gorodkov), *Scoliocentra brachypterna* (Loew), *Triphosa dubitata* (L.).

In the caves Hrušovská, Majkova and Miladá were discovered *Stenophylax permistus*, *S. sequax*, *S. vibex* and *Micropterna nycterobia*.

The fauna of the bats (Chiroptera) is rich in the Slovak Karst. The most known locations with an occurrence in colonies are the caves Ardovská Cave, Čertova díra, Drienovská and Jasovská Cave. The colonies were formed here all-year-round. In the whole territory 14 species of bats were determined, of them important above all are all species of the genus *Rhinolophus*, *Myotis myotis*, *Myotis blythi* and *M. schreibleri*.

Appendix 3.6.1

List of black-and-white photographs pictures

1. The canyon of the Slana River
2. The karstified ground area on the Plesivec Plateau
3. The scar walls of the Zadielska tiesnava Gorge
4. The sinter pools in the Domica Cave
5. The dripstone drums in the Domica Cave
6. The Wet Entrance of the Drienovska Cave
7. The Straw dripstone decoration in the Gombasecka Cave
8. The abyss mouth of the Silicka ladnica Ice Cave
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Photo:

Archives of the Slovak Museum of the Nature Protection and Caving, Liptovský Mikuláš

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Photo: I. Kundis (Administration of the Slovak Caves, Liptovský Mikuláš), 1994

Name: S-01 The Baradla - Domica Cave System

The localisation:

The Domica Cave is situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak Karst and subwhole Silická Planina. Geographic coordinates of its entrance are 48°28'43''n.g.latitude and 20°28'22''e.g.latitude. The entrance is counted in a land-register of the village Kečovo.

The legal state of law:

The Domica Cave is Protected Nature Phenomena, which was declared by Amendment of the Ministry of Culture of SSR No.9279/1972-OP from December 28, 1972 on base Act on State Protection of Nature No.1 /1955 Zb. from 1955.

The history of exploration:

In the vicinity of the Domica Cave were apart from the Baradla Cave for a long time well known chasmlike caves Čertova diera (the Devil's Cave), Líčšia diera (Fox's Cave) and Stará Domica (the Old Domica Cave). As Bartholomeides (1806) wrote about the Čertova diera Cave were spreading various legends. An interest in these phenomena increased only when the question of the origin of the subterranean stream Styx in the Baradla Cave began to be studied. In order to find this out L. Bartholomeides, a parish priest from Ochtiná visited the Čertová diera Cave on July 10, 1801. He wrote of it as of the Búdöstő Cave and as the first he pronounced an assumption that the Čertová diera, Líčšia diera and Stará Domica were only an entrance to much larger passages, the second entrance to the Baradla Cave.

One of its greatest explorers and pioneers I. Vass came to the same conclusion at surveying the Baradla in 1821. E. Nyári (1881) who carried out with other specialists extensive archaeological works in the Baradla Cave on the foundation of the same surface and subterranean rivers at Smradľavé jazierko (Stinking Lakelet) supposed that between both caves were larger underground passages. K. Siegmenth (1891) at the occasion of a visit to the Čertova diera cave mentioned about huge heaps of bat's droppings in the cave. The connection between the Čertova diera and the Baradla they only suspected. Nobody of the explorers of the time tried to get over two water siphons separating the Baradla from the Domica Cave of today. Nor was an exploration of underground passages of the Čertova diera which headed eastwards, carried out.

A discovery of the Domica Cave was not by a change, but a result of relentless, zealous and enterprising activity of Ján Majko, who with his companions got into the new passages through the Stará Domica Cave on October 3, 1926, and later proved their connection with the Čertová diera and the Líčšia diera. Spaces of the Domica Cave were open to the public in advance in 1930 and a new entrance they broke open in 1932. A connection of the Domica Cave with the Baradla Cave is ensured by a siphon about 250 m long, which was from the Hungarian side for the first time vanquished by H. Kessler on August 28, 1932, and from our side by V. Benický on September 6, 1932. That demonstrated that it is a case of one system.

The description

The underground passages of the Domica Cave rank among the most important and beautiful in the geomorphologic unit Slovak Karst: They rose

on the south border of the Silická Plateau 10 km southeast of Plešivec in the light limestones of the Middle Triassic (Ladin) which form a massif of the elevation point Domica 464 m a.s.l. and Poroň 505 m a.s.l. They were shaped by erosion of the underground stream, when all the more extensive cave corridors are spreading alongside pronounced tectonic fissures which are as a rule for the main part in a north to south direction with inclination westwards, and in a west to east direction with inclination to the north. They are drained by the underground stream Styx flowing across the whole system Baradla - Domica. By the altitude situation of the cave corridors and different composition of river deposits can be judged that at the creation of underground caverns took place of each other more periods of erosion and accumulation. Z.Roth (1937) identified in the development of the Domica Cave 3 erosional and 4 accumulative stages of two evolutionary levels. But more recent drilling works discovered another, lower lying evolutionary stage. According to the made lengthwise profile of cave corridors there are showing in the evolutionary levels with comparative declination 12-18 m. In each of them alternated periods of erosion and accumulation. Sinter decoration is notable for strange forms, as are dripstone shields and drums, sinter drums, cascade-like lakelets called Roman Baths, onion-like and breast-like shapes of stalactites (the Virgin Corridor and so-called guano pots). In addition the cave is important from the angle of archaeological and biospeleologic. This is demonstrated by finds of stone tools (knives and scrapers of obsidian, stone wedges and crusher for grain, splinters of clay vessels, tools made of bones, combs, sintered vessels) and additional proofs of existence of prehistoric settlement (the Bükk Culture).

The cave Domica is an extensive cave settlement from the Late Stone Age, which (as a big scarcity) was connected with an underground holy of holies. In accordance with the most recent research works the Domica (are) was a dwelling place for the people of the Bükk Culture with the interruptions about 300 years (6400 - 6100 before Christ). It is the richest cave finding place of the Bükk Culture as a matter of fact.

Man probably got into this cave as early as in the Early Stone Age, what is substantiated with a finding of the only one stone leafy spike which ranks in the Szelet Culture (35 000 - 40 000 years) in the cave alluvia. Another prehistoric inhabitants of the Domica were bearers of the Starčevo-Kriš and Seskel Cultures, characteristic of it is production of thin bowls without spirals and meanders. In about Middle of the Late Stone Age the bearers of East Slavonic Culture, characteristic of them is linear ceramics with rich cut ornaments. Small fragments of the ceramics confirm, that the cave was at that time settled in only for a short time.

The Domica offered only poor findings of skeleton relics of man :

- in 1926 a half of lower jaw was discovered
- in 1936 too, was found a half of already sintered jaw and footprints and handprints in clay. Important species of troglonites occur here (*Niphargus aggtelehiensis*, *Mesoniscus graniter* Friv).

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The protection and conservation status

Before ensuring legal protection, but even after that the cave is endangered above all by agriculture activities and by functioning of a tourist resort in the vicinity. Observation of the chemical properties of water in the cave substantiated that the sources of pollution on the surface continue in their activities and consequently they are causing a pollution in the cave. Recurrence of secondary phosphates brings about corrosion of carbonates. At the same time during heavy rainfall a downpour floods the cave spaces and this way causes the soils are flushed from the surface and fill the passages of the cave.

Protection of the cave are ensuring organizations stated under paragraph 2.d. The cave is protected by law since 1972 as Protected Nature Phenomenon. Each year a check-up of an observation of the protective conditions is carried out in the cave.

Protection of this specific karst geosystem is ensured in the frame of the frame of protected zone of protected nature phenomena or protected landscape area, which was in 1977 included into the international network of biospheric reservations.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

Suggested nature heritage is an example of development of a specific and unique karst geosystem with features of extraordinary nature beauty. The cave together with the protective zone includes all the components of ecosystem. It is the richest cave finding place of the Bükk Culture altogether.

It is a case of the most characteristic and the largest system of subterranean passages of the plateau karst, which spreads on the territory of Slovakia and Hungaria.

The integrity of the cave is ensured not only by legal protection but also by plans of the Action Plan of the Biospheric Reserve Slovak Karst.

Name: S-02 The Diviačia Chasm

The localisation:

The Diviačia Chasm is situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak Karst and subwhole Plešivecká planina. Geographical coordinates of its entrance are 48°35'05'' n.g.l. and 20°26'40'' e.g.a. and is counted in a land-register of the town Plešivec in Rožňava district.

The legal state of law:

The Diviačia Chasm is a Protected Nature Phenomena declared by the Amendment of the Ministry of Culture SSR No. 2916/1986-32 of March 31, 1986, which applies since July 1, 1986

The history of exploring:

A mouth of the Diviačia Chasm is known since time out of mind and chasm was explored to depth -38 m. In August 1964 M. Erdős excavated a choke on bottom and discovered a continue of the chasm to depth -118 m. In 1964-68 the chasm was surveyed by covers from Prague.

The abyss was named after the finding of sintered carcass of the wild boar, 3000 years old. It is a case of a specimen of *Sus scrofa* (det. A. Novotný) 15-18 months of age.

In the 70th years tight cracks on bottom of the chasm was explored to depth -127 m. The chasm is counted to most beautiful in the Slovak Karst therefore one was suffered from numerous visits. Its state changed to better after one was proclaimed as Protected Nature Phenomena and its visits was limited.

The description:

The Diviacia Chasm is situated on the Plešivecká Plateau in its southern part, about 700 metres west-south-west of the Bukový vrch Hill (above the Gombasecký bend), in the elevation 590 m above sea level.

The Diviačia Chasm is a system of a few crack fissure abyss-like domes, based on the faults in a north to south, north-north-west to south-south-east, north-east to south-west directions. The abyss was formed in the wetterstein limestones of the type ladin, cordevol, in lower levels in light and lightgrey dolomites.

The individual domes are interconnected, this way at the total number of 11 domes (out of that 2 are with the lakes) there are 8 abyss horizons produced. Larger lake surfaces are in the depths 55 m, 74 m, 76 m, when the largest lake is in the Lake Dome I. in the depth of 55 m. The largest lake dimensions are 7x3 m and depth 0,5 m. The abyss attains a depth 127,0 m. The mouth of the abyss has dimensions 10x8 m, the opening proper has only 4x3 m. The entrance abyss 24 m deep follows the fault of 330° direction.

Walls of the abyss are covered with various sinter decoration. Into the depth of about 40 m occur flowing sinter cascades and curtains. To the depth 55 m the walls are covered with red-and-brown pissolitic growth. In the deepest parts the clusters of a shrubby and carcass-like calcite grow on the older sinter decoration. In northern parts of higher situated domes the sinter decoration is white, in sinter lakelets are the lotus shapes and cave pearls present. In deeper parts while sinter decoration turns brown-and-red, with pronounced marks of corrosive activity on the sinter decoration. The lowest part of the abyss is without decoration, with gravel

sedimentary deposits on the bottom, which occur on the places of crossing the faults, where are sporadically fallen boulder present, in some parts settled by sinter.

In addition to the boar's carcass in the abyss were discovered findings of recent animals (a dog, a red-deer hind) and in two places in V. horizon a guano was present.

The public awareness:

The Diviačia Chasm ranks among the deepest chasms in Slovakia and with its rich various secondary decoration, evolution succession and uniqueness rates with the most beautiful and remarkable. Diviačia Chasm is a demonstration of karstic processes bound with expressive tectonic faults in ladin limestones.

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The protection and conservation status:

The Diviačia Chasm is comparatively hardly accessible subterranean space and it is only little affected by activity of man. In past not properly managed felling of timber aided soil erosion, that way washing away of the rendzina was coming about and the conditions for the rise of rock steppe were being created.

In the chasm the bulb-shaped dripstones on III. horizont are remarkable as well as a massive impression and an aesthetical value of the wall dripstone. The lakes form of the dripstone are singular, a water-lilies and an oolits namely.

Protection of the abyss is ensured by organizations referred to under paragraph 2 d. and the abyss is since 1986 a Protected Nature Phenomena. Legal documents directly concerning the protection of the abyss are stated under paragraph 2b. Protection of the abyss is ensured by organizations named under paragraph 2d.

The protection of the abyss is taken care of as well in the bounds of the protective zone of the protected nature phenomenon with an area 36,55 hectares, out of which 25,77 ha are protective forests. Protection of the abyss is ensured also in the bounds of protected zone of Protected Landscape Area, which is part of the international network of biosperic reserves.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

The Diviačia Chasm ranks among the deepest chasms in Slovakia and with its rich secondary decoration, evolution succession and uniqueness ra-

tes with the most beautiful and remarkable. Diviáčia Chasm is a demonstration of karstic processes bound with expressive tectonic faults in ladin limestones and serves for scientific and explorational goals.

The integrity of the chasm is ensured by legal protection, but also by the Action Plan of the Biospheric Reserve Protected Landscape Area Slovak Karst.

Name: S-03 The Drienovská cave

The localisation: The Drienovská cave is situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak karst and subwhole Jasovská planina. The geographical coordinates of its entrance are 48°37'30'' N.g.latitude and 20°57'15'' E.g.altitude. The Drienovská Cave is counted in a land-register of the Drienovec village in Košice-country district.

The legal state of law: The Drienovska Cave is a part of the State Nature Reservate of Palanta, proclaimed by Amendment of the Ministry for the Environment No 83/1993 Z.z in 1993.

The history of exploring: According to reports of the local inhabitants the cave was discovered in the second half of the past century by unknown explorers after a removal of the boulder cone covered strong spring. The cave was sometime made to temporary accessible, what is shown by pathway ruins in Lake Passage (Jazerná chodba). The speleological research was started in 20th years of our century by J. Zikmund who surveyed a part of the cave too. J. Seneš accomplished a large scale speleological investigation of the cave during the 1945 - 1954 years. He drawn a detailed map of the all passages discovered in that time. The archeological research was accomplished by J. Barta in 1955.

In following cavers from Jasov leaded by S. Furín investigated the cave in the second half of the 50th years. They explored the higher evolution levels and chimneys and attempted to excavate through boulder choke. In July 1969 the members of the Speleological Club from Brno drove a tunnel into the boulder fall and penetrated to 40 m.

From 1980 the Speleoclub Cassovia is exploring of the cave. In 1984 its members penetrated up an upper tier and in 1985 they discovered a way to the lower level over a first boulder fall (published in Zacharov 1985, Zacharov-Terray 1987). A length of the cave was increased up 1.3 km by this discoveries.

In 1985 cavers from Cassovia leaded J. Thuróczy exactly surveyed the cave by theodolit. In 1987 they drove a pit as new dry entrance and explored manholes on the upper tier. The geomorphological research of the cave was started in 1993 (Kladiwa 1993).

The description: The Drienovská Cave is situated on the south border of the Jasovská plateau 1.5 km to N from the village of Drienovec. The vault-shaped entrance with a typical erosion cross-section is opened on the south-western slope of the Palanta hill (366 m a.s.l.) near the Miglic valley embouchure.

The cave is situated in a close nearness of the shear thrust which borders the Hačava-Jasov particular structure of the Silica nappe. Karstifiable beds near cave are represented by carbonates of the Middle Triassic, mainly white and lightgrey limestones of the wetterstein type (ladin) somewhere crushed to tectonical breccia.

The Drienovska Cave is a cave with an erosion origin in the evolution stadium from Juvenile to Mature. The generally horizontal cave is developed in two altitude levels when lower from both is flowed through the whole length. Summary length of all passages is 1.3 km with altitude range 85 m. The passages are controlled by fissuring with the dominant direction 20°-200°, in entrance part with 110°-290° azimuthally. Generally the cave is gone to the NE.

In cave two evolution stages shifted in both time and direction can be determined, for lower level creating with 6-8 phases of widening and deepening and with a few cycles of the alternating accumulation and stream removal of the sediments.

A decoration is different on each tier. Various erosion and evorzion forms are remarkable on the lower level. Shapes of all dripstone and flow-stone types are represented there in creating. The massive dripstones on the upper level was self-destroyed by falls entailed their weight. A biggest dripstone in the cave is snowlike sinter streamfall with many miniature cascades closed the Gypsum Chamber. The area occurrence of the gypsum crystall crusts is notable too. The next interest type of the decoration are numerous pisolitic aggregates, dendrites and calcite shrubs-shaped forms craeting the unique formations, originally aragonitic and recrystallized to calcit subsequently. On the upper level is unique by occurrence of the druses of the calcit monocrystales with sizes from 9 to 12 cm, locally still 15 cm, compact covered walls of the small rooms.

The Drienovska cave is very important shelter for many species of the bat. They produce a layer of the guano on dripstones and boulders. Various troglobionts are lived near the guano. The cave is important also from the archeological point of wiew. In the entrance part both the Bükk and Pillin Culture pottery fragments have been found and human bones surpluses too.

The average air temperature in the cave is 8.9 - 9.1 °C and of the water there is 8.3 °C.

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The protection and conservation status

The Drienovská Cave presents a classic type of the cave created by a stream erosion with the object exhibits of the alternate of the accumulation and removal phases. The cave demonstrates all stages of the cave evolution from an early youth to an era of the falls and doom. Properties of the corrosion, erosion and accumulation are demonstrated too. Chemogen sediments are remarkable, correctly their varieties icnclusive helictites, particullary the Sinter Streamfall 8 m height and 5 m width is impressive.

Unique druses of the calcit monocrystales with side to 15 cm was a target of the mineralogists plunders in the past. The dendrites of the cave can be countered to rare phenomenas. An range of the area of the gypsum crusts occurence is notable too bat the clay stalagmites are world exotic.

Genesis of the cave isn't complete answered and its is needed in a continue of the speleological researche. The detailed microclimatic, biospeleological, tectonical and mineralogical investigations and exploring of the end parts of cave are planed. They raise some small changes in today's status of the cave regardless steps to reduce of the unsuitable impacts on the remarkableness of this cave.

The Drieňovská Cave is know yet from the second part of the past century and sometime was also freely accessable, what is origin of same drip-stone damages on the lower level, in Jazerna passage particularly. In 1983 members of today's Speleoclub Cassovia made a bars door in wet entrance of the cave as a protection for plunder visitors. After discovery of the upper passages the steel door was instaled in junction to them. In 1987 the second entry, dry, was driven by Speleoclub Cassovia for protection of the bats and animals lived in entry lake. The dry entry is closed by a metal trap-door but cavers plane its adjustment for a microclimatic regime touch up.

Law protection is ensured from 1993 in a frame of the State Nature Reservate Palanta, in which the cave is situated. The acts involved the cave is listed in paragraph 2d of the front part of the proposal. The conservation of this karst phenomena is ensured in frame of above showed S.N.R. Palanta and is co-ordinated by the Management of Protection Landscape Area Slovak karst.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

The Drienovská Cave represents an important locality of the spring cave. In one object its demonstrates a karstification variety. The cave is significant by some types of speleothems - the dendrites and the corral-shaped decoration, the druses of the calcit monocrystals and the gypsum crusts.

The Drienovská Cave is rare in Middle Europe by its genesis, cycles of the accumulation and erosion and the mineralogical finds. It is needed to consider its unique character in a context of the ansamble of all suggested objects, in which one represents complete evolution cycle of the karst cave.

The cave integrity is ensured by the protection of law as the part of the State Nature Reservation Palanta, prepared plans of the carefulness and by an action plan of the Protected Landscape Area - Biospherical Reservate Slovak karst, systematic carefulness by Speleoclub Cassovia in frame of the Gescia project (see below).

Name:

S-04 The Gombasecká Cave - the Silická ľadnica Ice Cave System

The localisation:

The Silická ľadnica Ice Cave and the Gombasecká Cave are situated in the Slovenské Rudohorie Mts., geomorphological whole Slovak karst and sub-whole the Silická planina Plateau. The geographical coordinates of the Silická ľadnica Ice Cave entrance are $48^{\circ}32'58''$ N.g.latitude and $20^{\circ}30'18''$ E.g.altitude and the cave is counted in a land-register of the village Silica. The Gombasecká Cave entrance geographical coordinates are $48^{\circ}33'46''$ N.g.latitude and $20^{\circ}28'02''$ E.g.altitude and the cave is counted in the village Slavec land-register. Both caves are situated in Rožňava district.

The legal state of law:

The Silická ľadnica Ice Cave is Nature Protected Phenomena, what was proclaimed by the Amendment of the Ministry of Culture of SSR No. 6176/1982 - 32 from the 30th September 1982. The Gombasecká Cave is a Nature Protected Phenomena proclaimed by the Amendment of the Ministry of Culture of SSR No. 9279/1972-OP from the 28th December 1972.

The history of exploring:

The Nature Protected Phenomena Silická ľadnica Ice Cave is situated at about 1.2 km SW from the village Silica. This cave abyss has attracting the native citizenship attention from time immemorial. From this reason the Silická ľadnica Ice Cave was the first nature object of the Slovak karst, about of the scientific society had heard. The report about it was given by the Slovak polyhistorian Matej Bél in his letter to the London Royal Society of Sciences in 1744 (Skutil, 1957). The Nature condition of the Silická ľadnica Ice Cave has been studied after this by more of the scientists, as A.A. Schmidl (1856), B. Schwalbe (1882), H. Sztéréyi (1883), K. Siegmeth (1909), and so on.

At the 4th November 1931 was succeeded by J. Majka to penetrate from the abyss bottom into the lower parts and to discover the recent Archeologický dóm (Archeological Dome) with the underground stream Čierny potok (Black Brook) and archeological discoveries. Today the Silická ľadnica Ice Cave is the place with concentrating attention of the cavers for the silicko-gombasecká cave system extension.

The opposite known part of the cave system is the Nature Protection Phenomena Gombasecká Cave. V. Benický (1934) said about a new cave system between the Silická ľadnica Ice Cave and Čierna Spring (Čierna vyvieračka) existence. The hydrographic problems of this system was solved and its existence was supposed on the whole riverbasin geomorphological conditions base also by Z. Roth (1939). The research more desirable circumstances has been created only after the Slovak Speleological Society foundation in 1949.

The Čierna Spring near the Gombasek attracted the mining geodeth V. Rozložník, who on to this time researchers supports has deciding to penetrate into this one by the outflowing riverbed water level lows. With L. Herényi, Š. Roda, A. Abonyi, A. Rusňák and Š. Ivanec all together were successful at the 21th November 1951 by the penetration again the Čierny potok stream, and this way they explored the Gombasecká Cave passages. The cave entrance is finding 11 m above the Čierna Spring and was in 1952 artificially joined with the Objavná chodba (the Discovery Passage). In the following years the cave was investigated and made accessible and on 15th May 1955 the cave was opened for the larger public. In the 60th years the

detail microclimatic investigation of the cave leaded Š. Roda was realized and the speleotherapeutic institution for asthmatic disorders, which was functioned with interrupts to 1993.

The description:

Both caves is part of the cave system created a underground river Čierny potok. The Silická ľadnica Ice Cave is situated on the Silická Plateau in 503 m above sea level and one represents short section in middle part of the hydrological system. The Gombasecká Cave in the distance about 3 km is situated up foot of the Silická Plateau in altitude of 244 m a.s.l. and the cave is an end of all system.

The impressive portal of ice abyss is turned to the NNE. The self ice abyss has a 30 m average large, 50 m long and 10 to 15 m high with the ceiling inclination at about 30°. Genetically it is very young phenomenon, with origin in the dome falling down in Silica-Gombasek Cave System. From the cave riverbed in the Archeological Dome is the abyss devided by the powerful layer of croase heap of rubbish, which is similar insulating from the warm cave air greater amount penetration. The abyss icing is dated just from this hindrance creation date and after archeological discoveries in horizontal cave parts is approximated to 2000 years (Kunský, 1950).

The Silická ľadnica Ice Cave is a classic static ice cave with three genetic types of the ice formations, namely: the floor ice, vertical ice formations and cave ice hoarfrost. The ice surface layer temperature during the summer season is at about 0 °C and the floor ice volume is reaching the minimal state (213 m³ measurement from the 1970). The maximum state is given year had been represented by the 340 m³ volume of the floor ice.

Before the thoroughfare from abyss closing (detrification) into the cave horizontal part this one a place of the prehistoric settlements. In the Archeological Dome (dimensions 60 x 35 x 10 m) were in the 1931 year discovery and the following years found the clay potsherds number, but also the twice type of settlement's vessels. Timely the oldier settlement, to this time investigated is the Bükk Culture of the Late Stone Age (Neolithic) falling into the 3rd millenium B.C. The second wealthier settlement from the Hallstatt Period - 2nd millenium B.C. The third youngier settlement has an origin in our chronology begin and represented by the La Tène Culture (the Late Iron Age). Exceeding this here were findet the human skull and the animal bones.

In 1988 the speleodivers from the Speleoquanaut Brno were successful in the penetration from the Archeological Dom due the outflow siphon (dimension 0.5 x 0.6 x 65 m) of the Čierny potok named Kufor into the following cave chambers: the Africká chyza (African Shanty), the Hlinitý dom (Clay Dome), the Dom Karina (50 x 30 x 40 m), the Hríbikový dóm (Mushroom Dome).

The Gombasecká Cave is evolved in light wetterstein limestones (Middle Triassic) and is originated alongside the tectonical breakdowns mainly ovaly forms and has been created by erosion activity of the Čierny potok stream and it's lateral flows. To the cave passages increase of main domes and halls has contributed in the great scale the rocks boulder breaking off and falling down from the ceiling and walls. Today the Gombasecká Cave represent the river type of cave with two to this time known stairs. It is geologically very young, there is impossible to see the accumulation stages change with the erosion ones.

The important places, which can be found in the cave are the Suchá

chodba (Dry Passage). This is remarkable by the clear white dripstones. The Suchá chodba is passing through into the Mramorová sieň (Mramor Hall) with 30 x 20 x 4 m dimensions, with heaping stalagmites and from the ceiling are hanging the thin white curls glass splendour and stalactite hanging of the red colour.

The next noteworthy chamber is the Sieň mieru (Hall of Peace), where are from the ceiling hanging the thickly growthed thin straws of white and also pink colours. Their diameter is 0.5 cm and lenght to 3 m. On the brown red substructure of limestone's walls they woking up an impression of stoned rain. From the Hall of Peace by the cleft corridor we passing into the Sieň Múdrosti (Hall of Wisdom) with 10 x 15 x 9 m dimensions, which was appeared by the fall down. It's adornment is created by pagoda-shaped stalagmites (still 2 m height), from which is attraking the 60 cm heigh stalagmit of owl form - what is considering as a wisdom sign. The above mentioned chambers are a part of the exposition tour 300 m lenght.

From the Wisdom Hall it is possible to pass into the Hlinená chodba (Clay Passage), evoluted on the cleft by the large of 1-2 m and 5-8 m height. From this we reach the Brkový dom (Quill Dome, what is covered by the yellow brown clay sediments by 8 m croase. From this hall it is possible falling down to the Čierny potok stream, what is flow to here from SE, from the Silická Ľadnica Ice Cave area. The cave total lenght is 1525 m.

The public awareness:

The most noteworthy nature speciality of the Slovak karst is the Silická Ľadnica Ice Cave which from speleoclimate point of view is an unique phenomenon. In spite of this it is relatively few known and is visited only by peoples known the circumstances.

Contrasting to this the Gombasecká Cave from 15th May 1955 date of made accessible begin to be one of the most visited caves in Slovakia in which had been successful aplicated the speleoclimate therapie methods.

The bibliography:

The bibliography of the Jasovská Cave is very numerous, mainly with speleological, microclimatic, speleotherapeutic and archeological branch, therefore here is presented some significant titles only.

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The protection and conservation state

The Silická ľadnica Ice Cave is finding just outside the frequent tourism routes and is visited only by peoples known the circumstances, but regarding to the unique rate of this phenomenon from the speleoclimatic point of view is necessary to create so circumstances to not is happening the microclimate conditions destroying.

The Gombasecká Cave is geologically young cave, when beside the old whatered stalactite formations are occuring the living, geologically very young curls with continued growth also today by the atmospheric water penetration. From this reason is necessary to investigate the microclimate circumstances evolution depending on the visit rate.

The Silicko-gombasecká cave system protection is provided by the organisations mentioned in the 2d. point, from the 1972 is the Gombasecka Cave a Nature Protected Phenomena and the Silická ľadnica Ice Cave from the 1982.

A protection of the Gombasecká Cave - the Silická ľadnica Ice Cave System is providing also through the protected zones both of the Nature Protected Phenomenas. The protection is provided also due the Protected Landscape Protected Area, what is the international network of the biosphere reservation part.

The reasons because of the wealth is considered regarding on one or more criterias to

The Silická Ľadnica Ice Cave from the speleoclimate point of view is an unique phenomenon and probably it is representing the most lowly placed ice cave of the world to this geographic latitude.

The Gombasecká Cave is still permanently geologically living with the unique adornment represented by the curls of the length still 3 m. The whole geosystem is an example of an unique and specific karst evolution with objectionally nature beauty components. The cave system with the protecting zone involve all of the components of ecosystem, what protection is a guarantee of the continuing geological process - the curls growth in the Gombasecká Cave, respectively the icing preservation in the Silická Ľadnica Ice Cave.

In Slovak Republic are exceed the Silická Ľadnica Ice Cave finding still two caves with the ice adornment (Dobšinská ľadová jaskyňa - Dobšinská Ice Cave and the Demänovská Cave), but the above mentioned Silická Ľadnica Ice Cave is the most low placed ice cave (503 m above the sea level). The Gombasecká Cave is geologically living cave and by it curl adornment of considerable amount is an unique natural phenomenon not only in the Slovak karst, but also from the world point of view.

The cave system integrity is provided by the protection of law, but also by the protection plans involved into the protectioning zones and the Slovak karst Biosphere Reserve action plan.

Name:

S-04 The Hrušovská Cave

The localisation:

The Hrušovská jaskyňa is situated in the Slovenské Rudohorie Mts., geomorphological whole Slovak karst and subwhole Silická Plateau. The geographical coordinates of its entrance are 48°36'08'' N.g. latitude and 20°38'37'' E.g. altitude and the cave is counted in the village Hrušov land-register in Rožňava district.

The legal state of law:

The Hrušovská Cave is a part of the State Nature Reserve Hrušovská lesostep (Hrušov foreststeppe), proclaimed by the Amendment of the Ministry of Culture of SSR No. 56/1984-32 from the 30th April 1984

The history of exploration:

The spring emptying periodical regime hydrological investigation, but also the massive accumulation of travertine at the valley and were the reason of the speleologists interest, what was resulting to the cave discovering. The Hrušovská Cave has been discovered at the 10th May 1978 by Robert Boroš and Tomáš Lázár, members of regional group of the Slovak Speleological Society in Rožňava. The discovery was accomplished by the passing into the Evetes Spring through the senile inundation corridor.

The Evetes Spring is situated on the eastern foot of the Silická Plateau in the Slovak karst near a land-register border between the Hrušov and Jablonov villages in the Rožňava district. In the spring space the Silická Plateau create an amphiteater through which is conducted the state road from the Soroška saddle at about 75 m near the east entrance to the tunnel of the railway road Plešivec-Košice.

The description:

The Hrušovská Cave is situated on the Silická Plateau and Horný vrch boundarie on its foot, S from the Soroška saddle. After the underground spaces direction the cave is belonging to the Silická Plateau. The cave has an origin in the grise Trias limestones of the Silica Nappe. The cave entrance is in the remarkable well amphiteater of Eveteš spring cca 300 m N from the Hrušovské rybníky (fisheries). The old fossil spring hole is by a part whole by the heap of rubbish, originated in the 195 m above the sea level height, was digged through the Slovak Speleological Society group members in Rožňava. The cave entrance part is created by 30 m long and closely cannal passage which have in the Dom Fundovaných the estuary. Ago the self Entrance Dome is a smaller abyss (depth cca -4 m) on the bottom with the outflow siphone lake of Evetes spring. To the Dom space we can pass through form the East side and going into the activ underground flow riverbed. Regarding to the surface narrow have the Dom Fundovaných an fall down character, the bottom is created by the boulders of the greater dimension, what consequence is the whirlpools creation by the underground flow and the waterfalls. In this dome with 25 m long average croase of 8 m is finding the more important sintres adornment.

From the side have an estuary into the Dom Fundovaných a side flow passage of the underground flow, what by its articulated character has gived the name Meander. The passage lenght cca 40 m is ovally turned from the back N direction to the W. The passage is founded on the vertical tectonical clefts and its morphological character is typically erosive.

After the mentioned 40 m the Rožňavská passage turns from the N highery placed estuary, by which but is flowing through unactive flow, this is flowing from the Mokra passage. this passage lenght of the approximately 80 m is the influx passage of the underground flow with greater sand-clay sediments accumulation, what are lower its profil. The passage ending by the influx siphone is.

Comming from the mentioned Meander we rise to the highery situated Rožňavská passage. The passage is long at about 200 m and from the begining N direction is turning on W and is parallel with the Mokrá chodba (Wet Corridor). From the beginings narrover passage of the eliptic forms is in the following flow by the inclined tectonical break down particulated onto the smaller cave halls. The bottom is created previsiously by sand-clay sediments and secondary adornment is represented by various sintres forms. This passage together with the Slovak Speleological Society (SSS) DOM, what is coupling this one, represent the genetically oldier evolution level, abandoned by the underground flow as the consequence of an origin erosion base lowing.

The SSS Dom is long 30 m and by its gothic vault of high average 15 m is the most highest space of yhe cave. If the bottom of Dom is created by the sediments, for the sintres adornment are characteristical the massive stalagtites and hangings, this same time we can here at first time to meet the macrocrystalled excentric formations. At the Dom end the cave is continuing by the low fall down passage, what is after at about 20 m stuffed off the sediments.

The third horizont of Hrušovská Cave is accessible by the chimney from the SSS Dom in relative hight 13 m and have a name Dom of Optimism. This Dom, locally large till 15m and lenght 25 m create the Hrušovska Cave dominance. The characteristics is thge subhorizont cleft genesis with the plauzabil evolution of the river erosion. The dominanting sintres adornment is created by the extrentic macrocrystallic formations, what is laying on the healed microclefts with the large scale extension. The unique formation, equivalent with the damaged formation of the Domica Cave named the Smútočná vřba (the Sorrow willow) is in this Dom growing from the floor as the excentric maxiform.

From the describes most higher cave level we are going again back into the Rožňavská Corridir and passing down to the approximately depth 5 m to the active flow influx siphone.

In the SW direction of the active flow current we go through the at about 70 m long passage named Ave Maria. The passage no doubtly has an end in the siphone, but the underground flow at about the 15 m of the unknown way flow out due the siphone of Mokrá Corridor.

The Hrušovská Cave is a spring cave of the underground flow on the verfen slates anticlinal elevation on the Silická Plateau and the Plateau Horný vrch (the Upper Hill) demarcation line. The total lenght is today gived to at about 780 m. The air temperature of the cave indoor part is during the year at about 10-11 °C.

In the cave has been finded the bats *Rhinolopus suryale* bones.

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The protection and conservation state

The Hrušovská Cave is not so long ago discovered and the people activities manifestation was expressed in the minimum degree. In the most places the cavers by the making to accessible have used the investigation sounds, leaving the minimum of traces on the cave adornment.

The cave protection is provided by the organisation mentioned in the 2d. point. The cave is protected of law from the 1984 as the Nature Protected Phenomena.

The documents of law touched the cave are mentioned in the 2b. point. The cave protection is provided by the organisations mentioned in the 2d. point.

The protection of this karst geosystem is provided also due the protected zone of the State Nature Reservation at the extent 40.27 ha, in the total amount it is the forest stocks, exactlier the protectioning forests.

The underground waters currenting the Hrušovská Cave are used as the drinking water source. This source have on the surface stated the hygienical protection zones, which have to ensure the mentioned source quality. Through the hygienical protection zone of the II. degree is passing the exponaded state road first class I/50 Košice-Lučenec and the same time the railways Košice-Zvolen with the diesel transportation.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

The Hrušovská Cave is a valuable karst discovery. The cave represent of the type locality of the spring caves. The protection is required also from the water source protection point of view. Exceeding the underground cave space interesting forms there are here also valuable sintres formations, any unique monocrystals of calcit, special are mainly the helictites and excrescences of the sintres crystals, representing in the Slovak karst the unique phenomenon.

The cave integrity is provided by the protection of law as the State Nature Reservation Hrušovská Lesostep (Hrušovska Foreststeppe) in its protected zone, but also due the biosphere reservation of the Protected Landscape Area Slovak karst action plan.

Name: S-06 The Jasovská cave

The localisation:

The Jasovská Cave is situated in region of the Slovenske rudohorie Mts., geomorphological whole Slovak karst and subwhole Jasovská planina. The geographical coordinates of its entrance are 48°40'40'' N.g. latitude and 20°58'41'' E.g. altitude. The Jasovska Cave is counted in a land-register of the Jasov village in Košice-country district

The legal state of law:

The Jasovská Cave is Protected Nature Phenomenon proclaimed by Amendment of the Ministry of Culture SSR No 9286/1972-OP from the December 28, 1972

The history of exploring:

Entrances of the caves belonged to the system of Jasovská cave were known from time out of mind. Results of the archeological researches shown that the cave was settled in the Paleolithic (the Aurignacien Culture), from Neolithic Era without interrupt. In the Middle Ages cave gave a shelter for inhabitants of the near both village Jasov and famous monastery during the Tatar's as well as Turkey's invasions, in the time of the insurrections leaded by Š. Bocskay and F. Rákóczi II. It is supported by many finds of the medieval potshreds and by numerous notices on the walls. The oldest proved notice on the cave wall is witness about a victory of the Jan Jiskra from Brandys forces from 1452. Next notices are came from 1654 to 1657. It is remarkable that any writed references about the cave was not found in an ample library of the premonsters monastery established in 12th century, which is considered up 30000 volumes.

The Jasovská cave is countered to oldest accessible caves in world. The cave was made to a public access in 1846 by Alojz Richter, a superior of the premonster canonicals in that time, for needs of the Košice's Assembly of the Hungarian Physicians and Natural Historians Society. According today's titles next passages was made accessible: Vstupná chodba (Entrancy Passage), Kamenná chodba (Stone Passage), Jedáleň (Dining Room), Starý dóm (Old Dome), Malý kostol (Small Church), Dóm netopierov (Bats Hall), Hlinená chodba (Clay Passage) and passages behind the Bats Hall (Srdcová komora - Heart Chamber). Difficult junctions was equiped by the wood steps as well as the bridges in passages needed in its. Parts from entrancy to Dinnig Room was enlarged in those time.

The cave was made accessible by a progressive way on 20. 7. 1924 and electrically illuminated in 1926. In the 1931 a new entrance was driven into cave and a new portal of entry was arranged. Very undesirable influence to the cave has got the time amount of the 1939-1949 years when the cave was owned by the premonsters order, respectively during and closely after the Second World War, when was happen the cave equipment neglection and also the markable damaging.

In 1878 J. Nyári realized an archeological researches in the cave, oldest known us. The first systematical research of the cave accomplished by geologist and paleontologist T. Kormos in the 1916, an extensive archeological researches in the cave headed prof. J. Eisner was realized in years 1924-25. In 1955 a correction archeological researches was accomplished by V. Ložek for more exact dating. L. Olexa headed a rescue archeological investigation in 1978 for a modification of the entrance part.

The Jasovská Cave is well-known by finds of the paleolithic bone and silicate tools dated to the Middle Aurignacien, the fragments of the Neolithic Bükk Culture pottery, the jewelry and utilities from the Bronze Age. It is well-known by intensive Hallstatt settlement with a proved beginning of the iron production, finds of the Roman Period and numerous valuable finds from the Middle Ages as well as historical notices showed on a refugial function of the cave.

In 1923-24 the Jasovská Cave was explored by V. Bluma, which drawn a plan of the cave too and by J. Zikmund, which exactly surveyed the cave. Next speleological exploring in cave was realized by J. Mitický and Š. Furín in the 50th years. Detail geomorphological researche of the cave was realized by A. Droppa in 1962. Members of the today's Speleoclub Cassovia explored the cave in the 70th years (Zacharov 1982).

The description:

The Jasovská Cave is a known cave system in geologic complex of the Jasovska skala Mt. (Jasov Rock) situated in the northeastern part of the Jasovská plateau. The cave is created in mesozoic carbonate rocks of the Silica Nappe - limestones and dolomites of the Middle Triassic.

It represent importantly complicated system with five evolution levels, connected with the ground by more entrances of the artificial and natural origin. The cave inside content from the widely doms, halls and passages with a summary lenght 2308 m and with an amplitude altitude 42 m. More significant chambers are created on the fissures of the E-W direction, for example Entry Junction, Old Dome and Tiger Passage, also Great Dome with the Smith Furnance Room, Mud Chamber, White Dome, Dining Room, Exit Passage and others. Most great chambers was created by falls on a crossing of the main direction fissures with faults of the NE-SW direction mainly and N-S direction too. This way for example Bat's Hall and Labyrinth were created.

Oldest channels created by a corrosion and an erosion of the vertically penetrated water was enlarged by waters of the Bodva river, for which the Jasovská skala Mt. represented a stream-attack riverside. Proved old passages in an entrance part have got a tunnel cross-section with well developed top trench. Passages was choked up by mechanical river sediments, later removed by nature way or by unearth. In west region of the cave a river activity made less.

Walls of the passages and domes boast a rich decoration of the flow-stones, sinter streamfalls, curtains and other forms of the dripstone. The massive stalagmit 8 m height and with perimetre of 28 m is remarkable in the Old Dome. The sinter drum in the Jewellery Room. The dripstone of the cave is noted for their massive impression. A signification of the cave on archeological point of view is presented in the paragraph on a history.

The bibliography:

The bibliography of the Jasovská Cave is very numerous, therefore here is presented some significant titles only.

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Bluma, V. 1924: Chronológia prác vykonávaných vojakmi moldavskej posádky v Jasovskej jaskyni v roku 1923 (The works accomplished by the soldier

- of the Moldavian garrison in the Jasovská Cave in the 1923 year). Manuscript 9,2.1924. Archív MSK a OP.
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- Orvan, J. 1977: Príspevok k hydrogeologickým pomerom Jasovskej jaskyne (Notice to the Jasovská Cave hydrogeological conditions). Slovenský kras, 15, s. 53-60, Martin
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- Zacharov, M. 1982: Geologicko - štruktúrne pomery siení za sifónom v Jasovskej jaskyni (The geological-structural condition of the chambers behind a siphon in the Jasovská Cave). Spravodaj Slovenskej speleologickej spoločnosti No.3, s. 22-26, Liptovský Mikuláš.
- Zacharov, M. 1984: Výskum geologicko-štruktúrnych pomerov a deformácií v Jasovskej jaskyni (Investigation of the geologic-structural conditions and deformations in the Jasovská Cave). Slovenský kras, XXII, s. 69-94. Liptovský Mikuláš.

The protection and conservation status:

The Jasovská Cave represents complicated cave system in tectonic faulted complex of the limestones and dolomites, which was shaped by allochthonous river in five levels. The cave demonstrates a historical evolution of the relation between man and cave in a time range up ten thousands years from primary settlement to refugal function and today's object of the science research and tourist attraction. Remarkable is the dripstone signed a massive impression. The cave is a significant winter shelter of the bats.

The numerous of the cave passage damages are entailed by frequent works to make a cave accessible in past. We consider as most mark a temporary unstability limestone blocks as a consequence of the blasting operations for an entrance tunnel driving, some destructions of the dripstones entailed by a drying of the clay substrate and an expansion of the lampenflora.

The time amount till the 1972 year when the Jasovská Cave was proclaimed to the Nature Protected Phenomena (and when its protection of law has been ensured) was left many enough negative footprint on the cave passages and decoration (the passages arrangement during its accessible making, various excavation works in the sediments connected with the exploring activities, but with the chance visits in the cave).

The law protection of the cave is provided from the 1972 year, when

the cave was proclaimed the Nature Protected Phenomena. Researche of the hydrological relations in the cave was realized in 1976, researche of the limestone massif stability was gone in years 1979-1982, when one confirms no peril of the cave. In last years the microbiological measurements of the air in cave were realized.

The cave is closed by steel doors. A periodic monitoring of the state of the cave is going.

The protection of this specifical karst geosystem is provided also due the Protection zone of the Nature Protected Phenomena as well in frame of then Protected Landscape Area Slovak karst, what is involved to the international network of the biosphere reservation.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage:

The Jasovská Cave is a valuable karst creation presented in suggested area a activity of the allochthonous river in tectonic faulted limestone-dolomite massif and especials of the genesis of the cave passages and speleothems in complicated tectonic conditions. It is needed to consider its unique character in a context of the ansamble of all suggested objects, in which one represents a historical varieties of the relation man-cave from Stone Age to today.

The cave integrity is provided by the protection of law, but also with the preparing preservation plans in frame of the its protected zone and in action plane of the biosphere reservate of the Protected Landscape Area Slovak karst.

Name: S-07 The Krásnohorská Cave

The localization

The Krásnohorská Cave is situated region of the Slovenské Rudohorie Mts., geomorphological whole Slovak Karst and subwhole Silická planina. Geographical coordinates of its entrance are 40°37'04" of north g. latitude and 20°35'30" of east g. longitude and the cave is counted in a land-register of the Village Krásnohorská Dlhá lúka in Rožňava district.

The legal state of law:

The Krásnohorská Cave is a Protected Nature Phenomena, which has been proclaimed by Amendment of the Ministry of Culture SSR Nr. 9281/1972-OP from the 28th of December 1972.

The history of exploring:

The smaller crack which powerful draught was felt through was opened in 1953 when water service was clearing about 30 m long section of the surface flow which streamed from Silická planina massif, 400m southeast from the village Krásnohorská Dlhá lúka. It was clear proof of direct air connections of the cave passages. The approximate borders of the cave system have been determined after longer surface reconnoitring of karst phenomena.

The cavers from Rožňava headed by Š. Roda started the exploring works at 14th March 1963 by a deepening of wheel-bed, which lowered the level by 2.5 m. The pyrotechnic work which has started on 15th May 1963 aimed at clearing of the chimney and being able to enter the farther spaces of the cave.

The work was successfully ended irregularly to the 18th of July 1964, when 180 m long crack cave system was overcome and the cavers from Rožňava group of Slovak Speleology Society entered to the bottom of huge cave passage river-bed.

The measuring work realized in 1965 found that the highest stalagmite all over the world with 32.706 m height is situated in the Krásnohorská Cave Hôrka.

In the 70th years works started to make the cave accessible. The fifty six meters long mine passage which enable the simple entrance was forced later for easier accession of the cave.

In 1981-83 speleodivers from Trenčín successfully explored a ending siphon and discovered 200 m of new passages. Next discoveries was achieved in 1984 in chimneys by cavers from Rožňava.

In the 90th years a project for use of the cave as source of drinkable water was prepared.

The description:

The Krásnohorská Cave is situated on the north foot of the Silická Plateau. Its entrance part is gone through gray gutenstein limestones of Lower Anis Period with dolomite boundis. The continued part of cave and its upper levels is created in the light steinalm limestones of Upper Anis Period.

The Krásnohorská Cave represents a type of the river cave in Juvenile and Mature evolution stage which was created on vertically fissures mainly. The cave is flowed through by stream, which runs out in the Buzgó Spring. In upper chambers a determination of the levels is very difficult therefore they representate halls and chimneys created by a vertically penetrating

rainfall water.

Thw bibliography:

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- Roda, Š. 1966: Je najvyšší na svete? (Is it the highest all over the world?) Krásy Slovenska, 7, pp. 258-269, Bratislava
- Roda Š., Rajman L., Erdös M., Szabová T.: Vznik a vývoj sintrových foriem v piatich jaskyniach Slovenského krasu (Rise and evolution of the sinter forms in five caves in the Slovak Karst). Rimavská Sobota 1982.

The protection and conservation status:

The Krásnohorská Cave is accessible only for small speleological society, therefore the possibility of the damage or endangerment of the Cave decoration is minimal. Entrance passage forcing and pyrotechnic work impress their influence there.

Protection of the Krásnohorská Cave is protected by organizations mentioned in 2d point. The Krásnohorská Cave is proclaimed by Protected Nature Phenomena from 1972.

Protection of this karst geosystem is secured also in a frame of protected zone of Protected Nature Phenomena as well as Protected Landscape Area Slovak Karst, which is part of international biospheric reservation network.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

Suggested natural heritage is an example of unique karst geo system development with the exceptional beautiful elements. The highest stalagmite all over the world for the present so called " Stalagmite of Rožňava speleologists" with the height 32,706 m is situated in the Krásnohorská Cave.

The integrity of the cave is secured by the juridical protection as well as by the prepared carefulness plans and action plan of biospherical reservation of Protected Landscape Area Slovak Karst.

Name:

S-08 The Ochtinská aragonitová Cave

The localization:

The Ochtinská aragonitová Cave is situated in region of the Slovenské Rudohorie Mts., geomorphological whole Revúcka Vrchovina and subwhole Hrádok. The geographical coordinates of its entrance is 20°10' 36" of north g. latitude and 48°39' 40" of east g. longitude. The cave is counted in a land-register of the Ochtiná village in Rožňava district.

The legal state of law:

The Ochtinská aragonitová Cave was proclaimed as a Protected Nature Phenomena by the Amendment of the Ministry of Culture SSR No. 9282/1972 - 08 from the 28th of December 1972. Inclusion of the Ochtinská aragonitová Cave into the List of the National Nature Monuments which will be a part of the most remarkable natural heritage of Slovak Republic is expected in connection with preparing new law of nature and landscape protection of Slovak Republic.

The history of exploring:

The Cave was discovered in 1945 during the mining work. It has become accessible to the public in 1972 and the juristical protection of it was secured at the same year, too.

The description:

The Ochtinská aragonitová Cave has been created in the lens of the paleozoic crystalline limestones in the area of Ochtiná cryptokarst. The development of the Ochtinská aragonitová Cave has connection with specific structural and tectonic, hydrogeochemical and paleoclimatic conditions during the whole geological development. It is the result of metasomatic processes (matasomatosis of limestones) operations which determined the ankernites arisen.

The cave chambers have created by weathering and successive wasting ochre ashore. This process is operating also in the present. The Cave chambers were fulfilled by pin, spiral and kidney - shaped excentric forms of aragonite. Radioisotopic dating by U/Th method which has been realized in Mc. Mastec Univ. laboratories in Hamilton (Canada) determined the age of the aragonite decoration from 13,600 ± 500 years (pin form of aragonite) to 138,400 ± 6,800 years (kidney-shaped form of aragonite).

The public awareness:

The public opinion according the result of readers inquiry in the Ekopanorama magazine Nr. 1/1990 supports the inclusion of The Ochtinská aragonitová Cave into the list of World Cultural and Natural Heritage.

The bibliography:

- Droppa, A. 1957: Ochtinská aragonitová jaskyňa (The Ochtinská aragonitová Cave). Geologický Časopis, Bratislava.
- Homza, Š.-Rajman, L.-Roda, Š. 1970: Vznik a vývoj krasového fenoménu Ochtinskej aragonitovej jaskyne (Origin and development of the karst phenomenon of the Ochtiná Aragonite Cave). Slovenský Kras, vol. VII, Martin
- Králik, F. - Skřivánek, F. 1963: Aragonit v československých jeskyních (Aragonite in Czechoslovak caves). Československý Kras, vol. 15, ČSAV, Praha
- Kubiny, D. 1959: Aragonitová jaskyňa na Slovensku (Aragonite cave at Slovakia). Ochrana Přírody, vol. XIV., Nr. 1, Bratislava

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- Rajman, L.-Roda, Š. jnr.- Roda, Š. sen. - Ščuka, J. 1993: Untersuchungen über die Gneise der Aragonithole von Ochťiná (Slowakei). Die Hole, zeit. of karst, heft 1 Wien
- Ševčík, R. - Kantor, J. 1956: Aragonitová jaskyňa na Hrádku pri Jelšave. (Aragonite cave in Hrádok near Jelšava). Geologické práce, zprávy 7/1956, GÚDŠ Bratislava

The protection and conservation state:

The aragonite decoration of the Ochtinská aragonitová Cave had been partly damaged before the securing of its juristical protection. The cave has become accessible to the public in 1972 by 143.5 m long gallery. The twohundred and thirtyfive meters from the total cave length 300 m is accessible. Present interferences in connection with the work which made the cave accessible have had a negative influence to the cave microclimate what cause the corrosion of the secondary decoration. It is necessary to regulate the microclimatic relations of the cave so that it prevent the water steam condensation by the gallery entrance closing as well as the direction or the exclusion of visiting.

The protection of the Ochťiná Aragonite Cave is secured by the organizations mentioned in 2d point. This Cave is juridical protected from 1972 as a protected natural creation. The control of standing by protected condition is held in the Cave annually. The results of the Cave research are used or will be used for this geosystem protection.

The protection of this specific karst geosystem is secured also in frame of protected zone of protected natural creation with area 73.29 ha from which wood takes 71.83 ha. The protection of the Ochtinská aragonitová Cave is secured in frame of protected zone of protected landscape area which was in 1977 included into the international network of biospheric reservations. Prepared action plan of biospheric reservation will support the fastening of ecosystem integrity which create immediate cave surroundings.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

Suggested natural heritage is an example of unique karst geosystem development with the exceptional beautiful elements. the cave together with the protected zone includes all parts of ecosystem which protection is a guarantee of the following geological process: metasomatosi of limestones.

Caves with the aragonite occurrence are known in Slovak as well as elsewhere in the world but the aragonite occurs in these caves only rarely. The Ochtinská aragonitová Cave is according the present knowladges the most unique world important natural phenomenon from the point of specific development view as well as copiousness of aragonite decoration.

The integrity of the cave is secured by the juridical protection as well as by the prepared carefulness plans not only in the frame of protected zone, but also in the frame of action plan of biospheric reserve of Protected Landscape Area Slovak Karst.

Name:

S-09 The Obrovská Chasm

The localization:

The Obrovská Chasm is situated in region of the Slovenské Rudohorie Mts., geomorphological whole Slovak Karst and subwhole Dolný Vrch. The geographic coordinates of its mouth is the 48°34'02" of north g. latitude and 20°41'05" of east g. longitude. The chasm is counted in a land-register of the village Jablonov nad Turňou.

The legal state of law:

The Obrovská Chasm is not particularly protected; its juridical protection is ensured in a frame of the Protected Landscape Area Slovak Karst, which was determined by the Amendment of the Ministry of Culture SSR No. 110/1973 Zb. from 30th August 1973.

The history of exploring:

The members of Hungarian speleological club Meteor Budapešť were first ones who entered the spaces of the Obrovská Chasm in 1959. However, the first measurment of depth was realized by the members of Karst section of National Museum Association in Prague and they found depth - 103 m.

The description:

This remarkable area is the deepest chasm on the Slovak part of Dolný Vrch Plateau. It belongs to the group of chasmes localized near Köves Tertés Kút. It is situated 440 m west from the well and 240 m west from the Fertés chasm.

The mounth of the chasm is at the platform among the water boreholes. The square ground - plane of the small holow has dimension 9 m. It is possible to descend to the depth 10 m under the South wall where is real chasm mouth of dimensions 2.5 x 1.5 m. It is bordered by the vertical wall from three sides. The main giant shaft continues downwards in the south and east corner of the wall. The main shaft has depth - 63 m and carries on the cone of rocks which is 6.5 m high. There is a larger dome which is broadened in a bottle shape. The other continuation by the shaft 3.5 x 8 m with depth 20 m is in the west part of this dome. The small window which falls into the Gallery with lenght 8 m is in the south-west part of main shaft in the depth - 30 m from the surface. The small lateral chasm which is again joined to the loft of main dome after 20m of depth leads from this Gallery.

The richest sinter decoration is right in the Gallery. It was found by measurement of depth that the total depth of the chasm is - 103 m.

The bibliography:

- Hradecký, P. et al. 1974: Propasti planiny Dolný vrch ve Slovenském krasu (Chasmes of the Dolný Vrch plain in Slovenský Kras). Československý Kras, 26 pp. 53-73, Praha
- Stárka, V. 1968: Do hĺbin Obrovskej priepasti (Into the depth of Obrovská chasm), Krásy Slovenska, 1986, pp. 10-11 Martin

The protection and conservation state:

The Obrovská chasm was discovered till in 1959 and the whole area of Dolný Vrch is relatively little visited therefore the chasm has no serious traces of damage. It is the deepest chasm at the Dolný Vrch plain with relatively heavy entrance and thus only mature speleologists visit the

chasm.

The protection of the chasm is guaranteed by the organization mentioned in 2d point. Since 1973, the chasm is a part of Protected Landscape Area Slovak Karst and it is not particularly protected.

The integrity of the chasm is guaranteed by juridical protection as well as by prepared carefulness plans not only in the frame of Protected Landscape Area Slovak Karst Kras but action plan of biospheric reservation, too.

Name:

S-10 The System of the Skalistý potok Cave - Kunia Chasm

The localization:

The Skalistý potok Cave and the Kunia Chasm are situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak Karst and subwhole Jasovská planina. The geographic coordinates of the Skalistý potok Cave entrance are 48° 37' 24'' n. g. l. and 20° 53' 34'' e. g. a.. The geographic coordinates of the Kunia Chasm mouth are 48° 37' 47'' n. g. l. and 20° 52' 58'' e. g. a.. Both caves are counted in a land-register of the village Háj. in Košice-country district.

The legal state of law:

The Skalistý potok Cave and the Kunia Chasm are not particularly protected, their juridical protection is secured in the frame of the Protected Landscape Area Slovak Karst, which was established by Amendment No. 110-1973 of the Slovak Ministry of Culture of SSR on 30th Aug. 1973

The history of exploring:

The karst spring-out of the Skalistý potok called as the Birešova Cave too belongs among springs in the southern part of the Jasovská Plateau. It became speleologically interesting in 1968, when an exploration adit was driven in the proximity of the Skalistý potok spring by workers of IGHP n.c. Žilina, plant Košice. After 13m they drove into free chambers which went down and over 25m from the entrance a water surface appeared. At pumping trials that followed the water level was lowered by about 2m and that enabled to penetrate as far as 60m from the entrance. In 1982 speleodiver J. Kucharovič explored siphons over 258 m from entrance.

Starting in 1986 the speleodiving group headed by Z. Hochmuth successfully overswimmied 21 siphons to rise part and in this way explored the cave to today's known length more than 3274m with the rise of 284m was verified.

The Kunia Chasm is the next cave, which passages created together with the Skalistý potok Cave one karst cave system (at present not penetrable yet). The first information on existence and investigation of the Kunia Chasm comes from 1947, when G. Stibrányi, sen. descended through a narrow oval orifice of the slope abyss into the depth of -28m. From there, after widening the narrow place, he penetrated into the depth of -53m in 1953. In 1975 this part of the chasm surveyed G. Stibrányi, jun.

Later members of the today's Speleoclub Cassovia from Kosice started exploring work in the abyss and as late as 16th Febr. 1986 Š. Labuda, J. Tencer, J. Ferenc and V. Valiska successfully penetrated into new abysses of the Kunia Chasm. In the next year cavers reached the record depth in the Slovak Karst of -203m in this chasm.

In 1986 members of the Speleoclub Cassovia surveyed the cave and proved direct connection between the Kunia Chasm and Skalistý potok Spring by colorimetric tests. Next smaller caves (Kamenná pivnica Cave, Fakir Chasm, Borsučia Chasm) explored by cavers from Košice in 1988-1993 belong to the cave system.

The description:

The entrance mine gone into the Skalistý potok Cave, is situated on the foot of a steep slope by which the Jasovská Plateau falls into the Košice Basin. From geological point of view, the south margin of the Jasov

Plain is formed by Middle Triassic limestones - of the wetterstein type and is counted to Silica-Turna structure of the Silica Nappe.

In summer the Skalistý potok Spring has average yield of 7 l/s. In conditions of increased surface and underground run-off, e.g. during or after greater rainfall or in springtime the yield of the Skalistý potok Spring Brook spring increase to 300 l/s, extremally to 700 l/s. In such situation the underground stream of the Skalistý potok represents evidently a single long siphon, some raises only are not flooded. The water collection area covers whole northwestern part of the Jasovská Plateau. At the same time, hydraulic connection with the stream in the Kunia Chasm was proved by dyeing tests.

The Skalistý potok Cave represents a system of crevice passages and it consists of two considerably different parts. The horizontal siphon section is over 1500m long and is brocaded over by totally 21 siphons with the length up to 130m. The general direction of this section is E-W or ESE-WNW and it runs parallelly with the Jasovská Plateau margin.

From the section the second part of the cave follows up against the stream, which has character of a mountain cave comprising meandering sections with an active flow-bed and vertical sections, wells up to 31m deep, by which the water stream falls in waterfalls. The cave runs under slopes of the plain and its highest parts are situated already under the plain proper surface, with continuation northward. The cave ranks, according to its vertical rise, to the first place among the Slovak Karts caves and to the fourth place in Slovakia. The mentioned second part of the cave has unique decorations comprising helictites, eccentric sinter formations and particular powder sediments.

The proper chambers of the cave are modeled by the underground Skalistý potok stream, which forms a great number of siphons, small lakes, wells and rock thresholds with waterfalls. The rise between the NW and SE (cave orifice) parts represents about 230m. The cave is almost without secondary decorations, only in dry parts there are isolated sinter crusts.

The passages of the Kunia Chasm and the Skalistý potok are closest each of other approximately in the area of 6th siphon. The Kunia Chasm is situated in the Jasovská Plateau south slope, about 3km north from the village of Turnianske Podhradie, and it represents a system of vertical abysses with different stage of karst-forming. They are separated by different direction dislocations in height into individual grades. The oval hole of the abyss is 80cm wide, it widens gradually down to 52m depth, onto so called "Old bottom" with nice sinter decorations.

Through a narrow crevice the chasm continued into the Lake Passage (30m long) with flowstone cascade lakes with 1 m high dams, which is leaded into the Studňa večného dažďa (Well of Everlasting Rain) with rich sinter decorations, curls, sinter cascades and water-lilies on small lakes.

The chasm drops by series of the undepth abysses to the Easter Well with 15m diameter and 35m depth, with a big waterfall. It can be approached further by the Meander-shaped Passage, White Passage with plenty of bigger or smaller waterfalls. The biggest of them, the Big Waterfall with 23m height falls into a dome with dimensions of 30x15x30m, which over the passage Meander ends by a final siphon in 203m depth. However, there is an assumption to verify by speleodiving investigation the further continuation of the Kunia Chasm cave system, which gets on to the Skalistý potok Cave.

The bibliography:

- Hochmuth, Z. 1989: Výsledky speleopotápačského prieskumu jaskyne Skalistý potok (The results of the speleodiving investigation of the Skalistý potok Cave). The Slovak Karst XXVII, p. 3-16, Martin.
- Hochmuth, Z. 1992: Novšie poznatky z prieskumu jaskyne Skalistý potok a morfológia častí objavených v rokoch 1989-1990 (New knowledge of prospecting the Skalistý potok Cave and morphology of parts discovered in 1989 - 1990). The Slovak Karst XXX, p. 3 - 15, Martin.
- Hochmuth, Z. 1993: Skalistý potok - denivelácia 287 m (The Skalistý potok Cave - denivelation 287 m). Spravodaj SSS, No. 4, p. 4-6, Liptovský Mikuláš.
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- Thuróczy, J., Erdős, M. 1987: Kunia priepať - 203m (The Kunia Chasm - 203m). Speleoforum '87, ČSS Brno, p. 52 - 54.
- Thuróczy, J., Erdős, M. 1988: Kunia priepať - 203 m (The Kunia Chasm - 203 m). Slovenský kras, XXVI, p. 25 - 32, Martin.

The protection and conservation state:

The Skalistý potok Cave as well as the Kunia Chasm form single, till now just hydraulically connected cave system, which is accessible just for a narrow range of speleogists that perform speleoinvestigation there. As this cave system is a source of drinking water, it is necessary to create conditions for protection its quality and quantity, mainly in the area of rainfall water infiltration (northward from the Jasovská Plateau). Regarding to the presence of an active stream, which flows in relatively narrow passages, wells or siphons, the occurrence of secondary decorations is limited and minimum interfered with prospecting works.

Protection of the cave system is ensured by the organizations given in paragraph 2d. Since 1973, the system is a part of the Protected Landscape Area Slovak Karst.

Protection of this specific karstic geosystem is ensured in the frame of a protection zone of the Protected Landscape Area, which is a part of the international network of biospheric reservations.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

The proposed natural inheritance is an example of the specific karstic geosystem, combination of vertical abysses with horizontal cave sections comprising an active stream, which overcomes 250m rise on its way. The cave system is the deepest in the Slovak Karst with its for this time being verified -248 m depth. In suggested assembly of the caves the System of the Skalistý potok Cave - Kunia Chasm represents large cave of mountain type.

Integrity of the cave is secured by the juridical protection, but also by solicitude plans in the frame of the protected zone of the Protec-

ted Landscape Area, or also by the action plan of the Slovak Karst biospheric reservation.

Name:

S-11 The Snežná diera Cave

The localization

The Snežná diera Cave is situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak Karst and subwhole Plateau Horný vrch. The geographical coordinates of its entrance are 48° 39' 07'' n. g. a. and 20° 47' 40'' e. g. l.. The cave is counted in a land-register of village Bôrka in Rožňava district.

The legal state of law:

The Snežná diera Cave is a part of the State Natural Reserve Havrania skala Mt., which was proclaimed by Amendment of the Ministry of Culture of SSR No. 2961/1982-32 on 30th April 1982.

The history of exploring:

Underground chambers of the Snežná diera Cave were investigated by the Natural Science Body Karst Section of the National Museum Society in Prague in August 1955.

The description:

In the massif of the Velká snežná skala Mt. (881 m a.s.l.), which is in 2100m distance to NW from the Zadiel chalet, a 23m deep abyss and 45m long cave of the Snežná diera Cave have developed. It concerns a 15-20m high crevice of W-E direction, which is closed on its top with fallen boulders. The crevice walls are partly rounded by activity of water. There are tiny pea-shaped dripstones in the cave west end. The cave is functioning as a dynamic ice cave.

On the bottom of the passage west end, ice creates in small quantities forming small dripstones and coats on the walls with maximum thickness of 20cm. The creation of ice is bound probably with overcooled deep crevices in the rock, into which cold air falls from above that is further cooled by evaporation of water from the crevice walls and flows at the Snow Hole bottom outside. The ice partly degenerates in summer month, but still keeps up. Temperature of air at the cave end in August moves about 0.25°C and at the entrance 2.5°C.

The bibliography:

Skřivánek, F. - Stárka, V. 1955: Krasové zjevy státní přírodní rezervace Zádielská dolina v Jihoslovenském krasu (The karstic phenomena of the state natural reservation Zadiel Gorge in the Southslovakian Karst). Zpráva o pruskumu prováděném v srpnu 1955 Krasovou sekci Přírodovědeckého Sboru Společnosti Národního musea v Praze, s. 6, Praha

Name: S-12 The Zvonivá diera Chasm

The localisation:

The Zvonivá diera Chasm is situated in region of the Slovenské rudohorie Mts., geomorphological whole Slovak Karst and subwhole Plešivec plateau. Its geographical coordinates are 48°37'08" n. g. a. and 20°25'40" e. g. l.. The chasm is counted in land-register of the town Plešivec in Rožňava district.

The legal state of law:

The Zvonivá diera Chasm is not individually protected; its legal protection is ensured in frame of the Protected Landscape Area Slovak Karst, which was proclaimed by Amendment of the Ministry of Culture of SSR No. 110/1973 Zb., from August 30, 1973.

The history of exploring:

Inhabitants of the villages surrounding the Plešivecká Plateau have long been interested in the Zvonivá diera Chasm, which is located in central part of the plateau.

The wroted records show that the first investigator of this chasm was Emil Fabnik, who in 1875 first lowered himself into the chasm, but advanced only as far as the rock bridge. Another descent was achieved in 1882 by an inhabitant of the town Plešivec under the direction of Jozef Pachel, who published a description of the chasm in the Rožňava Report in 1882. The first serious description and sketch of the chasm and cave came from Jozef Drenk, who in 1925, with his friends Kolesár, Vajda and Orban reached the floor of the chasm and explored the adjacent part of the cave.

In 1943 a group led by Hungarian speleologist Dr. Hubert Kessler descended into the chasm. They completed an exact scheme of completed with photographs. Further notable investigations of descents were realized by cavers, who mapped the chasm at various heights.

The description:

The Zvonivá diera Chasm is situated in the central portion of the Plešivec Plateau and belong to the most important natural phenomena of the plateau. It was formed from masses of Middle Triassic light organodedritic calcium particles. The limestones are fully filled with tectonic fractures.

The mouth of the chasm begins with a side opening with a diameter of 30m, which continues to a vertical karst chimney of "aven" type with a diameter of 8m and a depth of 100.5m. At a depth of 50m there is a rock bridge, from which one can enter to a lateral "stone hallway". This hallway, as well as the vertical continuation of the chasm, leads to the underground dome of the Zvonivá diera Chasm. From the stone bridge the chasm opens into a bell shape and forms the ceiling of a large underground area, the inner part of the cave.

The underground part of the cave forms an extensive fractured area longer than 220 meters (including canal spurs), 40m wide and 20 to 50 meters high. The underground dome of the Zvonivá diera Chasm was formed from the intersection of many fissures with the maion direction determined by NE and NW-NE fissures. The relatively plane floor rises steeply toward the S and SSE debris piles. In the SE part of the cave are large conical towers, some of which are oveturned.

The other part of the expansive underground area is toward the north, where at first the floor has a gentle angle of debris and later steep steps

about 10m high to the "Gallery". The Gallery forms a huge debris pile over an area covered by formations. On a steeply angled surface covered with formations as mighty as 3m are pagoda like stalagmites as large as 20m, the highest known as the "Column of Terror" which is 26m high. Pagoda stalagmites in the Gallery perhaps form the largest in the group of pagoda-shaped stalagmites in the caves of Slovakia. There are many valuable column formations in the Gallery.

The bibliography:

- Drenko, J. 1925: Zostup do Zvonivej diery (Descent into the Zvonivá diera chasm), manuscript
- Dropa, A. 1959: Geomorfologické pomery priepasti Zvonica (Geomorphological conditions of the Zvonivá diera Chasm and vicinity). Slovenský kras, 2, pp 18-23, Martin.
- Henz, Z. 1953: Priepasť Zvonivá diera a jej jaskynná sústava. (The Zvonivá diera Chasm and its cave system). Geografický časopis, 5., pp 229-237, Bratislava
- Kessler, H. 1943: A Csengölyuk legújabb feltárása (The Zvonivá diera Chasm and the newest information). Turisták Lapja, 55, pp. 157-167, Budapest.
- Michalko, J. 1959: Poznámky k vegetácii Zvonivej diery a jej okolia (Notes on the vegetation of the Zvonivá diera Chasm and its vicinity). Slovenský kras, 2, pp 38-41, Martin
- Ortuba, J. 1959: Metereologická charakteristika priepasti Zvonivá diera (Meteorological characteristics of the Zvonivá diera Chasm). Slovenský kras, 2, pp 25-34, Martin.
- Rozložník, V. 1955: Priepasti Plešiveckej planiny (Chasms of the Plešivecká Plateau). Geografický časopis, 7, pp. 178-185, Bratislava.
- Ščuka, J. et al. 1988: Výskum mikroklimy vertikálnych jaskýň typu aven v Slovenskom krase (Research of the microclimate of the vertical caves of aven type in the Slovak Karst). Slovenský kras, 26, pp 113-128, Martin.

The protection and conservation state:

The cave Zvonivá diera Chasm is relatively difficult to reach and so has little influence of human activity. Modern equipment, however, allows more frequent visitation of the cave, but only for experienced spelunkers who have a smaller likelihood of damaging the cave formations. Despite these facts, recently there has been vandalism which caused damage to the debris formation "Bull's Eye" on the floor of the chasm.

Protection of the chasm and cave is insured by the organizations listed in section 2d. Since 1973 it has been part of the Protected Landscape Area Slovak Karst.

The reasons because of the wealth is considered regarding on one or more criterias to the World Heritage

The proposed nature heritage is an example of the evolution of a specific and isolated karst system as a whole. Pagoda-shaped stalagmites in the Gallery with a maximum height of 26 meters (Column of Terror) form the most dramatic group of these formations in the caves of Slovakia.

Integrity of the chasm and cave is ensured by legal protection, but

also by active plans prepared by the biosphere reserve of the Protected Landscape Area Slovak Karst.

Appendix to part 4.

4.1 Mission of the Administration of the Slovak caves
(An extract from its Statute)

The Administration follows its mission particularly in a way that:

a/ in the field of the nature preservation they

- provide an overall protection of the caverns made or being made accessible, including special care of them
- take part in preparation of the bills for legislative protection of the caverns made accessible
- make professional standpoints and documents for administrative boards' determining
- supervise the performance of the measures and acts connected with the underground of the caverns made or being made accessible
- are responsible for following the protection requirements within the protected natural creations - the caverns made or being made accessible
- provide research, exploration and documentation of the caverns made or being made accessible
- by suitable methods evaluates the state and development of the conditions in the caverns made or being made accessible, as well as the number of visitors, and other use of those cavern ecosystems
- propose the conditions for running the accessible caverns, and with the agreement of the Ministry, they follow them
- manage and coordinate making the caverns accessible
- provide and make documentation and archiving of caverns research, exploration and monitoring results
- cooperate with other home and foreign organizations

b/ in the field of running, making accessible and using the caverns they

- in accordance with the stated conditions of protection, visiting and entering orders, provide safe running of the accessible caverns, within their capability
- are responsible for following the rules regulating the conditions of the activities allowed in the caverns
- provide professional guidance in the accessible caverns
- provide the making accessible of chosen caverns
- construct, develop and use appropriately the running establishments of the accessible caverns
- provide conditions for running regenerative and regaining-fitness climatical stays and speleotherapy in the specially chosen caverns areas
- carry out the propagation, editory and other cultural-educative activities
- provide development of services for the caverns' visitors and organizations, in accord with law rules.

4.2. The Conception of the Administration of the Slovak Caves in the field of karst protection.

On the basis of overall research of the karst areas in their mutual interactions and bonds, the aim is to reach balance of socio-economic activities, to precede unwary anthropogenic acts, which may cause disturbance of the homeostasis and changes in the reproductive ability of a karst region, with the emphasis on the under-surface karst forms, the caverns made or being made accessible to the public as protected parts of nature, with dominant scientific, cultural-educative and medical functions, and their water-power utilization.

Activity focus

1. MONITORING of

1.1. Natural elements

1.1.1. relief

1.1.2. mineral

1.1.3. atmosphere - its flow, temperature, dew point, relative humidity, O_2 , CO_2 , CO , Rn_{222} , chemical analyses

1.1.4. water - flowing, still, active flow including draught and spring, chemical analyses

1.1.5. sediments - chemical analyses

1.1.6. biota: a/ fauna - species representation, amount

b/ synantropic vegetation - spread, reproduction

1.2. Socio-economical elements

1.2.1. influences of tourism, from the point of ecological admissibility

2. RESEARCH

2.1. Applied

2.1.1. Re-assessing and attaching to the preceding research.

2.1.2. Assessment of the anthropogenic acts in a karst region, and their impact on cavern environment.

2.1.3. Ascertaining and judging the acts carried out in the caverns in recent period, eliminating of their possible negative impacts, stating the criteria for halting their repetition, as well as assessing new influences, with the aim of excluding unwanted changes in the karst geosystem.

2.1.4. Micro-climate elements analyses, micro-biological and biological research of the caverns environment, with the aim of its utilization for curing.

2.2. Specialized

1. Following and assessing the secondary filling, especially of the aragonite and ice caverns.

2. Elaborating special schedules of protection and running the accessible caverns, supervising their realization.

3. Elaborating measures, regulating the running, optimizing the visitors number of the accessible caverns so that it is in accord with their regenerative ability, and so that damage and deterioration of their natural elements does not occur.

4. Professional directing the making the caverns' accessible.
5. Elaborating papers for legislative protection of the caverns, as well as supervising the following of current legal measures for caverns.

Providing the activity

1. By own specialists.
2. By importing, at the specificity of the problem being solved, together with the coordination of own staff.
3. By cooperation with special organizations of the nature state protection, the institutes of SAV /The Slovak Academy of Sciences/, universities, specialized museums, volunteer organizations focusing at the subject problem.

Professional and personnel employment

The tasks in the field of karst protection will be carried out by professionals in the following specializations:

physical geograph - geomorphologist

legal karst protection

geologist, mineralogist

hydrologist - hydrogeologist

species protection

speleo-climatologist

The Department of Karst Protections activity proposals

The Department of karst protection pursue particularly the following duties:

1. carrying out the research of the surface karst forms and underground open to the public, and their development.
2. carrying out the research of exogenous or endogenous factors and their impact on the development of exokarst and endokarst
3. monitoring socio-economic activities carried out on the surface forms of karst relief, number of visitors in yearly and monthly periods, and maximums in a season's day
4. elaboration of special schedules of protection and running the accessible caverns
5. completion of legal measures and rules concerning the management of the accessible caverns
6. elaborating the novelization, actualization or new legal measures papers
7. providing papers and elaborating requirements for conceding exceptions from the protective conditions of the protected natural creations
8. providing contact with environmental offices, in the spheres connected with karst protection
9. directing the activities of persons /i.e. the members of Slovak Speleological Society/ in the accessible caverns
10. providing research and chemical analyses of allochthonic cavern filling
11. assessment and regulation of the activities connected with technical and other acts in the caverns made or being made accessible, from the point of view of tectonics, loosening of maternity mineral, stability, etc.

12. commentating the project documentation connected with making the caverns accessible
13. research of the secondary cavern filling
14. preparation of papers for classification, but as well for legislative protection of sinter cavern forms
15. carrying out the longdated physical-chemical research of the Ochtinská Aragonite Cavern phenomenon
16. assessing the possible impact of the changes in the cavern's micro-climate on preservation of the creation of secondary autochthonous caverns filling
17. providing specialized analyses within monitoring in the whole scale of karst waters
18. karst waters research from the point of view of their qualitative and quantitative figures in time, as well as their physical and chemical characteristics
19. cooperation with external specialists from the branches of biospeleology, chiropterology, zoology, nature protection and other, in order to elaborate special schedules for fauna protection of particular caverns made or being made accessible
20. elaboration of purpose maps and chiropterofauna family books of the accessible caverns important from the point of bats occurrence
21. solving the problems of synantropic vegetation in the accessible caverns
22. providing and coordinating research and monitoring of micro-climatological parameters of the accessible caverns
23. on the basis of monitoring the caverns environment results, compared to particular hygienic measures as well as to regenerative and self-cleaning ability of caverns, directing the utilization of their specific micro-climate for curing purposes
24. solving the problems of micro-climate temperature changes, mineral coat, in dependence on external climatic conditions, air flow and humidity
25. research of making the cavern accessible impact on cavern's micro-climate
26. research of micro-climate changes impact on decoration of the accessible caverns
27. research of caverns micro-climate changes in accord to external climate

4.3. Gescia

Project of the underground karst phenomena protection (An extract from the project)

Responsible authority: the Cassovia Speleological Club, Košice

Project aim: to elaborate methodology of a long dated volunteers patronage over the protection of underground karst phenomena, and test it practically on the example of the eastern part of CHKO Slovak Karst

Partial aims:

research - reconnaissance and assessment of the present state of caves and chasmes, stating external influences negatively effecting the state and nature of the locality, elaborating the possible ways of solving the elimination of civil threat of caves and chasmes

practical protection - performance of the methods in terrain, stated on the basis of research, and directed to limit or halt the negative factors of external influence

work with people - education of local inhabitants and tourists in order to increase their ecological awareness in relation to karst processes and their manifestation, with emphasis on the underground forms, the project and its results propagation among wide public and specialists

documentation - establishing of whole-Slovak databank of ecological state of caves and chasmes, on the PC basis, in order to follow and assess longdated and whole-level changes of the underground karst localities character and nature

Limiting the subject area: the eastern part CHKO-BR the Slovak Karst limited by protected line, from the west bordered by the Blatnický and Choťárny Stream

The project justification:

The natural underground creations in karst areas - caves and chasmes - represent the least touched by civilization ecotype of a karst region, thanks to their uneasy access. In their sediments they conserve the type and character of a collection of surrounding ecotypes, and they also intercept their development dynamics in a scale of thousands years. Their study offers important knowledge, on the basis of which it is possible to create an absolute picture of the original country.

The environment of underground karst localities represents quite a labile ecosystem, strongly sensitive to external disturbing influence. The processes in cave environment caused even by low-intensity disturbing influences come into being after a short time of their impact. Therefore, along with ascertaining and study of the external influences on the cave environment, it is necessary to develop activities to lower or halt the known negative effects.

One of them is the inadequate and undisciplined visiting the caves. Especially close to residential areas, the caves are strongly strained. Among the worst results belong damage of sinter decoration, soiling the

walls and floor sediments, collecting and searching for archeological artefacts, threatening the cave's fauna. The state of some caves is terrible. Reason of that is weak knowledge of karst processes specialities, and uncological approach to the underground localities. Therefore, it is necessary, on one hand, to protect important localities by closing them, and, on the other hand, to work with potential caves visitors to acquaint them with the karst areas specificities and educate them to a safe relation to the nature.

From various reasons, caves were getting to the edge of interest of the nature state protection, and thus their preservation, first of all by means of mechanical closings, research and propagation were carried out mainly by the Slovak Speleological Society. It was not a conceptional approach, rather a practical solving of the hottest problems. Many influences, like the infiltrating waters contamination, litter storing were not of interest. Even today, the Society remains the only one nongovernmental organization in the Slovak Republic which is systematically and for long interested in caves and chasmes yet not accessible. Recently, the Society strengthened the preservation activities, which showed in the agreement on cooperation with the Ministry of Environment, and development of regional groups and societies cooperation with local nature preservation authorities. A higher degree of cooperation is represented by direct patronage over the underground karst localities in a limited area.

Therefore it is necessary to elaborate and practically test the methods of patronage, and spread it to other karst regions. It seems to be useful having a databank with information about the ecological state of all underground localities as specific ecotypes, for the need of the protection and professional community.

Methods of following the partial aims:

1./ research

- a/ localization of the known caves and chasmes on a map 1:10 000
- b/ elaborating a system of localities identification, attaching identification numbers with the aim of uniting the marking of localities for the need of geodesy, scientific research, nature preservation boards and volunteer preservation groups
- c/ completion of a description of the locality's present state, from the point of view of civilization impacts on the locality's nature
- d/ elaborating particular methods for solving the negative impacts

2./ practical protection

The practical protection follows the first aim. All methods leading to disturbance of the area will be coordinated with the protected area authorities. For the time being, it is necessary to carry out the following practical steps:

- a/ installment of identification signs at caves' entrances
 - b/ cleaning the Moldavská Cave
 - c/ cleaning the floor of the Hačavská Cave /length 200 m/
 - d/ installment of a mechanical lock at the Hačavská Cavern entrance
 - e/ adding to mechanical locks of the Moldavská Cave and the Mníchova diera Cave
 - f/ replacement of the provisional lock in the Drienovská Cave
 - g/ periodical maintenance of the existing caves' locks
- 3./ work with people and propagation
- a/ elaborating a special report of the ecologic state of the under-

ground karst forms in the subject area, which will be offered to nature state protection boards

- b/ completing a collection of slides demonstrating the present state of some important localities and the negative impacts of the external influences, for documentation and lectures
- c/ completing a collection of photographs
- d/ publishing information brochure on the caves of Košice's surroundings
- e/ a series of lectures in the towns and villages close to the most damaged localities, connected with a slide-show in order to gain support in the caves and chasmes protection
- f/ exhibition temporarily joined with the exhibition Speleophotography
- g/ erecting informative boards in order to direct tourists' attention to the values of karst region, the possible consequences of their disobedience with the underground karst phenomena
- h/ publishing a series of articles on methods and results of the project in popular and special magazines

4./ documentation

The databank formed within the project will represent the basis of documentation on preserving activities and the ecological state of localities within whole Slovakia

It suggests:

- a/ elaborating a system of documentation including localization, geomorphological description, description of the underground karst phenomena state together with working influences, solving the problems and its realization leading to elimination of the negative impacts
- b/ purchase of a computer, software development, service instruction
- c/ databank completion
- d/ permanent actualization according to the project results, the databank will be developed with following projects and will serve for the needs of nature state protection boards, the Slovak Speleological Society and other volunteer ecological organizations

5./ international cooperation

- a/ publishing the project results in a foreign magazines
- b/ informing the national speleological federations of Hungary and the Czech Republic of the project results
- c/ exchange of information with with the karst protection board of the UIS

Expected contributions of the project:

- a/ creating and testing the system of longdated care of underground karst phenomena by a new form of commission from the side of a civil group
- b/ creating a databank for following the ecological state of the underground karst phenomena
- c/ education and strengthening the ecological relation of the population to caves and the karst phenomenon
- d/ improving the protection of the underground karst phenomena, and lowering the negative influence on the state and nature of the underground localities
- e/ strengthening the protection concerning the cave activities
- f/ propagation of the volunteer speleologists activities directed to the

nature preservation, in the public and state administration
g/ elaborating a methodology of assessing the ecological threatening the
underground karst phenomena
h/ gaining knowledge for initiating scientific research

Preliminary budget:

The preliminary expenses are planned to be covered by the means of
deposit from the project authorities, next by grants, funds contributions,
sponsoring and the cooperating organizations contribution.

Preliminary expenses: 331 300,- Sk. The progress of project is fully depended on gained supports.

The project elaborated by: RNDr. Eduard Kladiwa, Speleologicla club Cassovia, Košice, 5. III. 1994

Hungary and Slovak Republic

**Nomination for
World Heritage List**

**Caves of Aggtelek
and
Slovak Karst**

1994

Content

1. **Exact location**
2. **Juridical data**
3. **Identification**
4. **State of preservation and conservation**
5. **Justification**

Scientific Description

Appendix:

Description of the selected caves

Maps

Photographs

Videotape (joint production)

1. Specific location

- a) Country The Hungarian Republic, The Slovak Republic
- b) State, province or region Hungarian Republic, Borsod-Abaúj-Zemplén county
The Slovak Republic, the Rožňava District and the Košice-county District
- c) Name of heritage **Caves of Aggtelek and Slovak Karst**
- d) Exact location and indication of geographical coordinates
- The site belongs geographically to the southern limestone foothills of the northern Carpathian mountains. The territory with very varied but characteristic karst landscape with features regarded as being among the best in Europe is situated in the southwestern part of East Slovakia and in northeast Hungary. The state boundary divides the area into two parts; the larger part belongs to Slovak Republic and the smaller one is extending in Hungary. The Slovakian part is a protected landscape area declared 1973 (Slovenský Kras) and the Hungarian part had been being under protection at first as protected landscape area since 1978 and then as Aggtelek National park since 1985 on approximately 20000 hectares. Both territories were accepted as international biosphere reserves inside of UNESCO MAB project. The Aggtelek National Park became biosphere reserve in 1979 with its whole area (19708 ha). There are two core areas: 150 ha and 80 ha, together 230 ha; around these the buffer 1. zone is 874 ha.
- The north bounds of the territory run in accordance with natural geological borderline of karstic area and nonkarstic rocks, the south and southwestern bounds are given by natural discontinuance of the karst and its submersion under younger covering formations. The westernmost point of the area is at Jelsava, the southernmost is at Trizs and the northeastern part of the territory reaches up to Jasov.
- The border of the interested area runs from Jasov to Medzev, westwards through Pipitka hill to Krasnohorské Podhradie, then to Brzotin in the direction of Rožňavské Bystré, Stitník, Ochtiná to the east edge of Jelsava, turns to southeast, passes Hucin, Gemerská Horka, Dlhá Ves towards Trizs where it turns to east and continues up to Szalonna, Martonyi, Tornaádaska, Drienovec, Debrad and it reaches Jasov again.
- The territory extends between 48°25'30" and 48°40'50" northern geographical latitude and from 20°15'00" to 21°00'00" degrees of eastern geographical longitude. These coordinates give a 55km length and 35km width territory. The protected area without protective belt encompasses 558 squarekilometers.

The highest point in the protected area is the Matesova Rock with 925m on the Borcanska Plateau in Slovakian territory and the lowest part of the territory can be found in the Bódva-valley in Hungary at 150-180 m above sea level. The highest point of the Hungarian part is 604m at Fertőstető.

e) Maps and plans

See maps and plans in the Appendix.

2. Juridical data

a) Ownership

The owner of the property is the Hungarian State

b) Legal status

The protection of Hungarian caves has been guaranteed by the Law since 1961, according to the law-decree No.18/1961 the caves are state properties. This high-level protection can be explained by the wide range natural scientific, historical and aesthetic values, furthermore the water management-, foreign touristic- and medical significance of the presently known, almost 3000 caves. The legal protection covers the caves as a whole (from the entrance), the encasing rocks, the paleontological and archeological finds, the vegetation of the entrance, the cave-lover and cave-dwelling animals, independently from their level of protection.

The Aggtelek Karst declared as protected landscape area within the meaning of the decision No.8/1978 OKTH of the President of the National Authority for Environment and Nature Conservation (OKTH).

The territory of the Aggtelek Karst Protected Landscape Area was declared as National Park with the No.7/1984 (XII.29)OKTH provision which gained validity on 1st of January in 1985.

The legal status of the every single cave is detailed in the Appendix.

c) Responsible national agency and / or administration

Aggtelek National Park Directorate (3758 Jósvalő, Tengercsém oldal 1.) which belongs to the National Authority for Nature Conservation (1121 Budapest, Költő utca 21.) of the Ministry for Environment and Regional Policy (1011 Budapest I., Fő utca 44-50.)

d) Collaborating national agencies and organisations

Speleological Institute (1121 Budapest Költő utca 21.)
Hungarian Speleological Society (1027 Budapest, Fő utca 68.)

3. Identification

a) History

The first documentary evidences about the Aggtelek Karst date from the 13th century, which mentions some caves and shaft-caves. The denominative village of the territory - Aggtelek - occurs at first in a paper from 1343.

The Baradla cave, opening with natural entrance beside Aggtelek, was used as living, sanctuary and burial place from the neolithic age. Descriptions and studies of travellers and scientists were published only from the 18th century. The first printed reference can be found in the 4th volume of "Notitia Hungariae novae historica geographica" by Mátyás Bél (1742) in latin language.

An unknown author of an article in "Ungarisches Magazin" (1781) informed the period readers about that the entrance of the cave had been bigger before, because some well recognizable cart-tracks could be seen in the cave. The J.M.Korabinsky's geographical encyclopaedia published in Pozsony in 1786, gave some details about Baradla cave and it mentioned that two members of the British Royal Academy of Sciences spent three days in the cave without reaching the end of the cave.

Robert Towson English traveller visited the cave in 1793 and his study published in London in 1797 contain detailed information about this underground world. At the same time Domonkos Teleki also visited the cave and called the attention to the skulls found inside.

The first cavemap all over the world created by an engineer was made about a two kilometers long part of Baradla cave by József Sartory in 1794 (see the map in the Appendix).

In 1801 only small, apparently independent short caves were known in the surroundings of Domica, but László Bartolomaeoides had already thought so these caves were in connection with the Baradla caves.

Raisz Keresztély the surveyor of Gömör county - who was the guide of the poet, Csokonai Vitéz Mihály - measured the cave's unknown part up to 1801 of Aggtelek cave. His work was published in 1807 (see in the Appendix).

József "nádor" - the palatine of Hungary - visited the cave in 1806 and in this occasion ways, stairs and fences were made in the cave. This was the first building-in in touristic aim which makes easier to walk in the cave and this kind of work was mentioned in Pál Balogh's article entitled "Tour in Baradla cave in 1818" which was published in the "Scientifical collection"(journal) in 1920.

Miklós Kay chancellor wrote a detailed report of his experiences in the Baradla cave in 1823, he also mentioned the unexplainable cart-tracks.

Markó Károly, well known artist, drew inspiration from the characteristic and romantic atmosphere of the cave and painted an aquarell-series about the mysterious underground world of Baradla.

One of the most important events of the history of Baradla cave was when Imre Vass, chief engineer of Gömör county, after one unsuccessful attempt; explored, mapped and described the unknown main-branch of Baradla, which reaches through the Giant's hall to the "Theatre Stage". His outstanding exploration was the footprint of the prehistoric man and some broken vessels in the Giant's hall 6 kilometers far from the entrance of Aggtelek.

One of the most famous Hungarian poets, Sándor Petőfi visited the cave in 1845 and at the last point of the then tours he also wrote his name to the cavewall. You can read this signature even now.

An unknown author wrote about the effects of the increasing tourism of Baradla cave in "National almanac" published in Kassa in 1847.

Adolf Schmidt, Austrian naturalist, give a precise detailed description of the karst phenomena in the surrounding territory in his article in 1857.

Also in 1857, a book was printed about Gömör county compiled by János Hunfalvy, which contain the best Hungarian description of the Baradla cave in last century.

Baron Jenő Nyári did the first regular archeological excavation in the cave near Aggtelek in 1876-77. Kossuth Lajos gave a critical analysis of the scientific document made on the basis of above mentioned archeological work.

Károly Siegmeth on Hungarian "Kárpát" Society's authority examined the condition of Baradla cave in 1880. On the basis of his suggestion the society took the cave on lease, which stopped the destruction and removal of the formations of the cave. Paths and bridges were built and the branches of the cave were widened at some places.

Kálmán Münnich, member of the mining board of Igló, based on his surveying in the cave in 1886, built a modified tour-path. In 1889-90 an artificial shaft was built which reached the middle of the newly discovered part of the cave system. This artificial entrance, called 'Red Lake' entrance, made the cave accessible to the visitors.

The last unknown part of the main branch was explored by Péter Kaffka in 1922. As the result of this exploration, it was possible to open a new entrance at Jósvalő, which was completed in 1928.

The Domica cave was explored by Jan Majko in 1926 and in 1932 Hubert Kessler and József Sandrik were successful in passing through the siphons of the Styx-stream to the Domica cave and thus the obvious connection between the two caves was proved.

At the same time some scientific survey started. Professor Endre Dudich examined and published the natural history of the Baradla cave with special regard to the living world of the cave in 1929-30.

From the first part of 1930s, the Hungarian Tourist Association was the owner of the Baradla cave. The development of the underground part and the surface got new rates.

The exploration of the other parts of Aggtelek Karst started also in the beginning of this century, Imre Bekey and his fellows organised the first considerable shaft-research expedition to the Hungarian part of the 'Alsó hill' in 1911. This work was going on in 1927 under the direction of Hubert Kessler. He tried to find the supposed cave system of 'Nagy-Tohonya' spring in 1933.

After the Second World War different touristical organisation were the manager of the Baradla cave. From 1983, at first the Aggtelek Protected Landscape Area and then the Aggtelek National Park Directorate directed the protection of the caves in Aggtelek Karst.

The more important improvement period was at the end of 1940s, in the middle of 1960 and at the beginning of 1990s. The result of this development the people can visit and see the rare karst phenomena of the caves in better conditions and in more safety way in nature conservation point of view.

There was organised more and more scientific exploration from 1950. On the ground of Hubert Kessler's and later László Jakucs' works a lot of speleologist group joined to the surveying and exploration projects and the result is that we know 240 cave in the territory of Aggtelek Karst.

- b) **Description and inventory** The territory of Aggtelek Karst is characterized by fully developed karst phenomenon of the karstic surface and the underground places. These forms are the result of a long term geomorphological process typical of the temperate climatic zone. The scientific value of these karst phenomenon, especially in the representability of forms, is all stages of the karst development can be studied in this area. Extraordinary high concentration of the karst form underground as well as on the surface is characteristic to the suggested territory. On the basis of the registration performed up to this time there are kept caves and chasmes of 712 in the whole area (Slovakian and Hungarian part also), from these there are 240 caves found in the territory of Aggtelek National Park. Detailed description and inventory about the geology, geomorphology, hidrology, climatic condition, the underground and superficial vegetation and fauna of the suggested area can found enclosed after this general description.
- c) **Photographic and/or cinematographic documentation** See the photographs and slides can be found in the Appendix and the enclosed videotape.
- d) **Bibliography** **70 ÉVES A SZERVEZETT MAGYAR KARSZT- ÉS BARLANGKUTATÁS (1910-1980)** (1980); Magyar Karszt- és Barlangkutató Társulat, Budapest.
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e) Public awareness

It is very important that not only the inhabitants of surrounding area to be aware of the significance and values of the property ,but to become a well-known natural creature for the board public.

There is no permission to enter for tourists to the most of the caves only for experts in order to make scientific investigation (geological, hidrological, meteorological and biological), new exploration and documentation. The reasons for that are on the one hand is the conservation of these caves and on the other hand is technical, because in most cases the caves are not easily accessible for "the man in the street", but some educational and propagational materials are available about these caves.

The Aggtelek National Park Directorate as responsible authority does everything possible to advertise, to make them more and more popular and provide the tasks connected with tourism. There are three caves which is accessible for tourists and they are open all year long. The most popular is the Baradla-Domica cave system. Every year approximately 150-200000 tourists visit the cave. The national park arranged different long and difficult tours with qualified guidance every day several times. There are special tours to Béke (Peace) cave and Rákóczi cave too.

The curriculums of the primary and secondary school include the activity of national parks and the natural, scientific and cultural values which they are responsible for; so the pupils are get to know among other things the Aggtelek Karst and its caves in early ages. The higher educational institutes such as universities usually attend the area within a frame of field course. Every year groups of students can study these interesting karst formations. Beside these, dozens of different summer camps are arranged not only with the supervisory of the national park. The aims of these camps are very varied; from the recreational child camp, through the educational and work camps (for example: reconstruction of damaged place) to the serious scientific camp. Not only the national park takes part in this kind of activity but the NGO-s of the region is make very important and usefull volunteer works.

It is worth to mentioned that the so called "medical tourism" is getting more and more significant with the spread of "urban deseas": bronchitis and asthmatic illness. This kind of use of the Béke (Peace) cave has had a long time tradition.

The Aggtelek National Park Directorate have focussed on developping the following communications services:

Information service: to help people organise and enjoy their stay by providing information on local opportunities, facilities and services and to encourage responsible behaviour and safe public use of the caves as well as the countryside.

Interpretation service: to increase awareness, understanding and appreciation of the park's special environmental qualities and generate support for park managemant programmes.

Education service: to influence and contribute to the teaching of environmental education and the role of National Parks, both in the formal and non-formal educational sectors.

4. State of preservation / conservation

a) Diagnosis

In general we can say that the caves of Aggtelek Karst are in good condition and there are no directly and seriously endangering effects. The National Park takes almost all precautionary measures on behalf of the caves and insures the sustainable use of which is accessible for tourist.

The locking of the caves has been already done in order to keep away the unauthorized entering. Every caves, except from the Vecsem-bükki shaft-cave, have got good closing and safety doors in compliance with the use of the cave. The Vecsembükki shaft-cave is accessible exclusively with special speleological equipment. Since there is no large-scale farming in the surrounding area and on the so called "belt parcels" of the land (small-scale production) the traditional way of cultivation is going on so the use of the artificial fertilizers is not significant and it does not cause contamination of the subterranean water.

There are only two small villages inside the territory of the National Park and the problem of the communal sewage and waste has been already solved.

Before an intensively working limestone quarry was a relatively serious endangering factor in Extramos Hill, which is situated just at the boundary of the National Park. Nowadays the mining activity has increased in a greater extent so this kind of endangering root has been getting minimal according to the preserving point of view and the building in and locking with the aim of conservation of Rákóczi caves has made as well as the protectional pillars was left.

The National Park Directorate tries to eliminate completely the problems caused by the mass-tourism. The building in with aim of tourism of course in harmony with the nature conservation, the expert and suitable supervisory, the careful instruction before the cave-tours and the legal regulation (the damage of the dripstones and other underground karst phenomena is qualified as a contravention) insure the sustainable use of the caves.

b) History of preservation / conservation

The Hungarian "Kárpát" Society took the Baradla cave on lease in 1881. The Society's Department working in Rozsnyó (Roznava) was responsible for the conservation supervisory and the maintenance of the cave, this is the starting point of the institutional protection.

Except from the troublous time between the two World War, the current owner tried to make everything possible on behalf of the caves and their phenomena.

The first provision in Hungary which dealt with the protection of the caves was the "Forest Law" come out in 1935. According to the order on behalf of the conservation of a cave its superficial area can be taken under protection and permission is needed to enter definite caves in order to do exploration work and scientific research.

Pursuant to the No.35000/1838 departmental decision of Ministry of Agriculture which is the enforcement order of the former law ("Forest Law"), in order to reach the most effective conservation the surface of the larger caves and their catchment area declared as state nature reserve; the establishment took place in case of Baradla in 1951, in case of Peace cave in 1953, in case of Freedom cave in 1956, in case of Imre Vass cave in 1958. Thus the whole nature reserve area above the caves was 1643 hectares.

In Hungary every caves are protected pursuant to the law-decree No.18/1961, thus there are no separate protection procedure needed for every single cave. The Aggtelek Karst declared as protected landscape area within the meaning of the decision 'No.8/1978 OKTH' of President of National Authority for Environment and Nature Conservation (OKTH) in order to preserve this geological, geomorphological, speleological and biological very varied area with its natural values and to keep up the relatively untouchability of Aggtelek Karst. The President of OKTH declared the area as a National Park with the No.7/1984 (XII.29.)OKTH provision from the 1st of January in 1985, which means the stepping up the standard of the conservation, management and scientific works.

c) Means for preservation / conservation

The legal protection of the suggested territory is assured by the No.7/1984 (XII.29.) OKTH provision come out on the basis of the 'Nature Conservation law-decree' of 1982.

The tasks of the National Park Directorates and the Directorates for Nature Conservation as authorities (administrative and specialized) are detailed in the No.3/1990(XI.27)KTM (Ministry for Environment and Regional Policy) 's departmental order.

The direct protection of the territory of the National Park is provided by armed rangers who goes when performs the duty, on foot, on horseback or by motor vehicle depending on the field conditions. The first aim is the prevention of any kind of damaging of the protected area or phenomena. The rangers have right to impose punishment on the pot or take initiative in contravention complaint.

The conservation and preservation activities are taken with the use of the results of scientific investigation and later the result of a biomonitoring system wich is now under evaluation, of course the instructions of the management plan.

The technical means of conservation in the surface are the informational, warning and prohibitory board placed in an appropriate system. There are different signed tour-path network in a good density in the area and the tour-map of Aggtelek Karst is also available.

The untouchability of the strictly protected caves - if it is accesible - assured by the good closing and safety doors in order to avoid the unauthorised entering. The keeper of the keys is the Directorate of Aggtelek National Park.

There are four so called "shower reservoir" built in the covered karstic catchment area of the Baradla cave. The reservoirs protect the cave against the superficial deposit taken into the cave by the flood after heavy rains.

The financial background of the conservation is ensured; the Aggtelek National Park Directorate as regional organ of the Ministry for Environment and Regional Policy manage the protectional activities from the state budget. The above mentioned activities qualified as basic activity thus they get priority and there are some oppurtunities to apply for support other important works from separate state fundations.

d) Management plans

The conservation and preservation works are going on according to the guiding principles listed in the appendix of the OKTH's orders and technical guiding principle called "Nature Protecting Management of Protected Properties" (number MI-13-56) is valid from April, 1992 and it gives special attention to the protection of the caves, the water in them and their surface. The management plan of the National park was made in the spirit of the OKTH order and because of since then happened legal modofication and the shortly accepting "Nature Conservation Law" the National Park has to make an up to date plan . Presently it is under evaluation and it will gain its definitive forms during 1995.

However according to the still valid management plan and the conceptions of the new plan the following main principals come across in the National Park conservation activities:

-The protection of the superficial area: Under the protection of a cave cannot be understood only protection the proper cave area without the protection of the territory next above it. A cave and its nature pattern in under the influence of a larger territory (the catchment area), which affects its development. That is why the protection of caves and its directing must start from this fact.

- There is a different situation at ensuring the protection of caves those open to the public and those inaccessible. The National Park carries out informational service, interpretation service, educational service, instructional guide, publicity and research tasks. Beside that the National Park is responsible for the maintenance of the space and facilities necessary for their operation.

- It is necessary to regulate the scientific explorations and research in the cave as well as in the surface. There is only entering to the strictly protected caves with the permission of the National Park. During research and exploration must take into account the principles of the protection and avoid damaging the caves and superficial karst forms as well.

The permission of the Authority for Nature Conservation of Ministry for Environment and Regional Policy is necessary to make new building in activities in the caves.

5. Justification for inclusion on the World Heritage List

b) Natural property

- i) Reasons for which the Proposed nature heritage is an example of property is considered to development of a unique karst geosystem with the meet one or more World elements of uncommon beauty. The nomination was Heritage criteria with, as made on the basis of the Aggtelek and Slovak Karst as appropriate a comparative a group of nature phenomena made up of such physical evaluation of the property and biological formations, which have some aesthetic in relation to properties of or scientific standpoint of an extraordinary world similar type value.

All caves and shaft-caves as well as the other karst forms are constituents of one geomorphological unit of the Slovak and Aggtelek Karst. Therefore they belong to the same physical-geographical formation, to the same biogeographical area just as the ecosystems of the two area are the same type. Suggested nature heritage is propounded to include in the list of the world heritage in accordance with the Convention's criteria: iii) and partially iv) too.

The nature heritage suggested for inclusion in the world heritage is made up of the remarkable subterranean cave systems with unique and unrevolving karst decoration.

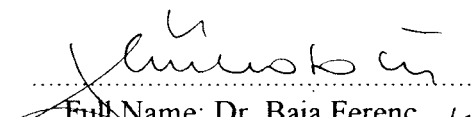
The underground cave systems as well as the karst surface are also an important and significant place of natural occurrence of the surviving endangered species of animals, with great scientific value also. In addition the subterranean chambers have a major speleoarcheological significance.

The Baradla cave is the longest cave in Hungary and the highest stalagmite in the country, the "Observatory" can be seen in the cave with its 19 metre height. The Baradla-Domica cave system is 25 kilometer long. There are a lot of considerable dripstone forms in the caves of Aggtelek Karst such as the botryoidal stalactites and different helictite variations can be found in the Rákóczi caves and the Rejtek shaft-cave. The Kossuth cave is remarkable because of its particular cross sections of its galleries and its pulsating watercapacity. The Béke cave has long time medical tradition in the treatment of lung-disease and asthmatic illness.

Suggested nature heritage complies with the demand of integrity, for one thing the territory of concentrated occurrence of caves includes the national park and the protected landscape area too.

- ii) Evaluation of the property's present state of preservation as compared with similar properties elsewhere
 Nowadays in the protection of suggested nature property is given by the valid legislative rulings. The whole Hungarian part of the suggested territory is extending within the boundary of National Park. The kind and intensity of the special protection of protected areas is categorized accordingly to the importance of the particular territory.
 Direction and supervision in the field of the state protection of the natural values is the duty of the Ministry for Environment and Regional Policy of Hungarian Republic.
 On the territory of Aggtelek and Slovak Karst all the karst forms characteristic of the karst of temperate climatic zone essentially occur. Diversity of forms and its nature values rank of this territory rise to among the largest and most known karst territories of Central Europa.
- iii) Indications as to the integrity of the property
 The integrity of the karst forms are taken care of by legal protection as well as by the plans of management and the Plan of the Aggtelek National Park and Slovak Karst Protected Landscape Biospheric Reserve. Some modifications on the legal regulation is supposed and the new up to date management plan is under evaluation in order to ensure the integrity and untouchability of the area and to step up the standard of the conservation activities.

Signature


 Full Name: Dr. Baja Ferenc
 Title: Minister for Environment and
 Regional Policy of Hungarian Republic
 Date: 12th September 1994

**Detailed Scientific
Description of Aggtelek
Karst**

1. Geological Conditions of the Area

a) Geological Structure

The mountain and hollow areas that include the territory of the ANP constitute, despite of their small extension, one of the areas in Hungary of the most complicated geological structure.

From the stratigraphic point of view various types of rocks that developed in various sediment collectors can be found. These are one beside and above the other, which renders the folded, scaled and fault structures even more complicated.

Regarding the geological description of the area we give preference to the geological conditions of the territory of the ANP. The various rocks and sediments occurring in the surroundings of the Park will be just mentioned.

The oldest rock of the area is the anchimetamorph layer-series being in tectonic position and consisting of dark-gray-black clay, flint slate and lydite from the Silur-era and occurring on the southeast edge of the Rudabánya mountain.

The oldest rock of the area of the North-Borsod Karst and the Cserehát belonging to the ANP is the Perkupa Evaporite Formation of the Upper-Perm. In this there are black dolomite and green-gray aleurolith layers here in addition to the anhydrite and gypsum layers that developed under hypersaline conditions. On some places plant residues are found /Alsó-hegy/. Its more significant surface-occurrences are in the zone of the Ménes-valley, and its subsurface forms can be found everywhere under the Mesozoic and Cenozoic sediments.

Lower-Trias layers developed above the Perm layers on a continuous basis. The lowest of these are the seismic, red sandstone developed in and under the tide belt, resp /Bódvaszilasi Homokkô F./ and clay slate with the occurrence of a rich shell fauna comprising an age-indicating formation /Claraia clara/. Above it there are kampili marl series from the shallow sea containing limestone with shell fauna /Szini Márga F./ and sandstone.

Dark-gray, laminar limestone developed in closed lagoons under the tide belt and containing shell fauna layers constitutes the uppermost member of the Lower-Trias. /Szinpetri Mészô F./ The more significant occurrence of the Lower-Trias sediments mentioned up to now is on both sides of the Jósza-valley /In the area of Rudabánya this line of layers has got ore content /Fe/. In the upper part of the kampili layer the thickness of the rock layers increases progressively, being a transition to younger rocks.

Closed, euxin, lagoon-facies dark-gray-black limestone and dolomite /Gutenstein F./ developed at the beginning of the Middle-Trias /Anizus floor/, with rock layers inside that developed in tide belt environment. Its typical occurrence is known to the southwest from Jósvalfö, however it occurs on a relatively great area also on the Szalonna-Karst.

At the time of Anizus an open carbonate platform developed, on the well-ventilated reefs and in the lagoons of which white and light-gray thick banked limestone developed without layers /Steinalm F./. This limestone turned to dolomite on some places. Inside the age-indicating Dasycladacea and brachiopod fauna occurs /Hangyás -tető, surroundings of the Vörös-lake/.

On the Szalonna-Karst and the Esztramos also the variety of the Steinalm-limestone that underwent epizonic metamorphosis can be found.

Towards the middle of the Medium-Trias era significant geographic changes took place on the spot of sediment development. Due to this and later tectonic processes there are much different layer series in the territory of the ANP that developed from limestone, including the sediments of carbonate platform and rocks of the oceanic crust.

These layer series are at present in various tectonic units, thus they are described accordingly.

A./ Around Aggtelek and north from Szin-Szinpetri and on the Dusa there is light- and dark-gray limestone and dolomite /Wetterstein F./ with saccharoidal texture. Both developed under the same circumstances with continuous transition from Steinalm limestone in the Ladine-Karn era, with age-indicating dasycladaceas.

Because of its great thickness and extension karsting processes are typical of the surface and of the crack-system of this rock.

During the Upper-Trias sinking started, and as a consequence first platform/hollow transition-facies, banked, biogenic limestone /Szádvarborsai F./ developed. Subsequently pelagic-hollow facies, pink, light-gray and red, banked, thick-banked limestone /Hallstatti F./ containing tuber-like fire-stone on some places developed. From the layer series known on the Haragistya plateau hollow-facies, brown-gray, laminar marl and marl-limestone /Zlambachi F./ with terrigenous material inflow at the end of the Upper-Trias can be found that includes also a typical miniature Ammonites-fauna.

B./ In the independent tectonic unit beside Szőlőszárdó there are a dolomarl layer series in the Middle-Trias, and then thin- and thick-banked limestone that developed on a pelagic slope under the basis of wave-movement, in various colors and containing Halobia residues. Limestone development was taking place also at the beginning of the Upper-Trias.

Above it there are aleurith clay marl and spotted marl /Szôlôsardói Márga F./ containing fire-stone, limestone and marl layers that can be considered typical sloping sediment, from the beginning of the Karni. The layer series are closed by gray, bank-layered limestone containing pelagic hollow-facies, tuber-like fire-stone and fire-stone layers /Pötscheni Mészkö F./

C./ In the series of Bódva, above the Steinalm limestone /Rudabánya mountain, Szalonna-Karst/ pelagic, hollow-facies, banked, thick banked limestone /Dunnatetői Mészkö F./ is settled in various colors and indicating the sinking of the carbonate platform. There is well-layered, pink and lilac-red limestone indicating the intensive sinking of the hollow and containing abyssal clay slate and fire-stone above it /Bódvalenkei Mészkö F./ and under the carbonate compensation level, on the confines of the Medium- and Upper-Trias also abyssal flint slate /Szárhegyi Kovapala F./

In the Upper-Trias, due to the compensation process the development of deep-sea sediments came to an end on temporary basis, and the development of the foregoing mentioned Halstatt limestone started, followed by the marl of Zlambach.

The sediments of the abyssal Jura of the Bódva-series are known in the Telekes-völgy /Telekes-völgyi F./ and in the Bódva-break-through /Telekes-oldali F./

The Lower-Jura is represented by limestone olistolithe multicolored marl, the Medium-Jura by clay stone, lime-marl and flint-marl. In the latter paleoriolithe layers being the product of a faraway one-time volcanic activity are known.

The sediment of the Upper-Jura is first characterized by sandstone-olistolit, and then by limestone-olistolit clay slate, the latter indicates the filling up of the hollow and active tectonic processes.

D./ On the Szalonna-Karst a series with a development similar to that of the layer series mentioned in case of a tectonic unit beside Szôlôsardó are known. A great difference is that the rocks here underwent an epizonal metamorphic transformation. Its present position can be explained by tectonic causes.

E./ Beside Tornakápolna and in the Felső-Bódva hollow ultrabasis serpentinite originating from the upper-mantle and ocean floor metabasalt that are hardly known on the surface but well-discovered with drillings. Its age is on the basis of the radiolarit found together with it can be traced back to the Ladin-era. The magmatic rocks can be found at the present only in tectonic position, kneaded into the evaporite total /the bottom of the Mesozoic rocks/.

F./ In small surface occurrence, south from the Esztramos, medium- and dark-gray, well-layered limestone and dolomite from the Middle-Trias that alternate with black fire-stone layers can be found /Bódvárakói F./. The layer group was developed in an euxin and carbonate deep-sea hollow. Its bottom is represented by Gutenstein F., its top by green-gray, black clay slate and total marl from the Jura. The reason for mentioning it in particular is that the sediment series from the Medium Trias-Jura are positioned under the perm evaporite total, as an independent tectonic unit.

We do not know a Mesozoic sediment younger than Jura in the Hungarian part of the region. On the basis of the senon limestone being in tectonic position in the Slovakian Felsô-hegy the mountain may have gained its main structure as it is today at the end of the Crete /chapter 2.2/. The first representative of the Cenozoic overburden sediments known here is the abrasion coast limestone conglomerate /Bretkai Mészkö F./ known on the south edge of the mountain, which is the first formation of the sea extending from the southwest and rolling here in the Lower-Miocene.

Above it there is a slir total also from the Lower-Miocene /Putnoki Slir F./ indicating the deepening of the sea. On the southeast edge of the Rudabánya mountain, there is a continental alluvial cone-like gravel conglomerate, consisting mostly of metamorphic basic material. /Szuhogyi Konglomerátum F. . On the basis of their materials the gravel originate from the Upponyi and Szendrői mountain. In the Upper-Miocene the area was covered by a thin riolith - tuff layer /Cserehát Tufa F./. It is known at present only as the basis formation of the Pannon sediments being its cover, from drillings.

The Pannon sediment series /Edelényi F./ are known nearly just in the hollow areas. Here under lake-, marsh-, bog- and river conditions clay, aleurith, gravel-aleurith and lignite developed. From the lower part of the layer total, as praehominida fossils, the bone remains of the Rudapithecus hungaricus, together with the bones of many big mammals were unearthed.

The closing member of the Pannon sediments is the fresh-water limestone (thickness approx. 10 cm) known on the edge of the Szalonnai-Karst.

On the confines of Pliocen - Pleistocen the clay-gravel total (thickness 50 m) that was accumulated as the alluvial cone of the old Sajó river settled in the surroundings of Trizs.

In the younger stages of Pleistocene travertine /Szögliget/ terrace sediments and red clay filling the dolinas of the karst plateaus settled.

b) Structural-Geological
Conditions

The facies areas of the sediment collecting hollows of the formations described in the foregoing chapters were /as far as their present position is concerned/ from north to south as follows:

1. Area of Szilice
Development areas of
 - 1.1 Aggtelek
 - 1.2 Szôlôsárdó
 - 1.3 Bódva
 - 1.4 Telekes-valley
2. Area of Melléte
Area of
 - 2.1 Bódvarákó
 - 2.2 Area of Tornakápolna /ultrabasits/
3. Area of Torna

The first significant structural process may have taken place in the time of Jura-Crete, which caused a significant space-shortening. At this time, because of the areas of Szilice and Torna getting closer to each other a part of the ocean-bottom area was swallowed down /subduction. and the other part was pushed upon the Tornai series /obduction/ creating the cover of Melléte. At the end of the process the confrontation of the Szilice and Torna areas took place, where the Melléte-type rocks suffered a high-pressure, low-temperature metamorphosis /blue slate facies/. Due to the elevation the area of Szilice slipped on the evaporite that acted as a lubricant, on to the rocks of the cover of Melléte, creating the cover system.

At the end of the Crete the cover system was affected by new forces. At this time, with an east-west axis and strike anticlinal-synclinal systems came to exist, with movements to the left on some places. In the more mobile rock types significant foldings were created /f.e. Jósua-valley/.

From north to south the following units developed:

1. Alsó-hegy-synclinal, blocks from the environment of Derenk, movement zone
2. Line of the Ménes valley - anticlinal
- 2/3 Scaling
3. Haragistya - Dusa range - synclinal
- 3/4 Extrusion of Jósua
4. Jósua-valley anticlinal /antiform/
5. Aggtelek mountain, Teresztenye plateau - synclinal

The structural elements can similarly be followed in the smaller Rudabánya mountain with north-east, south-west strike.

The 3rd tectonic stage took place on the Oligo - Miocene confines, and is connected with the horizontal drags along the Darnó-zone. Effected by the mass of the Bükk- and Szendrői mountain moving from southwest also some units of the cover of Szilice moved. A part of them bumped against the rocks of the Aggtelek-mountain /Szólószardói rög /block mountain/, Lászi-pusztai rög/ whereas its other part passed along /Rudabánya mountain/. Between the two masses a crumbed zone developed from the parts that broke off.

The Paleozoic rock belt, and also the scale consisting of the conglomerate of Szuhogy made a northeast movement in accordance with the foregoing on the southeast edge of the Rudabánya mountain.

The dragging process clamed down at the end of the Miocene and at the beginning of the Pannon. From this time the area was affected only by edge breakage and block tectonic movements.

2. Geomorphologic Characterization of the Territory of ANPI

a) Karst-Morphological Phylogeny

On the basis of the geological data most of the area elevated and became dry in the Crete-era, and the erosion of the upper part of the Mesozoic sediments started.

In the time of the Upper-Cretathe area may have been coastal mainland, where tropical karsting took place. The evidence for this can be found again in Slovakian area only: Miglinc-valley - tectonic position senon platform limestone, Dobsina - fresh-water limestone gravel, Gombaszög - pollens from the Upper-Crete. from karst cracks. The forms of the process was destroyed by later processes.

Regarding the surface processes of the Eocene era we do not have any reference point in the Hungarian part of the territory. The position of the Eocene gravel than can be found at the foot of the Slovakian Felső-mountain /Somodi/ is not yet cleared in a reliable way.

In the Oligocene, south-southwest from the North-Borsod karst a big sediment collecting hollow developed. Herein the sea progressively moved to the north, reducing the area of the karst mainland there. On the confines of the Oligo - Miocene, in the south area of the Karst there is a slightly rising rock coast, where abrasion and the rolling waves exercised their effects, creating a conglomerate. On the karst mainland erosion (tropic-subtropic karsting) created a block surface, the former plane of which is determined by the top level of the present mountains. The territory may have been covered by the sea for a short time in the Lower-Miocene, however there are just indirect evidences to prove this /known confines of the sediment extension, sea depth/.

By the end of the Miocene the sea has withdrawn, and the possible thin covering sediments were destroyed. The thin rhyolite tuff cover that covered the karstland for a short time at the end of the Miocene, was destroyed similarly. The one time presence of rhyolite tuff is indicated by the bipyramidal quartz crystals unearthed from the red clay only.

During this time significant karsting may have been going on. This is evidenced by the fossil gypsum karst with intensively indented surface and covered by Pannon sediment beside Alsótelekes; south from Felsőtelekes by the iron ore prospecting drills also under Pannon covering sediment and in the Hallstatt limestone crossing caverns that are partly filled up with limestone. In some caves /Baradla, Széki-zsomboly/ we can find tracts with forms that developed supposedly in this period by dissolving under the level of karst water, however most of its characteristic form marks were transformed by later processes.

In the Lower-Pannon a newer transgression took place. Resulting from this the south border of the area and the hollows between the mountains became lake, bog, marsh areas, where the function of river water intensified periodically. The washing away area may have been the surroundings of the present Rozsnyó, on the basis of the mineral composition of the sediment. The development of sediments reached as high as to the present height of 300 m above sea level, and karst areas below this level were covered. The temporary end of sediment development is indicated by travertine precipitation in the area of Martonyi, Szalonna, Cinégés puszta and Tereszténye. On the basis of the snail fauna found in them the travertine developed at a temperature of about 30 C° degrees from the water of karst springs or in brooks. At this time karst plateaus of Aggtelek-Szelcepuszta and Alsó-hegy may have been just by some 10 meters higher than the level of the hollow, but the complete covering cannot be excluded either. The Szalonna karst was by ca. 200 m higher than the terrain, on its surface, at a height of 400 m above sea level, in a dolina, a 6 meter wide dripstone bank refers to the former cavern and filling, resp. In the Upper-Pannon - Pliocene era the clay-bearing gravel sediment of the alluvial cone of the old Sajó accumulated in the area of Aggtelek-Trizs, the top level of the sediment was at 400 meter above sea level. At the end of the activity of the river also the karst plateaus were covered by a thin gravel cover, which is indicated by the sporadic pebbles found on the surface and in the cave. On the Esztramos at this time caves developed by solution below the karst water level. Some of these caves became filled up with sediment containing fossils of the vertebrate fauna indicating its age.

At the end of the Pliocene the karst area, with an axis Esztramos-Jósua-valley, elevated on one side. This is proved also by the sloping of the karst plateau levels to the south by some 2.5° degrees, and the similar slope of the solved upper bed plane of the Földvár cave of Esztramos. Within the area also block tectonic movements can be verified /which is proved by the different top levels of the part-plateaus/Nagy side 600 m, Szelcei karst 450 m, Kuriszlán hollow 300 m/.

The level of the river network that was functioning on the covered karst of those times is indicated by the mouth levels of the valleys with dolina lines being in vertical position compared to the valleys of today. On the to 50% covered karst of the more elevated plateaus the development of dolinas started within a short time, which was accompanied by the solution of the old shafts of the covered cave openings.

After tilting, in the course of Pleistocene, in accordance with the structural directions, a west-east directional valley network developed, and the Kanyapta hollow became the erosion basis of the area. The main valleys of those times were the Torna and Jósua-valley, whereas the Ménes valley was not fully developed yet. An advanced sump function is proved by the caves that are inactive today and that have a special status /Szarvasól-, Por-lyuk, Csempész-, Hosszú tetô, Csapás tetô caves/ and also the inactive spring-caves being positioned also higher than the karst springs functioning today.

This period is indicated by the only known Pleistocene travertine occurrence in the Kútfej valley. On the Esztramos the solution below the karst water level continued on a deeper level. The caves that became dry were filled with red clay containing accumulated bone residues of the Pleistocene vertebrate fauna.

With the further deepening of the valley network the active and periodically active karst systems of today developed under the ancient systems. The development of the Ménes valley resulted in the reduction of the size of the surrounding systems and the development of new, water-guiding caves networks /Sárogkert caves, karst springs around Derenk, Fedor-spring etc./

The already mentioned rearranging process going on also today can be observed on numerous places, which is verified by ca. 100 water trace tests carried out in the area.

b) Types of Terrain Configurations

Because of the geological-tectonic structure the picture of North Borsod Karst, the part of the Cserehát belonging hereto and the surrounding areas as we see it today, is very indented. Accordingly we can differentiate between 3 main morphological units

1. Karst areas built mainly from limestone
2. Hill-country built from overburden sediments
3. Hollow plains

1. The karst areas constitute the southeast part of the South-Slovakian Karst, from geographical, hydrological and morphological point of view they are an inherent part of it. The karst plateaus indicate the plane of a former Oligo - Miocene block surface that was covered even twice later and then unearthed.

An exception are the blocks around Derenk, these came to the surface from tectonic melange, due to the activity of a river-water. As far as the nature of the karst surface is concerned it is a former (Pleistocene) river-water karst that was, due to the elevation and because the water network became subsurface water system, transformed into a karst surface with dolinas. The present periodical water flows get into the soil through on the edge of the karst, and through sumps inside the dolinas. The sinking and leaking precipitation reaches the surface also on the edge of the karst, on structural confines, and rarely inside the karst, in a high karst spring. On some places karst ravines with periodic water flow developed.

In the valleys that developed in structural zones and separating the karst plateaus only the Lower Pleistocene and Old-Holocene terrace can be recognized. The flow-rate of the present water flows is significant because of the high number of karst springs.

The edges of the plateaus are separated from their environment sometimes by 40 ° slopes or slopes with a 400 m difference of level.

2. The hill-country being constructed from overburden sediments can be divided up into two areas of different morphological structure.

The clay-gravel area around Trizs is characterized by long, plain hill ridges, 5-15° slopes in general and 4-5 m deep ravines. On the confines of the cover sediment and Trias rocks sumps with a catchment area of even 1 km² developed.

On the area consisting of clay, aleurithe, Pannon sediments deep ravines are rare, and even these are not deep. In addition to the plain hill ridges wide, derasion valleys are typical, with water-courses of small flow-rate.

3. On the peripheries of the ANP two hollows are known, the Lower- and Upper-Bódva hollow. Both are perfectly plain, their uppermost typical filling material is the Old-Holocene terrace gravel of the Bódva river. In the Upper-Bódva hollow we know Pleistocene terrace levels in a height of 240 and 300 m above sea level.

In the lower reaches of the Bódva river Meander fossils can be found. These survived as mortlakes because of the river regulation.

c) Characterization of Karst Forms

Surface Karst Formations The most typical karst forms are the dolinas that developed through solution. Their average width is 100 m, their depth is 20-20 m. The biggest depth is 50 m, and the diameter of the widest dolina is 300 m. Their shape is in case of valley-dolinas mostly extended, individual and/or the shape of roof dolinas is round. On their bottom there is often a red clay filling with a depth of several meters. On many places dolina twins or independent valley dolina-lines, uvalas. Escarpment dolina is known only northeast from Derenk.

The sumps in the area can be divided up into four groups on the basis of their positions. The most typical ones are the periodic sumps that developed on the discordance confines of the clay-gravel and clay-sand and Trias limestone known from Aggtelek to Szôlôsardó. Their catchment areas vary from some ha-s to ca. 1 km². The most significant is the sump of the rock wall of Aggtelek, where we know 2 inactive sumps and one periodically active sump one under the other, with the related caves.

The sump of the Ördôglyuk of Imola is the sump with the biggest area /2.5 km²/, the section of which reveals Pannón gravel, Miocene conglomerate and Trias Steinalm limestone.

The periodic sumps known in the line of the Alsó mountain and Ménes valley developed along the tectonic connection line of Perm evaporite and Hallstatt limestone from the Upper-Trias. Their catchment area is max. 1 km² /sump of Bükkhápa/

Sump dolinas belonging to short valleys developed inside the karst plateaus that are active on rare occasions. Their area is smaller than 0.5 km².

Bottom sumps are known in the karst ravines, where the water is drained in a concentrated manner /Telekes valley/ and/or by slow leakage along the line /Lófej valley/

On the southwest slope of the Alsó mountain and west from Derenk the cave mouths indicate the place of former sumps that lost their catchment areas.

“V” shaped karst ravines are known in the surroundings of Derenk, Jósvald, and Perkupa. The most significant one is the ravine of the Telekes valley, where the steep, rocky valley sides become vertical on some points.

“Sump lake” that developed in stead of a filled-up sump. Known on the periphery of Aggtelek and Derenk. The Vörös-lake that developed in a dolina filled up with red clay is a dolina lake with permanent water.

The karst springs having their sources in the valleys or on the tops of the valleys are typical surface karst objects /f.e. Bolyamér spring/ Most of them have water on a permanent basis, in many cases there are flood springs above them /Vecsem spring/ Many periodic karst springs are known, that are not connected with subsurface brooks, their function is in close connection with the current karst water level /Hazug-well/.

In the valleys of certain karst springs significant travertine precipitation are known /Kopolya-valley/. The cave mouths that are sometimes by several tens of meters higher than the springs indicate the position of inactive springs that are no more functioning today /the Szelelô-hole above the Kossuth cave/

Because of the area being intensively indented well-developed subterranean stream systems came to exist. The most beautiful is the system sump No. 3 of the Bába valley-Frank cave-Acskó spring /400 m/ - sump on the Acskó meadow- Papkert spring /2 km/.

In the territory of the ANP most of the mountains are covered with forests, which furthers the stabilization of the soil and clay-cover. On some points this cover was recently destroyed and the forms that developed through subsurface corrosion can be studied on the revealed limestone rocks. The most beautiful are the Medve - rocks beside the Vörös lake,, where on the high rocks rounded down surfaces, prepared fossils and the so-called root-char created by the humus acids of roots can be seen, accompanied by solution levels. Where the soil cover was destroyed earlier, char-field developed /Aggtelek, Szôlô-hegy/ These phenomena can be observed usually on mountains sides exposed to the south. On the bald limestone rocks there are undeveloped groove chars.

Subsurface Karst Forms

The most significant subsurface karst forms of the territory of the ANP are the caves. The longest ones are known between Aggtelek and Égerszög, where there are 4 caves being longer than 1 km, the Baradla cave is ca. 25 km long. These are typical active or periodically active caves with brooks passing through the cave. The Baradla cave has 3 floors, the Szabadság cave has 2 floors.

The erosion effect of the quartz gravel borne by water from the sumps into the cave played the most important role as to their development. The cross-section of the galleries changes from cave to cave. The main gallery of the baradla is ellipsis, trapezoid or $\cap$ -shaped, the fissure - section of the side branches is usually narrowing to the top. The galleries of the Béke and Szabadság caves also have a fissure section. In the latter there are also plain and wide creeping galleries. The gallery sections of the Danca cave are a mixture of the foregoing.

In case of the Baradla there is a fully explored, so-called Rövid Alsó Barlang /Short Lower Cave/ and a so-called Hosszú Alsó Barlang /Long Lower cave/ that is now just theoretically revealed, with a supposed length of 6 km and bringing significant amounts of water to the surface. These are by some 40 lower than the intermediate level.

North from Jósvalfő two caves have a length near to 1 km. In their development erosion caused by alluvium plays a subordinated role, their existence is due to the solving effect of the karst water flowing through the caves. One of the is the Vass Imre cave, where 5 terrace levels are known. These cannot always be separated from each other. Its section is usually fissure that is constituted by parallel walls on some points.

The Kossuth cave is also the product of solving processes, there is a constant water flow only closer to the center of the cave. Two main levels are known in this cave, the active lower level being poor in dripstone and having a brook, and the inactive upper level with dripstones. A 30 m deep siphon means the end of the brook branch. The section of the galleries is vertical and has the shape of a tilted oat-grain. The cave center can be passed only by swimming or in boat, there is a 50 m long lake there.

The caves behind the Bolyamér and Kopolya springs are similar to the Kossuth cave, however their dimensions are more modest from every respect.

There are two relatively significant sump caves above Bódvaszilas, on the Alsó mountain. As both developed in the tectonic connection zone of Perm and Upper Trias rocks, their upper part is full of debris. The Meteor cave reveals the evaporite rocks on several points. Both solving and erosion by alluvium due to the sandstone pieces of Perm rocks played a role in the development of these caves. The parts of the galleries provided with vertical shafts and being free of debris have a fissure section, and on some points floors developed as well.

The Frank cave explored in the Bene peak was a sensational discovery. Here, through the artificially opened inactive sump passage the explorers found their way to the cave of the Acskó spring with active brook.

The ground-plan of the cave passages follow the direction of the break lines determining the galleries /Kossuth cave/, however they created well-developed meanders on many points /Béke-, Frank-cave/.

Typical caves are the covered opening caves that can be found in most cases only on the plateau of the Alsó mountain. Beside this there are only one typical covered opening cave on the Baradla top /83 m/ and one on the Szár mountain /45 m/. The depth of the covered opening cave in Vecsembükk is 240 m, that of Szabó-Pallag 150 m, the covered opening cave of Almási is 93 m deep. The depths of the others are at present less than 100 m. Their development started on covered and to 50% covered karsts, leaking and streaming waters played a role in it.

The block of Esztramos hides also significant caves. Here the huge caves developed by solving below the karst water level that solved from the Pliocene on /Földvári cave/ in many stages.

On some points the floors merged /Rákóczi cave/. The further development of cavities of deeper caves is going on also these days.

The caves of the area, due to the way of their development, are rich in forms that were created by erosion and corrosion. The most typical of erosion forms, that are known mainly in the caves in the surroundings in Aggtelek, are the slightly inclined erosion levels/planes that can be followed on the sidewalls of the caves along several tens or even hundreds of meters. Their depth is on some points as much as 1 meter, their max. height is 0.5 m. The gallery cliff-bottom being as smooth as glass and the existence of which is due to erosion by alluvium are also rare.

The most spectacular corrosion form is the scallops that can be found on the sidewalls of galleries and sometimes on the top. Their dimensions vary between some mm²-1 dm², depending on flow-rate creating them. In addition hackly, sharp, corroded rock edges are also typical in the Kossuth cave. On some points also horizontally solved levels/planes /Béke cave/ indicating former water levels can be found. The top plane of the brook caves in the surroundings of Aggtelek being horizontal on some points have a similar meaning.

There are running channels, kanelluras on some points of the cave walls. Their dimensions are quite modest: their depth and width is 1-2 cm, and they are 1-2 m long. In contrast, in the covered opening caves that widen in the first line along such channels, their length is even as much as several ten meters, and their depth and width is 10-15 cm.

In the brook caves there are also meteor forms in subordinated position. A part of them are due to the swirling motion of the brook /Baradla/ whereas they developed in the Freatic zone in the course of cavity development in case of the Esztramos caves

In the same place also the solving effect of air humidity can be observed. In the Rejtekt covered opening cave irregular finger pad char can be observed on the surface of the dolomite limestone.

The most spectacular forms of cave fillings are the dripstone formations. The caves in the surroundings of Aggtelek are very rich in dripstones with variegated colors and forms the view of which attracts also foreign tourists. The special dripstone types of the Baradla are in addition to the well-known dripstones the drum dripstones, the radish-shaped dripstones and the hanging vertical dripstone columns. The latter indicate the level of the former, removed filling.

The Meteor cave of the Alsó mountain is also famous for the huge dripstones, columns of its greatest hall /Hall of the Titans/. In the same cave helictites occur in unbelievable abundance. Helictites are common in some of the covered opening caves. Certain shafts of the covered opening caves are decorated by dripstones with a length of several tens of meters.

On some points small calcite crystals precipitated in the dry dripstone basins of caves, creating pink-shaped brushes /Almási zsomboly/

In the brook branches of the Baradla, Béke, and Vass Imre a high amount of dripstone dam /tetarata/ developed in the waterfall parts. A part of them is being eroded also by the devastating effect of gravel erosion.

The pisolite formations are considered special formations in the North Borsod Karst. Their richest occurrence is in the caves of Esztramos, however they occur in significant amounts also in the Szabadság, and Csapás-tető caves, and also in the Vecsem-Bükk and Rejtekt covered opening cave. In the latter the variegated pisolites contain also 5% aragonite.

In the covered opening caves the pisolites grown on to the wall of cliffs and/or clay surfaces, whereas in the other caves we can find them rather on the surface of dripstone formations. Their development was recently connected to hydrothermal, subwater conditions, however new research proved the development in the atmosphere.

In some cavities of the Esztramos calcite crystals reaching a length of even 10 cm developed under cold water conditions.

The various sedimentary fillings belong to the morphological form elements of the caves that promote the genetic tests of certain parts of the caves. On some points the debris of huge collapses fills the galleries. These developed because of the collapse of halls being separated from each other just by thin walls or because of the vicinity of a tectonic zone /Meteor cave/.

In brook caves the water of the brook created terraces from the clay-gravel alluvium, on some points even several floors. On some points dripping waters created clay pyramids on the surface of clay filling /Frank cave/. In certain cavities of the Esztramos ochre fillings originating from the erosion of sedimentary iron ore can be found. In the same place, in red clay fillings there are hematite clogs and rich, age-indicating vertebrate fauna. Red clay and brown cave clay are otherwise typical of all caves known in the territory of the ANP.

In the Baradla cave significant amounts of caveman bone and means remains were found (culture of Bükk and Hallstatt/ from the uppermost part of the filling.

3. Hydrological conditions of ANPI

a) Surface waters

The most important stream of the area is the Bódva river springing in Slovakia and entering Hungary at Hidvégdó. The lowest and highest water level measured so far at the water measuring point near Komjáti is 14 cm and 294 cm, respectively. Since 1984, the water level and output of the river has been measured at Hidvégdó. The latter is an average of about 3 m³/s, from a watershed area of 875 km². The next measuring point is Szendrő, south of the Rudabánya mountains, where the average water output varies between 0.08 and 43.6 m³/s.

The streams feeding the Bódva from its left-hand watershed area are the following: the Kovács stream and the Sas stream springing near Tornaszentjakab as well as the Ragya (Juhász) stream springing east of Tornaszentandrás, the water output of which is about 200 l /min. It is joined by the water of the Mile spring at the north-west side of the Szalonna karst, then by the Rakaca stream south of Szalonna with a significant water output, which also gathers the water of the karst springs at the south-east side of the Szalonna karst belonging to ANP.

On its right-hand watershed, the Bódva is first joined by the Torna stream springing in Slovakia and gathering the water of the 12 karts springs at the north side of the Alsó mountain. The water output of this stream is about 3000 l/min. Later it is fed by karts springs with a water output of 500-1300 l/min, through several streams not longer than a few hundred meters, then by the the Ménes and Jósva streams gathering the water of several flood-springs with high water output and layer-streams with low output. South of the Jósva stream, near Perkupa, it is joined by the Cigány-völgyi and Varbóczi streams springing in the area of Galyaság, with a base output of 100 l/min, the Henc (Rét) stream with a base output exceeding 1000 l/min as well as by the Telekes stream, which is seasonal at its middle and lower reaches. Near Szalonna, it is fed by the 22 °C overflow water of the local waterworks based on the Meleg spring. There are some well-grown meanders at the lower reaches of the stream valleys and some small waterfalls at the upper reaches, the largest of which is the one at the devil's dam at Telekes-völgy, with a fall height of 2 m.

The hydrological character of the area is determined by the impermeable and karts sediments as well as the swallow-holes along the rock contact lines. The most and largest swallow-holes are known within the watershed area of the Baradla and Béke caves, in the south boundary zone of the karts, but there are several smaller ones near Égerszög, Teresztenye and Szőlösardó. They are seasonal, except for the devil's hole near Imola, which is the only steady swallow-hole with a watershed area exceeding 2.5 km².

The small natural lakes in the ANP area have a water surface of a few thousand m² and a depth up to 3 m. The best-known ones are the Vörös lake near Jósvalő, which came to being in a dolina, as well as the Aggtelek and Derenki lakes, which arose in blocked swallow-holes. There are several seasonal lakes, which are formed after heavy rains or thawing in clayey, flat areas, in dolinas or in the place of blocked swallow-holes. After extremely heavy rains, temporary lakes can be formed even in well-grown swallow-holes, if the inflow exceeds the swallowing capacity.

The Tengersizem lake in the Törőfej valley at Jósvalő as well as the fish-lake in the Ménes valley are artificial ones.

The annual rainfall in the range of mountains is 600 mm, calculated from the data of five measuring stations. The average of the last years has been lower: e.g. 574 mm in 1982 and 582 mm in 1989. The rainiest months are May and June, the driest are January and December.

b Subsurface waters

Karst waters

For geological and tectonical reasons, the North-Borsod Karst and the Szalonna Karst including ANP are very articulated from both structural and morphological point of view. That is why there are more than sixty karst-springs in the karst areas. Their springing place is mostly determined by structural lines, some of them are located at hollow edges or discordancy boundaries. Their springing level varies between 150 and 452 m above sea-level.

The water output of the springs is very different and changing. The base output varies between 5 l/min and 3900 l/min, the average output between 30 l/min and 12000 l/min. The springs with large watershed areas and cave networks have significant maximal output. After heavy rains or snow thaw this output may exceed 10,000 l/min, in the case of the Jósza spring it reaches 40,000 l/min.

According to the measurements and experiments by the Jósza Research Station, 27 % of the rain falling on the area mostly (82 %) covered with forest seeps into the soil. The springs are mostly supplied with water by this seeping rate. The flood-water flowing in through swallow-holes may cause a significant but only temporary increase of output. The ground- and layer-water streaming in subsurface evaporite lithoclasts and pores of the Pannon sediment is less significant but it provides a steady water supply. The water seeping in also feeds the deep karst, from where the water arrives at the individual karst springs as subthermal component.

to the Nagy-Tohonya spring, so its changes of output caused by siphons are not significant. The velocity of the pressure wave is 1,000 m/h.

The lunisolar fluctuation of the vertical fractures in the karst-rock causes a periodic change of six hours in the water output of some springs. This effect can also be observed in 30 % of the siphonic outbursts.

The karst-springs are suitable for water supply because of their significant output. Nine springs are used for local and long-distance water supply.

There are five seasonal karst-springs in the North-Borsod Karst, the activity of which is related to the raise of the karst-water level. Their output is insignificant, a few 100 l/min.

In extremely dry weather, the springs springing at the hollow edges apparently dry up. Apparently, because even then there is a small amount of water flowing out of the karst, but that feeds the ground water of the pebbly sediment. The correlation between the ground and karst water stored in caves can be traced in the Rákóczi cave.

Spring discharge examinations have confirmed that the descending branches of the output time-series take the shape of a logarithmic polygon. As five polygon sides could be distinguished, the limestone karst has fivefold porosity. According to this, the discharge order is the following: main corridor - side corridor - main fracture system - side fracture system - microlithocases.

The characteristic water temperature of the descending karst springs is determined by the springing level as well as local microclimatic factors. The lowest temperature is 8.9 °C, except the ones springing at the edge of the Bódva-hollow, where it is 11.0 °C. This is the annual average temperature of the area also. 20 % of the karst springs are warmer than this, which means additional subthermal components ascending from the deep karst. The warmest ones are the Lótusz spring (27 °C) and the Melegvíz at Szalonna (22 °C), while the other mixed-water springs have a temperature between 12 and 17 °C.

The temperature of the karst springs with swallow-holes may drop by 4-6 °C at thaw time in spring, which is caused by the cooling effect and rapid through-flow of the melted snow. At the time of heavy summer storms, a slight increase can be observed.

The karstland in the ANP area can be divided into seven units from karst-hydrological point of view. These units can be distinguished from hydrochemical point of view, too. The karst-water reaching the surface through springs is normal karst-water with calcium-hydrogen-carbonat. The mineral concentrations are the following: K and Na 1-5 mg/l, Ca 110-360 mg/l, Mg 4-70 mg/l, HCO_3 370-530 mg/l, SO_4 25-800 mg/l. The relatively high concentration of Ca, Mg and SO_4 and total dissolved material is typical of the springs located along the line of the Derenk-Ménés valley, the non-karst watershed of which is an area formed from evaporit. The Mg concentration of the springs springing from dolomit storage spaces is lower.

differs from the average. It reaches 30 mg/l and 50 mg/l, respectively.

The denudation of the karst-region calculated from the water outputs and hydrochemical conditions is about 60 t/year/km², which means a denudation of about 25 m³/year/km² in the ANP area.

The change of the karst-water level has been measured in the observation bore-hole at Szelcevölgy. According to the continuous observation, the average water level is 227.9 m above sea-level, with a minimum of 224.29 m and a maximum of 240.92 m. The fluctuation in the well 400 m away from the Kis-Tohonya spring with dolomit storage space is only about 6 m.

The age of the karst-water exiting through springs has been determined by the tritium-concentration and the radiocarbon method.

According to the tritium analysis it could be established that the descending karst-water originates from rainwater seeped in a few month, at most one or two years ago. In the case of dolomite storages this may be 4-6 years. The ascending subthermal components are older than 40 years. Their rate to the descending karst-water varies between 20 and 50 %. At Lótusz and Szalonna Melegvíz, the rate of the tepid component reaches 90 %. Here, the age of the water is between 8000 and 9350 years according to C^{14} measurements, while the water of the Tapolca spring at Törnánadaska is "only" 1450 years.

The connection between swallow-holes and karst-springs has been examined in several systems. About 100 tracing experiments have been carried out in the area, mostly with fluorescein, in some cases with NaCl and in two cases using isotopes. In spite of the numerous experiments we do not have reliable information about the subsurface connections in several areas.

According to the experiments (swallow-hole marking), the water velocity is between 5 and 100 m/h, depending on the system and the water output. Experiments carried out in shaft-caves have shown a water velocity of 0.23- 6.0 m/h. At the flood in 1974, a water velocity of about 1000 m/h was measured in the Baradla cave.

Further examination of the subsurface water connections requires international cooperation.

Layer-waters

In the ANP area, layer-water can only be found in the area south of Aggtelek formed from clayey pebble. Because of the clay layer, only 5 % of the rainwater seeps in. Some of this seeps into the karst-rock below and probably arrives at the Jósza spring. The rest streams southwards and is pushed to the surface by the slir at Putnok in the form of layer-springs.

Ground-water

Significant amount of ground-water can only be found in the Jósza valley and the Bódva hollow, in alluvial pebbly sediments, outside the ANP area. Examinations have shown that the ground-water is regionally polluted by the agriculture.

4. The climatic conditions

The Carpathian Mountains have relatively strong climatic influence upon Aggtelek Karst. The average annual temperature is rather low, 8.2 °C (at Jósvalő), similar to the higher mountains in Northern Hungary. The fluctuation of the monthly average temperature is not as big as elsewhere in the country (21.6 °C) so the summer maximum temperature is also lower here.

According to the cooler clima the growth season is shorter too, the first day when the average temperature is above 10 °C is after 20th of April and the last is between 5 and 10th of October. During this period (175days) the average temperature is 15.5 °C; such value can be measured at the highest parts of Mátra and Bükk Mountains (with 800-1000m).

It is worth to mention that the average temperature of January shows fluctuation in a wider scale than the temperature of other months (for example: in 1964 the mean temperature is -9.3 °C while in 1983 it is +0.8 °C). The differences of the further months of the year is much more smaller and the summer months are so called balanced.

There are only 60 sunny hours averagely in January and the greatest number of sunny hours is in July when the sun is shining 280 hours during the month. The annual mean value is 1900 hours, the worst is all the country. The number of the clear days when the cover of clouds are under 20% is only 50 days . The number of the days when the cover of clouds is more then 80% is 120 and there are 60 foggy days per year.

The distribution of the annual precipitation shows a particular picture; the second part of the winter and the first two months in spring the lack of rainfall is characteristic of this area, in autumn it is balanced and the maximum moisture is usually observed in July. The annual precipitation is between 600 and 700 mm. The area is covered by snow during 50-60 days and its thickness is 6-8 cm.

The prevailing direction of wind is west-northwestward. The frequency of windless days is low (10.18%).

It is very interesting to see the formations of local microclimatical conditions. The temperature in the valleys is much more balanced than in the plateau. The summer maximum temperature in the 500-600 m high hills is always exceeding the temperature measured in the valleys. Although it is expected that in wintertime the colder air moves down into the valleys but the experiences show the wheather is milder here compared with the sourranging hills. We can recognise that the situation is the same with the formations of day and night temperature changing; the reason of that is the valleys of the karstic area have extremely high humidity. The consequence of the plateau-like type of the hillside the mountain and valley wind can be expressly perceptible at several places.

Summarize it can be established that the climate of Aggtelek Karst is humid continental with long summer, because of the near position of Carpathian Mountains a strong mountain effect can be felt, but in late summertime especially in August and September the southern currents are also effective.

5. The vegetation and fauna

VEGETATION:

The site belongs to the Tornense flora district of the Pannonian flora sector, bordering directly to the Carpathian flora sector. The overlap of above mentioned flora sector and the special karstic surface make possible the existence of unique biotops. Due to the extreme microclimatical conditions the vegetation shows mosaik like picture, some north-Carpathian representatives can be found in the dolinas of higher plateau and in the colder valleys whilst some submediterranean plants live in the dry and warm hillside in southern exposition. The 70 % of the area of the national park is covered with deciduous woods. Mosaik-like openings, rocky rasslands, stone exposing hillside provide life-space for our precious soft stemmed plants. There are in significant extension some seconder and seminatural assotiations (for examle seconder assotiation with juniper and heather *Calluna vulgaris*), mesofil and medium dry meadows, step-like grasslands. Most of them had been hay-field and intensively grazed grassland, the rest had developed as the result of 'uncultivated land-succession' for the end of 1960s. It is worth to mention the stream-accompanying assotiation : assotiation with alder, different marsh and moor fields which unfortunately occurs only in a few places.

The characteristic plant communities are:

Woods: Melitti-Fagetum, Querco petreae-Carpinetum, Tilio-Fraxinetum, Ceraso mahaleb-Quercetum pubescentis.

Grasslands: Asplenio ruta-murariae-Melicetum ciliatae, Festucetum pallentis subcarpathicum,

Diantho-Seslerietum heuflerianae, Pulsatillo-Festucetum rupicolae.

Secondary communities consisting of juniper: Callunetum, Festuco ovinae-Nardetum.

The most well-known native plant of the Aggtelek Karst is Tornaian Yellow-drop (*Onosma tornense*) and the *Dracocephalum austriacum* is also very rare plant species; both plants are listed in the Red Book of the endangered species. Other characteristic species: *Sesleria heufleriana*, *Alyssum montanum* ssp. *brymii*, *Pulsatilla slavica*, *Jurinea mollis* ssp. *macrolathia*, *Astragalus vesicarius* ssp. *labidus*, *Carex brevicollis*, *Thalictrum foetidum*, *Adonis vernalis*, *Erythronium dens-canis*, *Dentaria glandulosa*.

FAUNA

Wandering specimens of wolf (*Canis lupus*) which once was a native animal here (*Lynx lynx*) often occur here only coming from the Slovakian mountains. The lynx (*Lynx lynx*) settled again in this territory and the growth of the population is proved. Presently the red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*) wild boar (*Sus scrofa*), badger (*Meles meles*) and wild cat (*Felis catus*) is characteristic here. The insect and the cave fauna are particularly rich and interesting. The fauna has very varied geographic affinities too, submediterranean, Carpathian and continental. Saw-legged Cricket (*Saga pedo*) must be emphasized from the extraordinarily rich insect world of this area, this species is a post-glacial relic of the steppe. *Fuxia birivia* is a xeromontane species and *Apamea rubrivena* is a representative of Siberian fauna. Bird rarities nesting on this territory are as follows: Rock Bunting (*Emberiza cia*), Black Stork (*Ciconia nigra*), corn-crake (*Crex crex*), Imperial Eagle (*Aquila heliaca*), dipper (*Cinclus cinclus*) and uralian owl (*Stix uralensis*). The Hazel Hen (*Tetrastes bonasia*) which can be found in a comparatively bigger population, make the world of birds more colourful.

The "hucul" stud bred for gene preservation is to be found only here

6. Biology of the caves and the subsurface waters

The biological significance of the about 200 caves of the Aggtelek-Rudabánya Mountains is not simply in the fact, that these are the biotope of special cave-dwelling animals, but also because the area offers possibilities for the observation of other species living under the surface (dwelling in the soil and rock), in the surface waters - stygobions and hemitroglobions respectively pseudotroglobions (e. g. bats). The primitive crabs, living in the waters of caves are without exception getting into the cave from other subsurface waters - shallow groundwater, confined groundwater, karstic water - the populations thereof are frequently not even able to exist in caves. The most famous endemic species (*Niphargus aggtelekiensis*), a blind animal, belongs also into this group along with *Bathynella hungarica*, *Ceuthoneustes hungaricus*, *Candona dudichi* and some other primitive crab species - not to speak about the species of unicellars occurring in large numbers.

" Real" cave-dwellers are only found amongst the terrestrial animal groups - mainly insects - but the number thereof is also low as compared to the fauna of the Dinaric Karst or that of the caves of the Bihar mountains (Transylvania). The endemic blind *Trechus* (Duvalis) *hungaricus*, *Mesoniscus graniger* and its subspecies *Eucuenenia austriaca vágvölgyii* and further-on some more endemic *Collembola* species are the most precious ones on this list. Some cave-like animals (that is those occurring also in surface biotops) are also worth of mentioning, being of interest in the sense of biogeographical and ecological importance, such as: *Trechus austriacus* and *Trechus* (*Trechoblemus*) *micros*, *Porrohoma errans*, and the *P. rosenhaueri* spider species and some Diptera families Phoridae, Sphaeroceridae, Helomyzidae, Trichoceridae. Amongst the pseudotroglobionts the most remarkable are of course the bats (mainly *Rhinolophus ferrum-equinum*, *Rh. hipposideros*, *Myotis myotis* and *M. oxygnathus*), but in some cases stone marten (*Martes foina*) and fox (*Canis vulpes*), large dormouse (*Glis glis*) and *Neomys Fodiens* are observed to behave similarly.

The number of causally occurring cave-guests is of course the largest. Frogs, salamanders, swimming beetle, wood-ouse are often caught in the trap of the cave, where these will most probably die and become a nutrient for the organisms living in the cave.

The bones of perished animals are, often for millions of years, accumulated in the sediments of the caves thus offering a possibility of reconstructing the environmental conditions of the former vertebrata and at the same time also the climate.

Of very great importance are vertebrata bones of the Pliocene-pleistocene era, for instance found in the caves of the Esztramos Mountain - such as the *Estramomys*. Green plants are to be found in caves only in the vicinity of the entrances of poor light-conditions and around the artificial lights. These are mainly green algae and mosses, in rare cases small ferns (e.g. fragile fern - *Cystopteris fragilis* and *Asplenium trichomanes*). In the real darkness originally only bacteria, fungi and some blue weeds, were found.

The largest biological explorer of caves in Hungary was Endre Dudich, who carried-out his important investigations in the Baradla Cave - and later-on he achieved great result in organising research activities. In the caves of the surroundings good results were achieved by Kovács I. E., I. Loksa, D. Bajomi, J. Plonyi, A. Zicsi and several other experts.

Appendix

for the Nomination for World Heritage List

**Caves of Aggtelek
and
Slovak Karst**

Description

A-1	Baradla cave
A-2	Béke cave
A-3	Kossuth cave
A-4	Meteor cave
A-5	Rákóczi I. cave
A-6	Rákóczi II. cave
A-7	Rejtekk shaft-cave
A-8	Szabadság cave
A-9	Vass Imre cave
A-10	Vecsebbükk shaft-cave

A-1

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod-Abaúj-Zemplén County, Aggtelek - Jószař Settlement
- c) Name of Property **Baradla cave** (the hungarian part of it)
- d) Exact location and indication of geographical coordinates The main entrance of the cave opens at the foot of a 52 metre high wall rock which lies at the south-western foot of Baradla-tető, north-west from Aggtelek township.
Co-ordinates: longitude of 48° 28' 20" North, latitude 20° 29' 49" East, height above sea level 326 metres, cadaster No. 5430/1.
- e) Maps and/ or Plans Exact maps of the cave are available, the most important of which are the following:
Sartory-Farkas: 1794 (not exact, pertaining description missing)
Raisz-bartolomaides: 1801 (exact, already supplied with scale and denominations)
Vass I.: 1825 (section and horizontal plan, absolutely exact, including all denominations - artistic work)
Münnich K.: 1886
Konrád-Kessler: 1936
Baradla Speleogroup: Baradla-cave 1:1000, 1970-89 (original: 1:500, the most exact one till now)

2. Juridical data

- a) Owner The owner of the cave is the Hungarian State.
The cave is managed by the National Park Management of Aggtelek.
- b) Legal status On the basis of Law Decree No.18/1961 the owner of the cave is the Hungarian State and the cave is under protection. The cave is under protection to a greater extent on the basis of Law Decree No. 4/1982, Decree of the Counsel of Ministers No. 8/1982 (15/03) and the OKTH (National Authority for Environment and Nature Conservation) No. 1/1982 (15/03).
- c) Responsible national agency The Aggtelek National Park Directorate that belongs to the Authority for Nature Conservation of Ministry for Environment and Regional Policy.
- d) Collaborating national agencies and organizations Speleological Institute -- Költő 21, Budapest 1121--
Hungarian Karst Research and Speleologic Society -- Fő 68, Budapest, 1027--

3. Identification

a) History

It was not necessary to explore the Baradla-cave artificially, its natural entrances, the main entrance and the Bat-branch (Denevér-ág) entrance was already known by the caveman as well. As a result of the first regular cave- and archaeological excavations (1876-77) 160 pieces of polished Neolithic objects such as lance-heads, chisels, scrapers made of bear-bones, furthermore stone axes, stone anvils, shell-amulets, saws made of fish teeth and 39 objects from the Vas Kapu were found. Furthermore 13 complete skeletons came to light (the people were buried with their faces down, big flat stones on their napes, with knees pulled up to the stomach). Finds of baron Jenő Nyáry furthermore included cultivated plant seeds and bones of 14 different animal species (included for example those of a cave-bear). Later on several finds of "Bükk Culture" came to light that are approximately 7000 years old.

The Baradla-cave was mentioned for the first time by György Werner (Georgius Wernherus) in his Latin language work called "De admirandis Hungariae aquis hypomnema" in 1549. The first detailed description in Hungarian language was made by Pál Almási Balogh in 1820.

The first map of the cave was made by József Sartory and János Farkas in 1794 when Keresztély Raisz, engineer, made the first, exact, detailed cave-map of parts already known.

The most important event in the history of the cave was the discovery of Imre Vass, Chief Engineer of Gömör county. Imre Vass tried to penetrate through the Iron Gate (Vaskapu) but he succeeded only after 3 years' continuous dryness in August, 1825. He ranged the cave right up to the Stage (Színpad) then mapped the place. He made an exact, detailed description furthermore 2 very important and detailed maps with artistic value which he published in Hungarian language in 1931 and later in German language as well.

In 1880 a new era began in the history of the cave. Károly Siegmeth, Vice President of Eastern Department in the Carpathian Society of Hungary ranged the cave and the society leased it on his request in 1881. So it was the end of vandalism and taking away of formations. Paths and bridges were built and passages were widened in some places.

Kálmán München, Mine Counsellor, surveyed the cave in 1886 on the basis of which he created the "München passage" then in 1889-90 he and his men broke through the "Red Lake Entrance" (Vöröstói bejárat) into the middle of the newly discovered part. With this they made possible for the general public to visit the cave.

In 1922 Péter Kaffka discovered the last 500 m section of the cave to which he drove a 100 m long horizontal gallery from the surface in 1927-28. In the meantime 104 concrete bridges were built and wooden staircases were substituted with those made of stone. So it became possible even for everyday tourists to enter the cave in Aggtelek and after covering minimum 6800 metres to get out of it in Jósvalő.

On 21st August, 1932 Hubert Kessler and József Sandrik managed to get over to Domica-cave (Slovakia) through the siphons of stream Styx and by this the already known connection between the 2 caves got proven.

A few days later József Sandrik and his partners discovered the most beautiful, more than 1 km long continuation of the Reddish-branch (Retek-ág). They opened up the long ago blocked and unknown Bat-branch entrance (Denevér-ág).

In 1935 the first spotlights lit up and already more than 6000 guests visited the cave that year.

In 1966 the 2300 m long Vörös-tó - Jósvalő touring route was opened for foreign tourist traffic supplied by modern, high-performance lighting techniques and barriers.

In the following years the aim was to promote cultured foreign tourist traffic, roads and hotels were built on the surface, renovations and extensions were continuous in the cave.

b) Description and Inventory

Actually the Baradla cave consists of an almost 7 km long main branch and the pertaining side-branch corridors. Nowadays we already know that it has 2 separate lower caves 30 m lower. One of them is the Short lower cave, it has 6 siphons and is 1 km long. The other is the Long lower cave which is with water as well. We do not know too much about it, but on the basis of surveys it is approximately 10 km long.

According to our present knowledge the Hungarian section of Baradla-cave is altogether 18.836 m long. The water runs through it only when there is a lot of rainwater, as the water is drained to the Long Lower cave with the help of sumps in the cave.

The temperature of the air in the cave is an average 10,5 C but it may cool down in case of thawing. The relative humidity of air is 95-100 %. Draft conditions are very interesting and changing in summer and winter.

On the surface an active sump and an on-surface running down reservoir valley belong to each side-branch of the cave.

The soil of the cave mostly consists of - in most places - quartz sand and gravel, the rest is of finer grain-size mud (settled from water) and brown clay, sometimes 9 m thick.

There are more than 400 living beings in the cave among which the *Niphargus aggtelekiensis* and the *Mesoniscus graniger* - which blackens everything - are the most known ones. In the full length of the cave bats, "cave guests", cave-lover animals are present everywhere, we can often meet dormice, foxes and beech martens.

As for waters of Baradla, we have to mention the Ferro- and manganese bacteria and those very special sulphur bacteria which are able to do metabolism without light and organic food as well.

In 1930 Dr. Endre Dudich established an underground biological laboratory in the Fox-branch (Róka-ág) which is still in operation today.

Almost all morphological elements and mineral fillings can be found in the cave. The spectacular, huge drop stone formations, the spacious gallery sections, the touching music - thanks to the monumental size of Giants' Hall (Óriás terem) and the Concert Hall - furthermore the 0,5% slope of the cave make the Baradla-cave one of the most favourite touristic targets. Since decades more than 140.000 guests visit the cave every year.

In the Aggtelek part there are presently 5 entrances, a 2 km long section is illuminated for tourists. The visitors can enjoy a 2,3 km long illuminated section between the Red Lake (Vörös tó) entrance and the exit in Jósvalfő.

c) Photographic and/ or cinematographic documentation

First photos of the Baradla-cave were made by Imre Vass, the as-light-as-air hand-coloured section can be seen on his map. The following photo can be found in a book called "Hungary on Photos" (Magyarország képekben) published in 1868. In 1879 the left side of the entrance was eternized by Ignác Spöttl in a large-size pencil drawing.

d) Public awareness

The existence of prehistoric inhabitants is proven by archaeological finds from the cave. The man of Middle Age as well used the cave, they were escaping there from Tartars and Turks. They used bat guano as manure, they crashed and ground the dropstone to increase milk-yield and used it as medicine.

From written materials of the beginning of 19th century it can be seen that carts as well went down to the cave for merry-making. During the 2nd world war the people of Aggtelek and Jósvalfő used the cave as a shelter or hiding place.

e) Bibliography

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4. State of preservation/ conservation

a) Diagnosis

The Baradla-cave can take visitors all the year. The Aggtelek tour is 1,3 km long and last for 1 hour. The Vörös-tó medium tour is 2,3 km long and lasts for 2 hours. The long-distance tour is 7 km long, it lasts 4-5 hours and can be ranged only with lamps and a notice of it must be given in advance. These tours are managed by well-trained tour guides. Generally it is a very big problem to clean up after 140-160.000 guests a year.

b) History of preservation/ conservation

The protection of the Baradla-cave as an objective was put in writing for the first time on the basis of a common proprietorship decision in 1839 (breaking off and taking away of dropstone were banned).

In 1881 the management of the cave was taken over by the Carpathian Society of Hungary and roads, tourist hotels, roads in the cave, bridges and pavements were built.

Torches and shooting were banned and professional guides got employed.

In 1935 extensions were renovated and a new illuminated section was created from Vörös-tó to Jósvalő.

In 1978 the Decision No. 8/1978 of OKTH (National Authority for Environment and Nature Conservation) established the Aggtelek Protected Landscape Area which took over the management of the cave from the Bureau for Foreign Tourist Traffic in 1983, put the Baradla-cave under strict protection and drew up guiding principles in the interest of the protection of the cave.

Since 1985 the cave has been managed by the Aggtelek National Park Directorate.

c) Means for preservation/ conservation

The following serve the theoretical protection and safeguarding of the cave and its environment:

Provisions of Law

Ministry for Environmental and Regional Policy

Authority for Nature Conservation

Aggtelek National Park Directorate

Institute of Speleology

Hungarian Karst and Speleological Society

Basic Principles of National Nature Protection

National Nature Protection Service

Nature Protection Counsel

Policy of National Safeguarding of Nature

The practical protection and safeguarding of the cave is served by the massive and lasting construction of the entrance section and the closing of it by safe doors. The keeper of the key for the doors is the National Park Directorate.

Visitors and researchers are allowed to enter the cave only with the permission of the National Park Directorate.

Tour guides regularly take part in courses and extension trainings.

Lighting is optimised with special respect to vegetation appearing due to the influence of light.

d) Management plans

On the basis of guiding principles issued by the National Authority for Environment and Nature Conservation in February, 1994.

The "ex lege" protection of Hungarian caves has been guaranteed by the Law since 1961. This high-level legal protection can be explained by the wide range natural scientific (geological, mineralogical, hydrological, paleontological, archaeological, botanical, zoological, climatological etc.) historical and aesthetic values, furthermore the water management-, foreign touristic- and medical significance of the presently known, almost 3000 caves. The cave is an especially sensible, composite and complicated system, so to say an environmental indicator. The legal protection covers the caves as a whole (from the entrance), the encasing rocks, the paleontological and archaeological finds, the vegetation of the entrance, the cave-lover and cave-dwelling animals, independently from their level of protection.

The efficiency of "de facto" protection is reduced by environmental contamination affecting the reservoirs on the surface (open mining, unprofessional or not satisfactory sewage water drainage systems and waste disposal, improperly chosen and improperly applied agricultural cultivating methods, excessive dosage of chemicals etc.) and direct, unprofessional interventions and those without permission (increasing sport tourism, cave-going, unauthorised intrusions, illegal gathering of finds etc.).

In the law about the protection of nature, legal gaps concerning the ownership of caves and sources inside furthermore the chance of different interpretations must be ceased, the range and the way of activities, subject to permission, must be regulated.

Conditions of control, reconstruction works and complex research activities - which offer a basis for multi-purpose utilisation - must be ensured and great attention must be paid to the protection of the unique thermal karst in Budapest and karst objects in Aggtelek and in hill Bükk Mountains are well known on international level as well.

Among priorities of nature protection policy the most important is the protection of caves endangered by anthropogenic on-surface and under-surface interventions as they are scientific data banks, environmental indicators, water sources and health resorts, touristic and educational objects. The other important aspect is to guarantee the legal, financial and organisational conditions for their maintainable and multi-purpose utilisation.

The complex research of caves, the definition of protection tasks and the development of their data base, play a very significant role in research and development priorities.

The technical guiding principle (No. MI-1356, in force from April, 1992) called "Protection Treatment of Protected Values" gives high priorities to and deals separately with the protection of caves, their water and surface.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type

It is an extraordinary example of how perfectly the sensible nature, the cave, the human intervention, the dwelling place, the tourism, the continuous research, the examinations, the instrumental measurements and the medical science can live together.

Great attention must be paid in order to learn more about this scientific and cultural treasure furthermore how to utilise its preserved archaeological potential, tourist attractiveness, medical effects protecting the acquired values, the knowledge and the preserved potential and supporting scientific research at the same time.

The caves, that belong to the category of lifeless treasures of nature, preserved the history of the Earth that is rich in wonderful events such as structural moves in the Carpathian basin, changes in climate, accumulation- and erosion-deflation processes, episodes of changes in the living world, consequently they offer a very useful help for special sciences, education, economy and production and for propagation of popular sciences. Caves are scientific data banks, objects of a rich stock of means for Earth sciences and nature protection. Among these the Baradla cave occupies an outstanding position.

- ii evaluation of the property's present state of preservation as compared with similar properties elsewhere

This cultural treasure is an extraordinary example to show how wonderful results the deliberate and scientific research can produce. The development of human culture can be traced in the history and the knowledge of and the artificial interventions in the cave.

The Baradla-cave is the first to mention in the Hungarian speleology, in the cave tourism and in research.

- iii indications as to the authenticity of the property

There is no need to protect its cultural value, this task is perfectly done by nature protection. Its cultural value was already established by the introduced publications in Section 3/e although this is not a finished process anyway.

b) Natural property

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|---|--|
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>This proposed natural and scientific heritage is an example for the special formation of the karst ecosystem with its exceptionally beautiful natural elements and a good chance for scientific knowledge as well.</p> <p>A special example of how peacefully the sensible nature, the cave, the human interventions, the continuous research, the examinations and the instrumental measurements can peacefully live together.</p> <p>We must pay much attention to get to know more and more of this treasure of the nature , utilise its cultural, tourist and natural values and medical effects as much as possible by protecting the treasure, the knowledge and by supporting scientific research.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>The Baradla-cave is a typical erosion dripstone cave, a very rare, valuable natural treasure, one of the most beautiful caves of the country.</p> <p>Foreign tourist traffic and tourism can use the possibilities of the cave and this must be the same way in the future.</p> <p>The cave plays more and more significant role in education as well, the present layout is modern, comfortable and these all help the most beautiful natural treasure of Hungary be a target of tourism offering a grand view.</p> |
| iii indications as to the integrity of the property | <p>The intactness of the cave is protected by legal regulations, the Aggtelek National Park Directorate - Aggtelek and the action plan of karst biosphere-reserve in Aggtelek as well.</p> <p>The intactness of this natural treasure is ensured and supervised by the Aggtelek National Park Directorate, Aggtelek.</p> <p>Parts closed from tourist are still intact.</p> |

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod-Abaúj-Zemplén county; Aggtelek and Jósvalő
- c) Name of Property **Béke Cave**
- d) Exact location and indication of geographical coordinates
The artificial main entrance of the cave is situated at the west edge of a dolina at the north-western side of the Szomor mountain.
Its co-ordinates are: north latitude: 48° 27' 39", east longitude: 20° 32' 35", altitude above sea-level: 330 m, cadastral No.: 5430/3.
- e) Maps and/ or Plans See enclosed map in the Appendix.
Several maps of the cave details has been made. A precise summary map will be finished by the end of 1994.

2. Juridical data

- a) Owner The cave is owned by the Hungarian State.
It is managed by the Aggtelek National Park Directorate.
- b) Legal status The cave is state-owned and protected according to the law-decree No. 18/1961. It is protected in an increased degree according to the law-decree No. 4/1982, the decree 8/1982 (III. 15) MT and the order No. 1/1982 (III. 15) OKTH.
Number of declaration as medicinal cave: 460/Gyf/1969 (decision by the Ministry of Health). The cave section at the Jósvalő entrance is currently working as lung sanatorium run by the HELIOSZ company.
- c) Responsible national agency The Aggtelek National Park Directorate that belongs to the Authority for Nature Conservation of Ministry for Environment and Regional Policy.
- d) Collaborating national agencies and organizations Institute of Speleology -- 1121 Budapest, Költő u. 21.--
Hungarian Karst and Cave Research Association
-- 1027 Bp, Fő u. 68. --

3. Identification

- a) History The discovery history of the Béke cave is interesting because this was the first cave discovery in the world that was the result of a preliminary theoretical research work. At the same time it verified the correctness and usability of the new karst research methods taking shape in the early fifties.
At the beginning of 1952 the geologist László Jakucs found out during the research of the disappearing and reappearing subsurface streams that some of the swallow-holes at the foot of the Aggtelek mountains were not connected to the cave system of Baradla.

The painted water disappearing in the swallow-valleys at the feet of the Szár and Szomor mountains at Aggtelek did not flow into the courses of Baradla and did not reach the surface through the Jósva spring at Jósvalő but flew immediately to the Komlós spring at Jósvalő through an unknown underground way. He also proved with water-painting that the Styx stream of Baradla did not feed the Komlós spring. As a result of these most important water-painting, the existence and location of another dripstone cave, independent from Baradla, became proved.

In summer 1952 a discovery research started based on the research of the karst phenomena inside Baradla and on the surface. On 4 August 1952 the theoretically conquered but so far unreachable cave system was discovered practically too. Through the successfully opened funnel of the Bibic dolina they got into a wonderful side-corridor of the Béke cave never seen before by human eyes. From this branch named Explorer they reached the wide, easily passable and streamy main corridor without difficulty.

It was very tiring to get from the side-entrance at Bibic dolina to the main corridor and carry on researching there. For that reason, Jakucs and his team surveyed the main corridor in 1953, then they checked the exact surface projection of a cave room found suitable for opening a new main-corridor entrance by locating an electromagnet placed below and opened a new entrance from the surface in 1954. This entrance was the first main-corridor entrance of the Béke cave at the foot of the Szomor mountain.

Using the cave as a sanatorium, however, necessitated the opening of a horizontal entrance, through which the asthmatic patients could walk into the cave rooms without stairs. The second main-corridor entrance of the cave was finished in 1964, near the Tengersiz Hotel in Jósvalő.

For nature protection and preservation reasons, the main entrance at the Szomor mountain was renovated and covered with concrete in 1992-93.

- b) Description and Inventory The Béke cave is a live and steady dripstone cave with streams at its full length, which came to being by erosion. Regarding her age and formation, she is a twin-sister of the Baradla cave. The Béke cave has neither lower cave nor internal swallow-holes. The cave stream reaches the surface through the Komlós spring. The full length of the cave is 6,800 m. Its vertical extent is 60 m. The cave has three entrances: the artificial main entrance (Szomor mountain) with a tunnel length of 115 m, the entrance at the Explorer-branch (Bibic dolina) and the artificial entrance at Jósvalő with a tunnel length of 102 m. The age of the encasing rock: middle Trias (Witterstein limestone); subordinated: middle Trias (Guttestein limestone) and lower Trias (Campi limestone). Practically all kinds of morphological elements and mineral fillings can be found in the cave. The average air and water temperature is 10.5 °C, with a maximum of 11.1 °C. The average air humidity is 98 %.

The group of biologists led by István Kovács started to collect the cave fauna right after the discovery. At that time the biology of the Béke cave could be studied in its untouched, ancient state. Among the cave inhabitants they found the blind crayfish (*Niphargus aggtelekiensis*) known from Baradla and a few other white and blind inferior insects typical of Baradla.

The first bats moved in in 1956, then they multiplied quickly. In the last few years, entering the Explorer-branch during the winter-sleep of the bats has been forbidden.

Flint ground, series of calc-tuff dams, pseudo-bottom storeyed galleries and a great amount of drip-stone formation are characteristic of the cave.

Radon and climate measuring is regularly done in the cave. There are surface karst-measuring stations near the main entrance, but the dolinas and the ground are also being measured.

The curative effect of the cave was already known during the 1952 research period. In 1953 the climate as well as the bacteria and fungus culture was examined and the cave was declared the first medicinal cave of the country. In the case of lung asthma and bronchitis, the duration of cave therapy is still much less than that of medicinal treatment.

c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

d) Public awareness

Since the fifties it has appeared in common knowledge as touring cave. Since the sixties it has also appeared as medicinal cave.

e) Bibliography

There are more than 200 publications dealing with the Béke cave. The most important are the following:

BALOGH K. (1948): Adatok a Gömör-Tornai-karszt geológiájához; MÁFI évi jelentése, Budapest.

BAJOMI D. (1968): Recherches écologies-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

BERÉNYI D. - JUSTYÁK J. (1960): Mikroklimatológiai megfigyelések az Aggteleki-cseppkőbarlangban; Kossuth L. Tud. Egy. Mat. Int. Közl., Debrecen.

GÁL Zs. (1959): Szanatórium a föld alatt (A Béke-barlangban); Ország Világ, Budapest.

FODOR I. (1970): A Baradla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.

JAKUCS L. (1953): A Béke-barlang felfedezése; Budapest.

JAKUCS L. (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauz, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KESSLER H. (1956): Das Aggteleker Höhlengbiet; Miskolc.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

KOVÁCS I. (1954): Első vizsgálatok az aggteleki Béke-barlang faunáján; Állattani Közlemények, Budapest.
PETHŐ T. (1966): Budapest - Miskolc - Aggtelek (II. kiadás); Magyarország írásban és képekben. Budapest.
SIEGMETH K. (1890): Az aggteleki cseppkőbarlang; Eperjes.
VÉRTES L. (1952): Új természeti kincsünk a Béke-barlang; Természet és Technika. Budapest.

4. State of preservation/ conservation

- | | |
|---|--|
| a) Diagnosis | The Béke cave is managed by the Aggtelek National Park. The Jósvalő part is run and utilised by the spa-hotel. |
| b) History of preservation/
conservation | <p>Number of the preservation decision: 123/1958, number of the increased preservation decision: 18/1961 (decision by the Presidential Council). The protection of the cave is guaranteed by the organisation mentioned in section 2/c according to the laws in section 2/b.</p> <p>The main entrance was walled up in 1954.</p> <p>In the last two years the main entrance has been fully renovated by the Aggtelek National Park. It has been reinforced with concrete and secured. The entrance door has been equipped with massive door fittings and a hidden lock.</p> <p>In 1994 the entrance at the Explorer-branch was equipped with multiple iron bars. Humans cannot come through it but the bats can easily fly in and out.</p> |
| c) Means for preservation/
conservation | <p>The cave is closed up safely.</p> <p>It is not open to the public.</p> <p>Sometimes there are cave tours for small groups led by trained guides.</p> <p>The discovery research is standing still at the moment.</p> <p>The theoretical protection and preservation of the cave and its environment are guaranteed by:</p> <ul style="list-style-type: none"> the law Ministry for Environment and Nature Conservation Authority for Nature Conservation Aggtelek National Park Directorate Institute of Spelaeology Hungarian Karst and Cave Research Association National Principle of Nature Protection Nature Protection Service Nature Protection Council policy of nature preservation |
| d) Management plans | <p>This special karst object is protected according to the nature protection laws and principles. The Aggtelek National Park pays special attention, protection and care to it as part of the biosphere reservation.</p> <p>The directives of the Authority for Nature Conservation of the Ministry for Environment and Nature Conservation issued in January 1994 are the following:</p> |

The “ex lege” protection of the Hungarian caves has been guaranteed by the law since 1961. This high-level legal protection is justified by the scientific (geological, mineralogical, hydrological, paleontological, archaeological, botanical, zoological, climatological, etc.), historical and aesthetical values of the almost 3000 caves currently known as well as their importance in water-supply, tourism and therapy. Caves are extremely sensitive and complex systems and environment indicators. Their legal protection involves the entire cave beginning at the entrance, the encasing rock, the paleontological and archaeological findings, the flora of the entrance, the dark flora and the animals inhabiting the cave apart from their protection. The efficiency of the “de facto” protection is weakened by the pollution of the surface watershed area (open mining, insufficient sewage system and waste deposition, improper cultivation methods in the agriculture, over-use of chemicals, etc.) and the direct, unpermitted or dilettantish human interference inside the cave (increasing sport tourism, cave tours, unauthorised penetration, illegal finding collection, etc.).

The legal deficiencies of the nature protection law referring to the caves and the ownership of cave resources as well as its ambiguities should be eliminated. The scope and way of permitted activities should be regulated. The conditions of supervision, reconstruction work and complex research work aiming at the manifold utilisation should be ensured. Special attention should be paid to the protection of the unique thermal karst in Budapest as well as the Aggtelek and Bükk karst objects. The guarantees for the legal, organisational and financial conditions of protection and manifold utilisation of caves as scientific data-banks, environment indicators, water resources, spas as well as touristical and educational objects especially threatened by surface and subsurface antropogen interference are highlighted priorities of the nature preservation policy.

Complex research of the caves, specification and database of the protection tasks are important research and development priorities.

The technical directive No. MI-13-56 dating back to 1992 (“Management of nature protection values”) highlights the protection of caves including their water and surface.

The sanatorium should be used for therapy in the future too.

5. Justification for inclusion in the World Heritage List

a) Cultural property

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|---|--|
| i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>It is a particular example for the co-existence of nature, human interference, research work, instrumental measuring and therapy. Special attention should be paid to the further study and therapeutical utilisation of this scientific resource, protecting the values and knowledge preserved so far and supporting scientific research.</p> <p>The caves, belonging to the category of inanimate nature, have preserved for science, economy, education and popular science the episodes of a rich event series in Earth history: structural and climate changes, accumulation and erosion/deflation processes as well as changes of the biology in the Carpathian basin. They are scientific data-banks, objects of the rich tool-kit of nature preservation and geology. The Béke cave is an outstanding example.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>This cultural heritage is an extraordinary example for the results of conscious scientific research.</p> <p>It is one of the few unopened caves detected and discovered by scientific research.</p> |
| iii indications as to the authenticity of the property | <p>Its cultural value does not need extra protection. This job is done perfectly by nature protection. Its cultural value has been established in the publications listed in section 3/e, although this is not a finished process.</p> |
| b) Natural property | |
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>The proposed natural and scientific heritage with its extremely beautiful formations is an example for the special formation of karst ecosystems.</p> <p>It is a particular example for the co-existence of nature, human interference, research work, instrumental measuring and therapy. Special attention should be paid to the further study and therapeutical utilisation of this scientific resource, protecting the values and knowledge preserved so far and supporting scientific research.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>The Béke cave is a typical erosion cave with dripstones. It is a rare and valuable natural resource, one of the most beautiful caves of the country. The facilities of the cave should be utilised by therapy in the future too.</p> <p>To a restricted extent, the cave can be involved in tourism in the future, as it gives an unforgettable experience to the tourists.</p> |
| iii indications as to the integrity of the property | <p>The intactness of the cave is protected by the law, the Aggtelek National Park and the action plan of the Aggtelek-karst biosphere reservation. The measurings going on in the cave and its neighbourhood as well as the sanatorium require quiet and intactness, too. The intactness of this natural resource is guaranteed and supervised by the Aggtelek National Park, which is the manager of the cave.</p> |

1. Specific location

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| a) Contry | Hungarian Republic |
| b) State, Province or region | Borsod - Abaúj - Zemplen County, Jósvalő (village) |
| c) Name of Property | Kossuth cave |
| d) Exact location and indication of geographical coordinates | At present the only (artificial) entrance to the cave is above the Nagy-Tohonya spring north to the village. The coordinates are the following: northern latitude 48°29'17", eastern longitude 20°33'09", height above sea level 220 m, cadastral number 5450/1. |
| e) Maps and/ or Plans | See enclosed map in the Appendix. |

2. Juridical data

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| a) Owner | The cave is in the ownership of the Hungarian State Property. The trustee is the Aggtelek National Park Directorate. |
| b) Legal status | On the basis of the 18 th Law-Decree of 1961, the cave is in state property and it is a preserved area (reservation). The cave is protected to a greater extent on the basis of the 4th executive order of 1982; the cabinet decree of 15th, March, 8/1982; and the OKTH provisions of 15th, March, 1/1982. |
| c) Responsible national agency | The Directorate of the Aggtelek National Park belongs to the Authority for Nature Conservation of the Ministry for Environment and Regional Policy. |
| d) Collaborating national agencies and organizations | Institution of Speleology - 21, Költő str. Budapest.
Association of Hungarian Carst - and Speleologists - 68, Fő str. Budapest. |

3. Identification

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| a) History | <p>The Speleology Section of the Budapest University Tourist Association during their caving in 1993, broke into a narrow opening of a cave 30 m above the Nagy-Tohonya-spring near Jósvalő, where they experienced warm air streaming out from the opening, in winter. After a little demolishing of the rocks they got into a hall with stalactites, where the end of the cave was closed by a detritus. At that time they could not move this detritus away from there, but presumably there must have existed a large cave-system because there could be found a lot of dolinas and there was a sinking of the ground in 1931. They could more or less determine the catchment area of the assumed cave-system; these results they reported in details in 1933.</p> <p>In the years after the second World War, especially in 1950, László Jakucs geologist did some new karst-hydrological research in the karst-region of Aggtelek-Jósvalő. As a result of these research activities some new important data were revealed concerning the unknown cave-system of the Nagy-Tohonya-spring.</p> |
|------------|---|

On the basis of these acquired theoretical data the methods of the exploration possibilities of the hidden cave-system could be elaborated and determined.

The research was continued when Hubert Kessler (the leader of the Karst-water Research-team of the Water-conservancy Scientific Research Institute) could officially deal with the inspection of the Jósvalfö karst-water springs. The detailed karst-hydrological survey even dealt with the Nagy-Tohonya-spring, as well. The research team stated, that the spring takes its source not from a narrow fissure-system, but from wide and spacious cave-galleries. To verify this idea they opened a 40 m long adit towards the direction of the assumed cave, above the spring.

In February, 1956 the team succeeded in getting into the natural cave-gallery and in following the subsurface stream (party with the help of a pneumatic raft) as far as a deep siphon. At that time they did not manage to overcome the siphon (trap), with the help of the Dräger-type respiratory apparatus, which was then available; but they could find an off-gallery (off-level), - which was 250 m long -, at the upper section of the cave. At the end of this off-gallery it was again very narrow; but its presumably in relation with the Szellő-holes, which were uncovered in 1933.

In 1972 the members of the Amphora Diving Sports Club succeeded in diving into the siphon down to a depth of 30 m, but there they were kept back from getting further into the siphon, because they reached a bottle-neck again. This cave so far has been explored in a length of 1 km, so there is a lot of chance left for newer enterprises to get to know the following sections of the cave.

In 1988 the entrance adit was covered with concrete in a length of 36 m, and was locked with 2 doors.

- b) Description and Inventory The point where the cave-stream reaches the surface is at the Nagy-Tohonya-spring (213 m high above sea level); this spring is the second largest in these mountains. The water temperature of the cave-stream in winter (with low water level) is 15 °C; in summer, when there is a lot of rain, it's 10 °C; it means, this stream probably gets a thermal-water-feed, as well. This cave does not resemble the neighbouring erosional caves, there is no quartz-pebble, the water-flow follows the direction of the tectonic openings (disclussions). The shape of the sections of galleries is just like an oat-grain. The present length of the airy section of the cave is 850 m, the height is 20 m, the max. horizontal width is 412 m, the volume is 14,000 m³.
- The age of the enclosing rocks: Middle Triassic period; at the endpoint siphon: Lower Triassic Period; its type: limestone; in the lower Trias it's bituminous limespar-compylite, the formation: Steinhalm-limestone, Jósvalfö limestone section. The morphological elements found in the cave are the following: duct, shaft, meander, round-chamber, anastomosis, wave-shell, kanellura, calcspar, bassets, inactive stream-bed, clay-pyramide.

The visible clay-fills: stalactite, stalagmite, drop made coloumn, strawy -dripstone, drip -slat, drip-flag, helictite, drip -flow, drip -incrustate, microtetarate, drip-basin, drip-adze, peastone, corall pea-stone, other variations of pea-stones, sediments in the stream-bed.

The average water discharge of the stream: 7,400 L/min, max. 14,500 L/min. 5 intermittent swallers of the stream are known: their distances as the crow flies are as follows: 3,600-1,800-680-3,600-5,700 meters.

The length of the end-point siphon is approx. 100 m, its depth is approx. 50 m. The elaboration of the cave has been carried out in the following thematic system: minerology, sediment-geology, genetics, morphology, hydrology-water-discharge, hydrology-water-quality, hydrology-water-level, hydrology-water-temperature, hydrology-relationship, climatology, geophysics, description, research-history.

c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

d) Public awarenes

e) Bibliography

There are more than 110 publicattions dealing with the Béke cave. The most important are the following:

BERTALAN K. (1956): Felfedezték a jósvaői Tohonya-forrás patakos barlangját; Karszt és Barlangkut. Táj., Budapest.

BAJOMI D. (1968): Recherches écologies-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

BODNÁR O. (1956): A Kossuth-barlang felfedezése; Szabad Nép, Budapest

EMBER S. (1968): A Kossuth-barlang Reménytelen-szifonjában végzett búvárkutatás; MKBT kiadvány, Budapest.

FODOR I. (1970): A Bardla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.

JAKUCS L. (1953): A Béke-barlang felfedezése; Budapest.

JAKUCS L. (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KESSLER H. (1956): Das Aggteleker Höhlengbiet; Miskolc.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

MAUCHA I. (1989): Karsst wather resources research in Hungary and its sigfinicance; Karszt és Barlang Special Issue, Budapest.

MOZSÁRY P. (1974): A Kossuth-barlang szifonja (Összefoglalás); Karszt és Barlang, Budapest.

PETHÓ T. (1966): Budapest - Miskolc - Aggtelek (II. kiadás); Magyarország írásban és képekben. Budapest.

SZABLYÁR P. (1988): Jelentés az MKBT 1988. évi központi kutatótáboráról; MKBT kiadvány, Budapest.

4. State of preservation/ conservation

a) Diagnosis

The trustee of the cave is the Directorate of the Aggtelek National Park; the cave at present hasn't got an operating, developing, care-taking organ. The pit portal (entrance adit) and the doors were made in 1988, with the intention of nature-protection (conservation). At the source there is a spillover and a flowmeter operating. For the present the cave can not be exploited for tourism, because the visitors would endanger the intact character of the cave formations. Its importance from scientific aspect is very high. Those inner spacious sections which may be revealed after this cave's further exploration, could yield some interest and beauty that may not have been guessed or foreseen before. The Hucul-stud, near one of the swallers of the cave may endanger the quality of the water-flow, therefore that is to be moved. The Kossuth-cave and its water-flow have been discussed many times so far as the base and reservoir of the potable water supply of the neighbouring region; but the economic regulations always forced us to choose some other ways of solving this question.

b) History of preservation/ conservation

The number of the provision that declared the cave a nature-conservation area is: 18/1961, by the Presidium. The protection of the cave is ensured by the organ, mentioned in point 2/c, on the basis of the regulations, mentioned in point 2/b. In 1988, the entrance adit to the cave was durably covered with concrete with the intention of nature-preservation purposes; the door (made of iron) was furnished with a safe, hidden lock.

c) Means for preservation/ conservation

The theoretical protection and preservation of the cave and its environment is served by:

Provisions

Ministry for Environment and Regional Policy

Authority for Nature Conservation

Directorate of Aggtelek National Park

Institute of Speleology

Hungarian Karst and Speleology Association

National Nature-Conservation Principia

Nature-Conservation Service

Nature-Conservation Council

Policy of National Nature-Conservation

The practical protection and preservation of the cave is served by locking the entrance section with a safe door and by building it out durably and massively. The key of the door is kept in a safe place at the Directorate of the Aggtelek National Park.

Visitors and researches are allowed to enter the cave only with holding the permission of the Directorate of the Aggtelek National Park.

Tourism and visitors do not endanger the cave at present. The cave-walking also does not endanger the condition of the cave. Exploring research is being done at present from outward.

d) Management plans

The protection of this special karst-object is done on the basis of the nature-conservation legal regulations and directives; the cave receives the special care and protection of the Directorate of the Aggtelek National Park as a part of the biosphere preserve.

By virtue of the directives issued in February, 1994 by the Authority for Nature Conservation of the Ministry for Environment and Regional Policy:

The “ex lege” protection of the Hungarian caves since 1961 is warranted by law. This high-level legal protection for the presently known nearly 3000 caves is justified by the water-economic, tourist and medicinal significance, moreover by their historical and aesthetical values, furthermore by their wide-range scientific (geological, mineralogical, hydrological, paleontological, archeological, botanical, zoological, climatological, etc.) values. The cave is a particularly sensitive, complicated and complex system, it's really an environmental indicator. The legal protection of the caves extends from the entrance to the whole cave, to the enclosing rocks, to the paleontological and archeological findings, to the flora of the entrance, to the dark-flora, to the cave-loving and cave-living animals, independently from their immunity. The efficiency of the “de facto” protection is moderated in two ways: firstly by those environmental contaminations which make their effect on the superficial basin (surface mining, inefficient sewage disposal, inadequate waste disposal, badly chosen and applied agricultural ways of cultivation, overdosed chemicals, etc.); secondly by those interventions which were done without permissions directly into the internal life of the cave (the increasing sports-tourism, cave-searching, cave-walking, unauthorized enterings, illegal collecting of findings, etc.).

In the law about the conservation (protection) of the nature it is necessary to put an end to the gaps in the legal effects in connection with the ownership of the caves and sources springing from the caves; furthermore it's also necessary to do away with the possibility of the verious interpretations of laws; there is also a need for controlling the sphere and ways of those activities that are limited to permissions.

The conditions and circumstances of supervision, reconstruction works and of those complex research activities that establish the multi-purpose utilization, must be ensured in the future. It's of high priority to pay attention to the protection of the Aggtelek,- and Bükk karstic objects, over and above to the protection of the internationally unique Budapest thermal-karst. Among the priorities of the nature conservation policy it is highly important to protect the tourism-educational objects, the water-supplies and health-resorts, the environmental indicators, the scientific data-banks; summing up: to protect the caves, which are particularly endangered by the outward and the subsurface anthropogenic interventions. In addition to the protection, it is also very important to guarantee the legal, organizational and financial conditions of the multi-purpose exploitation of the caves.

Among the research and development priorities an important role is assigned to the complex research of the caves, to the determination of the protective tasks and to the development of its data base.

The governing technical principles, --- which are valid since April, 1992 (No.MI-13-56), titled "Nature Conservation Handling of Protected Values" ---, pay prominent attention to the protection of caves, their water-flows and surfaces.

The trustee will help and pay attention to the subsequent explorations.

The trustee thinks about the moving of the stud.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- | | |
|--|--|
| i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>It is a special precedent, which verifies that the sensitive nature and cave on one side and the human intervening, continuous research, inspection, instrumental measurements, therapy on the other side get on very well with one another, in peace. Special attention must be paid to the further scientific research activities to get acquainted with this cultural treasure; the exploitation of its curative power must be as perfect as possible; protecting the knowledge and values preserved so far; supporting the scientific research.</p> <p>Those caves that belong to the category of the inanimate natural values, preserve the episodes of the rich cycles of events of the Earth-history. (These cycles are the following: the structural movements of the Carpathian-basin, climate-changes, accumulation and erosion-deflation processes and the changes in the living world.) These episodes are preserved for the specialized branches of science, for the economic-productive sphere, for the propagation of general knowledge and popular science, respectively. The caves are scientific data-banks; objects of the rich tools of nature-conservation and earth-sciences. Among these caves the Kossuth cave is of high priority.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>This cultural heritage is a remarkable example in the point of view, what magnificent results can be achieved with conscious scientific research. It belongs to the group of those unaccessible caves (which group includes a great number of caves), which were found by means of scientific research and were opened using scientific exploration.</p> |
| iii indications as to the authenticity of the property | <p>Its cultural value does not need to be additionally protected, this task is perfectly fulfilled by the nature-conservation. Its cultural value has already been shown in the 3/e point (publications); although this is naturally not a completed process.</p> |

b) Natural property

- | | |
|---|--|
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | The Aggtelek-Karst, especially the Kossuth cave is outstandingly suitable to become a sample-area showing the connections between various geological and hydrogeographical phenomena - particularly suitable, because of its high -level exploration. This proposed natural heritage is an example for the special formation of a karst eco-system, with its exceptionally beautiful natural elements; furthermore it's the example for the conscious scientific research of the nature. |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | The present state of the Freedom-cave is stable and secure. The formations and the natural values did not lose their original conditions. Among the 240 caves of the Aggtelek-Karst 20 are protected in an greater extent; moreover among these 20 caves this one is of high priority, and is a natural treasure. Its natural value and riches is significant on a world scale, as well, but may only be visited on special occasions, for the sake of its protection. |
| iii indications as to the integrity of the property | The integrity of this natural treasure is protected by legal rules, directives, the nature-conservation policy, the Directorate of the Aggtelek National Park and the action plan of the biosphere preserve of the Aggtelek-Karst, as well. The intactness of the cave is ensured and supervised by the trustee of this natural treasure: the Directorate of the Aggtelek National Park. |

A-4

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod-Abaúj-Zemplén County
Village of Bódvaszilas
- c) Name of Property **Meteor cave**
- d) Exact location and indication of geographical coordinates The cave is the property of the Hungarian State.
It is managed by the Aggtelek National Park Directorate.
- e) Maps and/ or Plans See enclosed map in the Appendix.

2. Juridical data

- a) Owner The cave is the property of the Hungarian State.
It is managed by the Aggtelek National Park Directorate.
- b) Legal status As declared in Law Decree 18 of 1961 it is in state ownership and deemed to be a reserve. According to Law Decree 4/1982, to Order of Council 8/1982 (III.15) MT, and Order 1/1982(III.15) OKTH it enjoys special protection
- c) Responsible national agency Aggtelek National Park Directorate under the Authority for Nature Conservation of the Ministry for Environment Regional Policy
- d) Collaborating national agencies and organizations Institute of Speleology -- 1121 Budapest, Költő u. 21. --
Association of Hungarian Karst and Cave Explorers
-- 1027 Budapest, Fő u. 68. --

3. Identification

- a) History The cavers of the Red Meteor Association of Naturalists have been working on locating and exploring the caves and karst-caves (shaft-caves) of Alsó-hegy. While the 1957 expedition investigated only 14 shaft-caves, by the middle 60's more than sixty deep shaft-caves became known. In the 1970's the number of known Alsó-hegy shaft-caves rose well over 100. (thanks to the enthusiastic cavers of Red Meteor: György Dénes, Tamás Hazslinszky, Attila Kósa, Miklós Rónai, Tamás Nyári, Ernő Ránki, Klára Dunszt, Mária Hanga, Kinga Székely, István Szenthe, László Csernavölgyi, András Molnár).
The "classic" expeditions had no idea of its existence, since its entrance was not open, the discovery was not restricted to the exploration of the cave. They were looking for and exploring the catchment basins and sink-holes belonging to the springs of the surrounding area.

- The largest Alsó-hegy cave explored this way so far is the Meteor cave-system connected to Vecsem-spring which was entered by the Red Meteor cavers on August 6th, 1961 after a week-long strenuous effort, digging and showeling. The group worked both at the Kisvizestöbör and Nagyvizestöbör sink holes at the same time while trying to open them up.

- b) Description and Inventory The water disappearing in the cave is probably resurfacing in the Vecsem-spring which is situated 1700 metres from the cave entrance, as the crow flies. The meteorological conditions of the cave do not fit the shaft-caves of Alsó-hegy, rather fit in with the low central mountain range type of conditions. Air temperature varies between 7.3-12.5 °C, its mean value is 10.4 °C. Average relative humidity is 95.3 %.
- The Meteor-cave is the fourth richest in species cave in Hungary, and judged by the large number of real troglodyonts (13 species) it ranks second.
- The mineral fillings in the cave: stalactites, haliclites, stalactite flows, stalactite incrustation, microtetrata, stamigmite basin, cave pearl, corrosion hollow, tufaceous limestone barrage.
- The Hall of the Titans with its natural riches (large numbers of crystal flowers, gypsum crystals, bent stalactites) represents an unforgatable experience for the explorer.
- The entrance section of the cave is reinforced concrete lined (for 2.5 meters), with fitted steel door, safety lock. In the lower section there are three short lengths of rope fitted.
- c) Photographic and/ or See enclosed photo in the Appendix.
cinematographic
documentation
- d) Public awareness
- e) Bibliography There are more than 80 publications dealing with the Meteor cave. The most important are the following:
- BAJOMI D.** (1969): A Meteor-barlang faunisztikai vizsgálata; Karszt és Barlang, Budapest.
- BALÁZS D.** (1957): Összefoglaló beszámoló a Kinizsi bg. kut. csop. 1957. aug. vecsembükki expedíciójáról; Budapest
- DÉNES GY.** (1961): A Meteor-barlang feltárása; Karszt- és Barlangkutató, Budapest.
- DÉNES GY.** (1961): Előzetes jelentés a VMTE BSZ 1961. évi expedíciójáról; Karszt- és Barlangkut. Tájé., Budapest.
- JAKUCS L.** (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauz, Sport. Budapest.
- JAKUCS L.** (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.
- JÁNOSSY D.** (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.
- KORDOS L.** (1984): Magyarország barlangjai; Gondolat. Budapest.
- SZENTES GY.** (1980): A Bódvaszilas környéki karsztterület genetikai kérdései; Karszt és Barlang, Budapest.

4. State of preservation/ conservation

- a) Diagnosis
- The tour of the Meteor-cave ranks high among the Slovakian and Hungarian cavers, it is often visited. A visit to the cave does not require special skills, however, it offers an everlasting experience. Therefore the number of permissions to tour the cave has to be very limited.
- The possibility of damages occurring to the formations could be reduced to a great extent by a minimum amount of targeted construction.
- Only small groups of experienced cavers should be allowed to visit the cave for the present.
- Up till now damages can only be noticed on the paths used by the touring groups.
- b) History of preservation/
conservation
- In 1991 the entrance section of the cave was fitted with concrete, in part for safety (protecting lives) in part for nature preservation (damages to formations, generating natural debris and human origin refuse) considerations.
- c) Means for preservation/
conservation
- The theoretical protection and preservation of the cave and its environment is served by:
- Provisions
 - Ministry for Environment and Regional Policy
 - Authority for Nature Conservation
 - Directorate of Aggtelek National Park
 - Institute of Speleology
 - Hungarian Karst and Speleology Association
 - National Nature-Conservation Principia
 - Nature-Conservation Service
 - Nature-Conservation Council
 - Policy of National Nature-Conservation
- The actual protection of the Meteor Cave is carried out by the Aggtelek National Park Directorate as the managing organ.
- The cave is closed in a safe manner.
- It is not open to casual visitors and tourist.
- Tours are few and far between, permitted only when led by experts. Risk of damages is minimal.
- Explorative research has been stopped for the time being.
- d) Management plans
- The protection of this special karst-object is carried out according to the guidelines and regulations for the protection of nature. The cave, as part of the biosphere enjoys of the special attention and protection of the Aggtelek National Park Directorate.
- Based on the guidelines published in February 1994 by the Authority for Nature Conservation of the Ministry for Environment and Regional Policy : The "ex lege" protection of the caves of Hungary is guaranteed by law since 1961. This high level legal protection is justified by the wide ranging significance of the almost 3000 known caves in the fields of natural sciences (geology, mineralogy, hydrology, palaeontology, archeology, botany and zoology, climatology, etc.), and of its historical and aesthetical values, and in water management, tourism and in medicine.

The cave is a very sensitive, complex and complicated system, an environmental indicator. Legal protection extends from the entrance to the cave to the whole of cave, the surrounding rock, its paleontological and archeological findings, the vegetation of the entrance section, the dark flora, cave-favouring and cave-dwelling animals, regardless of their being protected. The effectiveness of the "de facto" protection is somewhat reduced by the affect of environmental pollution events (operating quarries, improper or inefficient waste water drainage and waste disposal, the wrong or inefficiently applied agricultural cultivation methods, excessive use of chemicals, etc.) and by direct, or inexpert interference without permission (growing sporttourism, cave touring, unauthorised entry, illegal collection of findings etc) within the cave itself.

Regarding the law on the protection of nature the loopholes affecting the ownership of caves and the springs rising from them, and the possibility of different interpretations should be eliminated, and the sphere and method of activities requiring permission have to be regulated, as well. All the conditions necessary for inspection/control, reconstruction, research providing the basis for multi-directional utilization need to be ensured, as well. Special attention shall have to paid to the protection of the even internationally unique thermal karst of Budapest, and the Aggtelek and Bükk karst objects.

Among the priorities of the policy of nature preservation, the protection of caves endangered by above the surface and beneath the surface anthropogenic interference, as these are truly scientific data-banks, environmental indicators, water collectors and spas, can be used as towrism and educational facilities.

Ensuring the legal, organisational and finacial conditions for their manysided utilization is also a special priority.

Among the priorities of R & D the complex researc of the caves the definition of the protective tasks, and the development of its data base play an important role.

The technical quideline No MI-13-56 in force since April 1992, titled "The nature protective management of reserved heritage places strong emphasis on the protection of caves, their surfaces, and waters.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type

This proposed scientific heritage is an example of the special development of the karst eco-system, with its extraordinarily beautiful natural elements.

It is a unique example of the fact that the sensitive nature, the cave, human interference, continuous research, examination and instrument measuring can peacefully exist side by side.

Special care have to be taken to gain further knowledge of this scientific-cultural treasure, while quarding all values and knowledge protected this far, and supporting scientific research.

- | | | |
|-----|--|---|
| ii | evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>There are no quartz pebbles to be found in the Meteor-cave, it came into being by corrosion development along tectonic fractures. Its fauna is limited, which leads to reason that this cave is of different character than the other large stalactite caves of the area. Its interesting formations are also of different character, and from the scientific point of view, it is one of our most important caves.</p> <p>It the future, under limited access it could be opened to tourism, since it offers an unforgettable experience to its visitors.</p> |
| iii | indications as to the authenticity of the property | <p>Its cultural value needs not to be given special protection, this tasks is perfectly fulfilled by nature protection. Its cultural value was already specified in the publications listed in Item 3/e, however, it is not a completed process, as telemetering is being is being continuously carried out at present, as well.</p> |
- b) Natural property
- | | | |
|-----|--|--|
| i) | reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>This proposed scientific heritage is an example of the special development of the karst eco-system, with its extraordinarily beautiful natural elements.</p> <p>It is a unique example of the fact that the sensitive nature, the cave, human interference, continuous research, examination and instrument measuring can peacefully exist side by side.</p> <p>Special care have to be taken to gain further knowledge of this scientific-cultural treasure, while quarding all values and knowledge protected this far, and supporting scientific research.</p> |
| ii | evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>There are no quartz pebbles to be found in the Meteor-cave, it came into being by corrosion development along tectonic fractures. Its fauna is limited, which leads to reason that this cave is of different character than the other large stalactite caves of the area. Its interesting formations are also of different character, and from the scientific point of view, it is one of our most important caves.</p> <p>It the future, under limited access it could be opened to tourism, since it offers an unforgettable experience to its visitors.</p> |
| iii | indications as to the integrity of the property | <p>The integrity of the cave is protected by regulations, the Aggtelek National Park Directorate, and by the action plan of the Aggtelek Karst Biosphere Reserve, as well. Measurement being carried out in the cave require tranquillity.</p> <p>The integrity of this natural treasure is supervised and ensured by its managing organ, the Aggtelek National Park Directorate.</p> |

A-5

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod - Abaúj - Zemplén County, Bodvarákó (village)
- c) Name of Property **Rákóczi I. cave**
- d) Exact location and indication of geographical coordinates The cave opens from the seventh level prospect-shaft of the old iron core mine. Coordinates:
-48 grade, 31' 15" of northern latitude
-20 grade, 45' 08" of eastern longitude -180 m height above the sea level -Cadastral number: 5412/2.
- e) Maps and/ or Plans See enclosed map in the Appendix.

2. Juridical data

- a) Owner The cave is in the ownership of the Hungarian State Property.
The trustee is the Aggtelek National Park Directorate.
The surface lands belongs to the stone mine (EURO-TEAM Ltd).
- b) Legal status According to the 18 th. law-decree/1961. the cave belongs to the state and protected. According to the decree 4 th decree/1982. and the 8/1982. (March) of the (Work Code) and that of 1/1982. (March 15) of the OKTH the (National Authority for Environmental and Nature Conservation) the cave is protected to a greater extent.
- c) Responsible national agency Responsible national agency is the Aggteleki National Park Directorate belonging to the Authority for Nature Conservation of the Ministry for Environment and Regional Policy.
- d) Collaborating national agencies and organizations Barlangtani Intézet (Institution of Speleology)
-- 1121 Budapest, Költő u. 21. --
Magyar Karszt-es Barlangkutató Társulat (Society of Hungarian Carst and Cave Research) -- 1027 Bp., Fő u. 68.--

3. Identification

- a) History The Rákóczi I Cave was discovered at Eszramos (famous for iron mining, botanical species and local caves minerals) in the 1920-s, at the 7 th level of the iron core mine at the height of 170 m above the sea level while breaking a prospect-shaft.
The cave had been used as a pit-heap:
The nearby exploited several hundreds cubic meter gangue had been poured into the downwards cave of the shaft side. István Venkovics made the first investigation and map about the cave, which contained the No I pond. It was the time when the cave got the name Rákóczi I.
The continuation of the cave was discovered by the Nature-lover Department of the Customs Guard with heading Gyula Szilvássy in November 1959, namely by breaking across the Golden Cage. They could get into the hall where you can see the No 2 pond.

At Easter 1968, Delfin Light Divers Department attempted to swim across the siphon of the No 2 pond. After several attempts they managed to swim into a large airy hall at a labyrinthian Apr. 30 m pond at the depth of 25 m.

At the No 1 and No 2 ponds in August 1971 the Tatai Viziklub (Aquatic Club) made further underwater experiments, but they managed to get in only vertically, however they were able to make several map-sketches. Between 1972 and 1975 several camps did research in the cave, however, they could discover no further parts. They acquired a great deal of local knowledge and became familiar with different techniques of diving and safety relevant to underwater cave research and diving.

Since the 1950-s on the top of the hill there has been limestone mining, and the emerged limestone is transported at the 7 th level during a spilling pit to the selector. In 1972 the prospect-shaft which you could get through to the cave was closed for nature-protective reasons.

Partly with the help of volunteers (with the head of Pál Berczik) the cave was built up in 1989-1992. This prevents people from causing damage to the formations on the surface of the cave, moreover, it helps admission to everyday tourists as well

b) Description and Inventory

Entering the old 7 th level iron ore shaft at Tornaszentandrasi Esztramos, which is known for iron ore mining, botanical species and rare minerals, there is a cross prospect shaft from which you could get into Rakoczi I cave.

The entering shaft takes its level at the height of 170 m above the sea level. The prospect shaft is at the first possible entrance.

Admission is applicable by the nature-protective authorities.

Having covered more than 200 after the solid steel door (there are natural calcite pits in the meantime) you arrive at the crossing where at the same time you can see the stairs to the cave. In the continuations there are several interesting natural recesses and caves where special formations catch your eyes.

In the north-east cleft the 70 m vertical cave's under-water parts overwhelm even 30 m. You are admitted to two large halls of the lit and built up cave, which are covered by stalactites at the top, and by pisolites at the bottom even running below the water-level.

A great deal of pisolites, needle-calcite formations and solvent kettles are characteristic of the cave. The great amount of massively and thickly covering colourful dripstone formations makes the cave part of the natural heritage.

During Janoss Denes's excavations in 1967, and from 1969 to 1972 14 vertebrate fossils were found in the clayey grounds of Esztramos hill's caves and recesses, which made faunas of Euro-Asian importance going back to the middle Pliocene to middle Pleistocene.

These excavations elicited some cave-genetical topics of Esztramos Cave in general. At the underwater parts of the cave arisen from the large vertical cleft, it is the characteristic kettlish formations that prove the solution even these days.

There is up-to-date equipment and lighting facilities in the cave, but because of its size only 8 people can be admitted at the same time, therefore it cannot be regarded as a real cave of tourism.

c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

d) Public awareness

e) Bibliography

There are more than 90 publications dealing with the Rákóczi Nr. I. cave. The most important are the following:

ANTALFFY GY. (1965): Felfedező úton az új cseppkőbarlangban; Magyar Nemzet, Budapest.

BAJOMI D. (1968): Recherches écologiques-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

CAROL A. HILL - PAOLO FORTI (1986): Cave minerals of the world; National Speleological Society.

EMBER S. (1968): A Kossuth-barlang Reménytelen-szifonjában végzett búvárkutatás; MKBT kiadvány, Budapest.

FODOR I. (1970): A Bardla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.

JAKUCS L. (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KOLLÁR K. (1979): Az esztramosi Rákóczi-barlangok víz alatti részeinek kutatása; Karszt és Barlang, Budapest

KORDOS L. (1973): Adatok az Esztramos barlangjainak ismeretéhez; Karszt és Barlang. Budapest.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

MAUCHA I. (1989): Karsst wather resources research in Hungary and its significance; Karszt és Barlang Special Issue, Budapest.

NÁSFAY B.. (1974): Az esztramosi Rákóczi-barlangok víz alatti részeinek kutatása; Karszt és Barlang, Budapest.

VAJNA GY. (1973): Barlani kristályok múzeuma; Élet és Tudomány, febr. 2. Budapest.

4. State of preservation/ conservation

a) Diagnosis

The Rakoczi I Cave becoming more known in general public is of great natural importance, However, because of its small size and the protection of hand-held damageable formations, and because of the fact that maximum 10 visitors are admitted per hour on average, in many cases, the cave's manager have ethical frictions with the customers. His current solution is that he does not advertise admission to the cave in great public.

Another further problem is that the cave can be visited across the route of a working mine.

b) History of preservation/
conservation

In 1964 the OTVH proclaimed the Rakoczi I Cave protected. Protection is guaranteed by the above mentioned institution (2/c) according to the law regulations mentioned at 2/b. The mine never protected cave, therefore there is a great deal of damage at the entrance, however, it was the mine who unintentionally protected it from the tourists. The first protective shutting in the shaft was erected in 1972

c) Means for preservation/
conservation

The cave is safely closed. Public admission is not free. Cave-tours are allowed rarely and in small groups with qualified cave-guides.

Provisions

Ministry for Environment and Regional Policy

Authority for Nature Conservation

Directorate of Aggtelek National Park

Institute of Speleology

Hungarian Karst and Speleology Association

National Nature-Conservation Principia

Nature-Conservation Service

Nature-Conservation Council

Policy of National Nature-Conservation.

Further protection is guaranteed by the manager of the working mine, who prevents the 7 th level shaft from visitors.

d) Management plans

This special karst-object is protected according to nature protective laws and regulations, and as a part of biosphere reserve it is under the special attention, care and protection of the Aggteleki Nemzeti Park.

According to the principles by the Természetvédelmi Hivatal (Környezetvédelmi és Területfejlesztési Minisztérium) in February, 1994.

The "Ex lege" Protection of Hungarian caves has been guaranteed by the law from 1961. This high-quality legal protection is motivated by the momentarily known nearly 3000 caves' widely-spread scientific (geological, mineralogical, hydrological, palaeontological, archeological, phytological, zoological, climatological, etc.) historical and ethetical, water-economical, tourist, therapeutical reasons. The cave is particularly sensitive, intricate and complicated system, and environmental indicator. Their legal protection covers the whole cave from the entrance namely the mounting mineral, palaeontological and archeological fossils, the plants of the entrance, the dark flora, cavephilous and cave-dwelling animals, independently from their protection. The effect of "de facto" protection is restrained by environmental contamination penetrating the surface catch-water area (outcrop mining, unqualified or dissatisfactory disposal of sewage and waste-handling, mischosen and mistreated agricultural methods, overdoses of chemicals) and direct and unqualified intrusions without legal admission to the cave. (prospering sport-tourism, cave-tourism, unwarrantable interference, illegal fossil-picking up.)

The nature-protective law should eliminate the caves' and their sources relevant legal deficiencies and the ambiguities, and should regulate the licence-required activities scopes and methods. It should guarantee the conditions of good control, reconstruction work. It should pay significant attention to the protection of internationally unique Budapesti thermal karst and the Aggteleki and Bukki karst objects.

The nature-protective politics priorities cover by anthropogenical interfering overendangered caves on the surface and under the surface protection of scientific data, environmental indicators, water-catch and thermal places, tourist-educational objects and the guarantee of legal, institutional and financial conditions for maintainable multiple usage.

Among the priorities of exploration and technical development there is an emphasis on complex cave research, the determination of protectional tasks and the technical development of scientific-data base.

The technical theory enacted in MI-13-56 April, 1992 is particularly engaged in the protection of caves, their water and surface. The mine's unused parts could be rebuilt as museum, exhibition or look-out tower.

5. Justification for inclusion in the World Heritage List

a) Cultural property

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| i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>This cave was explored by mining, which without it could never have been a valuable sight. Mining used to damage the cave, these days prevents people from intrusion. Nevertheless, production is limited by cave protection to a great extent. They erected protective pillars, a lot of minerals of good quality are not mined, which leads to a great loss of income and uneconomical method of mine-keeping.</p> <p>The fight in its historical line between mining and nature protection and their reconciliation is represented by the present character of the cave.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>The present condition of this cultural treasure could not be compared to other caves' cultural treasure because of its unique historical development.</p> |
| iii indications as to the authenticity of the property | <p>The handling of the cave belongs to the Aggteleki Nemzeti Park Directorate but it is also protected and cared by the present mining directory. Admission could be allowed by the above mentioned institutions with a qualified cave-tour guide.</p> |

b) Natural property

- | | |
|---|---|
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | This cave was explored by mining, which without it could never have been a valuable sight. Mining used to damage the cave, these days prevents people from intrusion. Nevertheless, production is limited by cave protection to a great extent. They erected protective pillars, which leads to a great loss of income and uneconomical method of mine-keeping. The fight in its historical line between mining and nature protection and their reconciliation is represented by the present character of the cave. |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | This natural treasure can be mentioned as one of the most precious visited caves in Europe, which does not mean an economical activity or the fact of having to be visited. This natural treasure is of great importance to the future and this possibility of preserving that to the following generations should come to the front, it is not the present exploitation that counts. |
| iii indications as to the integrity of the property | The handling of the cave belongs to the Aggteleki Nemzeti Park Directorate but it is also protected cared by the present mining directory. Admission could be allowed by the above mentioned institutions with a qualified cave-tour guide. |

A-6

1. Specific location

- | | |
|--|---|
| a) Contry | Hungarian Republic |
| b) State, Province or region | Borsod-Abaúj-Zemplén County , settlement Bódvarákó |
| c) Name of Property | Rákóczi No. II. cave |
| d) Exact location and indication of geographical coordinates | The cave opens from the VII level of an old iron ore mine,by the side of a slipping shaft .Its coordinates are northern latitude 48 31' 14",eastern longitude 20 45' 08,height above sea level is 178 m, its topographical number 5412/3. |
| e) Maps and/ or Plans | See enclosed map in the Appendix. |

2. Juridical data

- | | |
|--|--|
| a) Owner | The cave is a state property. Its trustee is the Management of the Aggtelek National Park Directorate.
The territory on the surface is the property of a quarry (EURO-TEAM Ltd.) |
| b) Legal status | According to the Decree of legal force No.18 passed in 1961 the cave is a protected state property. As to the law decree No. 4 of 1982 , the Cabinet-decision of 8/1982.(III.15) and the Decree by OKTH of 1/1982.(III.15) it is protected to a greater extent.Its topographical number is 5412/2. |
| c) Responsible national agency | The Directorate of the Aggtelek National Park belongs to the Authority for Nature Conservation of the Ministry for Environment and Regional Policy. |
| d) Collaborating national agencies and organizations | the Institute of Speleology--1121 Budapest,Költő u.21.--
The Hungarian Association of Speleology
-- 1027 Budapest,Fő u. 68. -- |

3. Identification

- a) History
- The cave 'Rákóczi II ' was discovered in 1950 in Esztramos of Tornaszentandrás,famous for its iron ore mining,botanic specialities, caves and rare minerals,while driving a gangway in the direction of the slipping shaft at level VII of the mine at 170 m above sea level.For a long time the cave was used as a.peat heap the nearby exploited: hundreds of cubic metre of gauge was poured into the chamber (cave) opening at the side of the gangway,and at the moment it serves as a vacuum cleaner at the end of the gangway.
- It was in 1976 when the FTSK dolphin diving club made the first survey and the first map about the cave,which contains the lakes as well.That was also the time when the cave was given the name of Rákóczi II.At Eastern 1968 the club tried to swim across the lake No II.

In August 1971 and April 1972 there were further investigations carried out in lakes I and II, but divers could get along only vertically, however they managed to make several schemes. The two Rákóczi caves were impossible to join.

Between 1972 and 1975 there were several camps surveying the cave but their efforts remained without new results. However they obtained an excellent knowledge of the place, tried out different diving and security techniques, which could be well utilized by underwater speleology and the diving sports.

Since 1950 there has been lime stone mining at the top of the hill and the broken lime stone is transported to the place of selection through the slipping shaft at level VII.

In 1972 the entrance of the cave was closed by an iron door, which fact did not have any practical sense. At present you need a permit to enter.

- b) Description and Inventory On Esztramos of Tornaszentandrás, which is famous for its mining of iron ore, botanic specialities, caves and rare minerals, entering the transporting shaft at level VII, at the end of the original bogie-track we can find the entrance to the cave Rákóczi II. The entering gangway can be found at 170 m above sea level.

Total length of the cave exceeds even 300 m. Underwater part of the cave formed in a huge gap of N-S direction could be deeper than 50 m. Near the surface the cave has dripstone, in lower parts as far as 5 m under the water there is pisolite.

Special features of the cave are a wide range of pisolite, needle-like calcitic formations and dissolved kettles. The walls are full of thick and colour dripstone, which make the cave a world famous heritage of nature.

In 1967 and later between 1969 and 1972 during the excavations made by János Dénes 14 finds of vertebral prehistoric remnants were dug out from the clay sediment filling the gaps of the cave. They date back to the epochs of mid pliocene and mid pleistocene, and appear to be of Euro-Asian origin. Based on these results it is possible to clarify the questions of genetics of caves on the Esztramos.

On the underwater parts of the cave formed along the huge vertical gap the typical kettle-like formations prove that dissolution is still going on.

The cave can possibly be built out for partial tourism.

- c) Photographic and/ or
cinematographic
documentation

See enclosed photo in the Appendix.

- d) Public awareness

e) Bibliography

There are more than 90 publications dealing with the Béke cave. The most important are the following:
ANTALFFY GY. (1965): Felfedező úton az új cseppkőbarlangban; Magyar Nemzet, Budapest.
BAJOMI D. (1968): Recherches écologies-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.
CAROL A. HILL - PAOLO FORTI (1986): Cave minerals of the word; National Speleological Society.
EMBER S. (1968): A Kossuth-barlang Reménytelen-szifonjában végzett búvárkutatás; MKBT kiadvány, Budapest.
FODOR I. (1970): A Bardla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.
JAKUCS L. (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.
JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.
JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.
KOLLÁR K. (1979): Az esztramosi Rákóczi-barlangok víz alatti részeinek kutatása; Karszt és Barlang, Budapest
KORDOS L. (1973): Adatok az Esztramos barlangjainak ismeretéhez; Karszt és Barlang. Budapest.
KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.
MAUCHA I. (1989): Karszt wather resources research in Hungary and its sigfinicance; Karszt és Barlang Special Issue, Budapest.
NÁSFAY B.. (1974): Az esztramosi Rákóczi-barlangok víz alatti részeinek kutatása; Karszt és Barlang, Budapest.
VAJNA GY. (1973): Barlani kristályok múzeuma; Élet és Tudomány, febr. 2. Budapest.

4. State of preservation/
conservation

a) Diagnosis

The Rákóczi II cave is a valuable heritage of nature that is more and more well known by the public. People interested in speleology would often like to visit it. However since the walls are covered with sensitive formations, tours of the cave will be permitted only a possible construction. An other problem is that the cave can be entered only on the territory of an operating mine.

b) History of preservation/
conservation

The cave was declared protected in 1964 by the OTVH. It is protected by the institution indicated in point 2/c on the basis of regulations indicated in point 2/b. Since the mining company has never protected the cave, there is damage at the entrance, but on the other hand it was mining that protected it from visitors, though unwillingly.

c) Means for preservation/
conservation

The cave is safely closed.

It is not open to the public. Practically there are no tours inside, and opening is stopped at present as well.

Factors in service of theoretical protection of the cave and of its environment are as follows:

Provisions

Ministry for Environment and Regional Policy

Authority for Nature Conservation

Directorate of Aggtelek National Park

Institute of Speleology

Hungarian Karst and Speleology Association

National Nature-Conservation Principia

Nature-Conservation Service

Nature-Conservation Council

Policy of National Nature-Conservation.

Further protection of the cave is guaranteed by the management of the mining company, which does not let anybody into level VII.

d) Management plans

Protection of this special karstic object is carried out based on the provisions of the law about protection of environment. As part of the biosphere reservation, it enjoys the attention, protection and care of the management of the Aggtelek National Park.

According to the principles by the Természetvédelmi Hivatal (Környezetvédelmi és Területfejlesztési Minisztérium) in February, 1994.

The "Ex lege" Protection of Hungarian caves has been guaranteed by the law from 1961. This extreme legal protection of the nowadays known 3,000 caves is motivated by its scientific (geological, mineralogical, hydrological, palaentologic archeological, botanical and zoological, climatological etc) , historical and esthetical values and its touristical and medical importance. The cave is a very sensitive, complex and complicated system, and an environmental indicator. Their legal protection is extended from the entrance to the entire space of the cave, its surroundings, its palaentological and archeological finds, the flora of the entrance, the dark flora, animals liking to be and living in the cave regardless whether they are protected or not. Effectiveness of 'de facto' protection is decreased by factors like contamination of the open cistern on the surface (surface mining, inefficient or partial sawage system and placement of waste, badly chosen or applied agricultural cultivation methods, application of too much chemical material etc.) and prohibited or unskilled entering into the cave (growing sports tourism, tours of the cave, unauthorized intrusion, illegal collection of findings etc).

In the law about nature there is a need to clarify the understanding of ownership and authorized utilization of caves and rivers coming out of them. Good conditions must be provided for control, reconstruction works and complex research of multiple utilization, proper attention must be paid to the Budapest thermal dolomit, which is unique in an international sense and to the protection of the Aggtelek and the Bükk karstic objects.

Among the priorities of the nature preservation policy, outstanding ones are protection of caves threatened by antropogenic penetration on and under the surface, which serve as scientific databank and environmental indicators, protection of water resources, medical places and touristical-educational objects, guarantee of the legal, organisational and financial conditions of their multiple utilisation.

There is an outstanding role of complex research done in the caves, that of determination of tasks of protection and development of database.

The technical guidelines No. MI-13-56 of April 1992 titled 'Environmental protection of protected values' deals with the protection of caves, their water and surface on the first place.

Parts of the mine not being used might be formed into a museum of mining, a show or a look-out place.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- | | |
|--|---|
| i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>Since the cave was opened by mining excavation, it would never have been possible to see it with human eyes without it. Underground excavations used to damage the cave and prevent from entering it, but for some time the mining company has decreased mining activity in the region, they have built protecting posts, and they do not excavate most of the good quality rock, which causes the company losses of income and uneconomicality.</p> <p>Presently the cave shows the historical process of battles and peace between mining and protection of environment.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>This cultural heritage in its present state cannot be compared with that of any other caves, since the historical process itself is unique.</p> |
| iii indications as to the authenticity of the property | <p>The cave is protected both by its trustee the management of the Aggtelek National Park, and that of the mining company. It can be entered only with the permission of the two above named institutions led by a trained guide.</p> |

b) Natural property

- | | |
|---|---|
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | Since the cave was opened by mining excavation, it would never have been possible to see it with human eyes without it. Underground excavations used to damage the cave and prevent from entering it, but for some time the mining company has decreased mining activity in the region, they have built protecting posts, and they do not excavate most of the good quality rock, which causes the company losses of income and uneconomicality. Presently the cave shows the historical process of battles and peace between mining and protection of environment. |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | This heritage of nature is probably one of the most valuable caves in Europe that is worth showing, which does not mean that it would be a profitable activity especially in the present state of things. Since it is of extreme value, it should be preserved for future generations rather than having its present profitable utilisation in mind. |
| iii indications as to the integrity of the property | The cave is protected both by its trustee the management of the Aggtelek National Park, and that of the mining company. It can be entered only with the permission of the two above named institutions led by a trained guide. |

A-7

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod-Abaúj-Zemplén County , settlement Szögliget
- c) Name of Property **Rejtekt shaft-cave**
- d) Exact location and indication of geographical coordinates The cave opens from a flat ridge of a place called Szilvástető on Dusa hill. There is a large dolina to its north . Its co-ordinates are:northern latitude 48 32' 16",eastern longitude 20 41' 41",height above sea level is 410 m, its topographical number 5450/6.
- e) Maps and/ or Plans See enclosed map in the Appendix.

2. Juridical data

- a) Owner The cave is a state property. Its trustee is the Directorate of the Aggtelek National Park.
- b) Legal status According to the Decree of legal force No.18 passed in 1961 the cave is a protected state property. As to the law decree No. 4 of 1982 , the Cabinet-decision of 8/1982.(III.15) and the Decree by OKTH of 1/1982.(III.15) it is protected to a greater extent.
- c) Responsible national agency The Directorate of the Aggtelek National Park belonging to the Bureau of Protection of Environment of the Ministry of Protection of Environment and of Land Development.
- d) Collaborating national agencies and organizations the Institute of Spelaeology--1121 Budapest,Költő u.21.--
The Hungarian Association of Spelaeology
-- 1027 Budapest,Fő u. 68. --

3. Identification

- a) History The most beautiful cave of the ' Small-plateau' is the shaft-cave called Rejtekt-zsomboly, the aperture of which was first discovered in 1957 by Zemlényi Lajos living at Bódvaszilas. He and a forest, called Szikra László descended to the first part of the cave and wandered all over in as far as 22 m. It was in 1958-59 that with Dénes György at the head, Buda György,Kósa Attila, Rónai Miklós and their company opened and surveyed the 62.5 m deep shaft of the cave full of spherical formations like coral,mushrooms and clusters of grapes.
In 1974 the members of the spelaeological group of the VMTE Tektonik, Pelikán István, Balogh László and their company invented a new parallel shaft of the cave full of mineral formations and surveyed it down to 72 m.
In 1989 there were iron ladders mounted to make the cave easier to reach, which also protect the walls covered with the special formations,and it was closed by a strong iron door too.

- b) Description and Inventory With its genetics and formations, the cave rises several interesting speleological problems. Its native rock is of Wetterstein limestone strongly contaminated with dolomite, despite of which fact it is one of the deepest caves of the 'Alsó-hegy'. However it is not only its depth, but other dimensions, its width and formations are also considerable.
- Its entrance is narrow, about 70 cm in width. The 5 m-long vertical narrow part under the entrance is like a ripped flue which widens into a small chamber, the bottom of which is covered with rocks.
- The second portion of the cave begins 8 m deep under the entrance and is 22.5 m long. Its bottom is a steep slope of fine-grained rubble. Originally bigger grains of this fallen masonry blocked the way further on. This part is like a gap widened by corrosion. The walls are covered with crumbling dripstones and here it is where the first 'every-day' botryoidal stalactites appear. In the lower chamber we can already find quite thick crustings and flags of dripstone.
- In the third part of the cave there are two shafts which meet at the depth of 31 m. At 44 m the diameter unexpectedly becomes narrower, we step out on a wide plateau from where we can enjoy very nice examples of corrosion and thick layers of botryoidal stalactites. The portion under the plateau continues in a different direction of the gap and departs at 54 m. One fork ends at 61.5 m and the other one at 62.5 m.
- The so called 'New-shaft' is even more beautiful than the third part with its special formations.
- All formations of the cave can be divided into four groups: hard botryoidal stalactites (coral-, and mushroom-like); dripstone; crumbling botryoidal stalactites (coral-, and pea-like); crystal needles on the triassic basis. Dimensions of the formations are varying from 2-3 to 6-7 cm. X-ray examinations showed that the crumbling botryoidal stalactites contain 5% aragonite.

- c) Photographic and/ or cinematographic documentation See enclosed photo in the Appendix.
- d) Public awareness

e) Bibliography

There are more than 50 publications dealing with the cave 'Rejtekt-zsomboly', the most important of which are as follows:

BAJOMI D. (1969): A Meteor-barlang faunisztikai vizsgálata; Karszt és Barlang, Budapest.

BALÁZS D. (1957): Összefoglaló beszámoló a Kinizsi bg. kut. csop. 1957. aug. vecsembükki expedíciójáról; Budapest

DÉNES GY. (1961): A Meteor-barlang feltárása; Karszt- és Barlangkutató, Budapest.

DÉNES GY. (1961): Előzetes jelentés a VMTE BSZ 1961. évi expedíciójáról; Karszt- és Barlangkut. Táj., Budapest.

JAKUCS L. (1961): Agtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

KÓSA A. (1963): A szögligeti Rejtekt-zsomboly; Karszt és barlang. Budapest.

KÓSA A. (1992): Alsó-hegyi zsombolyatlasz; Budapest.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

SZENTES GY. (1980): A Bódvaszilas környéki karsztterület genetikai kérdései; Karszt és Barlang, Budapest.

**4. State of preservation/
conservation**

a) Diagnosis

Tours of the cave have an outstanding importance among Hungarian and Slovak speleologists, though it is rarely visited. The cave does not require any special technical equipment hence it is fully equipped with ladders. Since it provides unforgettable experiences, we must strongly restrict the number of permitted tours.

Possible harms done to the formations could be decreased with an other minimal and special construction.

Only small groups of trained speleologists should be let in the cave.

In the meantime damage can be found only along the walking path in the cave.

b) History of preservation/
conservation

In 1988 there was a concrete entrance constructed from security (life protection) and environment protection (damage of formations, natural and human trash) purposes.

Ladders mounted on the walls in 1989 on one hand protect the formations from speleologists hanging on ropes and on the other hand make it possible for less skillful visitors to descend to the cave.

c) Means for preservation/
conservation

Factors in service of theoretical protection of the cave and of its environment are as follows:

Provisions

Ministry for Environment and Regional Policy

Authority for Nature Conservation

Directorate of Aggtelek National Park

Institute of Speleology

Hungarian Karst and Speleology Association

National Nature-Conservation Principia

Nature-Conservation Service
Nature-Conservation Council
Policy of National Nature-Conservation.

Practical protection of the cave is guaranteed and supervised by the management of the Aggtelek National Park.

The cave is safely closed.

It is not open to the public.

Jeopardy is minimal since there are only few tours in the cave in the company of researchers.

At the moment digging up research is suspended.

d) Management plans

Protection of this special karstic object is carried out based on the provisions of the law about protection of environment. As part of the biosphere reservation, it enjoys the attention, protection and care of the Directorate of the Aggtelek National Park.

According to the guiding principles of the Authority for Nature Conservation of the Ministry for Environment and Regional Policy issued in February 1994:

'Ex lege' protection of Hungarian caves has been guaranteed by the law since 1961. This extreme legal protection of the nowadays known 3,000 caves is motivated by its scientific (geological, mineralogical, hydrological, palaeontological, archeological, botanical and zoological, climatological etc), historical and esthetical values and its touristical and medical importance. The cave is a very sensitive, complex and complicated system, and an environmental indicator. Their legal protection is extended from the entrance to the entire space of the cave, its surroundings, its palaeontological and archeological finds, the flora of the entrance, the dark flora, animals living to be and living in the cave regardless whether they are protected or not. Effectiveness of 'de facto' protection is decreased by factors like contamination of the open cistern on the surface (surface mining, inefficient or partial sewage system and placement of waste, badly chosen or applied agricultural cultivation methods, application of too much chemical material etc) and prohibited or unskilled entering into the cave (growing sports tourism, tours of the cave, unauthorized intrusion, illegal collection of findings etc).

In the law about nature there is a need to clarify the understanding of ownership and authorized utilization of caves and rivers coming out of them. Good conditions must be provided for control, reconstruction works and complex research of multiple utilization, proper attention must be paid to the Budapest thermal dolomite, which is unique in an international sense and to the protection of the Aggtelek and the Bükk karstic objects.

Among the priorities of the nature preservation policy, outstanding ones are protection of caves threatened by anthropogenic penetration on and under the surface, which serve as scientific databank and environmental indicators, protection of water resources, medical places and touristical-educational objects, guarantee of the legal, organisational and financial conditions of their multiple utilisation.

There is an outstanding role of complex research done in the caves, that of determination of tasks of protection and development of database.

The technical guidelines No. MI-13-56 of April 1992 titled 'Environmental protection of protected values' deals with the protection of caves, their water and surface on the first place.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type
It is a special example how sensitive nature, the cave and human penetration, continuous research and surveys can peacefully exist side by side.
There must be further care paid to get to know this cultural value protecting what is known by now.
Caves belonging to the category of lifeless nature preserve interesting episodes of the history of the earth: structural and climatical changes, accumulation and erosion-deflation processes having taken in the Carpathian basin, and changes of life as well. The caves are rich databanks of sciences about our planet. The shaft-cave called 'Rejtek-zsomboly' has an outstanding place among them.
- ii) evaluation of the property's present state of preservation as compared with similar properties elsewhere
This cultural heritage is an example of great results of conscious research.
It is one of those not public caves which was looked for with scientific research and opened with scientific discovery.
- iii) indications as to the authenticity of the property
Its cultural value does not require special protection, this is properly done by protection of environment. Its cultural value is shown in publications listed in point 3/e though it is not a finished process yet.

b) Natural property

- i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type
With its special forms and exceptional formations the cave Rejtek shaft-cave is an important and rare member of the caves situated on 'Alsó-hegy' especially from the scientific point of view. It calls attention not to forget the hydrothermal phenomena of the area from the speleological point of view, and serves as an example of cave genetics and the way speleological formations develop.
It is also an example of the special formation of a karstic geosystem with its natural elements of exceptional beauty.
It also demonstrates how sensitive nature, the cave and human penetration, continuous research and surveys peacefully exist side by side.
This natural value is only partially known, there should be special attention paid to its further opening and also to protection of what is known up to now.

- ii evaluation of the property's present state of preservation as compared with similar properties elsewhere
In the cave there are no karstic pebbles found, probably it was formed by corrosion along tectonical gaps, its formations are of different character. That is why it is one of the most important of our caves from the scientific point of view.
The odd thing about it is that it was formed in a different way from that of other caves in the country.
Its special formations need to be preserved for future generations.
- iii indications as to the integrity of the property
Intactness of the cave is guaranteed by the Directorate of the Aggtelek National Park and the Action plan of the Aggtelek karst biosphere reservation. Measurements taking place in the cave also require tranquility.

1. Specific location

- | | | |
|----|---|--|
| a) | Contry | Hungarian Republic |
| b) | State, Province or region | B-A-Z County; Égerszög village |
| c) | Name of Property | Szabadság Cave |
| d) | Exact location and indication of geographical coordinates | At present the only (artificial) entrance to the cave is in the mouth of the Dász-dolina at the foot of Pitics hill near Égerszög village. The coordinates are the following: northern latitude 48°27'19", eastern longitude 20°34'26", height above sea level 322 m, cadastral number 5430/4. |
| e) | Maps and/ or Plans | Maps: 1:1500, 4-5, April, 1955, Balázs;
1:1000, 1st Part of Atlas 1960, Bártfai;
1961, Balázs;
1991, Sketch of the new section |

2. Juridical data

- | | | |
|----|---|--|
| a) | Owner | The cave is in the ownership of the Hungarian State Property. The trustee is the Aggtelek National Park Directorate. |
| b) | Legal status | On the basis of the 18th Law-Decree of 1961, the cave is in state property and it is a preserved area (reservation). The cave is protected to a greater extent on the basis of the 4th executive order of 1982; the cabinet decree of 15th, March, 8/1982; and the OKTH provisions of 15th, March, 1/1982. |
| c) | Responsible national agency | The Directorate of the Aggtelek National Park belong to the Authority for Nature Conservation the Ministry for Environment and Regional Policy. |
| d) | Collaborating national agencies and organizations | Institution of Speleology -- 21, Költő str. Budapest--.
Association of Hungarian Carst - and Speleologists
-- 68, Fő str. Budapest--. |

3. Identification

- | | | |
|----|---------|--|
| a) | History | The disclosure of the Szabadság - cave of Égerszög was a significant stage of the triumphant cave searching that started with the discovery of Béke (Peace) cave. The idea of the existence of a new cave-system ---which is independent from the Béke cave and the Baradla cave as well, lying just in the neighbourhood of Pitics-mountain --- already emerged in 1952. The exploring team formed by persons from Égerszög aimed at the opening up of the hidden natural wealth of their village with undoing the swaller in the Dász-dolina. A 12 m long slope was undone, but because of the insufficient support it caved in. |
|----|---------|--|

Still during the fall of that year the exploring team of László Jakucs continued the disclosure 8 m above the tumbled gap. This team succeeded in approaching the supposed heading, penetrating down to a depth of 14 m with a vertical shaft, to such an extent, that there appeared a strong draft between the washed stones of the end of the adit.

In 1954 a small group ---established by the Kinizsi Sports Club of the Ministry for Food Industry and by the volunteers of Égerszög village --- went on exploring the site. Their hard struggle lasted for one and a half month, but in the end by the first days of November, 1954 they succeeded in finding a narrow, winding, almost horizontal heading, in which they could penetrate some ten meters without excavating. Unfortunately this heading was also very dangerous; sometimes crushing weights of rocks were rolling down; at that time two members of the team got hurt, therefore the work had to be interrupted.

After the re-start of the operation, partly with newly employed workers, on the 14th of November, even the last rock slides were demolished and the team entered a wonderful, 2700 m long stalactite/stalagmite cave (Dénes Balázs, Lajos Balázs, Sándor Pozsgai, György Stefanik).

Later on, in 1955, on the grounds of the electromagnetic measurement tests, --- which tests were developed by experimentation at the Szabadság Cave ---, a new, non-dangerous heading adit was opened.

In October, 1991, the speleologist section of the Ferencváros Nature-lover Sports Club (the successor of the former Kinizsi Sports Club of the Ministry for Food Industry), --- with the lead of Mrs Vidics ---, managed to get into the continuation of the lower level of the Pokol (Hell) cave; as a result of the demolishing which -- at that time -- had already been pursued since 1980. This part of the cave was explored in a length of 500 m. The known (explored) length of the cave with this latter mentioned section exceeds 3200 m.

b) Description and Inventory

The Freedom (Szabadság)-cave lies beneath the territory that is enclosed by the Nagy-Jenei-tető, the Pitics-hill and the Kecske-well (kút); in the south-eastern region of the lime rock strata of Aggtelek-mountain from the Triassic period, which mountain stretches long in the eastern-western direction. This Szabadság cave is similar to the Baradla- and Peace (Béke) -caves, but its dimensions are much smaller compared to the other two ones. Its reason mainly is, that the catchment area of the primary branch (Branch of Realized Dreams) of the cave-system --- which is an above-ground, non-karstic, Pliocene series, clayey, rudaceous tributary basin --- is much less (0.3 km^2) than the area of the previously mentioned two caves.

The Szabadság cave is the ninth longest cave of the country, and the third longest (3219 m) of the Aggtelek-Karst. This cave can be entered through an artificial adit. The water-flow of the cave appears in the Kecske (Goat)- well (which spring is 1550 m from the entrance as the crow flies). This multi-level, medicinal stalactite cave is hardly feasible, and practically has not got side-branches.

Its dripstones are principally stalactites; particularly in the upper section of the main branch the pea lime stone incrustates can be found. Chiefly these pea limestones give a very characteristic, interesting feature to the cave, which stones show up in a large quantity and grow in a very wide range of patterns. The soil of the heading generally consists of quartz-pebbles; in the sections of Hell (Pokol) the soil is mainly brown loam. In the alley of the main branch of the cave there isn't any permanent water-flow; the stream that feeds the Goat (Kecske)-well flows beneath the present headings in dry periods. The air temperature in the cave is 9.8 °C, the humidity is 99-100 %. The flora and the fauna in the cave is similar to that of the Béke (Peace)-cave; the blind and white species are also dominating here; there are some rare species here as well: (*Oncopodura égerszögenensis*, *Pseudosinella aggtelekiensis*, *Koenenia vágvölgyi*). The mould funguses can also be met with here with a great variety.

The first section of the cave is the Realized Dreams branch, which stretches 1100 m from the swaller entrance to the Kuszoda (crawlway). Near Kuszoda the limestones are replaced by dark dolomites. This section is 64 m long, but is only 52 cm high. The following section is the Tube corridor, where at the end, close to Kuszoda, dolomite still prevails, but as the quantity of limestone increases, the narrow and small alley changes into a wider, more comfortable heading, taking the shape of a tube. The Tube corridor at the inner end turns into an acutely folded rock clay, here the cave is very collapsible, its slaty structure vertical rocks can nearly be broken manually. Here developed the largest hall of the cave with 32 m in length, 12-12 m in width and height, respectively. It's called the Giant-hall. The stream flows 5-6 m beneath the detritus. The geomorphologically most interesting section (The Hell) comes just behind this. In general, the previous heading splits into 2 or 3 levels, these levels form halls in some places, clinging with each other.

c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

d) Public awareness

e) Bibliography

There are more than 110 publications dealing with the Szabadság cave. The most important are the following:

BALÁZS D. (1955): Az égerszögi Szabadság-barlang feltárása és kutatásának első eredményei; Budapest.

BALÁZS D. (1961): A Szabadság-barlang; Budapest.

BALÁZS D. (1994): A csepegő kövek igézetében; Budapest.

BALOGH K. (1948): Adatok a Gömör-Tornai-karszt geológiájához; MÁFI évi jelentése, Budapest.

BAJOMI D. (1968): Recherches écologies-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

BÁRTFAI P. (1964): A Szabadság-barlang térképatlasza; Budapest

BERÉNYI D. - JUSTYÁK J. (1960): Mikroklimatológiai megfigyelések az Aggteleki-cseppkőbarlangban; Kossuth L. Tud. Egy. Mat. Int. Közl., Debrecen.

FODOR I. (1970): A Bardla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.

JAKUCS L. (1961): Agttelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KESSLER H. (1958): Das Aggteleker Höhlengbiet; Budapest.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

4. State of preservation/ conservation

a) Diagnosis

The trustee of the cave is the Directorate of the Aggtelek National Park; the cave at present hasn't got an operating, developing, management organ. For the present the cave can not be exploited for tourism, because the visitors would endanger the intact character of the cave formations. Its importance from scientific aspect is very high. Those inner spacious sections which may be revealed after this cave's further exploration, could yield some interest and beauty that may not have been guessed or foreseen before. The Szabadság cave and its water-flow have been discussed many times so far as the base and reservoir of the potable water supply of the neighbouring region; but the economic regulations always forced us to choose some other ways of solving this question.

The pit portal (entrance adit) and the doors were made in 1957, with the intention of nature-protection (conservation).

The outward area in front of the entrance is in private ownership.

- b) History of preservation/conservation
- On the 10th of October, 1956 the National Nature-conservation Council declared the Szabadság cave and its surface (210 ha) a nature-conservation area (the registration number is: 60/TT/57; the provision number is: 898/56). In May, 1957 the entrance to the cave was covered with concrete, and equipped with a door made of iron. On the 12th of December, 1957 the National Nature-Conservation Council and the Borsod County Council regulated the operational and visiting order of the cave, in a common rescript. Since 1957 it is prohibited to use a face-shield in the cave for the sake of the protection of the large volume of stalactites, which are suspending from the ceiling. On the 27th of July, 1958 Dénes Balázs, the leader of the research group, operating and maintaining the cave, stopped the flow of tourists, because the visitors caused damages in the cave formations. By reason of the provision 8/1978 OKTH the outward part of the Freedom (Szabadság) cave is a strictly protected nature-conservation area. In August, 1990 the Aggtelek National Park renovated the entrance buttress and furnished the door with a safe, hidden lock.
- c) Means for preservation/conservation
- The theoretical protection and preservation of the cave and its environment is served by:
- Provisions
 - Ministry for Environment and Regional Policy
 - Authority for Nature Conservation
 - Directorate of Aggtelek National Park
 - Institute of Speleology
 - Hungarian Karst and Speleology Association
 - National Nature-Conservation Principia
 - Nature-Conservation Service
 - Nature-Conservation Council
 - Policy of National Nature-Conservation
- The practical protection and preservation of the cave is served by locking the entrance section with a safe door and by building it out durably and massively. The key of the door is kept in a safe place at the Directorate of the Aggtelek National Park. Visitors and researches are allowed to enter the cave only with holding the permission of the Directorate of the Aggtelek National Park.
- d) Management plans
- By virtue of the directives issued in February, 1994 by the Authority for Nature Conservation of the Ministry for Environment and Regional Policy:
- The “ex lege” protection of the Hungarian caves since 1961 is warranted by law. This high-level legal protection for the presently known nearly 3000 caves is justified by the water-economic, tourist and medicinal significance, moreover by their historical and aesthetical values, furthermore by their wide-range scientific (geological, mineralogical, hydrological, paleontological, archeological, botanical, zoological, climatological, etc.) values.

The cave is a particularly sensitive, complicated and complex system, it's really an environmental indicator. The legal protection of the caves extends from the entrance to the whole cave, to the enclosing rocks, to the paleontological and archeological findings, to the flora of the entrance, to the dark-flora, to the cave-loving and cave-living animals, independently from their immunity. The efficiency of the "de facto" protection is moderated in two ways: firstly by those environmental contaminations which make their effect on the superficial basin (surface mining, inefficient sewage disposal, inadequate waste disposal, badly chosen and applied agricultural ways of cultivation, overdosed chemicals, etc.); secondly by those interventions which were done without permissions, directly into the internal life of the cave (the increasing sports-tourism, cave-searching, cave-walking, unauthorized enterings, illegal collecting of findings, etc.).

In the law about the conservation (protection) of the nature it is necessary to put an end to the gaps in the legal effects in connection with the ownership of the caves and sources springing from the caves; furthermore it's also necessary to do away with the possibility of the various interpretations of laws; there is also a need for controlling the sphere and ways of those activities that are limited to permissions.

The conditions and circumstances of supervision, reconstruction works and of those complex research activities that establish the multi-purpose utilization, must be ensured in the future. Its of high priority to pay attention to the protection of the Aggtelek,- and Bükk karstic objects, over and above to the protection of the internationally unique Budapest thermal-karst. Among the priorities of the nature conservation policy it is highly important to protect the tourism-educational objects, the water-supplies and health-resorts, the environmental indicators, the scientific data-banks; summing up: to protect the caves, which are particularly endangered by the outward and the subsurface anthropogenic interventions. In addition to the protection, it is also very important to guarantee the legal, organizational and financial conditions of the multi-purpose exploitation of the caves.

Among the research and development priorities an important role is assigned to the complex research of the caves, to the determination of the protective tasks and to the development of its data base.

The governing technical principles, --- which are valid since April, 1992 (No.MI-13-56), titled "Nature Conservation Handling of Protected Values", --- pay prominent attention to the protection of caves, their water-flows and surfaces.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type
Those caves that belong to the category of the inanimate natural values, preserve the episodes of the rich cycles of events of the Earth-history. (These cycles are the following: the structural movements of the Carpathian-basin, climate-changes, accumulation and erosion-deflation processes and the changes in the living world.) These episodes are preserved for the specialized branches of science, for the economic-productive sphere, for the propagation of general knowledge and popular science, respectively. The caves are scientific data-banks; objects of the rich tools of nature-conservation and earth-sciences. Among these caves the Freedom-cave is of high priority.
- ii) evaluation of the property's present state of preservation as compared with similar properties elsewhere
This cultural heritage is a remarkable example in the point of view, what magnificent results can be achieved with conscious scientific research. It belongs to the group of those not open caves (which group includes a great number of caves), which were found by means of scientific research and were opened using scientific exploration.
- iii) indications as to the authenticity of the property
Its cultural value does not need to be additionally protected, this task is perfectly fulfilled by the nature-conservation. Its cultural value has already been shown in the 3/e point (publications).

b) Natural property

- i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type
The Aggtelek-Karst, especially the Freedom-cave is outstandingly suitable to become a sample-area showing the connections between various geological and hydrogeographical phenomena - particularly suitable, because of its high -level exploration. This proposed natural heritage is an example for the special formation of a karst eco-system, with its exceptionally beautiful natural elements; furthermore it's the example for the conscious scientific research of the nature.
- ii) evaluation of the property's present state of preservation as compared with similar properties elsewhere
The present state of the Freedom-cave is stable and secure. The formations and the natural values did not lose their original conditions. Among the 240 caves of the Aggtelek-Karst 20 are protected in an increased degree; moreover among these 20 caves this one is of high priority, and is a natural treasure. Its natural value and riches is significant on a world scale, as well, but may only be visited on special occasions, for the sake of its protection.
- iii) indications as to the integrity of the property
The integrity of this natural treasure is protected by legal rules, directives, the nature-conservation policy, the Directorate of the Aggtelek National Park and the action plan of the biosphere preserve of the Aggtelek-Karst, as well. The intactness of the cave is ensured and supervised by the trustee of this natural treasure: the Directorate of the Aggtelek National Park.

1. Specific location

- a) Contry Hungarian Republic
- b) State, Province or region Borsod-Abaúj-Zemplén County , settlement Jósvalő
- c) Name of Property **Vass Imre cave**
- d) Exact location and indication of geographical coordinates The cave opens at the southern foot of the Haragistya highland,north to the stream called ' Kis-Tohonya 'Its co-ordinates are northern latitude 48° 29' 54",eastern longitude 20° 32' 17"height above sea level is 272 m, its topographical number 5440/2.
- e) Maps and/ or Plans A rough sketch of the map was drawn by Szenthe István in 1985. See enclosed map in the Appendix.

2. Juridical data

- a) Owner The cave is a state property. Its trustee is the Directorate of the Aggtelek National Park.
The cave is being taken care of by the Spelaeological Group named after Papp Ferenc.
- b) Legal status According to the Decree of legal force No.18 passed in 1961 the cave is a protected state property. As to the law decree No. 4 of 1982 , the Cabinet-decision of 8/1982.(III.15) and the Decree by OKTH of 1/1982.(III.15) it is protected to a greater extent.Number of research permit of the Papp Ferenc spelaeological group is: 486/1984.
- c) Responsible national agency The Directorate of the Aggtelek National Park belongs to the Authority for Nature Conservation of the Ministry for Environment and Regional Policy.
- d) Collaborating national agencies and organizations the Institute of Spelaeology --1121 Budapest, Költő u.21.--
The Hungarian Association of Spelaeology
-- 1027 Budapest, Fő u. 68. --

3. Identification

- a) History In the summer of 1956 a small group of students from the Budapest Polytechnics was carrying out further investigations using methods of research developed on the Aggtelek Karst. They were looking for an answer to the question whether it is possible to make deductions on unknown underground paths and holes from the hydrological features of karstic streams spouting in the most northern not very much known parts of the hill. Their attention was drawn to a temporary - that time entirely dry flood-time spring. This spring abyss situated NW from the settlement Jósvalő was last seen to have water in 1954:it was a several-metre-tall coloumn of water as thick as a man's waste.

Researchers began to widen the shaft on 25th, August 1954. At the depth of 5 m on the western side of the shaft they discovered limestone standing on mother rock. Below there were more and more holes in the rubble. Later On 31th August they found the cave at the depth of 7 m hidden in the mother rock.

In 1957 first in the history of spelaeology a researching-measuring station was established here by the Department of Mineralogy and Geology of the Budapest Polytechnics. This station has been developed since then, at present it is owned by VITUKI.

The upper part of the level was full of clay. Having excavated it, one could slip into a 60-m long inactive delta of a spring. The level, however, was blocked by the fallen masonry of a cleft, which could be broken through with explosion only on 18th August, 1955. Thus finally it was possible to get into the wide corridor of the main arm of the cave. That time the floor was covered with cold (8°C) water above knee level as far as 300 m, after which the cave was entirely under water. But by the end of September the syphon abated so on 8th October four members of the group could get through nearly dry.

At places the gallery has several levels, the lowest of which is full of clay so we can only crawl in it. Further on the levels are fallen so dimensions become bigger. At the end of the cave there is a huge masonry-chamber. Air draught coming through the stones proves the existence of more galleries. The cave has been opened and known as far as 1 km until today. Practically since it was discovered there has been regular measurement taken and investigation carried out. In 1974 a 24 m wide chamber was driven near the entrance.

b) Description and Inventory Similarly to cave Baradla, Vass Imre cave also extends under Slovak territory. Probably it starts under the Szilice Plateau. Total vertical dimension of the cave is 42 m, its height is 32 m, depth is 10 m; its horizontal dimension is 422 m, and its intaking volume is 15,000 cubic m.

Age of intaking stone is mid Anizus and Ladin, its type is lime stone and dolomit, formation: Steinalm and Wetterstein.

Geological morphological elements found in the cave are the following: abyss, ceiling meander, broken and fallen surfaces, anastomosis, ceiling chanel, ceiling plain, vavecut caused by corrosion, erosion caldera, alveoles, canellura, faultplane, breccia-zone calcite vains, limonite, inactive streambed, clay pyramid.

Visible mineral formations are : stalactite, stalactide, coloumns, strawstalactites, curtains, helictite, flow stone, aprons, microtetarata, lime stone pool, cave pearl, vavecut notches, dripstone baldachine, rim stone bar, resolution, mountmilch, coral pisolite, limonite, radish-like dripstone. In the cave between the ' Water-level ' and the ' Black syphon there is a temporary stream with the average flow of 900 l/min.

Its flow in June 1954 was about 30,000 l/min, but it has been dry since July 1993. There are detailed studies about the cave in the following themes: Petrology, Mineralogy, Geology of sediment, Genetics, Morphology, Hydrology (water flow, quality of water, water level, water temperature), Climatology, Geophysics, history of research.

The first 240 m of the cave can be illuminated, this is the part where instruments and equipment are installed.

c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

d) Public awareness

e) Bibliography

There are more than 180 publications dealing with the Vass Imre cave. The most important are the following:

BERTALAN K. (1956): Felfedezték a jósvafői Tohonya-forrás patakos barlangját; Karszt és Barlangkut. Tájé., Budapest.

BAJOMI D. (1968): Recherches écologiques-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

FILYÓ M. (1956): Új természeti kincsünk; Természetjárás, Budapest.

FODOR I. (1970): A Bardla- és a Béke-barlang hőmérsékletének vizsgálata; Földrajzi Tanulmányok a Dél-Dunántúl területéről, Budapest.

JAKUCS L. (1961): Aggtelek és környéke; (Az Észak-Borsodi Karsztvidék) Útikalauza, Sport. Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KESSLER H. (1958): Das Aggteleker Höhlengbiet; Budapest.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

MAUCHA I. (1989): Karszt water resources research in Hungary and its significance; Karszt és Barlang Special Issue, Budapest.

MAUCHA I. (1956): A Vass Imre - barlang feltárása és kutatása a speleológia új módszerével; Természet és Társadalom, Budapest.

MAUCHA I. (1957): Megkezdte működését a jósvafői Vass Imre Barlangkutató Állomás; Karszt- és Barlangkut. Tájé., Budapest.

PETHŐ T. (1966): Budapest - Miskolc - Aggtelek (II. kiadás); Magyarország írásban és képekben. Budapest.

SZABLYÁR P. (1988): Jelentés az MKBT 1988. évi központi kutatótáboráról; MKBT kiadvány, Budapest.

4. State of preservation/ conservation

a) Diagnosis

Trustee of the cave is the Directorate of the Aggtelek National Park, it is run by the Papp Ferenc Speleological Group (No. of permit: 486/1984). The entrance and the doors were made with the purpose to protect the environment and lead scientific investigations. Some of the illumination and the measurement instruments need replacing. Inside ladders need replacing.

- b) History of preservation/conservation
- No. of decree about declaring the cave protected is 123/1958, and that of the degree declaring it extremely protected is 18/1961 by the Presidential Council. It is protected by the institution indicated in point 2/c on the basis of regulations indicated in point 2/b.
- c) Means for preservation/conservation
- Factors in service of theoretical protection of the cave and of its environment are as follows:
- Provisions of law
 - the Ministry for Protection Environment and Regional Policy
 - Authority for Nature Conservation
 - Directorate of the Aggtelek National Park
 - the Institute of Speleology
 - the Hungarian Association of Speleology
 - National Principle of Environment Protection
 - Environment Protection Service
 - Environment Protection Council
- The policy of protecting the nature of the nation.
- Further protection of the cave is guaranteed and supervised by the Directorate of the Aggtelek National Park as its trustee and the caretaker Papp Ferenc Speleological Group.
- The cave is safely closed.
- It is not open to the public any longer.
- There are tours in it only occasionally together with researchers, jeopardy is minimal.
- Opening research is not being carried out at present.
- d) Management plans
- Protection of this special karstic object is carried out based on the provisions of the law about protection of environment. As part of the biosphere reservation, it enjoys the attention, protection and care of the Directorate of the Aggtelek National Park.
- According to the guiding principles of the Bureau of Protection of Environment of the Ministry for Environment and Regional Policy issued in February 1994:
- 'Ex lege' protection of Hungarian caves has been guaranteed by the law since 1961. This extreme legal protection of the nowadays known 3,000 caves is motivated by its scientific (geological, mineralogical, hydrological, palaeontological, archeological, botanical and zoological, climatological etc.), historical and esthetical values and its touristic and medical importance. The cave is a very sensitive, complex and complicated system, and an environmental indicator. Their legal protection is extended from the entrance to the entire space of the cave, its surroundings, its palaeontological and archeological finds, the flora of the entrance, the dark flora, animals living in the cave regardless whether they are protected or not. Effectiveness of 'de facto' protection is decreased by factors like contamination of the open cistern on the surface (surface mining, inefficient or partial sewage system and placement of waste, badly chosen or applied agricultural cultivation methods, application of too much chemical material etc.) and prohibited or unskilled entering into the cave (growing sports tourism, tours of the cave, unauthorized intrusion, illegal collection of findings etc.).

In the law about nature there is a need to clarify the understanding of ownership and authorized utilization of caves and rivers coming out of them. Good conditions must be provided for control, reconstruction works and complex research of multiple utilization, proper attention must be paid to the Budapest thermal dolomite, which is unique in an international sense and to the protection of the Aggtelek and the Bükk karstic objects.

Among the priorities of the nature preservation policy, outstanding ones are protection of caves threatened by anthropogenic penetration on and under the surface, which serve as scientific databank and environmental indicators, protection of water resources, medical places and touristic-educational objects, guarantee of the legal, organisational and financial conditions of their multiple utilisation.

There is an outstanding role of complex research done in the caves, that of determination of tasks of protection and development of database.

The technical guidelines No. MI-13-56 of April 1992 titled 'Environmental protection of protected values' deals with the protection of caves, their water and surface on the first place.

Further theoretical and practical research must be provided since there is no other cultural and scientific process like this one in the country.

5. Justification for inclusion in the World Heritage List

a) Cultural property

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| i) reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>It is a special example how sensitive nature, the cave and human penetration, continuous research and surveys can peacefully exist side by side.</p> <p>There must be further care paid to get to know this cultural value protecting what is known by now.</p> <p>Caves belonging to the category of lifeless nature preserve interesting episodes of the history of the earth: structural and climatic changes, accumulation and erosion-deflation processes having taken in the Carpathian basin, and changes of life as well. The caves are rich databanks of sciences about our planet. The cave called 'Vass Imre' has an outstanding place among them.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>This cultural heritage is an example of great results of conscious research.</p> <p>It is one of those not public caves which was looked for with scientific research and opened with scientific discovery.</p> |
| iii indications as to the authenticity of the property | <p>Its cultural value does not require special protection, this is properly done by protection of environment. Its cultural value is shown in publications listed in point 3/e though it is not a finished process yet, since measuring takes place continuously even now.</p> |

b) Natural property

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|---|--|
| i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type | <p>It is an example of the special formation of a karstic ecosystem with its natural elements of exceptional beauty.</p> <p>It also demonstrates how sensitive nature, the cave and human penetration, continuous research and surveys peacefully exist side by side.</p> <p>This natural value is only partially known, there should be special attention paid to its further opening and also to protection of what is known up to now.</p> |
| ii evaluation of the property's present state of preservation as compared with similar properties elsewhere | <p>In the cave there are no karstic pebbles found, probably it was formed by corrosion along tectonical gaps, its fauna is poor, which shows that it differs from the other big dripstone caves of the region. Its formations are of different character and in the same time they are very interesting from the scientific point of view. In the future the cave could be opened to the public at a limited extent since it gives unforgettable memories.</p> |
| iii indications as to the integrity of the property | <p>Intactness of the cave is guaranteed by the Directorate of the Aggtelek National Park and the Action plan of the Aggtelek Karsti biosphere reservation. Measurements taking place in the cave also require tranquility.</p> <p>Tours to the cave must always be guided by one of the managers of the Papp Ferenc speleological group.</p> |

1. Specific location

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|----|---|---|
| a) | Contry | Hungarian Republic |
| b) | State, Province or region | Borsod-Abaúj-Zemplén county; Bódvaszilas |
| c) | Name of Property | Vecsembükk shaft-cave |
| d) | Exact location and indication of geographical coordinates | <p>The cave opens in the middle of the plateau of the Alsó hill at Szilas, at the upper edge of the northern side of a dolina at the Hungarian-Slovakian border.</p> <p>Its co-ordinates are: north latitude: 48° 34' 03", east longitude: 20° 43' 41", altitude above sea-level: 522 m, cadastral No.: 5450/4.</p> |
| e) | Maps and/ or Plans | Kessler 1927; Boegan 1929; Kessler 1936; Jakucs 1957; Kósa 1965; Pogácsás 1975; Szenthe 1971; Kordos 1984; Klingenfuss 1976; KVM-BTI 1988; BEAC 1993 |

2. Juridical data

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|----|---|--|
| a) | Owner | <p>The cave is owned by the Hungarian State.</p> <p>It is managed by the Directorate of the Aggtelek National Park.</p> |
| b) | Legal status | <p>The cave is state-owned and protected according to the law-decree No. 18/1961. It is protected in an increased degree according to the law-decree No. 4/1982, the decree 8/1982 (III. 15) MT and the order No. 1/1982 (III. 15) OKTH.</p> |
| c) | Responsible national agency | <p>The Directorate of the Aggtelek National Park belongs to the Authority for Nature Conservation of the Ministry for Environment and Regional Policy.</p> |
| d) | Collaborating national agencies and organizations | <p>Institute of Spelaeology: --1121 Budapest, Költő u. 21.--</p> <p>Hungarian Karst and Cave Research Association: --1027 Bp, Fő u. 68.--</p> |

3. Identification

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|----|---------|--|
| a) | History | <p>The big, open shaft of the Vecsembükk cave has always been known by the local inhabitants. The scientific expedition in 1911 was the first one to attempt to get in. The well-equipped expedition of the Hungarian Geological Association had got into several shaft-caves but they did not manage to get into the Vecsembükk cave, where even the 100-m-long plumb was too short.</p> <p>In 1927, four young members of the Cave Research Department of the Budapest University Tourist Association (András Beliczay, István Frank, Hubert Kessler and Gyula Kiss) organised an expedition, proposed and supported by Ottokár Kadic, to the Alsó hill in order to attempt to get into the shaft-caves where the 1911 expedition had failed. Using a 36-m-rope, a rope-ladder and a field telephone, they managed to get down as far as 83 m. A few months later they got down as far as 93 m in the Almási cave.</p> |
|----|---------|--|

At the beginning of November 1969, a few members of the alpinist group of the Budapest Vörös Meteor Sports Club, led by István Szente, broke through a bottle-neck at the bottom of the shaft and got into the next, wide and deep shaft and reached the depth of 173 m. For lack of time, only one person could reach the bottom of this second, 90-m-deep shaft. The result of the 1969 expedition was that it opened the way toward further depths and showed that the equipment was insufficient and a telephone connection between the intermediate levels and the surface was necessary.

The next expedition, with 36 members of five associations, started in April 1970. After a one-day preparation they managed to get from the bottom of the 90-m-deep shaft into a wide funnel through a tight one discovered but not explored in the preceding year. The blocked bottom of this funnel at a depth of 235 m is the currently known end-point of the shaft-cave.

In June 1971 another expedition tried to get deeper but they only could advance 6 meters. However, they found some side-corridors and side-funnels, drew a precise map and carried out hydro-geological examinations.

In 1989 the shaft cave was adapted to the up-to-date one-rope technique. Rivets were stuck on and four ropes (with a full length of 70 m) and two ladders (with a full length of 17 m) were built in for the sake of the International Cave Research Conference to be held there. At the same time they built a trail to and a rail round the opening of the cave.

b) Description and Inventory The Vecsembükk shaft-cave is the second-deepest cave of the country with its depth of 235 m. It includes the longest contiguous depth (90 m). Its large opening has a typical funnel-shape, then, going downward, the first shaft becomes wider. The entrance is surrounded by a rail, as animals or people could easily fall into the funnel-like opening.

The several wide parallel shafts of the cave are concentrated in a small base area (31x21 m). Often they are only separated by a 10-cm-rock-wall, which has collapsed in several places, forming holes between the shafts.

At the bottom of the first shaft there is a booth, from which one can get into the wide (7x3-5 m) 90-m-shaft through a funnel becoming wider. The shaft wall is covered with drip-stones, with the usual stalagmites and stalactites in its upper part and palm-like drip-stones in its lower part formed by the water dripping from above, well-known from the shaft-caves in France. The bottom of the 90-m-shaft is horizontally filled with clay, which is covered with a thin layer of drip-stone.

In order to get further, one has to climb up 6 meters to the 2-m²-wide funnel placed in the longitudinal axis of the 90-m-shaft. The funnel wall is covered with thin and fragile layer. From this funnel one gets into a 7x10-m-wide funnel, which branches into several small funnels. The 1-2x2-3-m-funnels fall into a labyrinth-like belt. From here, another 2x2-m-wide funnel starts, widening out to 2-4 x 4-5 m. The bottom of this funnel is the currently known end-point of the cave. At the bottom there is a slope covered with broken stone filled with clay.

Except for the lower-most 2 meters, the mother-rock of the cave is light-grey, massive, homogeneous witterstein limestone, with a spot of crinoidea limestone at its very bottom, which corresponds to the bottom of the middle-anisus storey.

Surprisingly, the air is warmer in the third shaft than in the parts above.

Nowadays, the amount of water getting into the karst through the Vecsembükk cave is slight. Water marking has proved that Zsámány well and Kör well springing in the Torna valley are connected.

- c) Photographic and/ or cinematographic documentation

See enclosed photo in the Appendix.

- d) Public awareness

- e) Bibliography

There are more than 1400 publications dealing with the Baradla cave. The most important are the following:

ANDRÁSSY I. (1959): Nematoden aus der Tropfsteinhöhle "Baradla" bei Aggtelek ...; Acta Zool. Hung., Budapest.

BAJOMI D. (1968): Recherches écologies-faunistiques dans des guffres de la Hongrie; Karszt- és Barlangkut., Budapest.

BEKEY I. G. (1914): A vecsembükki zsombolyok; Turista Közlöny 21.

DÉNES GY. (1970): Az első irodalmi adat a Torna-hegy zsombolyairól; Karszt és Barlang, Budapest.

JAKUCS L. (1975): Aggteleki Karsztvidék; Útikalauz, Sport. Budapest.

JÁNOSSY D. (1979): A magyarországi pleisztocén tagolása gerinces faunák alapján; Akadémia Kiadó. Budapest.

KESSLER H. (1936): A barlangok mélyén; Budapest.

KESSLER H. (1956): Das Aggteleker Höhlengbiet; Miskolc.

KESSLER H. (1957): Az örök éjszaka világában; Budapest.

KORDOS L. (1984): Magyarország barlangjai; Gondolat. Budapest.

KÓSA A. (1992): Adalékok az Alsó-hegy zsombolyainak megismeréséhez; Karszt és Barlang, Budapest.

KÓSA A. (1994): Alsó-hegyi zsombolyatlasz; Budapest.

SZENTHE I. (1969): Új sikerek a zsombolykutatásban; Karszt és Barlang, Budapest.

SZENTHE I. (1971): Vízföldtani kutatások a Vecsembükki-zsombolyban; Karszt és Barlang, Budapest.

TOWNSON R. (1797): Travels in Hungary; London.

WALKOVSKY A. (1970): Mikroklímérések a Vecsembükki-zsombolyban; Karszt és Barlang, Budapest.

4. State of preservation/ conservation

- a) Diagnosis

The first shaft of the Vecsembükk shaft-cave has to be cleaned regularly because of its large opening. the lower parts are relatively intact, although it is one of the most frequented shaft-caves of the country.

The cave cannot be closed up because of its large opening.

- b) History of preservation/conservation
- The security and preservation equipment of the cave was installed in 1989. It can only be used by trained persons.
The rail round the cave opening was built in 1989, for security reasons.
- c) Means for preservation/conservation
- The theoretical protection and preservation of the cave and its environment are guaranteed by:
- Ministry for Environmental and Regional Policy
 - Authority for Nature Conservation
 - Aggtelek National Park Directorate
 - Institute of Spelaeology
 - Hungarian Karst and Cave Research Association
 - National Principle of Nature Protection
 - Nature Protection Service
 - Nature Protection Council
 - policy of nature preservation
- The cave is not closed up.
It is not open to the public.
Tours guided by researchers are frequent. The risk is minimal.
The discovery research is standing still at the moment.
- d) Management plans
- This special karst object is protected according to the nature protection laws and principles. The Aggtelek National Park pays special attention, protection and care to it as part of the biosphere reservation.
- The directives of the Authority for Nature Conservation of the Ministry for Environment and Regional Policy issued in January 1994 are the following:
- The “ex lege” protection of the Hungarian caves has been guaranteed by the law since 1961. This high-level legal protection is justified by the scientific (geological, mineralogical, hydrological, paleontological, archaeological, botanical, zoological, climatological, etc.), historical and aesthetical values of the almost 3000 caves currently known as well as their importance in water-supply, tourism and therapy. Caves are extremely sensitive and complex systems and environment indicators. Their legal protection involves the entire cave beginning at the entrance, the encasing rock, the paleontological and archaeological findings, the flora of the entrance, the dark flora and the animals inhabiting the cave apart from their protection. The efficiency of the “de facto” protection is weakened by the pollution of the surface watershed area (open mining, insufficient sewage system and waste deposition, improper cultivation methods in the agriculture, over-use of chemicals, etc.) and the direct, unpermitted or dilettantish human interference inside the cave (increasing sport tourism, cave tours, unauthorised penetration, illegal finding collection, etc.).
- The legal deficiencies of the nature protection law referring to the caves and the ownership of cave resources as well as its ambiguities should be eliminated. The scope and way of permitted activities should be regulated. The conditions of supervision, reconstruction work and complex research work aiming at the manifold utilisation should be ensured.

Special attention should be paid to the protection of the unique thermal karst in Budapest as well as the Aggtelek and Bükk karst objects.

The guarantees for the legal, organisational and financial conditions of protection and manifold utilisation of caves as scientific data-banks, environment indicators, water resources, spas as well as touristical and educational objects especially threatened by surface and subsurface antropogen interference are highlighted priorities of the nature preservation policy.

Complex research of the caves, specification and database of the protection tasks are important research and development priorities.

The technical directive No. MI-13-56 dating back to 1992 ("Management of nature protection values") highlights the protection of caves including their water and surface.

5. Justification for inclusion in the World Heritage List

a) Cultural property

- | | | |
|-----|--|--|
| i) | <p>reasons for which the property is considered to meet one or more of the World Heritage with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type</p> | <p>It is a particular example for the co-existence of nature, human interference, research work and instrumental measuring. Special attention should be paid to the further study and exploration of this scientific resource, protecting the values and knowledge preserved so far and supporting scientific research. The caves, belonging to the category of inanimate nature, have preserved for science, economy, education and popular science the episodes of a rich event series in Earth history: structural and climate changes, accumulation and erosion/deflation processes as well as changes of the biology in the Carpathian basin. They are scientific data-banks, objects of the rich tool-kit of nature preservation and geology. The Vecsembükk shaft-cave is an outstanding example.</p> |
| ii | <p>evaluation of the property's present state of preservation as compared with similar properties elsewhere</p> | <p>This cultural heritage is an extraordinary example for the results of conscious scientific research. It is one of the few originally opened caves explored and opened to the public by scientific research.</p> |
| iii | <p>indications as to the authenticity of the property</p> | <p>Its cultural value does not need extra protection. This job is done perfectly by nature protection. Its cultural value has been established in the publications listed in section 3/e, although this is not a finished process.</p> |

b) Natural property

- i) reasons for which the property is considered to meet one or more of the World Heritage criteria with, as appropriate, a comparative evaluation of the property in relation to properties of a similar type

The Vecsembükk shaft-cave is rare and interesting member of the Alsó-hill cave family with its size, special genetics, climate and formations. It draws our attention to the speleological aspects of the hydrothermal phenomena in the area and also gives information about the genetics of shaft-caves and about cave formations.

The proposed natural and scientific resource with its extremely beautiful formations is an example for the formation of geosystems.

It is a particular example for the co-existence of nature, human interference, research work and instrumental measuring.

Special attention should be paid to the further study and exploration of this scientific resource, protecting the values and knowledge preserved so far and supporting scientific research.
- ii evaluation of the property's present state of preservation as compared with similar properties elsewhere

The Vecsembükk shaft-cave came to being by corrosion along tectonic splits. Its biology is poor, which means that it has a different character than the big drip-stone caves of the area. Its formations are of different character. Its one of the most important caves of the country from scientific point of view.

To a restricted extent, the cave can be involved in speleo-tourism in the future, as it gives an unforgettable experience to the tourists.
- iii indications as to the integrity of the property

The intactness of the cave is protected by the law, the Aggtelek National Park and the action plan of the Aggtelek Karst biosphere reservation.

The intactness of this natural resource is guaranteed and supervised by the Aggtelek National Park Directorate, which is the manager of the cave.

Hungary and Slovak Republic

**Nomination for
World Heritage List**

**Caves of Aggtelek
and
Slovak Karst**

Additional Documentation

1995

JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST

I.

Reasons for which the property is considered to meet one or more World Heritage criteria with, as appropriate a comparative evaluation of the property in relation to properties of similar type.

*** The underground world of the Aggtelek & adjoining Slovak Karst is, because of its 712 caves (of various origins and morphology and with many kinds of speleothems), one of the finest and most complex karstic developments at medium altitude in the temperate zone.**

The caves covering an area of some 60,000 hectares (20,000 hectares in Hungary and an adjoining 40,000 hectares in Slovakia) represent several types of cave genesis and different stages of cave development. From among the numerous caves of *fluvial origin*, there are 80 *active* caves with streams all the year round. Some of these caves contain both phreatic and watertable-controlled sections (e.g. Kossuth Cave, Skalisty Potok Cave); others are typical watertable caves evolved in the vadose (aerated) zone from the swallets to the springs (e.g. Béke Cave). A further 96 caves fed by seasonal surface streams or conveying water during floods only, are *episodic* in their recent role in the hydrologic cycle (e.g. Meteor Cave, Szabadság Cave, Vass Imre Cave). Several caves of fluvial origin became *relict* due to the karstic development during the Pleistocene age. Both active and relict varieties include multi-levelled branchwork systems displaying different stages of surface development (e.g. Drienovska Cave - two levels; Baradla-Domica Cave System - three levels; Jasovska Cave - five levels).

From among the vertical caves characterising the karst plateaus, the "*pothole*"-type represented by 162 systems of parallel shafts seems to have close connections with doline development, and is related to the corrosion effect of infiltrating, seeping waters (e.g. Vecsembükk Shaft-cave, Rejtekt Shaft-cave, Obrovská Chasm). A further 59 shafts - called "light holes" - were created by the collapse of deeper-lying caves (e.g. Zvonivá diera Chasm). Fissure-caves formed essentially by *tectonic* dislocations are frequent along the plateau escarpments (e.g. Diviaccia Chasm, Snežná diera Cave). The small *syngenetic* caves formed simultaneously within spring travertine deposits in Hajske Valley demonstrate an uncommon, less known type of cave genesis. The great variety of cave types is completed by 22 representatives of *hypogenic* caves formed under phreatic conditions in isolated limestone blocks to the NW and SE of the main karst massif, probably by the mixing corrosion effect of upwelling thermal-subthermal waters in the past (e.g. Ochtinská Aragonite Cave, Rákóczi Caves).

As a result of the long-term karstic evolution and the various generic factors acted (and mostly still acting) in the region, the caves of Aggtelek & the adjoining Slovak Karst display great varieties also in their morphology. This morphological heterogeneity is represented not only by the different shapes of passages (e.g. phreatic tubes, vadose canyons, meanders, shafts, chimneys) but also by various characteristic solutional sculpturing of the walls related to turbulent flows (e.g. scallops), stagnant waters (e.g. corrosional notches), seeping descending waters (e.g. grooves), or mixing waters (e.g. wall and ceiling pockets).

The caves display several types of spectacular calcite speleothems accompanied in certain caves by aragonite, gypsum and ice formations. From among the 25 basic types of carbonate speleothems (C. A. Hill - P. Forti: *Cave Minerals of the World*, 1986), up to now 17 types have been identified here. The most widespread forms are *draperies*, *flowstones*, *stalactites* and *stalagmites* with many varieties actively growing in several caves. All other types related to dripping and flowing waters - *cave pearls* (e.g. Béke Cave), *conulites*, *coral pipes* (Rejteš Shaft-cave), *rimstone dams and pools* (e.g. Baradla-Domica Cave System, Béke Cave); and also many types related to seeping and stagnant waters are present: *aragonite anthodites* (Ochtinská Aragonite Cave, Rákóczi Cave), several varieties of *coralloids* (Rákóczi Cave, Rejteš Shaft-cave), *helictites* (Hrusovská Cave, Meteor Cave), *folia* (Rákóczi Cave), *rafts* (Rákóczi II. Cave), *moonmilk* (Földvári Cave), *shelfstone* (e.g. Béke Cave), *shields* (Baradla-Domica Cave System) and *spars* (Drienovská Cave).

The Aggtelek & Slovak Karst differs from all karst regions with similar geographical and climatological conditions by its many independent fluvial systems evolved in the closest vicinity of each other (the distance between the main passages of the two largest caves, Baradla-Domica Cave System and Béke Cave is less than 600 m); by the unusual morphology and exceptional density of its potholes (among the 76 independent shaft-systems of Lower Hill, 20 are within an area of 0.5 square km); and from most other karst regions by the common presence of syngenetic, epigenetic, and hypogenic caves. The 32 m tall stalagmite in Krasnahorská Cave was recorded in the Guinness Book of Records as the highest stalagmite of the world in 1992. The shields in Domica and the coralloids of Rákóczi Cave are referred among "the best displays" in international literature (C. A. Hill - P. Forti: *Cave Minerals of the World*, 1986), where Rejteš Shaft-cave is listed as the seventh known locality for coral pipes, besides six caves in the western United States. The richness and sizes of aragonite anthodite "bushes" in Ochtinská Aragonite Cave are also considered to be unique; and the 3 m long "soda-straw" stalactites of Gombasecká Cave are among the longest displays of the type, too.

*** Baradla-Domica Cave System is the longest dripstone-decorated active stream cave in the temperate zone.**

Although the 25 km long Baradla-Domica Cave System - listed as the world's second longest cave in the last century; the 8th in 1965; the 14th in 1969, and the 20th in 1973 - is no more among the 100 longest caves of the world, there are no longer active stream caves in the temperate zone with a similar richness of dripstone speleothems. All the longer caves displaying rich decoration belong either to an absolutely different cave type (Lechuguilla Cave and Carlsbad Caverns), or are representatives of humid-tropical karstification (Gua Air Jerneh, Mamo Kananda, Gran Caverna Santo Tomas, etc.). Other large systems of the world are either Kentucky-type multi-levelled mazes (Mammoth Cave System, Flint Ridge Cave, etc.); subhorizontal active complexes (Ojo Guarena, Ease Gill Cave System, etc.); deep alpine caves (Hölloch, Siebenhengste-Höhlensystem, etc.); fault-controlled gypsum mazes (Optimisticheskaja, Ozernaja, etc.); or 3-dimensional mazes of suspected hydrothermal origin (Jewel Cave and Wind Cave), in which speleothems are sparse or occur in relict upper levels only.

*** Silicka l'adnica Ice Cave is the lowest-lying ice cave in the temperate zone.**

Silicka l'adnica opening on the altitude of 503 m and the latitude of 48°33'40" is a unique speleoclimatological phenomenon with its perennial ice in the form of a massive floor deposit and various ice speleothems (flowstones, hoarfrost, stalactites and stalagmites). Up to the latitude of 50° all other known ice caves are situated at higher altitudes: in the Alps (Austria, France, Switzerland) between 940 and 2100 m asl, in Bulgaria at 830 m asl, in Croatia above 600 m asl, in Georgia (W-Caucasus) above 1000 m asl, in Poland (High Tatra) between 1010 and 1850 m asl, in Romania above 840 m asl, in Slovakia between 660 and 1800 m asl, and in Slovenia between 758 and 1090 m asl.

*** The extended underground world of the Aggtelek & Slovak Karst provides a habitat for more than 500 species of troglobite, troglophile and troglaxene animals including endemic species as well as species first described from this region.**

Biospeleological research in Baradla Cave started as early as the middle of last century. In his monograph published in Vienna in 1932, Endre Dudich -- who is considered to be the founder of modern biospeleology -- described already 262 species from it, which number was unique in Europe that time. Biospeleological researches carried out in 29 caves of the region have revealed more than 500 species and subspecies of troglobite (cave-limited) and troglophile (living primarily in caves but also in similar habitats) invertebrates, including new species for almost all animal groups (Protozoa, Nematoda, Rotatoria, Annelida, Crustacea,

Diplura, Coleoptera, Diptera, Palpigradi, etc.). From among the 38 species first described from this region, *Duvalius hungaricus* (Coleoptera) is an endemic troglobite living exclusively in the caves of Aggtelek & Slovak Karst; for *Allolobophora mozsariorum* (Annelida) Baradla Short Lower Cave is the only known habitat; while *Mesoniscus graniger* (Isopoda) and *Niphargus aggtelekiensis* (Amphipoda) are prominent by their large populations and ecological significance.

The most important representatives of the troglomenes (animals using caves for part of their activities) are bats. From among the 28 bat species of Europe 21 species are present in the region. Besides *Myotis dasycneme* (e.g. Béke Cave) and *Myotis myotis* (e.g. Vecsebükk Shaft-cave, Béke Cave), registered as vulnerable species on the 1994 IUCN Red List, the winter colonies of *Rhinolophus euryale* in Baradla-Domica Cave System (appr. 1500 individuals each year) are of European significance.

*** The caves of the Aggtelek & Slovak Karst have preserved a series of prehistoric cultures with a timespan of at least 35,000 years; and involve paleontological sites of European importance in Pliocene stratigraphy as well.**

Starting as early as in 1876 in Baradla Cave, archaeological excavations revealed the presence of prehistoric man in more than 30 caves of the Aggtelek & Slovak Karst. Cave sites of the region have exposed charcoal fragments from the end of Middle Paleolithic (Jasovska Cave); Late Paleolithic (36-28,000 BC) tools of *Szeletian* (Domica Cave), *Aurignacian* (Jasovska Cave) and *Gravettian* cultures (Slaninová Cave); Neolithic (5-3,000 B.C.) ceramics of *Gemerian* (e.g. Ardovske Cave) and *Bükkian* (e.g. Baradla-Domica Cave System) cultures; as well as artifacts of the Copper Age *Badenian* (e.g. Mastalna Cave), Bronze Age *Pilinian* (e.g. Gocaltovo Cave) and *Kietian* (e.g. Silicka Ice Cave), and Iron Age *Hallstattian* (Fajka Cave) and *Celtic* (e.g. Certova diera Cave) cultures. The most important archaeological sites are the Baradla-Domica Cave System with its settlements of Bükkian culture both inside and in front of the cave entrance, and with its charcoal drawings unique in Central Europe; and Babia diera Cave was used by the people of the kietian culture as a burial place, where unique ritual masks made of human skulls were also found. The series of prehistoric findings are complemented by cave inscriptions dating back to the 13th century.

The 7 km long main corridor of Baradla-Domica Cave System offers a first-class exposure of the Triassic Wetterstein, Steinalm and Guttenstein Limestone Formations; where 7 profiles representing the different reefal and lagoonal facies (with characteristic algae, gastropod, ammonite, brachiopod and crinoid fossils) were declared to geological key sections -- they are considered to be the world's only key sections inside a cave. The sediments deposited in smaller caves, fissures and paleokarst cavities have preserved rich vertebrate remains of the geological periods from Middle

Pliocene to Upper Pleistocene. Especially important are the finds of the 23 localities on Esztramos Hill, which show the northern Carpathian nature of the Middle and Upper Pliocene and the Lower Pleistocene, and on which -- completed by other Hungarian cave localities -- a microstratigraphical sequence unique in Europe could be based. The internationally accepted vertebrate biostratigraphical stage "Estramontinum" for Middle Pliocene was named after this place, and Locality no. 7. is the international reference locality for the stratigraphical boundary between Pliocene and Pleistocene.

*** The characteristic karst morphology accompanying this underground world offers a unique possibility to study the relations between surface and subsurface karstic development.**

The karstic landforms above the caves involve all typical elements of temperate zone karstification at medium altitudes. The 600 m general height of the *extended karst plateaus* with hundreds of *dolines* (e. g. Plesivska and Silicka Plateau, Lower and Upper Hill) is unique in Europe: plateaus of the morphologically similar Dinaric Karst and the Bihar Mountains (Romania) are at higher (1000-2000 m) altitudes, the Karst of Languedoc in Southern France is situated in the mediterranean zone, while in the Moravian Karst similar plateaus have not evolved.

Further characteristic morphological elements are the karst valleys with rows of dolines and *uvalas* evolved by amalgamation of dolines; the spectacular *doline lakes* (Red Lake, Silicka Lake); the well-developed *karrenfelds* (e. g. Barázdálás); the narrow and deep *limestone gorges* of several kms lengths (Zadielska and Hajska Dolina); *blind valleys* with *sinking creeks* coming from non-karstic terrains (e. g. Zombor-lyuk); about 230 permanent or episodic *karst springs* fed by cave waters (e. g. Nagy Tohonya Spring); as well as the *travertine deposits* precipitated from the supersaturated spring waters (e.g. Ménes Valley, Vcelare).

*** Considering the heterogeneity in cave types, morphology, speleothems, and related karstic landforms, as well as the biological, archeological, and geological importance of the caves, Aggtelek & Slovak Karst provides a first-class underground museum and field laboratory for natural sciences.**

Though the overwhelming majority of the 712 known caves were discovered during the past few decades, contemporary documents prove that phenomena of this underground world drew naturalists' attention as early as the 16th century. These early descriptions and cave maps are of special historical importance, as documents on initial stages of cave science are very rare worldwide. The first brief description of Baradla Cave and its "drippings solidifying to stones" dates back to 1549; and since the beginning of the 17th century the cave has also been reported by foreign authors. The

map drawn by G. Buchholtz of Silicka Ice Cave in 1704 is the first cave map in Central Europe and the fifth in the world. The study of this strange, ice-filled cave prepared by M. Bél for the Royal Society was published in London in 1744. The description of Baradla Cave appeared in a school-book in 1788; and prominent nature scientists from several countries visited to the region for its spectacles (e.g. Townson, 1794; Staszic and Hunter, 1799; Glinka, 1808; Beudant, 1818). J. Sartory's map (1794) of the 2 km section of Baradla Cave known at that time is the first cave map surveyed by an engineer. The upstream continuation of Baradla Cave as far as "Büdöstó" entrance to Domica Cave was already predicted by L. Bartholomaeides (1801). With its downstream continuation explored and artistically mapped by I. Vass (1825-26) it became the longest surveyed cave of the world at that time. Baradla Cave is one of the world's first showcave with organised visits as early as the beginning of the 18th century and facilities (e.g. bridges) installed by 1806. Jasovska Cave was developed and opened to the public in 1846.

Modern visitors can get acquainted with the underground world of the Aggtelek & Slovak Karst in four showcaves (Jasovska Cave, Gombasecka Cave, Ochtinska Aragonite Cave and Baradla-Domica Cave System, which can be visited in three separate sections: Aggtelek, Jósvalfő, and Domica); as well as by special tours led in small groups to five caves with less or no facilities (Baradla long tour, Béke Cave, Rákóczi Cave, Földvári Cave, Silicka Cave). All these caves, open to the public, receive 280-300,000 visitors a year; and, considering the high proportion (above 50 %) of school-children and students in this number, have an important role in education. Foreign visitors (generally 40-50,000 persons) represent not only European countries but other continents, too.

Studies and research carried out in this region had (and have) an important role in the improvement of nature sciences. Besides the above discussed results achieved in geology, paleontology, archaeology, and biospeleology; special features of the caves and monitoring of on-going karstological processes also led scientists to significant findings also in the fields of speleoclimatology, speleotherapy, cave mineralogy (e.g. helictite growth), karstmorphology (e.g. doline development) and karsthydrology. Continuous recording carried out by the Karst Research Station at Jósvalfő on 15 large karst springs proved for the first time the tidal effect in spring discharge oscillations; and also enabled modelling of complex syphon effects (e.g. for Lófej and Nagytöhonya Springs). The results of hydrological research indicates tens of kilometres of unexplored cave passages in the region, offering a great potential for further exploration (e.g. Baradla Long Lower Cave, the upstream continuation of Kossuth Cave, connections between Milada Cave and Vass Imre Cave, Silicka Ice Cave and Gombasecka Cave, Meteor Cave and Vecsem Spring, etc.).

*** The outstanding scientific and aesthetical values of the underground world of the Aggtelek & Slovak Karst are completed by notable botanical and zoological interest on the surface.**

Though the nomination for World Heritage List is focused on the caves of the Aggtelek & Slovak Karst, the special botanical and zoological features of the region should also be emphasized. Due to its geographical and geological conditions, this area represents an individual flora-district ("Tornense") in the overlap of the Carpathian and Pannonian flora-sectors; which, combined with the microclimatic specialities of the karstic relief, resulted an extremely high habitat and species diversity here. The relatively small area comprises several faunal and floral elements of completely different ecological demands: *north-carpathian*, *east-carpathian* and *boreo-mountain* species in the extrazonal beech forest of the northern hillsides and deep dolines, and in ravine forests; *illyr-carpathian* elements in the rock forests of the escarpments; *steppe* and *forest-steppe* (ponto-pannonian and subponto-south-siberian) species dominating on grasslands and in calciphilous oak forests; *submediterranean*, *pontomediterranean* and *balkan* elements in the oak forests of the warm southern hillsides, in the pubescent oak shrub forests and in rocky grasslands; while the heather-juniper-robur oak vegetation on covered karst terrains is highly similar to the West-European *Heide vegetation*.

Considering the 1,462 vascular plant taxa identified so far, the area is one of the richest in Central Europe. From among the protected species (70 in Slovakia and 106 in Hungary) the endemic *Onosma tornense* is listed in the World Red Data Book; the endemic *Campanula xylocarpa* and a further 3 species are listed in the European Red Data Book. Besides the rich invertebrate fauna (e.g. more than 1,000 species of butterflies, about 1,500 species of beetles, etc.), 42 fish, 13 amphibian, 9 reptile, 178 bird (127 nesting), and 57 mammal species have been identified in the region. The avifauna includes 23 species endangered at European scale; European ground squirrel (*Citellus citellus*) is registered within the Bern Convention.

II.

Evaluation of the property's present state of preservation as compared with similar properties elsewhere.

From among the 712 explored caves of the Aggtelek & Slovak Karst, apparent changes due to human activities can be recognised in a few caves, but in limited sections only. The generally good condition of the caves is due to the facts, that:

- many of the spectacular caves were discovered only within the past few decades, when caves were already declared to be universally protected (as for Hungary), or were parts of a protected area (as for Slovakia); and, consequently, research and other activities in the caves were already regulated by laws in both countries.

- significant caves discovered earlier were declared protected individually, and were locked soon after their discovery (e.g. Béke Cave - 1953, Szabadság Cave - 1956, Vass Imre Cave - 1958.).

- from among approximately 70 caves known at the beginning of the century, those of common interest were visited as showcaves in a controlled form: e.g. for Baradla Cave (which became protected as the first cave in Hungary in 1940) there existed a "visitors' regulation" as early as in 1835, which prohibited breaking down and taking away of dripstones.

Significant interventions are in the four showcaves only (pavements, rails, electricity, etc.) which affect in Jasovska Cave 600 m of its total 2000 m; in Ochtinska Aragonite Cave 230 of 300 m; in the Baradla-Domica Cave System 5,700 of 25,000 m; and in Gombasecka Cave 300 of 1600 m. Modern reconstruction work is minimalizing these effects (by running the cables under pavements, using lamps of reduced luminosity, etc.) A further four caves, where even limited visits of specialists might damage the richly decorated walls and vertical drops, have been installed with iron ladders and elevated iron pavements (Rejteck Cave, Rákóczi Cave, Földvári Cave, Meteor Cave).

Some 40 caves discovered through dangerous breakdowns (e.g. Béke Cave, Kossuth Cave, Szabadság Cave), or utilized for drinking water supply (e.g. Krasnahorska Cave, Csörgő Cave), or locked for nature conservation purposes, are more or less modified at their entrances only.

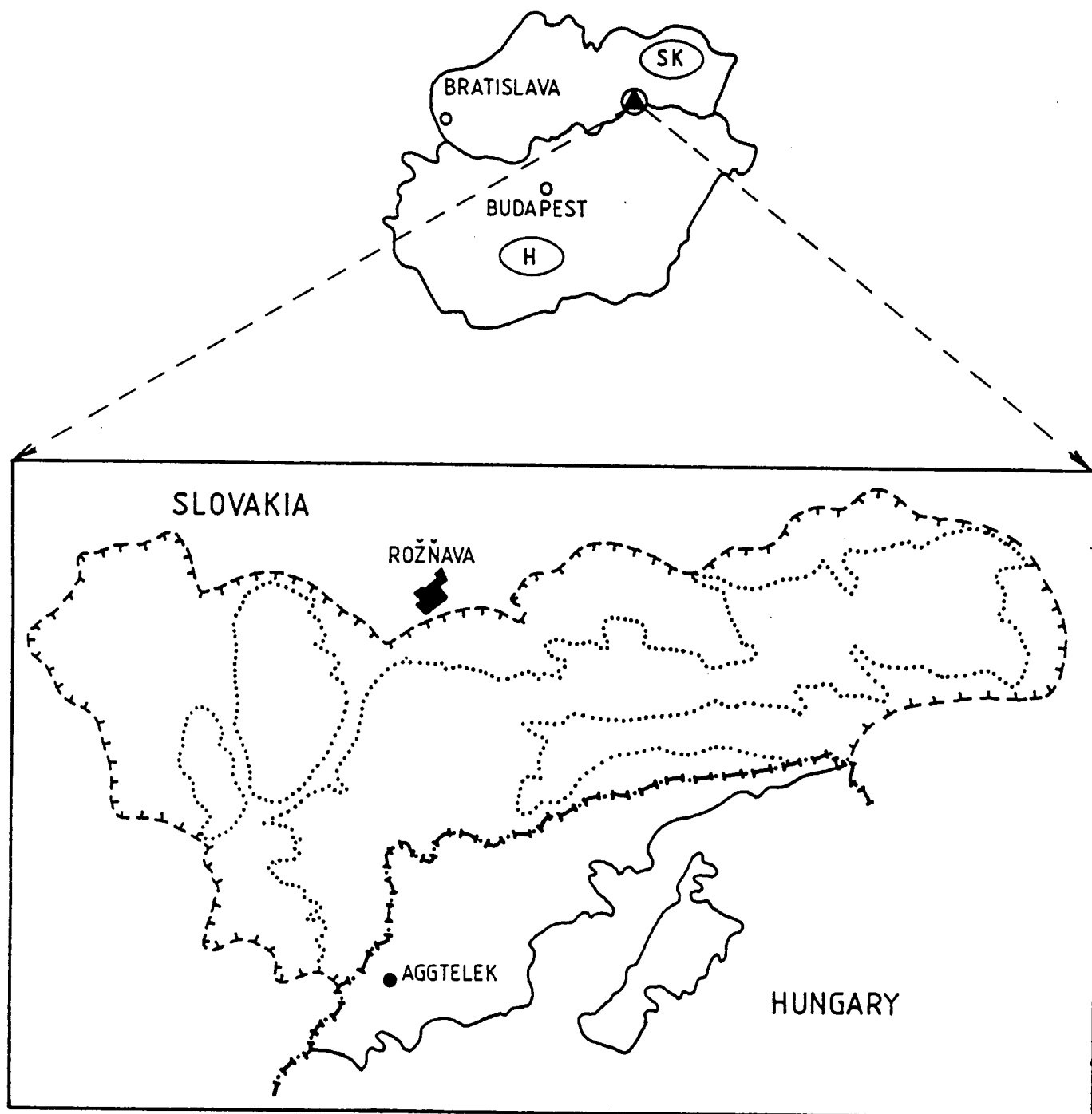
Summarizing the above data, the overwhelming majority (more than 90 percent) of the caves of the Aggtelek & Slovak Karst can be evaluated as in a completely natural state. This is considered to be much better than that of the similar Bihar Mountains (Romania), where most of the dripstone-decorated caves have been known for a long time, and the shortage of regulation in commerce of minerals has led to significant destruction.

III. Indications as to the integrity of the property.

The integrity of the underground world of the Aggtelek & Slovak Karst is guaranteed by the universal protection and exclusive state-ownership of caves (without regard to surface protection and surface ownership) declared in Hungary in 1961 and in Slovakia in 1995. From among the 712 caves explored in the region, 24 in Hungary and 14 in Slovakia are declared as "increased" protected because of their prominent natural values. A further guarantee for their integrity is the National Park (the Hungarian side) and the Landscape Protection Area status (the Slovakian side) of most of their surface area.

The laws concerned with caves involve their management by nature conservation authorities, and the necessity of permission for all activities which might result in changes in their natural state (e.g. exploration, scientific collection, utilisation of caves, and in certain caves even visiting itself). Management plans elaborated individually for the "increased protected" caves define the necessary restrictions, such as size of visitors' groups (e.g. for Rákóczi Cave), time and space limits of visiting (e.g. for Béke Cave during the hibernation period of bats), prohibitions (e.g. cave exploration work in archaeological and paleontological sites); as well as the frequency of state and activity supervision and other measurements.

PLAN OF THE LOCATION AND PROTECTION OF TERRITORY



———— National Park Aggtelek

- - - - - Protective zone

..... Protected Landscape Area
Slovak Karst

- - - - - Government border



5. The Dry Passage in the Dòmica Cave

WORLD HERITAGE NOMINATION - IUCN SUMMARY

CAVES OF THE AGGTELEK AND SLOVAK KARST (HUNGARY/SLOVAK REPUBLIC)

Summary prepared by IUCN/WCMC (March 1995) based on the original nomination supplied by the Governments of Hungary and Slovakia. This original and all documents in support of this nomination will be available for consultation at the meetings of the Bureau and the Committee.

1. LOCATION

Situated on the southern foothills of the Carpathian mountains, on the southern Slovakian and northeastern Hungarian border.

2. JURIDICAL DATA

The Slovak Karst and Caves of Aggtelek were both designated protected landscape areas in 1973 and 1978, respectively. The latter was redesignated a national park in 1985. Both sites have been individually accepted as biosphere reserves, Slovak Karst in 1977 and Caves of Aggtelek in 1979.

3. IDENTIFICATION

The Caves of Aggtelek and Slovak Karst territory extends over a total area of 55,800ha and topographically comprises limestone plateaus dissected by deep river valleys. The territory is characterised by a fully developed karst landscape, of which dolines are the most typical surface landform. These have developed through solution and are, on average, 100m wide and 20m deep. Other surface phenomena include sink holes and karren fields. This is the most extensively explored karst area in Europe, and a total of 712 have so far been identified. Many of the younger caves which have formed at the plateau edges, such as Krásnohorská and Gombasecká, occur on several levels and contain dripstone decorations. The most notable of these is the Baradla-Domica cave system which is 21km long and connects Hungary with Slovakia. It has a cavern capable of holding 1,000 people, a 13m long stalactite and the autochthonous underground river Styx. These caves are also noted for having the world's highest stalagmite (32.7m), aragonite and sinter formations and an ice filled abyss, which considering the territory's height above sea-level, is a unique phenomena for central Europe. All these karst landforms are the result of long term geomorphological processes typical of this temperate climatic zone. Hydrological conditions are characterised by a lack of surface streams, except between mountain basins, and the complex circulation of underground water.

The flora is representative of both Pannonian and Carpathian elements, giving rise to a unique biotope arises where two floral sectors overlap, and consequently many rare endemics can be found throughout the territory. Approximately 70% of the territory consists of deciduous woodland. The fauna is characteristic of steppe/forest-steppe habitats. The caves are noted for their diverse and abundant fauna.

4. STATE OF PRESERVATION/CONSERVATION

There is a serious pollution problem which is contaminating cave waters and threatening the park's ecosystem. This arises from the increased use of pesticides and fertilizers in the surrounding areas

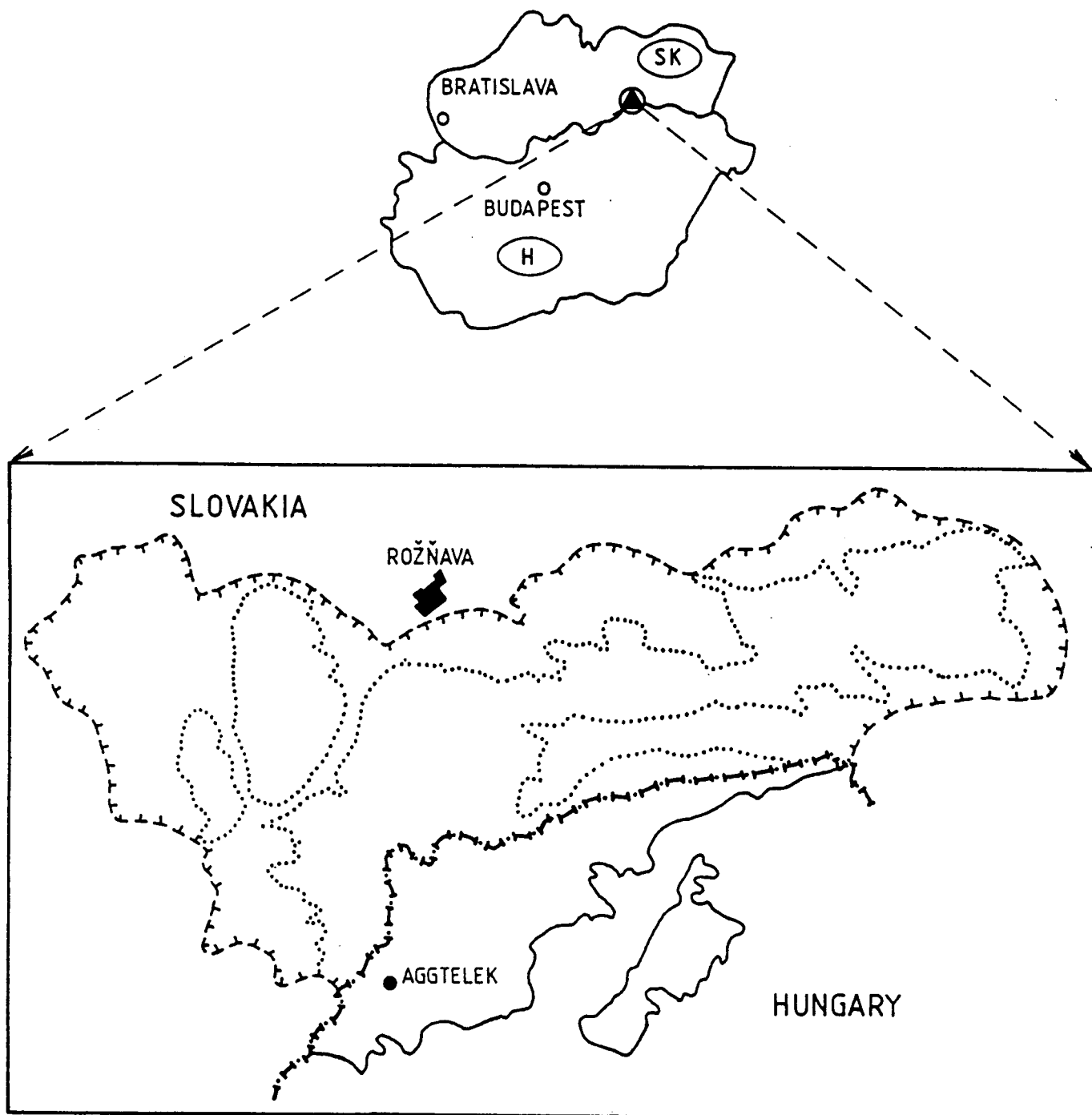
and from tourist vehicles and nearby industry.

5. JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST

The Caves of Aggtelek and Slovak Karst nomination, as prepared by the Governments of Hungary and Slovakia, provides the following justification for designation as a World Heritage natural property:

- (iii) **Contain superlative natural phenomena or natural beauty** The cave systems are noted for their aragonite formations which within Slovakia are unique. The caves are also known for having the world's highest stalagmite, an ice filled abyss, and various sinter formations such as plumes and shields. The Baradla-Dominca cave system is the second longest in Slovakia.
- (iv) **Contain the most important areas of high biodiversity and significant natural habitats for threatened species** The cave systems are an important and significant habitat for the occurrence and survival of endangered species.

PLAN OF THE LOCATION AND PROTECTION OF TERRITORY



———— National Park Aggtelek

..... Protected Landscape Area
Slovak Karst

- - - - - Protektive zone

- . - . - . Government border

WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION
CAVES OF THE AGGTELEK AND SLOVAK KARST (HUNGARY/SLOVAK REPUBLIC)

1. DOCUMENTATION

- i) IUCN/WCMC Data Sheet (13 references)
- ii) Additional Literature Consulted: Herak M. & Stringfield V.T. 1972. **Karst**; Courbon P. et. al. (ed.). 1989. **Atlas of the Great Caves of the World**. 369 pp; Middleton J. & Waltham T. 1986. **The Underground Atlas**. 239 pp; Jenik J. & Price M. Eds. **Biosphere Reserves on the Crossroads of Central Europe**. MAB; Hungarian Speleological Society. 1989. Karst and Cave. Special Issue. 112p. Bosák, P., I. Horáček, and V. Panos, 1989, Paleokarst of Czechoslovakia, in P. Bosák, ed., **Paleokarst**: Prague, Academia, p. 107-135. Bystricky, J., E. Mazúr, and J. Jakál, 1972, Karst of Czechoslovakia, in M. Herak and V.T. Stringfield (eds.), **Karst: Important Karst Regions of the Northern Hemisphere**: Amsterdam, Elsevier, p.297-325. Jakál, J., **Karst of the Silica Plateau** (in Slovakia): Osveta, Martin, 152 p.
- iii) Consultations: Fourteen external reviewers, Slovak and Hungarian Government officials and University specialists.
- iv) Field Visit: May, 1995. Jim Thorsell

2. COMPARISON WITH OTHER AREAS

Karst cave systems are widespread natural features found in many parts of the world. The attached map indicates the location of some of the more significant cave regions in Europe where Karst landscapes are widespread. Two sites have been inscribed on the World Heritage List for their karst features alone: Mammoth Cave in Kentucky and Skocjan Cave in Slovenia. Other very significant caves are associated features of other natural World Heritage sites in the Canadian Rockies, Nahanni, Grand Canyon, Tasmanian Wilderness, and the Australian Mammal fossil site. Other world class caves exist in Sarawak at Gunung Mulu and in Australia at Nullabor. In addition, the Carlsbad Caverns National Park in the USA has also been nominated as a World Heritage site.

Reasonably complete inventories of the world's cave systems are available in the above cited references. These provide "Guinness lists" of the longest, deepest, and largest which are continually being revised as exploration continues. In assessing all cave nominations, IUCN has close liaison with the International Union of Speleology and carefully weighs their opinions in cave evaluations. In this specific case of the Caves of the Aggtelek and Slovak Karst (CASK), this Union as well as outside reviewers felt that the area had high natural values but had difficulty comparing them to others.

CASK is very different from the other two existing World Heritage caves. Mammoth Cave is notable for its enormous length, large level passages and jagged domepits. Skocjan is famous for its awesome river canyons and textbook portrayal of karst hydrogeology. CASK is distinguished by its great variety of cave types and speleothems and the array of typical temperate zone karst features. CASK also contains 712 known caves, a very high concentration, but none of these by itself rates on world lists of the deepest/largest or most decorated.

As supplemental information requested from the authorities during the field visit has noted:



KARST AREAS OF EUROPE

From: Middleton J. & Waltham T. (1986)

"... longer caves displaying rich decoration belong either to an absolutely different cave type (Lechuguilla Cave and Carlsbad Caverns), or are representatives of humid-tropical karstification (Gua Air Jerneh, Mamo Kananda, Gran Caverna Santo Thomas, etc.). Other large systems of the world are either Kentucky-type multi-levelled mazes (Mammoth Cave Systems, Flint Ridge Cave, etc.); sub-horizontal active complexes (Ojo Guarena, Ease Gill Cave System, etc.); deep alpine caves (Hölloch, Siebenhengste-Höhlensystem, etc.); fault-controlled gypsum mazes (Optimisticheskaja, Ozernaja, etc.); or three-dimensional mazes of suspected hydrothermal origin (Jewel Cave and Wind Cave), in which speleothems are sparse or occur in relict upper levels only."

The CASK are also distinctive in terms of the variety of 500 species of troglodytes (cave dwelling animals). Its bat fauna (21 species) is of European importance and, though rich, is not as numerous as that, for instance, in Carlsbad. The caves contain substantial fossils but their significance has not been determined. The site, along with the Karst area of the Dinaric area of Slovenia, has been the center of much scientific research. Much has been contributed to the understanding of caves, particularly by the two national speleological societies.

In conclusion, CASK does not stand out on any particular natural feature. As one reviewer noted, other caves similar to those at Aggtelek exist elsewhere and, while the site is not considered unique, it is an excellent example. Although one of the better known cave areas in Europe it does not offer features in the "spectacular" category as are found in many other Karst areas. It does, however, stand out for the concentration of a wide variety of Karst features found in one area. These include 712 caves of many different types (eg. fluvial, shaft) with almost a full range of speleothems (17 out of 25 basic types including aragonite, calcite shields, helictite, moonmilk draperies, pearls, and soda-straw stalactites). It can be considered a "classic karst" area with most characteristic morphological elements present. These include dolines, uvalas, doline lakes, Karrenfields, gorges, Karst springs and travertine deposits. CASK thus draws its distinction from other cave areas not in terms of containing any dramatic natural feature but more for its variety of Karst features and their concentration in a relatively small area.

Finally, it is noted that CASK is in the Middle European Forest Biogeographic Province but as only the underground caves have been nominated and **not** the surficial features, the normal biogeographic comparisons do not apply.

3. INTEGRITY

The CASK nomination is a unique one in that it consists of underground caves and has no surface component. The caves, however, are all State-owned and the land above them has protected status (Category v by international standards). Management plans are available as are visitor centers and trained staff. Many of the 712 caves are closed to the public and there are many regulations in force (eg. to protect hibernating bats). The four "show-caves", however, have been substantially modified to allow human use which reaches 300,000 visitors annually. Only 10% of the caves have been affected by human use with the remainder still in an almost unmodified condition. This is in contrast to the similar Bihor mountain caves in Romania which have suffered major destruction. The caves, however, will need strict controls from surface activities as they can be adversely affected by agricultural pollution, deforestation and soil erosion.

4. ADDITIONAL COMMENTS

- 4.1 The extent of the surface area that protects the caves is 60,000 ha. As it is only the sub-surface caves that have been nominated, the actual size of the property is much smaller.
- 4.2 The CASK also preserve the remains of prehistoric cultures going back some 35,000 years. Tools and ceramics as well as artifacts from the Bronze, Copper and Iron ages have been recovered from some cave entrances. The significance of these cultural values has not been assessed.

- 4.3 Although both countries have other natural sites on their indicative lists, it is IUCN's opinion that this is the best and perhaps only prospect for a World Heritage site in Hungary and Slovakia.

5. EVALUATION

CASK is typical of many Karst localities in Europe. Its special distinctions are that it has a great number of caves (712) of different types found in a concentrated area. The caves themselves are of moderate extent and are not as long, deep or decorated as are other world caves. Research at the site by geologists, biospeleologists, mineralogists and paleontologists has been extensive (though little known outside the region) and demonstrates the importance of the site to science.

A significant aspect of CASK is that it has undergone a great deal of fossilization and later exhumation of landscape features and subsurface groundwater routes. In other words, many karst features, after having formed, were buried by later sediment and then later reactivated or exhumed by erosional removal of the sediment. The resulting karst features contain a great deal of evidence pertaining to the geologic history of the last several millions (or even tens of millions) of years. The present karst landscape has been developing intermittently since the late Cretaceous Period (about 100 million years ago). Pollen of Cretaceous age is present in the sediment fill in a cave near Gombasek, Slovakia. Relics of pre-Pleistocene karst (i.e., more than about 2 million years old) are very distinct in the Slovak Karst, and many of them show evidence for sub-tropical and tropical climates forms. These include rounded hills that are relics of tropical karst later modified by Pleistocene periglacial weathering. This is a very unusual combination of climatic effects that is probably better documented in the Slovak Karst than anywhere else in the world. Finally CASK's particular suite of paleokarst features is very unusual in showing a combination of both tropical and glacial climates.

The site thus meets criterion *i* for natural sites as an area which represents an outstanding example of on-going geological processes and is a significant geomorphic feature. The caves are well protected and the site meets the relevant conditions of integrity for this criterion.

6. RECOMMENDATIONS

The Caves of Aggtelek and Slovak Karst should be added to the World Heritage List on the basis of natural criterion (i). The Committee may wish to encourage the local authorities to ensure strict control over surface activities that may affect the underground caves.

COUNTRY: Hungarian Republic and Slovak Republic

NAME: Caves of Aggtelek and Slovak Karst

IUCN MANAGEMENT CATEGORY:

II (National Park)

V (Protected Landscape)

IX (Biosphere Reserve)

BIOGEOGRAPHICAL LOCATION: 2.11.05 (Middle European Forest)

GEOGRAPHICAL LOCATION: Straddles the international border between southern Slovakia and northeastern Hungary, on the southern foothills of the Carpathian mountains. Lies within Borsod-Abaúj-Zemplén county, Hungary and Rožnava District and Kosice county District, Slovakia. The site's northern and southern boundaries are defined by the geological borderline between karstic and nonkarstic rocks, whilst the western and northeasternmost points comprise Jelsava town and Jasov village, respectively. 48 25' - 48 40'N, 20 15' - 21 00'E

DATE AND HISTORY OF ESTABLISHMENT: The Aggtelek Karst (Hungary) was first declared a protected landscape area in 1978 under decision No.8/1978 of the President of the National Authority for Environment and Nature Conservation (OKTH), and in 1985 was designated a national park by law-decree No.7/1984 (XII.29.) OKTH.

Slovak Karst (Slovak Republic) was proclaimed a protected landscape area in 1973 by Decree of the Ministry of Culture No.110/1973 Zb. under the Act on the Protection of the Nature and Landscape No.287/1994 Z.z.

Both sites have been individually accepted under UNESCO's Man and Biosphere programme; Aggtelek National Park in 1979 and Slovak Karst Landscape Protected Area in 1977. They have been jointly nominated for inclusion on the World Heritage List in 1995.

AREA: Total area is 60 000 ha.

Aggtelek National Park and Biosphere Reserve:	19 861 ha
Slovak Karst Protected Landscape Area and Biosphere Reserve:	36166 ha
Nonprotected Landscape Area:	3973 ha

LAND TENURE: State

ALTITUDE: Ranges from 150 m to 925 m at Matesova Rock in Slovakia

PHYSICAL FEATURES: Topographically dominated by a system of plateaus dissected by deep canyon like valleys of the rivers Bódva, Slaná, Stítnik, Zádielska and Hájka. The territory comprises two geomorphologically different sedimentary rock formations. The first, laid down during the lower Triassic Period, comprises impermeable and resistant clastic rocks, namely argillaceous slates, and variegated grit and sandstone. Overlaying this is the second formation, a two kilometre thick layer of weakly resistant limestone and dolomite deposited during the mid and upper Triassic Period. The territory is characterised by a fully developed karst landscape, of which dolines are the most typical surface landform. These have developed through solution and are, on average, 100 m wide and 20 m deep. Other surface phenomena include sink holes and karren. This is the most extensively explored karst area in Europe, and a total of 712

caves have been identified so far. Many caves with nice speleothem decorations are occurring in several levels at the plateau edges (e.g. Krasnahorská-, Gombasecká- and Kossuth-Cave) The most notable of these is along the underground Styx river formed, 25 km long Domica-Baradla cave system which includes a hall with more than 50 m in diameter and a 13 m long stalactite. These caves are also noted for having the highest stalagmite (32.7 m) of the territory, aragonite and sinter formations and an ice filled abyss, which considering the height above sea level, is a unique phenomena for Central-Europe.

All these karst landforms are the result of long term geomorphological processes typical of the temperate climatic zone. Hydrological conditions are characterised by lack of surface streams, except between mountain basins and the complex circulation of underground water.

CLIMATE: Under the influence of the Carpathian Mountains, the climate is humid continental with long summers. The average temperature in the lower regions is -3 C in January and 19 C in July. These values decrease with an increase in altitude to -7 C and 14 C respectively. Annual rainfall total is 620 m, but the last decade was very dry.

VEGETATION: The flora is representative of both Pannonian and Carpathian elements, giving rise to a unique biotope where the two overlap. The variation in microclimate restricts some north-Carpathian representatives to the higher plateaus and colder valleys, whilst some submediterranean plants are confined to south facing, dry hillsides. Thanks to this bordering situation a lot of plant species reach their southern whilst others the northern limit here. Deciduous woodland 70% of the territory and is dominated by hornbeam and oak forest (*Quercus petraeae-Carpinetum*), but many differences from this forest type can be observed for example extrazonal beech forest, calciphilous oak forest, shrub forest with pubescent oak, ravine and rock forest. Mosaik-like opening, rocky grasslands, stone exposing hillside provide life-space for our precious soft stemmed plants. Some places woodland is surrounded by patches of secondary communities of juniper and heather (*Calluna vulgaris*) on the covered karst. Association of alder, marsh and moor fields are confined to stream bank.

The important endemic species are as follows: Klastersky's whitlow grass (*Draba klasterskyi*), *Onosma tornense**, bladder milk-vetch (*Astragalus vesicarius* ssp. *albidus*), thistle (*Colymbada badensis*), mustard treacle (*Erysimum pallidiflorum*), Pannonian festuce (*Festuca pannonica*), Sadler's giant fennel (*Ferula sadleriana*), Hungarian iris (*Iris aphylla* ssp. *hungarica*), *Campanula xylocarpa** and it is also worth to mention the Austrian dragonhead (*Dracocephalum austriacum**), lady's slipper (*Cypripedium calceolus**) and Laxman's reedmace (*Typha laxmanii**). The species, signed with *, are included in the European Red Data Book. (See the enclosed list for further examples.)

FAUNA: The fauna has varied geographic affinities too, submediterranean, Carpathian and continental. Saw-legged Cricket (*Saga pedo*) must be emphasized from the extraordinarily rich insect world of this area, this species is a post-glacial relic of the steppe. *Abax schueppeli* is a carpathian element, *Fuxoa birivia* is a xeromontan species and *Apamea rubirena* is a representative of Siberian fauna. Mammals include wolf (*Canis lupus*), lynx (*Lynx lynx*), red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus crofa*), wild cat (*Felis catus*) and badger (*Meles meles*). Bird rarities nesting in the territory are as follows: rock bunting (*Emberiza cia*), black stork (*Ciconia nigra*), corncrace (*Crex crex*), imperial eagle (*Aquila heliaca*), dipper (*Cimclus cinclus*), Ural owl (*Strix uralensis*) saker falcon (*Falco cherrugh*), short-toed eagle (*Circaetus gallicus*), honey buzzard (*Pernis apivorus*). (See the enclosed list for further examples.)

Of particular scientific interest are the cave and subterranean water fauna. Beetles including *Duvalius bokori bokori* and *D. hungaricus brzotinensis*, and insects such as *Limonia nubeculosa*, *Tarnania fenestralis* and *Eccoptomera obscura* are abundant. Cave worms including *Peloscolex velutinus* and *Rhyacodrilus falciformis* are often found in sand and clay deposits, whilst molluscs namely *Bythinella austriaca*, *Pisidium personatum* and *P. casertanum* are associated with underground streams. Crustaceans such as *Niphargus tatrensis* and *Gammarus fossarum* occur. The notable primitive crab is the endemic species *Niphargus aggtelekiensis*. A total of 21 bat species have been identified in the Slovak Karst and include *Myotis myotis*, *M. Blythi* and *M. schreoberi*.

CULTURAL HERITAGE: Archeological findings suggest that the Domica-Baradla Cave system was inhabited and used as a sanctuary and burial place since Neolithic times. Pottery relics from the Bükk, Pilin and Halstatt cultures have been found within Silická ľadnica Ice Cave and a Hussite inscription dated to 1447 on the walls of Jasovská Cave. Documentary evidence about the caves of Aggtelek and the Slovak Karst first appeared in the 16th century. The first cave map from the region was completed in 1704 about the Silicka Ice Cave, while in 1794 a two kilometre section of Baradla Cave was mapped by József Sartory. Some caves, such as Béke and Gombasecka Caves have a long tradition in the treatment of illnesses such as asthma and lung diseases.

LOCAL HUMAN POPULATION: There are one sizeable settlement (Silica) and two hamlets within the Slovak protected area and two villages (Aggtelek and Jósval with approximately 1100 inhabitants) inside the Aggtelek National Park's boundaries.

VISITOR AND VISITOR FACILITIES: Tourists have been visiting the Hungarian caves since 1806, when the first stairs and fences were constructed. Currently, tourist access in both regions is restricted to four caves which are open throughout the year, namely Domica-Baradla-, Gombasecka-, Ochtinska Aragonite- and the Jasovska Caves. 280 000 - 300000 persons are visiting the four showcaves yearly.

SCIENTIFIC RESEARCH AND FACILITIES: Research has been conducted on flora, fauna, speleology, geomorphology and geology of both territories. Educational institutes including schools and universities arrange field trips to the caves and there are study trails in both countries in order to help the visitors to get familiar with the natural values of the territory.

A komplex floristic and phytoecological survey was undertaken in 1970 on a selected part of the Slovak Karst namely the Silice Tableland by the Department of Geobotanics of the Natural Science Faculty, Comenius University. The flora of the site has been recorded in over 100 publications. For the period 1976 to 1980 and 1981-1990, approval was given for a complete survey of the entire Slovak Karst within the state plan of research for Comenius University.

The Aggtelek Karst was one of the favourite site of the Hungarian scientists especially geologists and speleologists. Several researches were conducted such as cave exploration, cave mapping, karst genetical, research of karst hidrological connections, cave climatological, bacteriological, karst hidrolics and an underground measuring system was set up in the Vass Imre-cave. Complex ecological survey have been conducted since 1992 on the whole area of the Aggtelek National Park.

CONSERVATION VALUE: The Aggtelek and Slovak Karst are noted for the unique karstic landscape and underground phenomena which comprise physical and biological formations with great scientific, medical, educational, recreational and aesthetic value.

CONSERVATION MANAGEMENT: Under the auspices of the National Authority for Nature Conservation, Aggtelek Karst is administered by the Aggtelek National Park directorate in collaboration with the Speleological Institute and the Hungarian Speleological Society. Management objectives are based upon the findings of scientific investigations and include the protection of terrestrial habitats as well as the caves themselves, regulating scientific exploration and research within the caves and increasing services such as information, interpretation and education. Those caves which are not opened to the public, have been locked with safety doors, eliminating the unauthorised entry. The biosphere reserve at Aggtelek has been zoned as follows: two core areas (150ha and 80ha) a buffer zone (874ha) and a transition zone (17,604ha). In Hungary the protection of caves has been guaranteed since 1961 according to law-decree No.18/1961. Armed rangers patrol the park either on foot, horseback or vehicle depending on the field conditions.

Under the Innovated Statue issued by the Ministry for the Environment, Slovak Karst is managed by the Administration of the Slovak Caves in cooperation with other national agencies namely Slovak Agency for the Environment, Slovak Speleological Society and the maintaining the accessible caves, providing information and education services and coordinating further research.

MANAGEMENT CONSTRAINS: The major part of the region was used during centuries for forestry, grazing and traditional agriculture, some places karrenfelds had developed as the result of erosion after deforestation, but the erosion does not mean significant and serious danger in the nominated territory. Since in a small extent the local inhabitants cultivate the land in a traditional way they hardly use pesticides and fertilizers. Increasing air pollution derive from only tourist vehicles, although it has not been a serious threat yet. Other pollution sources are not significant because the industry in the neighbourhood was collapsed during last years.

STAFF:

Staff of the Slovak Karst Protected Landscape Area: 38 persons (Management: 11, administration: 5, showcave, tourism and recreation: 16, on-site conservation staff: 2, maintenance: 4.)

Staff of the Aggtelek National Park Directorate: 71 persons (Management: 9, administration: 6, showcave, tourism and recreation: 29, on-site conservation staff: 11, maintenance: 16.)

BUDGET: Major part of it is supported by the Slovak and Hungarian Government and the minor is from other sources.

Annual budget of the Slovak Karst PLA: 5,190 million Sk.

Annual Budget of the ANPI: 90 million HUF (1994) and a fund (100 million HUF) have been available for improving the facilities of Baradla showcave since 1989.

LOCAL ADDRESSES:

Slovak Environmental Agency - Administration of the Slovak Karst Protected Landscape and BR, 049 51 Brzotin, Slovakia

Administration of the Slovak Caves, Hodzova 11, 031 01 Liptovsky Mikulas

Ministry for the Environmental of the Slovak Republic, Hlboká 2 812 35, Bratislava, Slovakia

Aggtelek National Park Directorate, 3758 Jósvafő, Tengerszem oldal 1. Hungary

Ministry for Environment and Regional Policy, 1011 Budapest I., F utca 44-50. Hungary

National Authority for Nature Conservation, Speleological Institute, 1121 Budapest, Költő utca 21.

Representatives of		animal examples	plant examples
Carpathian		Abax schueppeli Dendrocopus leucotus Eliomys quercinus	Prenanthes purpurea Polygonatum verticillatum Dianthus plumarius ssp. praecox
"Dacic" (east-carpathian - north-balkan)		Pholidoptera transsylvanica	Sesleria heuffleriana Pulsatilla grandis ssp pseudoslavica Dentaria glandulosa Ferula sadleriana
Dealpine, prealpine species (Zadiel Gorge)			Arabis alpina Biscutella austriaca ssp. hungarica Campanula carpathica Corthusa mathioli Primula auricula ssp. hungarica
Boreo-mountain		Drufus trifidus Canis lupus Lynx lynx Bielsia ceorulescens Rosalia alpina Sadleria pannonica	Polistychum lonchitis Cetraria pinastri
Steppe and forest steppe		Omocestus viridulus Eumedonia eumedon Arcyptera fusca Euxoa recussa Falco cherrugh Aquila heliaca Crex crex Cytellus cytellus Limenitis populi Metrioptera brachyptera	Dracocephalum austriacum Pulsatilla grandis Echium russicum Astragallus vesicarius ssp. albidus Nonea pulla Iris pumilla Anacamptys pyramidalis Adonis vernalis Anemone sylvestris Campanula sibirica Phlomis tuberosa Carex brevicollis
Baltic-sarmatian			Gentianella livonica Pulsatilla patens Lathyrus pisiformis
Illyr-carpathian			Erythronium dens-canis
Submediterranean ponto-mediterranean		Peribatodes umbraria Pierus mannii Saga pedo Hipparchia semele Agrodiaetus admentus Emberiza cia Ablepharus kitaibelii	Riccia glauca Ephemerum serratum Lathyrus pannonicus Ornithogallum pyramidale Quercus virgiliana
Pannon-balkan			Onosma tornense
Representatives in antropogenic environment		Ciconia ciconia Tyto alba Myotis emarginatus	

DÉSIGNATION POUR LA LISTE DU PATRIMOINE MONDIAL - RÉSUMÉ UICN

GROTTES D'AGGTELEK ET KARST SLOVAQUE (HONGRIE/RÉPUBLIQUE SLOVAQUE)

Résumé UICN/CMSC (mars 1995) préparé d'après la désignation d'origine soumise par les gouvernements de la Hongrie et de la Slovaquie. L'original et tous les documents présentés à l'appui de cette désignation seront disponibles pour consultation aux réunions du Bureau et du Comité.

1. SITUATION

Au pied du versant méridional des Carpates, à la frontière sud de la Slovaquie et nord-est de la Hongrie.

2. DONNÉES JURIDIQUES

Le Karst slovaque et les Grottes d'Aggtelek ont été, respectivement, désignés «paysages protégés» en 1973 et 1978. Les grottes d'Aggtelek ont été classées «parc national» en 1985. Le Karst slovaque est devenu «réserve de la biosphère», en 1977 et les Grottes d'Aggtelek, en 1979.

3. IDENTIFICATION

Les Grottes d'Aggtelek et le territoire du Karst slovaque couvrent une superficie totale de 55 800 ha. Leur topographie est marquée par des plateaux calcaires découpés par de profondes vallées fluviales. Le paysage karstique est complètement développé et les dolines en sont les formations superficielles les plus typiques. Elles se sont formées par dissolution des calcaires et, en moyenne, sont larges de 100 mètres et profondes de 20 mètres. Parmi les autres phénomènes superficiels, on note des gouffres et des karrens. C'est la région karstique la mieux explorée d'Europe avec, au total, 712 grottes décrites à ce jour. Nombre des grottes plus récentes qui se sont formées en bordure du plateau, telles que Krásnohorská et Gombasecká, s'étagent sur plusieurs niveaux et contiennent des stalactites et des stalagmites. Le réseau de grottes de Baradla-Domica, mesurant 21 km de long, et reliant la Hongrie à la Slovaquie, est le plus remarquable. Il comprend une grotte où 1000 personnes peuvent se tenir, une stalactite de 13 m de long et le réseau souterrain du Styx. Il possède aussi la plus haute stalagmite du monde (32,7 m), des formations d'aragonite et de tuf et une abysses remplie de glace, ce qui, si l'on considère l'élévation du territoire au-dessus du niveau de la mer, est un phénomène unique en Europe centrale. Toutes ces formations karstiques sont le résultat de processus géomorphologiques à l'oeuvre depuis longtemps et qui sont typiques de cette zone climatique tempérée. Les conditions hydrologiques se caractérisent par une absence d'écoulement des eaux en surface, sauf entre les bassins montagneux, et par la circulation complexe des eaux souterraines.

La flore est à la fois représentative du bassin pannonien et des Carpates: il en résulte un biotope unique où deux flores se mêlent et où, en conséquence, de nombreuses espèces endémiques rares sont présentes. Environ 70 pour cent du territoire est couvert de forêts claires décidues. La faune est caractéristique des habitats de steppe/forêt-steppe. Les grottes sont connues pour leur faune diverse et abondante.

4. ETAT DE PRÉSERVATION/CONSERVATION

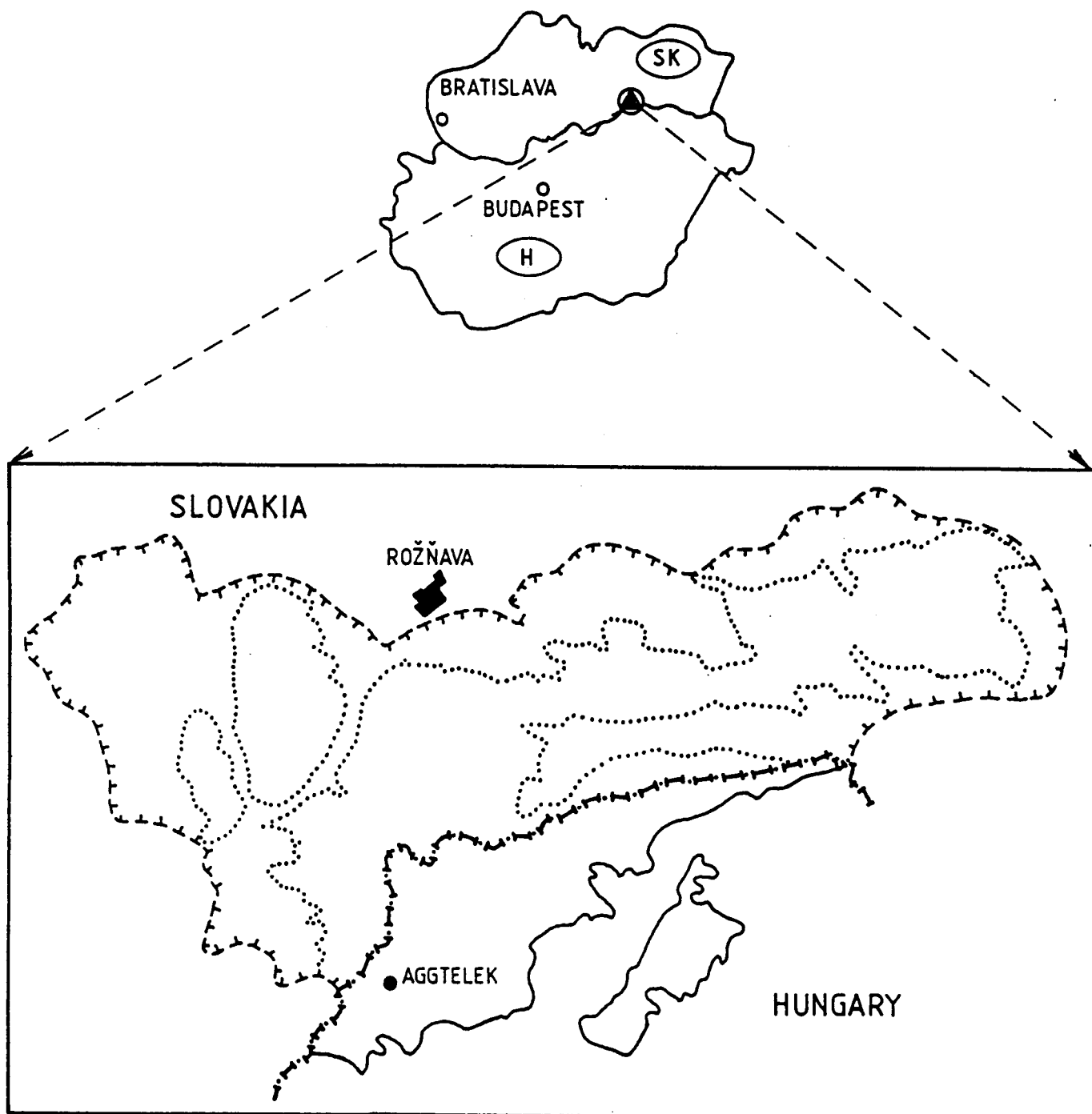
Les eaux des grottes sont gravement contaminées par la pollution qui menace l'écosystème du parc. Ce problème est dû à une utilisation accrue de pesticides et d'engrais en périphérie ainsi qu'à la présence de véhicules touristiques et de zones industrielles proches.

5. RAISONS JUSTIFIANT L'INSCRIPTION A LA LISTE DU PATRIMOINE MONDIAL

Pour justifier la désignation des Grottes d'Aggtelek et Karst slovaque pour la Liste du patrimoine mondial, les gouvernements de la Hongrie et de la Slovaquie donnent les raisons suivantes:

- (iii) **Contient des phénomènes éminemment remarquables ou de beauté naturelle exceptionnelle.**
Les grottes sont connues pour leurs formations d'aragonite qui, en Slovaquie, sont uniques. On y trouve aussi la plus grande stalagmite du monde, une abysse remplie de glace et diverses formations de tuf telles que des panaches et des boucliers. Le réseau de grottes de Baradla-Dominca est le deuxième de Slovaquie, par sa longueur.
- (iv) **Contient les régions les plus importantes du point de vue de la diversité biologique et des habitats naturels importants où survivent des espèces menacées.** Le réseau de grottes constitue un habitat important pour la survie des espèces menacées que l'on y trouve.

PLAN OF THE LOCATION AND PROTECTION OF TERRITORY



———— National Park Aggtelek

— — — — — Protektive zone

..... Protected Landscape Area
Slovak Karst

— — — — — Government border

DÉSIGNATION POUR LE PATRIMOINE MONDIAL - EVALUATION TECHNIQUE UICN

GROTTES D'AGGTELEK ET KARST SLOVAQUE (HONGRIE/RÉPUBLIQUE SLOVAQUE)

1. DOCUMENTATION

- i) Fiches de données UICN/WCMC (13 références)
- ii) Littérature consultée: Herak M. & Stringfield V.T. 1972. **Karst**; Courbon P. et. al. (ed.). 1989. **Atlas of the Great Caves of the World**. 369 pp; Middleton J. & Waltham T. 1986. **The Underground Atlas**. 239 pp; Jenik J. & Price M. Eds. **Biosphere Reserves on the Crossroads of Central Europe**. MAB; Hungarian Speleological Society. 1989. **Karst & Cave**. Special Issue. 112p. Bosák, P., I. Horáček, and V. Panos, 1989, Paleokarst of Czechoslovakia, in P. Bosák, ed., **Paleokarst**: Prague, Academia, p. 107-135. Bystricky, J., E. Mazúr, and J. Jakál, 1972, Karst of Czechoslovakia, in M. Herak and V.T. Stringfield (eds.), **Karst: Important Karst Regions of the Northern Hemisphere**: Amsterdam, Elsevier, p.297-325. Jakál, J., **Karst of the Silica Plateau** (in Slovakia): Osveta, Martin, 152 p.
- iii) Consultations: 14 examinateurs indépendants; fonctionnaires des Gouvernements slovaque et hongrois et spécialistes de l'université.
- iv) Visite du site: mai 1995. Jim Thorsell.

2. COMPARAISON AVEC D'AUTRES AIRES

Les réseaux de grottes karstiques sont des phénomènes naturels courants que l'on trouve un peu partout dans le monde. La carte ci-jointe indique l'emplacement de certaines des régions de grottes les plus importantes d'Europe où les paysages karstiques sont largement répandus. Deux sites ont été inscrits sur la Liste du patrimoine mondial pour leurs seules structures karstiques: Mammoth Caves, dans le Kentucky et les grottes de Skocjan, en Slovénie. On trouve d'autres grottes importantes dans d'autres Biens naturels du patrimoine mondial: les Rocheuses canadiennes, Nahanni, Grand Canyon, la Zone de nature sauvage de Tasmanie et le Site fossilifère de mammifères, en Australie. D'autres grottes d'importance mondiale se trouvent à Gunung Mulu, au Sarawak et à Nullabor, en Australie. Enfin, le Parc national des grottes de Carlsbad, aux Etats-Unis a également été désigné pour inscription sur la Liste du patrimoine mondial.

Nous avons cité, ci-dessus, en référence, des inventaires relativement complets des réseaux de grottes du monde. On y trouve des listes du type «Livre Guinness des records» qui citent la plus longue, la plus profonde, la plus large et qui sont révisées en permanence, au fur et à mesure de nouvelles découvertes. Pour évaluer les désignations concernant des grottes, l'UICN collabore avec l'Union internationale de spéléologie (UIS) et tient rigoureusement compte de l'avis des experts de l'UIS. Dans le cas des Grottes d'Aggtelek et Karst slovaque (GAKS), l'UIS et les examinateurs indépendants soulignent la grande qualité naturelle de l'aire mais ont eu des difficultés à la comparer à d'autres.

Le site des Grottes d'Aggtelek et Karst slovaque est très différent des deux sites de grottes inscrits sur la Liste du patrimoine mondial. Les Grottes de Mammoth sont remarquables par leur longueur, la largeur des passages entre niveaux et les dômes dentelés. Skocjan est célèbre pour ses gorges fluviales fabuleuses et parce qu'on peut y lire toute l'histoire de l'hydrogéologie karstique. Les



KARST AREAS OF EUROPE

From: Middleton J. & Waltham T. (1986)

Grottes d'Aggtelek et Karst slovaque se distinguent par la grande variété des types de grottes et de spéléothèmes et par la gamme de phénomènes karstiques typiques de la zone tempérée. Le site contient aussi 712 grottes explorées et une concentration très élevée de grottes parmi les plus grandes/plus profondes et plus décorées mais rien qui, en soi, puisse figurer sur des listes mondiales.

Durant la visite du site, des informations complémentaires ont été demandées aux autorités:

«... les longues grottes richement décorées appartiennent soit à un type de grottes complètement différent (grotte de Lechuguilla et grottes de Carlsbad) ou sont représentatives de la karstification tropicale humide (Gua Air Jernih, Mamo Kananda, Gran Caverna Santo Tomas, etc.). Les autres grands réseaux du monde sont soit des labyrinthes à multiples niveaux du type Kentucky (Mammoth Cave, Flint Ridge Cave, etc.), soit des complexes actifs sous-horizontaux (Ojo Guarena, Ease Gill Cave, etc.), soit des grottes alpines (Höllock, Siebenhengste-Höhlensystem, etc.), soit des labyrinthes de gypse dépendant de failles (Optimisticheskaya, Ozernaja, etc.), soit enfin des labyrinthes en trois dimensions d'origine hydrothermale probable (Jewel cave, Wind Cave) dans lesquels les spéléothèmes sont rares ou ne sont présents qu'en niveaux supérieurs reliques.»

Les Grottes d'Aggtelek et Karst slovaque se distinguent également par leurs 500 espèces troglodytes (animaux cavernicoles). La faune de chauves-souris (21 espèces) est d'importance européenne mais, tout en étant riche, n'égale pas celle de Carlsbad, par exemple. Les grottes possèdent beaucoup de fossiles dont l'importance n'a pas encore été déterminée. Le site, tout comme la région karstique des Alpes Dinariques de Slovénie, est l'objet d'une recherche scientifique intensive. Les deux sociétés nationales de spéléologie, en particulier, ont beaucoup fait progresser la connaissance des grottes.

En conclusion, les Grottes d'Aggtelek et Karst slovaque n'ont aucune particularité naturelle distinctive. Comme le mentionne l'un des examinateurs, il y a des grottes semblables ailleurs mais, si le site ne peut être considéré comme unique, c'est un excellent exemple. C'est une des régions de grottes les plus connues d'Europe mais elle ne mérite pas le qualificatif de «spectaculaire» à la différence de beaucoup d'autres régions karstiques. Toutefois, elle se distingue par la concentration, en un seul lieu, d'éléments karstiques très divers. On y trouve, notamment, 712 grottes de types très différents (fluvial, puits, etc.) et un échantillonnage pratiquement complet de spéléothèmes (17 sur 25 types de base): aragonite, boucliers de calcite, hélictite, draperies de *mond-milchs*, perles de caverne et stalactites de carbonate-paille). On peut considérer qu'il s'agit d'une région karstique classique où la plupart des éléments morphologiques sont présents. On y trouve des dolines, des ouvalas, des lacs de doline, des karrens, des gorges, des sources karstiques et des dépôts de travertins. Ainsi, le site des Grottes d'Aggtelek et Karst slovaque tire son originalité non de caractéristiques spectaculaires mais de la variété des formes karstiques qu'il contient et de leur concentration dans une région relativement restreinte.

Enfin, il convient de noter que le site se trouve dans la Province biogéographique de la forêt d'Europe centrale mais comme ce sont les grottes souterraines qui ont été désignées et **non** les caractéristiques superficielles, il est impossible de procéder aux comparaisons biogéographiques habituelles.

3. INTÉGRITÉ

La désignation des Grottes d'Aggtelek et Karst slovaque est unique en ce sens qu'elle concerne des grottes souterraines et n'a aucun élément superficiel. Toutefois, les grottes appartiennent à l'Etat et la partie superficielle est protégée (Catégorie v selon les normes internationales). Il y a des plans de gestion, des centres d'accueil pour les visiteurs et du personnel formé. Nombre des 712 grottes sont fermées au public et des règlements sont en vigueur (par ex. protection des chauves-souris qui hibernent). Toutefois, les quatre grottes «vitrines» ont été considérablement modifiées pour permettre l'accès aux visiteurs (environ 300.000 par an). Dix pour cent des grottes seulement ont été modifiés, le reste est pratiquement intact. Cette situation contraste avec celle des grottes de montagne de Bihor, en Roumanie, qui ont subi de lourds dommages. Néanmoins, il faudra protéger

rigoureusement les grottes contre les activités en surface. Elles pourraient, en effet, pâtir de la pollution agricole, de la déforestation et de l'érosion des sols.

4. AUTRES COMMENTAIRES

- 4.1 En surface, 60.000 hectares protègent les grottes. Comme il s'agit d'une désignation qui ne concerne que les grottes souterraines, les dimensions réelles du bien sont beaucoup plus réduites.
- 4.2 Le site contient les vestiges de cultures préhistoriques datant de 35.000 ans. A l'entrée de certaines grottes on a découvert des outils et des céramiques ainsi que des objets des âges du Bronze, du Cuivre et du Fer. L'importance des caractéristiques culturelles n'a pas été évaluée.
- 4.3 Les deux pays ont d'autres sites naturels sur leurs listes de référence mais l'UICN est d'avis qu'il s'agit sans doute de la meilleure et peut-être de la seule possibilité d'inscription d'un bien du patrimoine mondial pour la Hongrie et la Slovaquie.

5. EVALUATION

Le site des Grottes d'Aggtelek et Karst slovaque est typique de nombreuses localités karstiques d'Europe. Il se distingue particulièrement des autres par le grand nombre de grottes (712) de types différents, concentrées dans un périmètre réduit. Les grottes elles-mêmes ne sont pas très grandes et ne sont ni aussi longues, ni aussi profondes, ni aussi décorées que certaines autres grottes du monde. Des géologues, des biospéléologues, des minéralogistes et des paléontologues y ont mené des travaux de recherche intensifs (mais peu connus en dehors de la région) ce qui démontre l'importance scientifique du site.

Une des caractéristiques importantes des Grottes vient de ce qu'elles ont subi un processus de fossilisation de grande envergure puis d'exhumation des éléments du paysage et des voies d'eau souterraines. En d'autres termes, beaucoup d'éléments karstiques, après avoir été formés, ont été recouverts de sédiments plus tardifs puis réactivés ou exhumés suite à l'érosion des sédiments. Les éléments karstiques qui en résultent contiennent beaucoup de traces de l'histoire géologique des derniers millions (voire même dizaines de millions) d'années. Le paysage karstique actuel s'est formé de façon intermittente depuis la fin du Crétacé (environ 100 millions d'années). Du pollen datant du Crétacé est présent dans les sédiments d'une grotte près de Gombasek, Slovaquie. Des reliques de karst pré-Pléistocène (c.-à-d. ayant plus de 2 millions d'années) se distinguent facilement dans le karst slovaque et beaucoup d'entre elles présentent des traces de formes climatiques tropicales et subtropicales. Il s'agit, notamment de collines arrondies qui sont des reliques de karst tropical modifié ultérieurement par l'érosion périglaciaire du Pléistocène. Cette combinaison tout à fait inhabituelle d'effets climatiques est probablement mieux documentée pour le karst slovaque que pour n'importe quelle autre région karstique du monde. Enfin, la série d'éléments paléokarstiques particulière des Grottes d'Aggtelek et Karst slovaque est inhabituelle en ce qu'elle présente un mélange de climats tropical et glaciaire.

Le site satisfait donc au critère *i* des sites naturels en tant que région qui représente un exemple exceptionnel de processus géologiques en cours et contient des caractéristiques géomorphologiques importantes. Les grottes sont bien protégées et le site satisfait aux conditions d'intégrité attachées à ce critère.

6. RECOMMANDATIONS

Le site des Grottes d'Aggtelek et Karst slovaque devrait être inscrit sur la Liste du patrimoine mondial au titre du critère naturel *i*. Le Comité souhaitera peut-être encourager les autorités locales à imposer une réglementation stricte des activités de surface qui pourraient affecter les grottes souterraines.

File Name: 858bis.pdf

UNESCO Region: EUROPE AND THE NORTH AMERICA

SITE NAME: **Caves of the Aggtelek Karst and Slovak Karst
(extension to include the Dobšinská Ice Cave)**

DATE OF INSCRIPTION: 2nd December 2000

STATE PARTY: HUNGARY / SLOVAKIA

CRITERIA: N (i)

DECISION OF THE WORLD HERITAGE COMMITTEE:

WORLD HERITAGE COMMITTEE, Twenty-fourth session, Cairns, Australia

The Committee approved the incorporation of the Dobsinská Ice Cave as part of the Caves of the Aggtelek Karst and Slovak Karst World Heritage site. Although this ice cave is a relatively small (6km²) and specialised feature, it does add variety to the existing site and its features relate to and complement the Caves of Aggtelek Karst and Slovak Karst.

The Delegate of Hungary welcomed the extension and the Observer of Slovakia informed the Committee that an intergovernmental agreement between the two States Parties was established in 1999 for joint projects including research, protection and monitoring.

BRIEF DESCRIPTIONS

The variety of formations and the fact that they are concentrated in a restricted area means that the 712 caves currently recognized make up a typical temperate-zone karstic system. Because they display an extremely rare combination of tropical and glacial climatic effects, they make it possible to study geological history over tens of millions of years.

1.b State, Province or Region: Districts of Spišska, Nová, Ves, Poprad, Rožnava

1.d Exact location: 48°52'05" N, 20°18'22" E

SLOVAK REPUBLIC



World Heritage Centre
Documentation Unit

Reg. N°. 858 REV Date 29.3.99

Copy N°. 4

DOBŠINSKÁ ICE CAVE

Nomination for inscription to the World Heritage List

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Text enclosure No. 1

THE ACT OF THE PARLIAMENT OF THE SLOVAK REPUBLIC
No. 287/1994 ON NATURE AND LANDSCAPE PROTECTION

Text enclosure No. 2

THE STATUTE OF THE ADMINISTRATION OF SLOVAK CAVES
from March 18, 1996, No. 486/1996 - min.

Text enclosure No. 3

STRATEGIC MANAGEMENT OBJECTIVES FOR SHOW CAVES
AND CAVES IN PROCESS FOR OPENING TO THE PUBLIC
IN THE SLOVAK REPUBLIC (APPROVED BY THE OPERATIVE
CONFERENCE OF THE MINISTER OF THE ENVIRONMENT
OF THE SLOVAK REPUBLIC from March 8, 1996,
THE RESOLUTION NO. 45).

Text enclosure No. 4

THE VISITING RULES OF THE DOBŠINSKÁ ICE CAVE PUBLISHED
BY THE RESOLUTION OF THE DISTRICT OFFICE OF THE
ENVIRONMENT, No. SŠOPaK - 129/1995 from April 19, 1995 67

Text enclosure No. 5

THE STATUTE OF WORKING ACTIVITIES OF THE ADMINISTRATION
OF THE NATIONAL PARK SLOVENSKÝ RAJ from March 1, 1996
No. 5/9656 SNPS

Text enclosure No. 6

THE RESOLUTION OF THE GOVERNMENT OF THE SLOVAK REPUBLIC
No. 711 from October 22, 1996 TO PROPOSAL OF THE MANAGEMENT PLAN
FOR THE NATIONAL PARK SLOVENSKÝ RAJ UNTIL 2006

Text enclosure No. 7

THE GENERALLY BINDING NOTIFICATION OF THE DISTRICT
OFFICE OF THE ENVIRONMENT IN SPIŠSKÁ NOVÁ VES
NO. 3/1996 from April 15, 1996 ON THE VISITING RULES
OF THE NATIONAL PARK SLOVENSKÝ RAJ

Compiled by:

E C S Slovakia Ltd.
Environmental Consulting Services
Spišská Nová Ves

Administration of the Slovak Caves
Liptovský Mikuláš

Cooperating organisations:

Slovak Speleologic Society
Speleologic Club Slovenský raj
Spišská Nová Ves

Administration of the National Park Slovenský raj
Spišská Nová Ves

Slovak Museum of Conservation of Nature and Caving
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Spišská Nová Ves

Administration of Slovak Caves

Liptovský Mikuláš

1. IDENTIFICATION OF THE PROPERTY

a/ Country: SLOVAK REPUBLIC

b/ Regions: KOŠICKÝ, PREŠOVSKÝ

Districts: SPIŠSKÁ NOVÁ VES, POPRAD, ROŽŇAVA

c/ Name of Property:

DOBŠINSKÁ ICE CAVE

The locality comprises the following objects of the cave system:

1. The Dobšinská Ice Cave
2. The Stratenská Cave
3. The Psie Pits Cave

d/ Exact location on map and indication of geographical coordinates to the nearest property inscribed to the World Heritage List

The property is located at $48^{\circ}52'05''$ of northern geographical latitude and $20^{\circ}18'22''$ of eastern geographical longitude. (Fig. 1) Locality is located on the territory of the national park Slovenský raj (Slovak Paradise), in the west-southwest from Spišská Nová Ves (Fig. 2).

The nearest locality included into the World Heritage List "Spišský hrad a jeho pripojené kultúrne pamiatky" ("Spišský Hrad and its associated cultural monuments") is situated 30 km northeast from the Dobšinská Ice Cave.

e/ Maps and plans showing boundary of property

Fig. 1. Dobšinská Ice Cave

The position within Europe and the Slovak Republic

Fig. 2. Dobšinská Ice Cave

The position within Slovenský raj

Fig. 3. Dobšinská Ice Cave

Fig. 4. Dobšinská Ice Cave - transversal sections

Fig. 5. Dobšinská Ice Cave and Stratenská Cave

Fig. 6. Contemporaneous securing a protection of locality
proposed for registration to the World Heritage List

Fig. 7. The programme of protection of locality
proposed for inscription to the World Heritage List,
zones of protection

f/ Area of property proposed for inscription and proposed buffer zone if any

The Dobšinská Ice Cave is 1232 m long. It genetically belongs to the Stratenská Cave system which is 21 651 m long. The system represents the second longest cave system in Slovakia. The plain Duča, in which caves are located, comprises area of 6,07 km². The longest length of area is 3,5 km in east-west direction and 4 km in north-south one. In total, there exist 53 caves within regarded area.

2. JUSTIFICATION FOR INSCRIPTION

a/ Statement of significance

The Dobšinská ľadová jaskyňa ice cave (hereafter "Dobšinská Ice Cave") as a part of the cave system of the Stratenská jaskyňa cave (hereafter "Stratenská Cave") with genetic link to geomorphological evolution of ravines and surface forms of relief is a unique evidence of evolution of the underground karst since the late Tertiary until contemporaneity. It is an „text-book example“ of origin and evolution of an underground glacier since the Ice Age until the Holocene. The lowest altitude (above sea level) of the entrance of the cave and of the ice creation, ice volume, whole year's glaciation, balanced state of the underground glacier and its

natural substitution and static climatic regime rank the Dobšinská Ice Cave among exceptional and unique natural underground phenomena, which can not be found elsewhere in the World.

b/ Possible comparative analysis (including state of conservation of similar sites)

We have compared the Dobšinská Ice Cave with ice caves in Alps (Eisriesenwelt, Dachstein - Rieseneishöhle, Schellenberger Höhle...), in Eastern Carpathians (Scarisoara) and in Ural (Kungurskaja led'annaja peščera).

The Kungurskaja Cave is located approximately 10^0 more northwardly than the above mentioned caves and whole year's glaciation has essentially smaller dimensions and no concentration.

All the mentioned european ice caves are located in the altitudes 1150 m above sea level (Scarisoara), mostly 1462 - 1660 m above sea level. The entrance of the Dobšinská Ice Cave is situated in the altitude 969 m above sea level, the underground glacier is in the altitude 920 - 950 m. The location of the Dobšinská Ice Cave is the lowest (when all important ice caves are considered).

Ice caves in Alps are considerably dynamic from the climatic point of view and situated in cold high-mountain environment with essentially more favourable climatic conditions. These caves are represented by underground tunnels, mostly with two entrances situated in various heights with evolution of floor ice.

The Dobšinská Ice Cave is an immense underground cavity with the volume that exceeds $140\,000\text{ m}^3$. It is filled with one underground glacier with thickness of 26.5 m and volume of $110\,000\text{ m}^3$. This underground glacier had been created under particular geologic - geomorphologic, climatic and hydrogeological conditions. Beginning of the ice creation dates back to the Ice Age Riss (possibly the Penultimate Interglacial). The cave is considered to be stabilised. The whole year's glaciation is stable. The glacier grows in upper parts and gradually melts in lower ones. This process is balanced which diminishes considerable seasonal fluctuations of ice growth or ice decrease. Natural substitution of the ice filling takes approximately 5 - 10 thousands years.

c/ Authenticity/Integrity

The Dobšinská Ice Cave and Stratenská Cave system is considered to be localities without disturbing negative antropogenious interferences. There are well-preserved and unique nature values in Dobšinská Ice Cave, that originates from glacial cave geosystems as a result of local specific conditions. Glaciers within underground spaces are significantly influencing overall character of cave geosystems (particularly recent hydrologic and geomorphologic processes, occurence of fauna species, etc.). Several species of Chiropteroфаuna, including some of significant scientific and conservation value are present in the watter cave system.

d/ Criteria under which the inscription is proposed (and justification for inscription under these criteria)

1. The Dobšinská Ice Cave and the Stratenská Cave system represent principal stages of geologic and geomorphologic evolution of the territory in the period of the late Tertiary and Quarternary. Their origin and evolution is mutually interrelated from the geomorphologic point of view. They are an evidence of geologic and geomorphologic processes of evolution of the landscape.

There is a direct relation and connection between evolution of surface and underground karst forms. Underground karst phenomena had been evolved in certain evolutionary stages which correspond with both planed surfaces of the karst relief on the surface and due topical evolutionary stages.

2. The Dobšinská Ice Cave represents a unique „text-book example“ of an ice cave with „bag“ character with a massive floor ice. Moreover, it represents an outstanding nature phenomenon, particularly regarding the occurence of extraordinary glaciare situated in altitude below 1 000 m above the sea level.

3. Property suggested for inscription to the List is characterised by:

- preserved natural ecosystems
- high degree of ecological stability

The property is suggested for inscription to the World Heritage List under the criteria (i) and (iii) according to D. 44a article of the Operational Guidelines.

3. DESCRIPTION

a/ Description of property

Slovenský raj, plain Duča - a place of cave system

The Dobšinská Ice Cave within the Stratenská Cave system is located in geomorphological unit of the Slovenský raj. The Slovenský raj with nominated property is situated in the Spišsko-gemerský Karst in the Slovenské rudohorie Mts. It borders on Nízke Tatry Mts. in the west, Hornádska kotlina (basin) in the north, Volovské vrchy Mts. in the east and south.

Altitudes above sea level on the territory of ravines expansion fluctuate between 500 m (on the border with the Hornádska kotlina) and 1150 m (The Havrania skala - the highest hill). The relief generally decreases from the south to the north which is a consequence of a megaanticline of the Slovenské rudohorie Mts. A relative height dissection is considerable. With vertical differences of 150 - 300 m a centrally dissected relief prevails in the northern and northeastern part.

The Slovenský raj is regarded as a significant karst territory. Apart from small exceptions, there are dominant rocks of mesozoic that are mostly created by limestones (except of the Lower Triassic) and dolomites (northgemeral unit). Limestones of the Middle Triassic prevail in the northern part. Apart from limestones there are also numerous dolomites of the Middle and Upper Triassic in the southern part. In the north from the river Hornád there is an expansion of conglomerates of the Paleogene System and sandstones (centralcarpathian flysh).

Geological structure, petrographic composition and sequence rock proportions, tectonic movements as well as exogenous factors had originated a particular character of surface plasticity of the Slovenský raj which results in an exceptional variety of forms and dimensions of surface and of underground karst. There was created a particular territory that is extraordinarily rich in natural values and beauties; because of these the Slovenský raj

considerably differs from neighbouring non-karst territories. Karst valleys are dominant morphological elements of relief of the Slovenský raj.

According to both form of transverse and longitudinal section and age there are several types of karst valleys to be distinguished in the Slovenský raj: late tertiary solution valleys, ravines, open V-form karst valleys, canyons, dry cylindrical karst valleys.

The most typical form of relief in the Slovenský raj is systém of ravines with specific shapes of river modelling. The whole system of canyons on limestones had been originated by brooks which flow from centre of karst plateau to all directions.

Evolution of the territory has three stages (geomorphological cycles) with two levelling periods:

I. evolutionary stage (the late Tertiary): by destruction of the upland plane erosive-denudation relief was created and is characterised by shallow solution valley. The first evolutionary stage is brought to a close by a rodanic tectonic phase which is the beginning of the

II. evolutionary stage: vertical erosion of water streams had been evoked by tectonic movements - upraise which resulted in creation of open V-shaped karst valleys. Final product of the evolutionary stage is younger, lower, so called *riverine system* of surface levelling which had been originated in the Upper Pliocene (the late Tertiary).

That is to say that before creation of the today's canyon predecessor of the river Hornád flowed on a wide planed niveau approximately 150 m higher than the river Hornád does nowadays. This is to be stated also in other territories of Slovakia. The age of this so called "riverine niveau" refers to the Upper Pliocene (Ruman, the late Tertiary).

III. stage: the last (third) evolutionary stage starts in the end of the Upper Pliocene as a consequence of tectonic movements of the valasic (valašská) phase. A new wave of vertical erosion had begun with an uplift of mountains and has been lasting until recent. A deepening of valleys in the third evolutionary stage lead to creation of deep canyons, ravines and sharp V-shaped karst valleys.

The Slovenský raj is a significant example of underground karst phenomena. Caves are unique natural objects that have a scientific, cultural - educational or other social function. Closure of cave spaces causes conservation and preservation of allochthonous material that had been brought into underground (paleontological and archaeological discoveries...) which, in some cases, enables to reconstruct paleogeographical evolution of the landscape. On the territory of the Slovak Paradise there are 210 caves and chasms.

The cave system of the Stratenská Cave is the most significant and consists of these independent caves (except of others):

1. Dobšinská Ice Cave (1232 m)
2. Cave Duča (136 m)
3. Stratenská Cave + Psie Pits Cave (19 067 m + 2.584 m = 21 651 m)
4. Zelená jaskyňa Cave (31 m)

The best known Dobšinská Ice Cave is the third longest and the only accessible cave in the Slovenský raj (1232 m). A considerable part of the cave is created by large underground spaces that form an immense cavity which decreases from the entrance into the depth of 70 m. Nowadays, a considerable part of the underground space is filled with ice and thus divided into independent spaces: Malá and Veľká sieň (Small and Great Hall), Ruffínyho koridor (Ruffiny's Corridor), etc. The ice mass reaches the thickness that exceeds 26.5 m and the ice volume reaches 110 132 m³.

The Dobšinská Ice Cave created one underground system with the Stratenská Cave in the past. In the Quarternary, the late Pleistocene, the Riss Ice Age (approximately 200 thousands years ago) a collapse of top walls of underground spaces had occurred in the locality of current overfall Duča which resulted in permanent interruption of junction of these caves. Due to this there were created favourable climatic conditions for the origin of ice filling in the Dobšinská Ice Cave.

The territory belongs to mild climatic zone with prevailing western atmospheric circulation. It is characterised by high alterability of all meteorologic elements in the course of year. The territory is situated on interface between oceanic and continental type of climate.

The warmest month of year is July with average temperature 15 - 17 °C and the coldest one is January with monthly average from -5 to -6 °C.

The surface of terrain above the Dobšinská Ice Cave and the Stratenská Cave system is covered by forest, with prevailing types of Fageto-Abietum and Fageto-Picetum. In less extent are presented Fageto-Aceretum, Fageto dealpinum, Fageto-Abietum and Alreto-Fagetum.

Dobšinská Ice Cave

- entrance: northern latitude 48 52' 05''
eastern longitude 20 18' 22''

The entrance is situated in the elevation of 969 m and is orientated to the north. The accessible length is 475 m with a difference of -43 m. The entrance part of the cave has a character of a crushed sinkhole. It ends up in Small Hall (72x42 m), which is from 7 to 10 m high. Partly glaciated is also adjacent Crushed Dome. The lower parts of glacier beneath the Big Curtain are interconnected with upper ones throughout Ruffiny's corridor and spaces above Peklo. Original forms of river erosion are in several places remodelated by ice wheathering.

In the opposite to Chapel beneath Ruffiny's corridor there is an opening to Dry Dome which has no ice. From the space below Big Curtain follows down to Stalactic Cellar and Peklo. Unaccessible stalactit parts of cave decoration in upper part are mainly consisting of horizontal corridors and halls with typical river erosion forms (ceiling troughs, oval corridors, etc.) and sediments. These are accessible from nothern side of Big Hall. They consist of Grape Hall, Stalactic Hall, North Hall, White Hall and Rotunda. The water parts of cave have also several forms of sinter filling (stalagmits, stalactics, sinter crust, soft white sinter and others).

In the Old Pleistocene and Tertiary the Dobšinská Ice Cave and the Stratenská Cave created one underground system which had been formed by the river Hnilec. In the Quarternary, in the Late Pleistocene, in the Riss Ice Age (approximately 200 thousands years ago) a collapse of top walls of the underground spaces had occurred in the place of the current overfall Duča which resulted in permanent interruption of junction of these caves. Thus, favourable conditions for creation of ice filling of the Dobšinská Ice Cave had been created. Temperature in the cave oscillates between -0.3 and -4.9 °C.

A considerable part of the Dobšinská Ice Cave is created by large underground spaces which form one immense void that descends from the entrance into the depth of 70 m. In contemporaneity a large part of the underground space is filled with ice and thus divided into idependent parts (Small and Great Hall, Ruffiny's corridor and other). The underground glacier reaches the biggest thickness of 26.5 m in the Great Hall and the ice volume reaches 110 132m³. Unaccessible dripstone parts of the cave create mostly horizontal corridors and halls with typical river forms and sediments.

The ice decoration is characteristic of transparent or milk-like coloured stalagmites or columns that are 10 m high with diameter of 4 m and of hanging stalactites. On the walls and ceiling of Small Hall an occurrence of ice crystals is very common. Floor ice on the floor is formed by thin layers which can be seen especially in Ruffiny's corridor and below Big Curtain.

The Dobšinská Ice Cave is one of the oldest and most significant hibernation places of bats (*Chiroptera*) in Slovakia. Upper glaciated spaces are a hibernation place for (*Eptesicus nilssoni*). Lower warmer spaces are used as hibernation place for other species. They are the largest hibernation place of (*Myotis mystacinus*) and (*Myotis brandti*) in Slovakia. This place is used for hibernation also by one of the most precious bats in Slovakia - (*Myotis dasycneme*). As for termophile european species there is (*Myotis blythi*) that hibernates in the cave; as for other species there are (*Plecotus auritus*), (*Myotis myotis*) and (*Myotis nattereri*). Until now, 12 species of bats have been recorded in cave.

Bats (*Chiroptera*) are a considerably endangered group of animals. According to the national red book of endangered animal species (BARUŠ and comp., 1989) that have been switched into new categories IUCN for the red lists (IUCN, 1995) in the Dobšinská Ice Cave there are: one critically endangered species (CR) - (*Myotis dasycneme*) and two endangered species (EN) - (*Myotis mystacinus*) and (*Myotis brandti*).

Stratenská Cave and Psie Pits Cave

The Stratenská Cave (Fig. 5) and the cave Psie Pits Cave create the longest cave system in Slovakia (21 651 m). The caves are closed and inaccessible to the public.

The Stratenská Cave stands out especially due to its hugeness. The Rozprávkový Dóm (Fairy Tale Dome) with the volume of 79 017 m³ is the largest free cave space in the Slovak Republic. In the cave system of the Stratenská Cave there are 5 evolutionary levels and two horizons. The youngest levels are represented by level of lower exsurgences and karst springs on the circumference of the karst plateau. The fourth evolutionary level is the most significant; its spaces reach the width of 10 - 20 m and the height of 5 - 26 m. This level belongs to the riverain niveau and dates from the late Tertiary Age. Also main glaciated spaces of the Dobšinská ice cave belong to this level.

Magnificent calcite decoration is represented mostly by white-coloured shapes of usually big dimensions. Each part of the cave has a certain type of decoration. There are frequent straw stalactites and also larger stalactites and curtains but especially stalagmites - big heaps, cones, pagodas, sticks and other shapes such as lace lakes, cascades and big lakes. There are also valuable cave pearls of semisphere shape-hemispheroids, aragonite crystalline excrescences, dripstone excentric forms and gypsum. Allochthonous filler is created by river gravel, sand and clay that had been brought into the cave by the water streams of Hnilec and Tiesňavy. The biggest lake - Stalagmite Lake - has the area of 320 m².

In the western part of the Stratenská Cave the richest collecting locality in Slovakia can be found bones of the Cave Bear (*Ursus spelaeus Rösenmüller et Heinroth, 1793*) that are 15 490 - 17 530 years old. Therefore it is also an important palentologic locality.

b/ History and development

Caves of the Slovenský raj may be considered as an outstanding nature phenomenon of anorganic character. They always have attract interest of many for exploring and research. The entrance to the Dobšinská Ice Cave (called „Ice Pit“) has been known since times.

The cave was discovered by E. Ruffiny, G. Lang, A. Mego and F. Fehér on 15 June 1870. To the worthy of the town Dobšiná, the cave is open to public since 1871. First attempts for electric lightening comes from 1882, while permanent lightening is beeing installed since 1887. Together with Postojnská Cave, the Dobšinská Ice Cave belongs among the first electrically lightened caves in the world ever. The first plan of the cave (transversal section and cross-section) originate from 1881 and were elaborated by E. Ruffiny. The plan of cave made by I. Krenner is from 1874. The first climate records are comming from 1870-1871 (F. Fehér), 1873 (as authorised by the Hungarian Royal Nature Science Association) and 1880-1881 (J. Pelech). Surveys continued more comprehensively in 1913-1918 (L. Steiner).

The great attractivness of the cave resulded in a fact that it has been visited also by (except of others) significant personalities: Serbian King Milan, Bulgarian Czar Ferdinand I., French composers Leo Délibes and Jules Massenet, Norwegian arctic explorer Fridtjof Nansen, architect of the Suez Canal F. Lesseps and others.

After the First World War the cave lightening was connected to local electricity grid. Subsequently, in 1947 additional stalactic parts of cave were discovered (Stalactic Hall, North Hall and White Hall). Due to the reasons of cave protection climate recordings has begun again in 1950-1965 (Š. Petrovič, J. Šoltés and Š. Valovič) and in 1976-1985 (J. Halaš).

The oldest preserved information about speleological research in the Slovenský raj dates back to the beginning of the 18th century.

A result of the interest was a magnificent discovery of the Dobšinská Ice Cave on June 15, 1870 by E. Ruffíny who elaborated also the first cave plan in 1871. This is at the same time the beginning of systematic research of caves not only in the Slovenský raj but also in other regions of Slovakia.

Dripstone parts of the Dobšinská Ice Cave were discovered in 1947 (ŠIMKOVIČ, 1950; KVIETOK, 1948, 1949). The Medvedia jaskyňa cave was discovered in 1952.

A significant landmark was the year 1964 in which the Speleological club of the Slovenský raj from Spišská Nová Ves was established on the territory of the Slovenský raj. It is the beginning of a period of continual and systematical research, investigation and conservation of the karst of the Slovenský raj and especially of its underground phenomenon. A result of the activity of the club was the discovery of the Stratenská Cave on 1st December, 1972.

A continuation of underground spaces of the Psie Pits Cave was discovered in 1988 and in 1994 connected with the Stratenská Cave which made the Stratenská Cave with its length of 21 651 m the longest cave in Slovakia (Fig. 5). The Dobšinská Ice Cave is also a part of the cave system of the Stratenská Cave.

A proper legislative protection of the Slovenský raj dates from 1964 when the Slovenský raj was proclaimed a protected landscape area - the first one of this kind in former Czechoslovakia. In 1988 the territory was precategorised as the national park.

A systematic and conceptual nature protection activities in Slovenský raj has started by establishing of the Administration Office of Protected Landscape Area Slovenský raj. Since 1970, management of the Dobšinská Ice Cave is provided by the Administration of Slovak Caves. In 1979 the cave was established as a protected nature phenomenon.

In accordance with the Act No. 287/1994 on Nature and Landscape Protection, since 1996 is the cave declared for national nature monument.

c/ Form and date of most recent records of site

Due to its exceptionality, the Dobšinská Ice Cave evoked interest of scientists of various scientific disciplines: geologists, geomorphologists, architects, botanists, foresters, zoologists, nature protectors and other researchers.

In the period of acquainting with gorges and with the Dobšinská Ice Cave a great number of materials (research reports, studies, expert articles and publications) have been accumulated from studies of these objects.

Both knowledge and information gained in the whole period of acquainting with gorges were used for elaboration of this project.

The newest data from 80-ies and 90-ties are related to thermic balance of the cave, detail figures about thickness and volume of ice filling, dynamics and growth of ice, Chiropteroфаuna as well as geological mapping.

d/ Present state of conservation

The Dobšinská Ice Cave and the Stratenská Cave system are situated on the territory of the national park. Moreover, the Dobšinská Ice Cave is forming a part of specially strictly protected National Nature Reserve Stratená located at the surface above the cave (Fig. 6).

The new and progressive Act on nature and landscape protection (287/1994) determines a differentiated regime of conservation for the whole territory of Slovakia according to natural values. This regime is defined in the range of degrees from 1 to 5 whereby the strictest regime refers to the 5th degree of conservation (*Text enclosure No. 1*).

Admissible and prohibited human activity is specified for each degree of conservation. All caves, including the Dobšinská Ice Cave are national nature monuments with the highest - 5th degree of protection. Additionally, the National Nature Reserve Stratená located at the surface above the cave system, is protected by the 5th degree of protection.

e/ Policies and programmes related to the presentation and promotion of the property

Plans and programmes aimed at presentation of the locality are comprised in the Plans of main tasks of both the Administration of Slovak Caves and Administration of the National Park Slovenský raj and that result from the Resolution of the Government of the Slovak Republic No. 711 from October 22, 1996 about proposal of the Programme of carefulness about the national park Slovenský raj until 2006 (*Text enclosure No.6*). These programmes contain forms and modes of propagation and presentation of localities. The mentioned organisations have financial and material conditions for this activity the state budget.

As for presentation and propagation of objects responsible organisations ensure:

- lectures, dialogues in surrounding villages, schools, institutions of travel movement, sport and tourism,
- editorial - propagandistic activity aimed at environmental education and knowledge of nature, human influence on nature,
- public mass communication means (press, broadcasting, television),
- publishing scientific articles and research results, presentation and promotion of outcomes at conferences and other special events.

At the output of a footpath from the cave a new educational trail has been opened. Within interior of a new entrance hall of the cave there is a permanent exhibition on caves of Slovenský raj, morphology and genesis of the Dobšinská Ice Cave and the Stratenská Cave system, speleoclimatic conditions and icing within the Dobšinská Ice Cave, including its history.

4. MANAGEMENT

a/ Ownership

The land above the Dobšinská Ice Cave and Stratenská Cave system belong to the ownership of the town Dobšiná:

Mestský úrad
Nám. baníkov
049 25 Dobšín

The Dobšinská Ice Cave is in the state ownership.

b/ Legal status

The right to protection of environment and cultural heritage is secured by the Constitution of the Slovak Republic.

According to the Decree of the Government of the Slovak Republic (No. 23 from January 18, 1988) the territory of the Slovenský raj was precategorized from protected landscape area to national park in 1988.

The Dobšinská Ice Cave and Stratenská Cave system are situated on the territory of the National Park Slovenský raj and are also separately strictly protected areas of national nature reserves and national nature monuments (Fig. 6).

The regime of conservation of the National Park Slovenský raj is controlled by the Act on nature and landscape protection (the Parliament of the Slovak Republic No. 287/1994) and by the Decree on the National Park Slovenský raj (the Government of the Slovak Republic No. 23/1988).

The regime of conservation of national nature reserves, nature reserves, national nature monuments and nature monuments is controlled by the Act on nature and landscape protection (the Parliament of the Slovak Republic No. 287/1994) and by the following regulations:

1. Amendment of the Ministry of Culture of the Slovak socialist republic (MC SSR) from October 30, 1976, No. 7431/1976 - OP on the declaration of the Stráženská State Nature Reserve.
2. Amendment of MC SSR from November 30, 1979, No. 9162/1979 - OP on the declaration of the Dobšinská Ice Cave Protected Nature Phenomenon.

c/ Protective measures and means of implementation

Fundamental protective arrangements are determined by the nature and landscape protection Act (the Parliament of the Slovak Republic, No. 287/1994). This new and progressive act on protection of nature determines the differentiated regime of conservation for the whole territory of Slovakia according to natural values and mission. The regime is defined in the range of

degrees from 1 to 5 where the strictest regime refers to the 5th degree of conservation (*Text enclosure No. 1*). The 2nd degree of conservation is valid on the territory of buffer zone of the national park, the 3rd degree of conservation is valid on the territory of the Slovenský raj. The 4th degree of conservation is valid in the area of protected range and the 5th degree of conservation is valid on the territory of national nature reserves, nature reserves, national nature monuments and nature monuments (Fig. 6).

Activities of the Administration of the National Park Slovenský raj are controlled by the Statute of the Administration of the National Park Slovenský raj No. 5/96 from March 1, 1996 (*Text enclosure No. 5*) and by annual performance plan of main tasks that results from approved documents of conservation of nature, generally binding regulations and theoretical materials of conservation of nature, especially from the Strategy, principles and priorities of the state environmental policy and the Management Plan for the national park that has been approved by the Resolution of the Government of the Slovak Republic No. 711 from October 22, 1996 (*Text enclosure No. 6*).

The Dobšinská Ice Cave is a national nature monument to which the 5th degree of conservation is referred and the object itself is situated on the territory of the National Nature Reserve Stratená with the 5th degree of conservation.

Activities in the Dobšinská Ice Cave is controlled by the Visiting rules (*Text enclosure No. 4*). Being responsible for the conservation the Administration of Slovak Caves is an expert organisation of conservation of nature with 100 % share of the state. The organisation is subordinated by the Ministry of the Environment of the Slovak Republic (*Text enclosure No. 3*). Sufficient resources for the conservation are created and guaranteed by the state.

Activities of the Administration Office are determined by the Statute of Administration of Slovak Caves No 5/96 (text enclosure No. 2) and annual work plan based on agreed documents in the field of nature protection, generally binding regulations and conceptions, such as „Strategic management objectives for show caves and caves in process for opening to the public in the Slovak Republic“ (adopted by conference of minister of environment in 1996, No. 45) Text enclosure No. 3). The government is guarantering sufficient financial resources for implementation of these plans. The Administration of Slovak Caves is an nature protection organisation, providing protection and racional use of caves open to the public in Slovakia. It performs tasks in relation to research activities, survey and monitoring, field work, development of conceptual plans, documentation and informatics, environmental education and awareness.

Administration staff is consisting of 7 permanent members (geologist, geomorphologist, hydrologist, climatologist, biospeleologist, analyst of GIS and assistant for GIS). Visitation of the Dobšinská Ice Cave is performed by 2 permanent members and 10 seasonal workers. Protective measures in place are sufficient and efficient. Field work and practical maintenance of the Stratská Cave is provided by the Speleological Club in coordination of Administration office. The only allowed activity at the surface above the cave is trekking, but only by signposted footpaths under condition that vegetation and soil should not be damaged, the area should not be influenced by waste, and silence will not be disturbed. (Text enclosure No. 7). All other activities and potential threats are not permitted. Protective measures applied at the surface above cave systém is being provided and performed by the Administration of the National Park Slovenský raj in close cooperation with nature protection authorities - the Ministry of Environment of the Slovak Republic, as well as regional and district state execution offices. The main role of the Administration of the National Park Slovenský raj is to provide and secure protective measures. It performs management activities in protected areas, for endangered species, cooperates in research, survey and monitoring, development and conceptual documents, documentation and information systems, environmental education and raising awareness, closely cooperates with state execution authorities in the field of nature and landscape protection.

d/ Management authorities

The Administration of Slovak Caves - state organisation

The Administration of the National Park Slovenský raj - state organisation

e/ Level at which management is exercised and name and address of responsible person for contact purposes

Protection and operation of the Dobšinská Ice Cave is provided by the Administration of Slovak Caves, a nature and landscape protection organisation with national competencies within the Ministry of Environment of the Slovak Republic framework.

The Dobšinská Ice Cave is administered by the state organisation:

Administration of Slovak Caves

Hodžova ul. 11

031 01 Liptovský Mikuláš

Ing. Jozef Hlaváč, director.

Administration of the National Park Slovenský raj

Letecká 3

052 80 Spišská Nová Ves

Ing. Peter Hromjak, director.

f/ Agreed plans related to property

Orientation documents for both protection and conservation of the Dobšinská Ice Cave are the Statute of the Administration of Slovak Caves and the Strategic aims of development of carefulness and conservation of caves in the Slovak Republic that are either accessible or being made accessible (*Text enclosures No. 2 and 3*).

Both these documents were approved by the minister of the Environment of the Slovak Republic and result from the Strategy of principles and priorities of the state environmental policy (the resolution of the Parliament of the Slovak Republic No. 339/1993, the resolution of the Government of the Slovak Republic No. 619/1993) and determine strategic objectives, means of their attainment and material needs.

The basic conceptual documents for the National Park Slovenský raj are:

- Management plan for the National Park Slovenský raj that has been approved and financially secured by the resolution of the Government of the Slovak Republic No. 711 from October 22, 1996 and is valid for the period 1996 - 2006 (*Text enclosure No. 6*).
- Territorial projection of conservation of nature for the National Park Slovenský raj (1992)
- Studies of territorial plan of the Large territorial unit Slovenský raj (1992)

g/ Sources and levels of financing

Activities of the Administration of Slovak Caves concerning the Dobšinská Ice Cave and its conservation are secured by its Statute. Sources of finance come from the state budget and in contemporaneity are sufficient. Financial aid is needed also from other sources in order to modernise apparatus equipment for monitoring of cave environment.

Financial budget of the Administration of the National Park Slovenský raj is secured by the state budget and other financial means for concrete projects are supplied by the State environmental fund. This level of financing is sufficient. Planned sources of finance including sources for expertise and education in conservative and supervising processes are approved in the frame of the Management Plan for the National Park Slovenský raj until 2006 by the resolution of the Government of the Slovak Republic No. 711 from October 22, 1996 (*Text enclosure No. 6*).

h/ Sources of expertise and training in conservation and management techniques

(see previous section)

i/ Visitor facilities and statistics

Visitation of the Dobšinská Ice Cave is permitted in the period 15 May to 30 September). Average annual visitation within last 5 years has been 84 000 persons. On the base of results of monitoring the visitation is limited to 90 000 persons.

Visit to the cave is possible only with accompany of a guide who provides tourists with expert explanations. The accompanying word (reproduced explanation) is ensured in 10 languages. A permanent exposition is installed entrance hall of the cave. Sale of publications and souvenirs is also available.

The Dobšinská Ice Cave is easy accessible by walking from valley-based parking place near the state road Poprad-Rožnava. In surrounding of the National Park Slovenský raj there are recreational tourism centres: Dedinky-Mlynky, Čingov and Podlesok. Tourist facilities are located also in village Dobšinská Ice Cave.

Above mentioned tourism centres are facilitated by basic lodging and catering facilities. Each recreational centre has a parking place, sales of publications and souvenirs.

j/ Management plan and objectives

A background document for both protection and conservation of the Dobšinská Ice Cave is the Statute of the Administration of Slovak Caves and the Strategic aims of development of management and conservation of caves in the Slovak Republic which are open to the public or being made accessible (*Text enclosures No. 2 and 3*).

These determine major objectives and principles of management of cave and its parts, with special emphasis on ice filling. Protection measures are secured by guaranteed financial means from the state budget.

A background document for conservation of nature of the national park is the Management plan for the National Park Slovenský raj which is elaborated for 10-year period and approved by the Government of the Slovak Republic (*Text enclosure No. 6*). The Management plan contains a detailed elaborated strategy and concrete measures of territorial conservation, species conservation, documentation of conservation of nature, investigation and research, environmental education, propagandistic and editorial activity and last but not least measures on security of fulfilling tasks of the Administration of the National Park Slovenský raj.

The Management plan in its crucial part determines strategic objectives and principles of carefulness about nature and its single components. Another part of the programme consists of financial means for the measures that are supplied by the state budget, technical equipment and personal completion of the Administration of the National Park Slovenský raj which counts upon an increase of permanent workers from 12 to 27.

5. FACTORS AFFECTING THE SITE

a/ Development pressures

The Dobšinská Ice Cave is situated in national nature reserves which means in the areas with the highest degree of conservation; therefore no economic activity is performed. Whatever illegal interferences are excluded. All objects are permanently supervised by the management staff.

b/ Environmental pressures

In surrounding urbanised centres there are no industrial agglomerations and thus the localities are not affected by emissions.

Visitation in the Dobšinská Ice Cave is strictly controlled on the base of performed research and monitoring (influence of visitation on changes in microclimate and ice filling) and topically limited to the period from 15 May to 30 September. Remaining period of year is developed for regeneration of the cave.

c/ Natural disasters and preparedness

According to accessible literature the suggested territory was not affected by natural disasters in the past.

d/ Visitor/tourism pressures

Visitation of the Dobšinská Ice Cave is controlled and seasonally limited to period from 15 May to 30 September. Also number of visitors is limited to 90 000 per season. During hybernation of bats (winter season) the cave is not open and also the main hybernation places are located in lower inaccessible spaces.

Maintaining an accurate operational regime and current state of nature conditions, the thermic balance keeps very favourable for growth of ice filling, so the future of this unique nature feature is well-secured. (J. Halaš, 1989)

e/ Number of inhabitants within site, buffer zone

The proposed site is not inhabited.

6. MONITORING

a/ Key indicators for measuring state of conservation

A result of conservation of the cave is its maintenance in the optimal state. After the limitation of visitation the cave regenerates in the course of 8 months of year and simultaneously conservation activities are being performed. Since 1947 no extraordinary situation has occurred which would have endangered the microclimate and the filling of the cave. Both microclimate and ice filling are stabilized. The state of biotic component - the qualitative and quantitative structure of hibernation bat populations (*Chiroptera*) - is also stabilized. In the last 20 years there have been no important changes in the structure of hibernation bat populations.

b/ Administrative arrangements for monitoring

The Administration of Slovak Caves has elaborated a plan that results from the Statute of the Administration of Slovak Caves according to which monitoring of microclimate, influence of tributaries of precipitation waters into caves on ice filling in summer, water quality and geological - tectonic research is performed. The monitoring is arranged by the Administration of Slovak Caves in cooperation with state scientific institutions and other organisations. The monitoring is financially supplied by the Ministry of the Environment of the Slovak Republic.

c/ Results of previous reporting exercises

Monitoring of microclimate of the Dobšinská Ice Cave had begun immediately after its discovery and has been proceeding until present. Various types of research have been taking place and their results are summarized in these works: BOBRO, HANČULÁK, ZELINKA (1995); DÉNES (1971); DROPPA (1960); FEHÉR (1872); HALAŠ (1980, 1985, 1989); HLAVÁČ (1995); JAKÁL (1971); KRENNER (1884); LALKOVIČ (1995); TULIS, NOVOTNÝ (1989).

Information on animal populations in the Dobšinská Ice Cave are recorded in publications:

GEISLER, HANAK (1970, 1973); UHRIN (1995, 1998) and others.

A result of these essays is protection and conservation of the localities and initial elimination of unfavourable influences. Nature protection report is every year elaborated by the Ministry of Environment of the Slovak Republic.

7. DOCUMENTATION

a/ Photographs, slides, video, films, CD- ROM

(see attachment in original nomination, 1996) used with permission of the Ministry of Environment of the Slovak Republic

b/ Abstracts from the management plan and other plans related to the site (enclosures 1-7)

c/ Literature

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d/ Inventory, records and archives placement

The data used in this project are placed in following organizations and institutions:

Administration of the Slovak Caves

Liptovský Mikuláš

Hodžova 11

031 01 Liptovský Mikuláš

Administration of the National Park Slovenský raj

Letecká 3

052 01 Spišská Nová Ves

Slovak Museum of Conservation of Nature and Caving

Školská 4

031 01 Liptovský Mikuláš

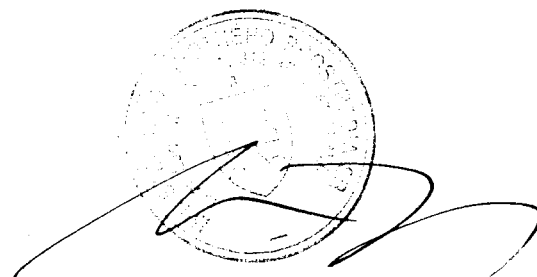
Slovak Speleologic Society

Speleologic Club Slovenský raj

Brezová 9

052 01 Spišská Nová Ves

Bratislava, 25 March 1999

A circular official stamp of the Ministry of Environment of the Slovak Republic is visible, with a handwritten signature in black ink written over it.

Minister of Environment
of the Slovak Republic

THE ACT OF THE PARLIAMENT OF THE SLOVAK REPUBLIC No.287/1994 ON NATURE AND LANDSCAPE PROTECTION (extract)
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The aim of this Act is to contribute to conservation of variety of conditions and forms of life on the Earth, to create conditions for permanent maintenance, rinnovation and racional exploitation of natural resources, for rescue of natural heritage, for characteristic relation of the landscape and for attainment and maintenance of ecological stability.

As far as conservation of nature and landscape is concerned the Act regulates authority of organs of the state administration and villages as well as rights and duties of artificial and physical persons. Five degrees of conservation have been established due to territorial conservation of nature and landscape. The range of limits grows with increasing degree of conservation.

Degrees of conservation:

a/ In the case of the *third degree of conservation* consent of the organ of conservation of nature is required for:

- ploughing and transposing soil and clay and arrangement of pastures
- tending flocks and movement of herds of economically significant animal species and construction of equipments for their protection,
- activity that changes natural state of water streams, water areas, swamps, fens, springs and draughts,
- free movement of home animals
- cultivating outlandish vegetable species, breeding outlandish animal species outside closed objects and expanding original vegetable and animal species by human activities outside approved forest economic plan,
- marking buildings, roads, pavements, areas, trees and other objects with informative, advertising or other tables, equipments and signs and placarding posters,
- using chemicals except of those of personal need and storing agrochemicals
- shipping with boats or in other ways, outlook and training low flights by aerial transport means,
- entering and stopping motor vehicles with exception of public land communications and transport and technological areas that are reserved to this scope

- mountaineering and climbing, skialpinism, camping and setting on campfire outside localities and places that are determined by the organ of conservation of nature,
- collecting plants, minerals and fossils,
- building and running offices of protection and security of the state boundaries.

b/ In the case of the *fourth degree of conservation* these activities are prohibited:

- to exploit wood mass in clear-cutting way and to build wood transport roads outside approved forest economical plan,
- to create folds of economically significant animal species,
- to exploit reed, peat, mud, loess, clay, soil, sand and gravel, to perform geologic activities, mining activities and activities executed in mining way and to use heavy mechanisms outside areas that are determined by the organ of conservation of nature,
- to change water regime of grounds,
- to cultivate and to expand non-original vegetable species, to breed and expand non-original animal species as well as original vegetable and animal species of different geographical competence outside approved forest economic plan,
- to let home animals, especially dogs move freely,
- to build industrial objects and equipments, field manure dumping sites, garden villages, residences and habitable sites as well as objects and equipments that prevent migration of organisms and exchange of their genetic information,
- to hang informative, advertising and other tables and equipments and to placard posters outside localities that are reserved by the organ of conservation of nature,
- to locate or expand sanitary landfills and to store agrochemicals,
- to use chemicals for covering roads and pavements,
- to apply airplane fertilizing or to use chemicals and fertilizers in other ways on large areas,
- to perform sport and recreation activity, camping and setting on fire outside roads and places that are determined by the organ of conservation of nature,
- collection of plants, animals, minerals and fossils and their parts with exception of permitted extent of scientific - research activity,
- execute military training,
- to burn out grass covers.

c/ In the case of the ***fifth degree of conservation*** these activities are prohibited:

- to perform activities that have been mentioned in the point b/
- to interfere with forest covers, to cut trees and to damage vegetal cover and soil cap,
- to change the shape of relief, to plough and transpose soil and clay and to perform geologic activities, mining activity and activity that is performed in mining way,
- to tend flocks and let them move freely as far as economically significant species are considered,
- to change natural state of water streams, water areas, swamps, fens, springs and draughts,
- to hunt animals and fish and arrange salt-supply places and forage supply places for animals,
- to carry in home animals, outlandish and non-original vegetable and animal species,
- to build and expand objects and equipments that are not used for water - protective, soil - protective, forest - protective or other needs of conservation of nature,
- to build hut villages, sport and recreation centres,
- to hang informative, advertising and other tables, equipments and signs that do not serve to conservation of nature,
- to contaminate the territory by refuse and rubbish and to store wastes,
- to apply chemicals and fertilizers,
- to enter and to stop with means of transport with exception of those that serve to water - protective, soil - protective, forest - protective or other needs of conservation of nature and to administration or maintenance of centres of public interest,
- to row and to carry out training and outlook low flights,
- to walk outside marked places and roads,
- to set on fire, to smoke, to camp, to perform sport and recreation activity except of foot-tourism on instructive and touristic pavements, climbing, mountaineering and skialpinism on places that are reserved by the organ of conservation of nature,
- to disturb quiet and silence,
- to collect plants, minerals and fossils,
- to locate equipments for protection and security of the state with exception of protection of the state borders.

According to this Act, caves and chasms are referred to the ***fifth degree of conservation***.

THE STATUTE OF THE ADMINISTRATION OF SLOVAK CAVES from March 18, 1996, No. 486/1996 - min. (extract)
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1. The Administration is a contributory organization, directly controlled by the ministry, and is linked to budget of the ministry.
2. The Administration is an expert organization of conservation of nature with whole-state efficacy which activity is aimed at conservation of caves that are accessible, being made accessible and interrelated from the evolution point of view.
3. The Administration fulfills tasks that are referred to conservation of nature, touristic movement, process of accessibility and other exploitation of caves in accordance with particular regulations (The Act of the Parliament of the Slovak Republic No. 287/1994 on conservation of nature and landscape).
4. The Administration takes part in methodical management of the karst landscape and other caves and their conservation that is secured by other subjects.
5. The Administration fulfills tasks that are referred to:
 - a/ carefulness about natural memorials - caves,
 - b/ touristic movement, process of accessibility and exploitation of caves,
 - c/ documentation and information system,
 - d/ education and propaganda.
6. Activities of the Administration are directed by generally binding legal regulations, other regulations that are valid in the department of the Ministry and by annual plan of main tasks which is approved by the minister of the Enviroment.
7. The Administration is supervised by director who is responsible for its activity. Responsibility of director for fulfilling tasks is due to the minister.

STRATEGIC MANAGEMENT OBJECTIVES FOR SHOW CAVES AND CAVES IN
PROCESS FOR OPENING TO THE PUBLIC IN THE SLOVAK REPUBLIC
(APPROVED BY THE OPERATIVE CONFERENCE OF THE MINISTER OF THE
ENVIRONMENT OF THE SLOVAK REPUBLIC FROM MARCH 8, 1996,
THE RESOLUTION NO. 45), extract

In order to secure development of carefulness about accessible and in the process of accessibility caves and their conservation the Ministry of the Environment of the Slovak Republic in accordance with the Strategy, principles and priorities of the state environmental policy (the resolution of the Parliament of the Slovak Republic No. 339/1993, the resolution of the Government of the Slovak Republic No. 619/1993) determines strategic objectives, modes of their attainment and material needs.

Strategic aims

a/ contraction and gradual minimalization of unfavourable antropogennous effects on caves and ecosystems that are connected with their visitation and exploitation of the landscape on the surface,

b/ re-vitalization of damaged parts,

c/ to secure a complex conservation of the sinter and ice filling,

d/ inventory and documentation process of geologic, geomorphologic, hydrologic, speleoclimatic and biospeleological conditions in caves,

e/ investigation and knowledge of structure and stability of cave ecosystems and of effect of visitation, attainment and maintenance of their bearable exploitation,

f/ to increase level of educational, propagandistic and editorial activity.

Modes of attainment of aims

In order to reach strategic objectives the Administration of Slovak Caves in its plans of main tasks is to secure:

1. In the area of research and investigation that is aimed at knowledge of phenomena and connections which are necessary for both execution of practical carefulness about caves and determination of limits and regulations of their exploitation, especially in the research of:

- a/ geologic conditions,
- b/ geomorphologic conditions,
- c/ hydrologic conditions,
- d/ speleoclimatic conditions,
- e/ biospeleological conditions,
- f/ cave ecosystems.

2. Monitoring of single elements and phenomena that affect the state of cave environment.
3. Carefulness about caves and their conservation.
4. Security and supervision of complex documentation, book and map funds.
5. Development of information systems.
6. Educational, propagandistic and editorial activity.

Material needs for attainment of aims

Security of material - technical equipment

THE VISITING RULES OF THE DOBŠINSKÁ ICE CAVE
PUBLISHED BY THE RESOLUTION OF THE DISTRICT OFFICE OF
THE ENVIRONMENT, No. SŠOPaK - 129/1995 from April 19, 1995 (extract)

1. Accessible caves belong to significant natural memorials of Slovakia and are protected due to the Act § 19 section 6 of the Parliament of the Slovak Republic No. 287/1994 on conservation of nature and landscape.

2. Visiting the cave comprises the Entrance Order, Price - list of both entrance fee and services.

3 Entrance into the cave is permitted only with accompany of a guide whose orders are to be respected by visitors.

4. In the cave it is prohibited:

- to touch decoration of the cave or to damage it,
- to collect natives,
- to disturb bats or other animals in whatever way,
- to damage equipments of the cave,
- to throw away rubbish, to smoke and to pollute the cave in other ways,
- to touch eletrical installation,
- to leave pavement of the trip destination,
- to depart from the group that is lead by a guide,
- to enter with dogs and other animals,

5. Entrance into the cave is prohibited for drunk persons.

THE STATUTE OF WORKING ACTIVITIES OF THE ADMINISTRATION OF
THE NATIONAL PARK SLOVENSKÝ RAJ from March 1, 1996 No. 5/1996
SNPS (extract)

1. The Administration of the National Park Slovenský raj is an organization component of the Administration of national parks of the Slovak Republic, established by the declaration of the minister of the Environment of the Slovak Republic from December 27, 1995 No. 23/95 - 4.1., on uniting administrations of national parks into one budget organization.

2. The Administration is an expert organization of conservation of nature which activity is aimed at conservation of nature and landscape, carefulness about ecosystems and area of the National Park Slovenský raj and its buffer zones within extraordinary regulations (The Act of the Parliament of the Slovak Republic No. 287/1994 on conservation of nature and landscape, the Decree of the Government of the Slovak Republic No. 23/1988 on the National Park Slovenský raj referring to the Act of the Parliament of the Slovak Republic No. 287/1994).

Carefulness about ecosystems is represented by a set of practical measures of conservation of nature in order to secure functions of these ecosystems.

3. Activities of the Administration are comprised in:

- area of cooperation in research, investigation and monitoring
- area of cooperation in creation of theoretical expert documents for needs of carefulness and environmental education
- area of practical carefulness about ecosystems
- area of environmental education, editorial and propagandistic activity
- area of documentation
- area of cooperation with authorities of the state administration of conservation of nature and landscape

4. The Administration in its longdated activity is directed by approved documents of conservation of nature, generally binding legal documents of conservation of nature, generally binding legal regulations and by other regulations that are valid in the department of the Ministry of the Environment of the Slovak Republic. In its one-year activity the Administration operates in accordance with annual plan of main tasks.

5. The Administration is linked to the state budget.

6. The Administration is supervised by director of the Administration who is responsible for its activity.

THE RESOLUTION OF THE GOVERNMENT OF THE SLOVAK REPUBLIC
No. 711 from October 22,1996 TO PROPOSAL OF THE MANAGEMENT PLAN
FOR THE NATIONAL PARK SLOVENSKÝ RAJ UNTIL 2006 (extract)

The Government

A. APPROVES

the proposal of the Programme of carefulness about the National Park Slovenský raj until 2006.

B. STATES

that nature and landscape of the Slovenský raj are a part of our national natural heritage and wealth, a resource of knowledge, rest and material profits.

In spite of longdated legal protection of the area of the national park certain negative influences that accompany our environment have not been managed to be eliminated. Therefore this area needs a more efficient protection and carefulness as far as citizens, villages, societies and state are considered that possess and exploit the area of the national park.

C. IMPOSES

1. to minister of the Environment, minister of the Soil Economy, minister of the Economy, minister of the Internal Affairs, minister of the Transport, Posts and Telecommunications and to minister of the Schools to secure realisation of measures of the Programme of carefulness about the National Park Slovenský raj until 2006.

2. to the minister of the Environment to introduce a control report about fulfilling the Programme of carefulness about the National Park Slovenský raj until June 30,2001 to the Government.

3. to Vice - Prime Minister and minister of the Finance to secure financial means that are inevitable for realisation of measures of the Programme of carefulness about the National Park Slovenský raj until 2001 in accordance with source possibilities of state budget of the Slovak Republic in proposals of budgets of the Ministry of the Enviroment of the Slovak Republic

(SR), Ministry of the Soil Economy of SR, Ministry of the Internal Affairs, Ministry of the Transport, Posts and telecommunications for 1997 and following years.

Executed by:

Vice - Prime Minister and minister of the Finance, minister of the Environment, minister of the Soil Economy, minister of the Transport, Posts and Telecommunications, minister of the Internal Affairs and minister of the Schools.

THE GENERALLY BINDING NOTIFICATION OF THE DISTRICT
OFFICE OF THE ENVIRONMENT IN SPIŠSKÁ NOVÁ VES NO. 3/1996
from APRIL 15, 1996 ON THE VISITING RULES OF THE NATIONAL
PARK SLOVENSKÝ RAJ (extract)

The Visiting Rules regulates details of duties of visitors of the national park and determines conditions for cultural - educational exploitation of the national park.

According to regulations of the Visiting Rules of the National Park Slovenský raj visitors are due:

- to move only within public communications, marked touristic pavements and instructive pavements. To respect all limits that are published by authorities of conservation of nature or by the Mountain service.

- to behave in such way that no superfluous damage or extinction of vegetable and animal species or damage and destruction of their environment including its pollution by wastes and disturbance of quiet and silence occurs.

- to respect prohibition of collection of plants and their products, of animals including evolution stages, of minerals and fossils, prohibition of entrance into gorges and inaccessible caves and prohibition of smoking in the area of national natural reservations, natural reservations, national natural memorials and natural memorials.

- to respect prohibition of both release of dogs and movement of visitors with dogs without muzzles.

- to respect prohibition of disturbing, killing, injuring, catching and removing protected animals and prohibition of destroying and damaging their biotops and settlements.

- to respect prohibition of damaging, destroying, plucking, digging or collecting protected plants and prohibition of damaging or destroying tree species.

- tent - camping with campfire is permitted only in autocampings (Čingov, Podlesok, Dedinky) on the circumference of the area of the national park.

Furthermore, the Visiting Rules determines authorities and persons that are responsible for control and supervision and entitled to impose penalties.

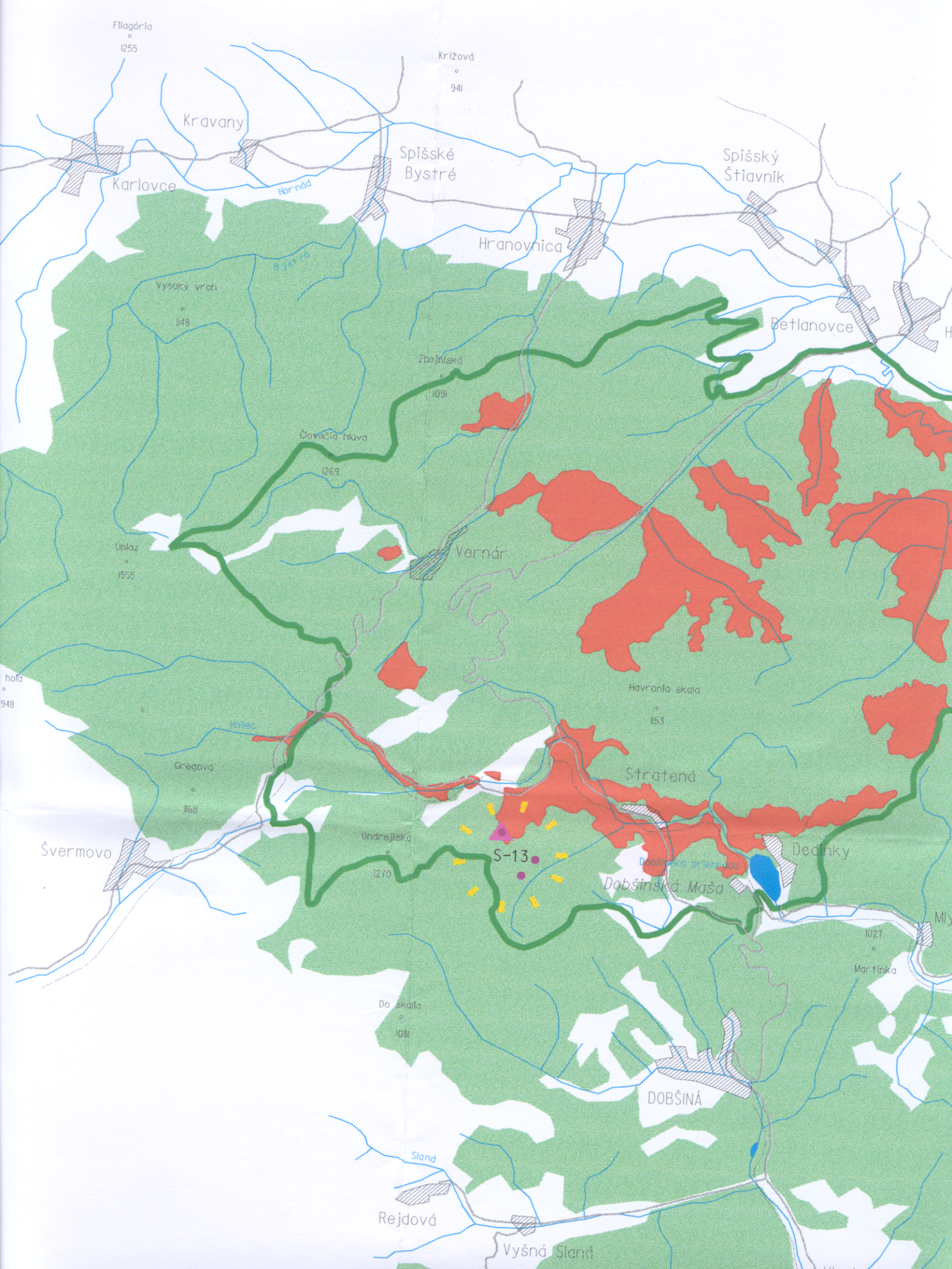
DOBŠINSKÁ ĽADOVÁ JASKYŇA
LOKALITA NAVRHNUTÁ NA ZÁPIS DO ZOZNAMU SVETOVÉHO KULTÚRNEHO A PRÍRODNÉHO DEDIČSTVA

THE DOBŠINSKÁ ICE CAVE
THE LOCALITY PROPOSED FOR INSCRIPTION TO THE LIST OF WORLD CULTURAL AND NATURAL HERITAGE

POLOHA V RÁMCI EURÓPY A SLOVENSKEJ REPUBLIKY
THE LOCATION IN EUROPE AND SLOVAK REPUBLIC



Fig. 1







**Dobšinská ice cave,
Velká sieň - *Great hall***

WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

CAVES OF THE AGGTELEK KARST AND SLOVAK KARST (HUNGARY / SLOVAKIA)

EXTENSION TO INCLUDE DOBŠINSKÁ ICE CAVE (SLOVAKIA)

Background note: The Dobšinská Ice Cave was part of the larger nomination from Slovakia considered by the 22nd session of the Bureau and Committee in 1998. The Committee report “recalled that the Bureau . . . decided to **refer** the nomination back to the State Party asking the Slovak authorities to consider incorporating the Dobšinská Ice Cave portion into the nearby World Heritage site of the Caves of The Aggtelek Karst and Slovak Karst. The report of the Committee session in 1998 shows that “the Committee did not inscribe the site on the World Heritage list” but that the State Party, the Centre and IUCN were encouraged by the Chairperson “to cooperate in the preparation of a revised nomination . . .”. This nomination of the Dobšinská Ice Cave in Slovakia as an addition to the existing cave site in Hungary is the result of that cooperation.

1 DOCUMENTATION

- i) **IUCN/WCMC Data Sheet:** (7 references)
- ii) **Additional Literature Consulted:** Lalkovic, M. 1995. On the Problems of the Ice Filling in the Dobšinská Ice Cave. *Acta Carsologica*. Krasoslovni Zbornik XXIV; Courbon, P. *et al.* 1989. **Atlas of the Great Caves of the World**; Waltham, T. 1974. **Caves**. Macmillan; Juberthie, C. 1995. **Underground Habitats and their Protection**. Nature and Environment No. 72. Council of Europe Press; Middleton, J. & T. Waltham. 1986. **The Underground Atlas: A Gazetteer of The World's Cave Regions**. St Martin's Press; Watson, J. *et al.* 1997. **Guidelines for Cave and Karst Protection**. IUCN World Commission on Protected Areas' Working Group on Cave and Karst Protection. IUCN; Stanners, D. & Bourdeau, P. eds. 1995. **Europe's Environment The Dobris Assessment** European Environment Agency; Esping, L. 1998. **Potential Natural World Heritage Sites in Europe**. Report on Parks for Life: Action for Protected Areas in Europe Priority Project 14a. IUCN-WCPA Europe/FNNPE-Europarc Federation.
- iii) **Consultations:** 22 external reviewers, Slovensky raj National Park staff and Slovak Government Officials.
- iv) **Field Visit:** J. Marsh and R. Hogan, May 1998.

2. SUMMARY OF NATURAL VALUES

The Dobšinská Ice Cave (DIC) is located in the western Carpathian Mountains and is a distinct feature within the Slovensky raj National Park. The DIC is located 21km north of the existing transfrontier Caves of the Aggtelek Karst and Slovak Karst site inscribed in 1995. It is one component of the Stratenská Cave network, all of which is part of the nominated site. DIC is isolated from the larger Stratenská cave by a fallen block of limestone, which traps cold air and permits the accumulation of ice. Cold air flows into the cave in winter and remains during the summer. The natural opening of the ice cave is north facing and shaded by forest so the cave is protected from warming. An ice mass with a maximum depth of 26.5m and a volume of approximately 110,000m³ fills a considerable part of the cave. The upper surface of this underground glacier, or glacière, is decorated with ice stalagmites from the freezing of local drip waters. The ice mass is stable in that the rate of ice accumulation in winter is in equilibrium with the rate of basal melt and lateral sublimation. Dobšinská Ice Cave contains one of the largest glacières known at a very low altitude (969m). Many reviewers consider the DIC to be a "textbook example" of an ice cave.

3. COMPARISONS WITH OTHER AREAS

Stratenská (of which DIC is a part) is one of the longest caves (23km) entirely on Slovak territory and contains the largest underground chamber (79,017m³) in the country. However, the 25km Baradla-Domica Cave System (part of the Caves of the Aggtelek and Slovak Karst World Heritage site), which straddles the Slovak-Hungarian border, is longer than Stratenská. On a global scale there are many cave spaces around the world which are measured in millions rather than thousands of metres cubed, e.g. Luse in Papua New Guinea (50Mm³).

Ice caves are relatively common at high altitudes. Small glaciers are found in caves in the Canadian Rocky Mountains and Nahanni World Heritage sites and other karst areas of the Mackenzie Mountains in the Canadian Northwest Territories. Indeed, the Grotte Valerie in Nahanni is recognised as the best example in the world of an ice cave. There are also ice caves in limestone areas of Europe such as Eisreisenwelt, Dachstein, Reisenhohle and Schellenburger Hohle in the Alps, Scarisoara glacier in Romania, and Kungur Ice Cave in the Urals. There are many other ice-clogged shafts and chambers known in limestone caves in Russia, the Alps and Pyrénées.

A distinct feature of Dobšinská is its topo-climatic setting. At 970m above sea level, it is lower than other tourist ice caves. The mean annual external air temperature is +6°C but the cave is able to conserve a -5 to -6°C temperature. In contrast, the glaciers in South Nahanni National Park are supported by mean annual external temperatures of -6°C to -8°C.

In terms of elevation, Dobšinská is by no means the lowest ice cave in the region. The mouth of the Silica Ice Cave in Hungary (part of the Caves of the Aggtelek and Slovak Karst World Heritage site) is at 503m and it is considered to be the lowest ice cave in the temperate zone. In Slovakia the opening to the Demänovská Ice Cave, in the Low Tatras is at 840m, again lower than the DIC. Up to the latitude of 50°, all other known ice caves are situated at higher altitudes: the Alps (940m); Bulgaria (830m); Croatia (600m); Georgia (above 1,000m); Poland (between 1010 and 1850m); Romania (840m); Slovenia (758-1090m).

However, the DIC is one of the largest glaciers in one of the warmest glacier sites that is known. It is considered by some to be a text-book example of an ice cave. There is also a long history of paleoclimatic research in Dobšinská Ice Cave and the site is important for research on climate change. (For further information on natural values and comparison with other areas see the 1998 IUCN Technical Evaluation of the Ravines of the Slovak Paradise and Dobšinská Ice Cave.)

4. INTEGRITY

The DIC was damaged to some extent during the first fifty years after its discovery, but current management now maintains the cave to a high standard. The area does not have any heavy industry in the immediate vicinity so damage from acid rain does not present a threat.

Protection of the area is complex. All land in the Slovak Republic is classified under one of five 'degrees of conservation' with the 'fifth degree of conservation' affording the highest level of protection. The nominated area is situated on the territory of the Slovenský raj National Park (IUCN category II protected area) with all the nominated area within zones of the fifth degree of conservation.

Only the caves themselves have been included in the nomination and not their protection zones above ground. However, a 6.6km² protection zone covers the karst plateau area immediately above the caves. The strict control of activities in this area is considered crucial to the protection of the caves. The Ice Cave is only open to the public for four summer months and is visited by about 90,000 tourists each year. The trail from the road up to the cave has been upgraded, and interpretive signs are being erected. All the boardwalks in the cave are new, and well-designed. At one point the route goes through a short tunnel cut many years ago in the ice, and elsewhere along a ledge cut into the ice, however, public access to the ice is generally prevented. Electric lighting has been installed, but is generally unobtrusive and designed to prevent excessive heating of the cave and algal growth. In several places instruments have been installed to monitor conditions in the cave, including the temperature of the air and the bedrock. Numerous survey points have been established to enable detailed mapping of the cave and ice, and to monitor changes in the volume and movement of the ice. A management plan covering the period 1996-2006 is available and is considered to be adequate for the management of the site.

The glacier is maintained by the plug or roof-fall, which prevents cool air escaping from the cave in summer. Should this plug become damaged dense cool air would quickly flow out of the ice cave causing the glacier to melt. Partly to avoid damage to this plug the Stratenská Cave remains closed to the public.

While IUCN finds the management of the DIC satisfactory it would like to remind the Bureau of concerns over threats to the transfrontier Caves of the Aggtelek Karst and Slovak Karst. The existing World Heritage site consists of underground caves and has no surface component. Though the surface area that protects the caves (60,000ha) has IUCN Category V protection, concerns have been raised about agricultural activities in this area effecting the caves. The 19th session of the Committee “requested the Centre to write to the national authorities to recommend that control is needed over surface activities such as agricultural pollution, deforestation and soil erosion” that could affect the caves.

5. ADDITIONAL COMMENTS

The authorities in Hungary have agreed (letter of 9 October, 1999) to the inclusion of DIC within the transfrontier Caves of the Aggtelek Karst and Slovak Karst.

The nomination document does not explain the functional linkages between the Stratenská caves and the existing World Heritage site 21km to the south. However, as the DIC is in close proximity and because the 722 caves of Aggtelek and Slovak Karst are not themselves a contiguous unit, the addition of DIC is a reasonable proposal.

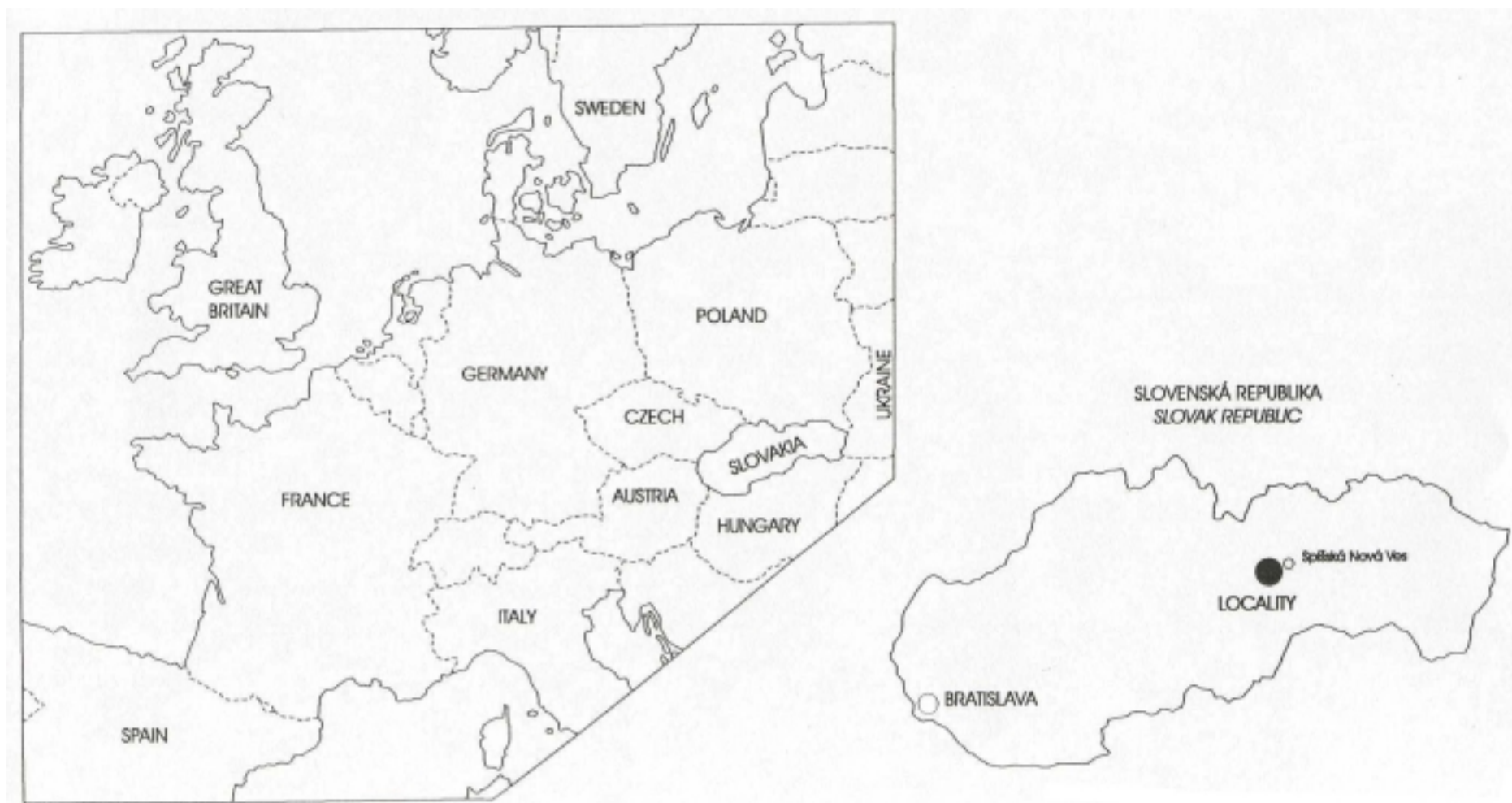
6. APPLICATION OF WORLD HERITAGE CRITERIA

As with the inscription of the Caves of the Aggtelek Karst and Slovak Karst in 1995, the DIC would qualify for incorporation within this site under natural criterion (i). Although the DIC is a relatively small (6km²) and specialised feature, it does add variety to the existing site. It would not merit inscription on its own but its features relate to and complement the Caves of Aggtelek Karst and Slovak Karst. Additionally, the proposal is in terms of the advice given to the Slovak authorities arising out of the Bureau and Committee sessions in 1998 as outlined in the Background Note.

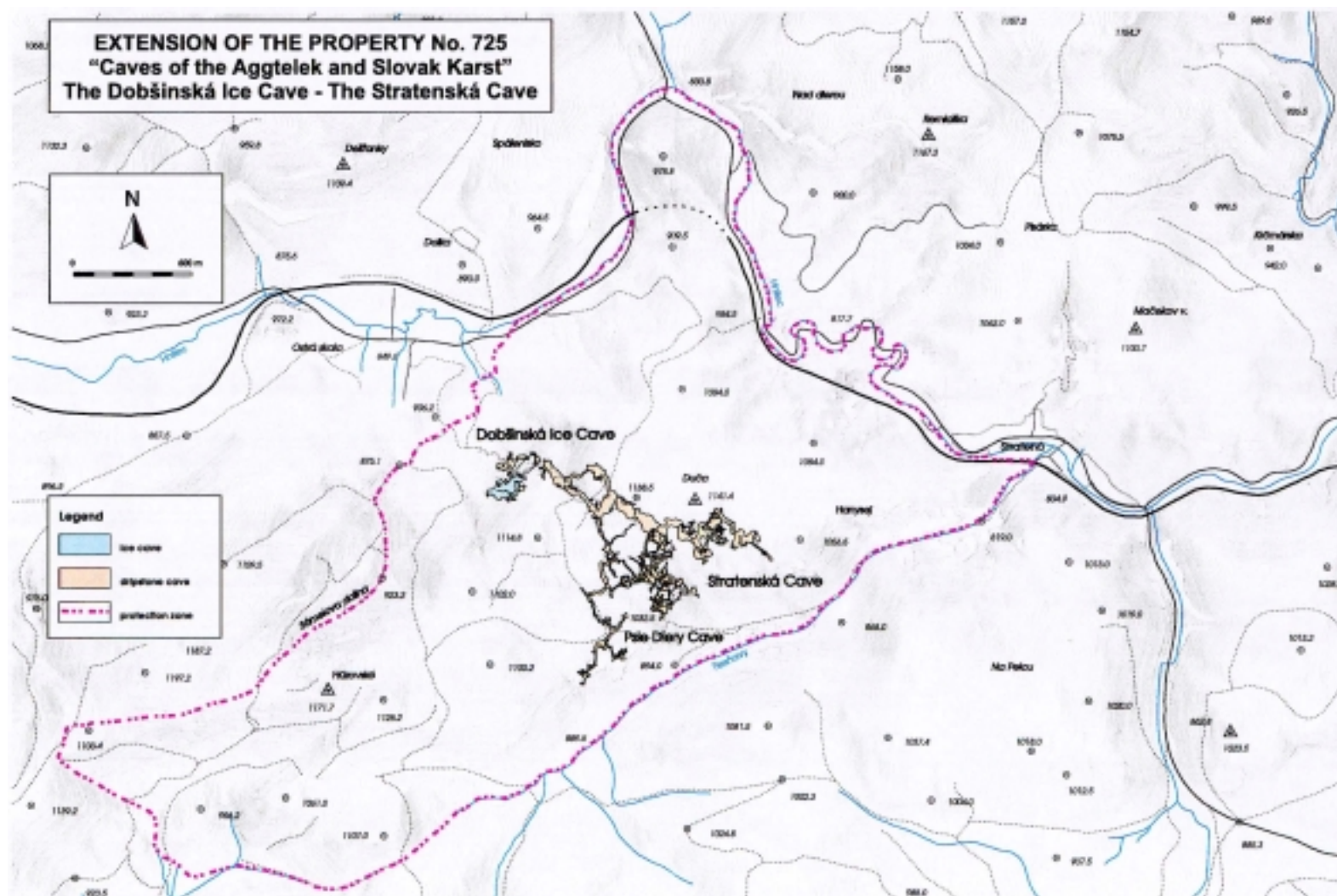
7. RECOMMENDATION

The Bureau recommend to the Committee that Dobšinská Ice Cave be **incorporated** as part of the Caves of the Aggtelek Karst and Slovak Karst World Heritage site. The Bureau noted that although the ice cave is a relatively small (6km²) and specialised feature, it does add variety to the existing site. It would not merit inscription on its own but its features relate to and complement the Caves of Aggtelek Karst and Slovak Karst

The Bureau encouraged both State Parties to regulate activities in the adjacent watershed that may affect the integrity of the Caves of the Aggtelek Karst and Slovak Karst World Heritage site.



**Map 1: Location Map - Caves of the Aggtelek Karst and Slovak Karst (Hungary / Slovakia)
Extension to include Dobšinská Ice Cave (Slovakia)**



CANDIDATURE AU PATRIMOINE MONDIAL - ÉVALUATION TECHNIQUE UICN

GROTTES DU KARST AGGTELEK ET DU KARST SLOVAK (HONGRIE/SLOVAQUIE) EXTENSION POUR INCLURE LA GROTTES DE GLACE DE DOBŠINSKÁ (SLOVAQUIE)

Note récapitulative: la grotte de glace de Dobšinská faisait partie de la proposition soumise par la Slovaquie et examinée par le Bureau et le Comité à leur vingt-deuxième session, en 1998. Dans son rapport, le Comité «a rappelé que le Bureau avait décidé, lors de sa vingt-deuxième session, de renvoyer cette proposition d'inscription à l'Etat partie en demandant aux autorités slovaques d'envisager d'incorporer la partie constituée par la grotte de glace de Dobsinska au site voisin des Grottes du karst aggtelek et du karst slovak déjà reconnu comme bien du patrimoine mondial.» On peut lire dans le rapport de 1998 que le Comité «...a décidé de ne pas inscrire ce site sur la Liste du patrimoine mondial» mais que le Président «...a encouragé l'Etat partie, le Centre et l'UICN à coopérer à la préparation d'une proposition d'inscription révisée...». La présente proposition concernant l'ajout de la grotte de glace de Dobšinská (Slovaquie) au bien existant en Hongrie et Slovaquie est le fruit de cette coopération.

DOCUMENTATION

- i) **Fiches techniques UICN/WCMC:** (7 références)
- ii) **Littérature consultée:** Lalkovic, M. 1995. On the Problems of the Ice Filling in the Dobšinská Ice Cave. *Acta Carsologica*. Krasoslovni Zbornik XXIV; Courbon, P. *et al.* 1989. **Atlas of the Great Caves of the World**; Waltham, T. 1974. **Caves**. Macmillan; Juberthie, C. 1995. **Underground Habitats and their Protection**. Nature and Environment No. 72. Council of Europe Press; Middleton, J. & T. Waltham. 1986. **The Underground Atlas: A Gazetteer of The World's Cave Regions**. St Martin's Press; Watson, J. *et al.* 1997. **Guidelines for Cave and Karst Protection**. IUCN World Commission on Protected Areas' Working Group on Cave and Karst Protection. IUCN; Stanners, D. & Bourdeau, P. eds. 1995. **Europe's Environment The Dobris Assessment** European Environment Agency; Esping, L. 1998. **Potential Natural World Heritage Sites in Europe**. Report on Parks for Life: Action for Protected Areas in Europe Priority Project 14a. IUCN-WCPA Europe/FNNPE-Europarc Federation.
- iii) **Consultations:** 22 évaluateurs indépendants, personnel du Parc national Slovensky raj et fonctionnaires du Gouvernement slovaque.
- iv) **Visite du site:** J. Marsh et R. Hogan, mai 1998.

2. RÉSUMÉ DES CARACTÉRISTIQUES NATURELLES

La grotte de glace de Dobšinská se trouve dans les Carpates occidentales et constitue un élément distinct dans le Parc national Slovensky raj. La grotte est située à 21 km au nord du Bien transfrontière des Grottes du karst aggtelek et du karst slovak, inscrit en 1995. C'est un élément du réseau de la grotte de Stratenská et le tout fait partie du site proposé. La grotte de glace de Dobšinská est isolée de la grotte de Stratenská, plus grande, par un bloc calcaire effondré qui piège l'air froid et favorise l'accumulation de glace. L'air froid qui pénètre dans la grotte en hiver y reste piégé durant l'été. L'ouverture naturelle de la grotte de glace, face au nord, est ombragée par la forêt de sorte que la grotte est à l'abri de tout réchauffement. Une masse de glace d'une profondeur moyenne de 26,5 m et d'un volume d'environ 110 000 m³ emplit une portion considérable de la grotte. La surface de ce glacier souterrain ou «glacière» est décorée de stalagmites formées par le gel des eaux d'infiltration locales. La masse de glace est stable, c'est-à-dire que le taux d'accumulation de glace en hiver s'équilibre avec le taux de fonte de la base et la sublimation latérale. La grotte de glace de Dobšinská est une des plus grandes glaciers connues à très basse altitude (969 m). De nombreux évaluateurs considèrent la grotte de Dobšinská comme une référence pour les grottes de glace.

3. COMPARAISON AVEC D'AUTRES AIRES PROTÉGÉES

Stratenská, dont la grotte de glace de Dobšinská fait partie, est une des plus longues grottes (23 km) située entièrement sur territoire slovaque et contient la plus grande salle souterraine (79 017 m³) du pays. Toutefois, le réseau de grottes Baradla-Domica, mesurant 25km (qui fait partie du Bien du patrimoine mondial des Grottes du karst aggtelek et du karst slovak) et chevauchant la frontière slovaque-hongroise, est plus long que Stratenská. Dans le monde, de nombreuses grottes se mesurent en millions plutôt qu'en milliers de mètres cubes, notamment Luse en Papouasie-Nouvelle-Guinée (50 millions m³).

En haute altitude, les grottes de glace sont relativement communes. On trouve de petites glaciers dans les grottes des Biens du patrimoine mondial des Parcs des Rocheuses canadiennes et du Parc national Nahanni, ainsi que dans d'autres régions karstiques des monts Mackenzie dans les Territoires du Nord-Ouest, au Canada. En fait, la grotte Valerie, à Nahanni, est considérée comme le meilleur exemple de grotte de glace au monde. Il y a aussi des grottes de glace dans des régions calcaires d'Europe telles que Eisreisenwelt Dachstein, Reichenhohle et Schellenburger Hohle dans les Alpes, la glacier de Scarisoara en Roumanie et la grotte de glace de Kungur dans l'Oural. Il y a de nombreux puits et salles comblés par les glaces connus dans les grottes calcaires de Russie, des Alpes et des Pyrénées.

Une caractéristique propre à Dobšinská est son environnement topoclimatique. À 970 m au-dessus du niveau de la mer, elle est située plus bas que d'autres grottes de glace touristiques. La température atmosphérique extérieure annuelle moyenne est de +6 °C mais la grotte se maintient à une température de -5 à -6 °C. Par comparaison, les glaciers du sud du Parc national Nahanni sont entretenus par une température extérieure annuelle moyenne de -6 à -8 °C.

Mais Dobšinská n'est, en aucun cas, la grotte de glace la plus basse de la région. L'ouverture de la grotte de glace de Silica en Hongrie (qui fait partie du Bien du patrimoine mondial des Grottes du karst aggtelek et du karst slovak) se trouve à 503 m. Silica est considérée comme la grotte de glace la plus basse de la zone tempérée. En Slovaquie, l'ouverture de la grotte de glace de Demänovská, dans les Basses Tatras, se trouve à 840m, ce qui est toujours plus bas que la grotte de glace de Dobšinská. Jusqu'à la latitude 50N, toutes les autres grottes de glace connues se trouvent plus haut en altitude: les Alpes (940 m); Bulgarie (830 m); Croatie (600 m); Géorgie (au-dessus de 1000 m); Pologne (entre 1010 et 1850 m); Roumanie (840 m); Slovaquie (758 à 1090 m).

Quoi qu'il en soit, Dobšinská est une des plus grandes glaciers dans l'un des sites glaciaires les plus chauds que l'on connaisse. Certains la considèrent comme une référence pour les grottes de glace. Dobšinská a également une longue histoire de recherche paléoclimatique et le site est important pour la recherche sur les changements climatiques. (Pour un complément d'information sur les caractéristiques naturelles et une comparaison avec d'autres aires protégées, voir l'évaluation technique réalisée en 1998 par l'UICN sur les Ravines du Paradis slovaque et la grotte de glace de Dobšinská.)

4. INTÉGRITÉ

La grotte de Dobšinská a été endommagée, dans une certaine mesure, dans les 50 ans qui ont suivi sa découverte mais la gestion actuelle lui assure aujourd'hui une qualité relativement élevée. On ne trouve pas dans la région d'industries lourdes, de sorte que la menace des pluies acides est inexistante.

La protection de la région est complexe. Tout le territoire de la République slovaque est classé selon cinq «niveaux de protection», le cinquième assurant la protection la plus stricte. Le site désigné se trouve sur le territoire du Parc national Slovensky raj (Catégorie II UICN pour les aires protégées) et toutes les zones proposées sont au bénéfice du cinquième degré de protection.

Seules les grottes ont été incluses dans la désignation et non les zones protégées se trouvant en surface. Une zone de protection de 6,6km² s'applique cependant au plateau karstique sous lequel se trouvent les grottes. Il est vital, pour assurer la protection des grottes, que les activités soient strictement contrôlées dans cette zone. La grotte de glace n'est ouverte au public que durant les quatre mois d'été et environ 90 000 touristes s'y rendent chaque année. Le chemin qui va de la route jusqu'à la grotte a été rénové et des panneaux d'interprétation sont mis en place. Dans la grotte, tous les passages en bois sont neufs et bien conçus. À moment donné, le chemin passe dans un bref tunnel, découpé il y a de nombreuses années dans la glace et, un peu plus loin, sur un promontoire découpé dans la glace mais le public n'a généralement pas accès à la glace. Un éclairage électrique a été installé mais il n'est pas gênant et conçu pour ne pas risquer de trop réchauffer la grotte et de favoriser la croissance d'algues. En différents endroits, des instruments ont été installés pour surveiller les conditions ambiantes, notamment la température de l'air et le lit rocheux. De nombreux points d'étude ont été établis afin de permettre un relevé détaillé de la grotte et de la glace et de surveiller les changements de volume et de mouvement de la glace. Il y a un plan de gestion qui couvre la période de 1996 à 2006 et qui est considéré comme suffisant pour la gestion du site.

La glacière est préservée par un «bouchon» provenant de l'effondrement de la voûte qui empêche l'air froid de s'échapper en été. Si le bouchon était endommagé, de l'air froid dense s'échapperait de la grotte de glace et entraînerait la fonte. C'est en partie pour éviter tout dommage à ce bouchon que la grotte de Stratenská reste fermée au public.

L'UICN estime que la gestion de la grotte de Dobšinská est satisfaisante mais souhaiterait rappeler au Bureau les craintes que suscitent les menaces pesant sur les Grottes du karst aggtelek et du karst slovak. Ce Bien du patrimoine mondial ne comprend que les grottes souterraines, sans élément en surface. Bien que le secteur en surface qui recouvre les grottes (60 000 ha) soit au bénéfice d'une protection de Catégorie V (UICN), il est à craindre que les activités agricoles menées dans la région n'affectent les grottes. Le Comité, à sa 19e session, a remarqué «...qu'un contrôle strict de la zone est nécessaire pour la protéger de certaines activités en surface, notamment la pollution agricole, le déboisement, et l'érosion du sol.»

5. AUTRES COMMENTAIRES

Les autorités hongroises ont accepté (par lettre du 9 octobre 1999) d'inclure la grotte de Dobšinská dans le site transfrontière des Grottes du karst aggtelek et du karst slovak.

La proposition n'explique pas les liens fonctionnels entre les grottes de Stratenská et le Bien du patrimoine mondial situé à 21 kilomètres au sud mais comme la grotte de glace de Dobšinská se trouve à proximité et que les 722 grottes du karst aggtelek et du karst slovak ne constituent pas une unité contiguë, ajouter la grotte de glace de Dobšinská est une proposition raisonnable.

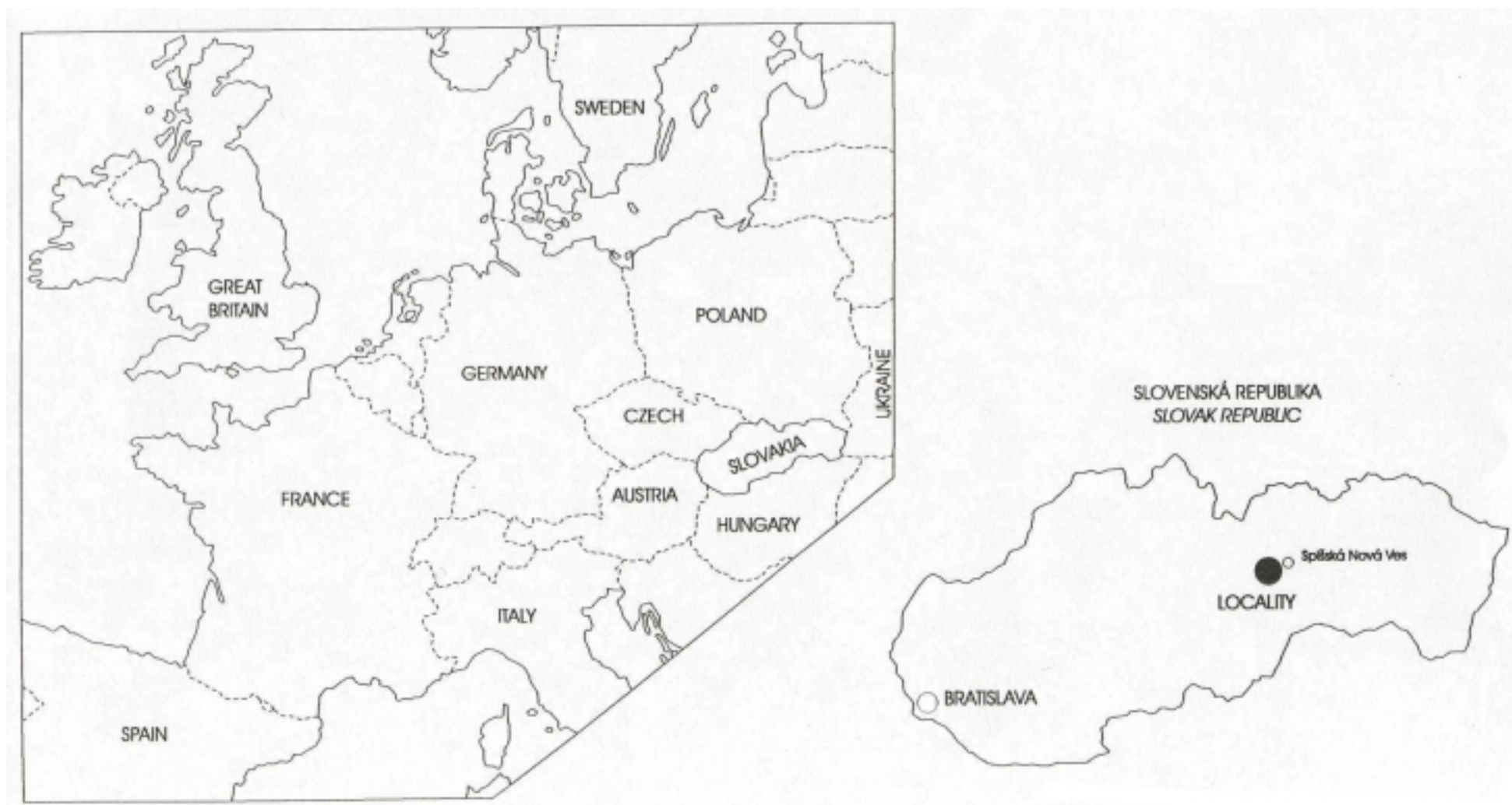
6. APPLICATION DES CRITÈRES NATURELS DU PATRIMOINE MONDIAL

Comme les Grottes du karst aggtelek et du karst slovak en 1995, la grotte de glace de Dobšinská peut être incorporée à ce site au titre du critère (i). La grotte de glace de Dobšinská est un élément relativement petit (6 km²) et spécialisé mais elle ajoute de la diversité au site existant. Elle ne mériterait pas, en soi, d'être inscrite mais ses caractéristiques sont complémentaires à celles des Grottes du karst aggtelek et du karst slovak. En outre, la proposition correspond à l'avis donné aux Autorités slovaques par le Bureau et le Comité, à leurs sessions de 1998, comme le souligne la Note récapitulative.

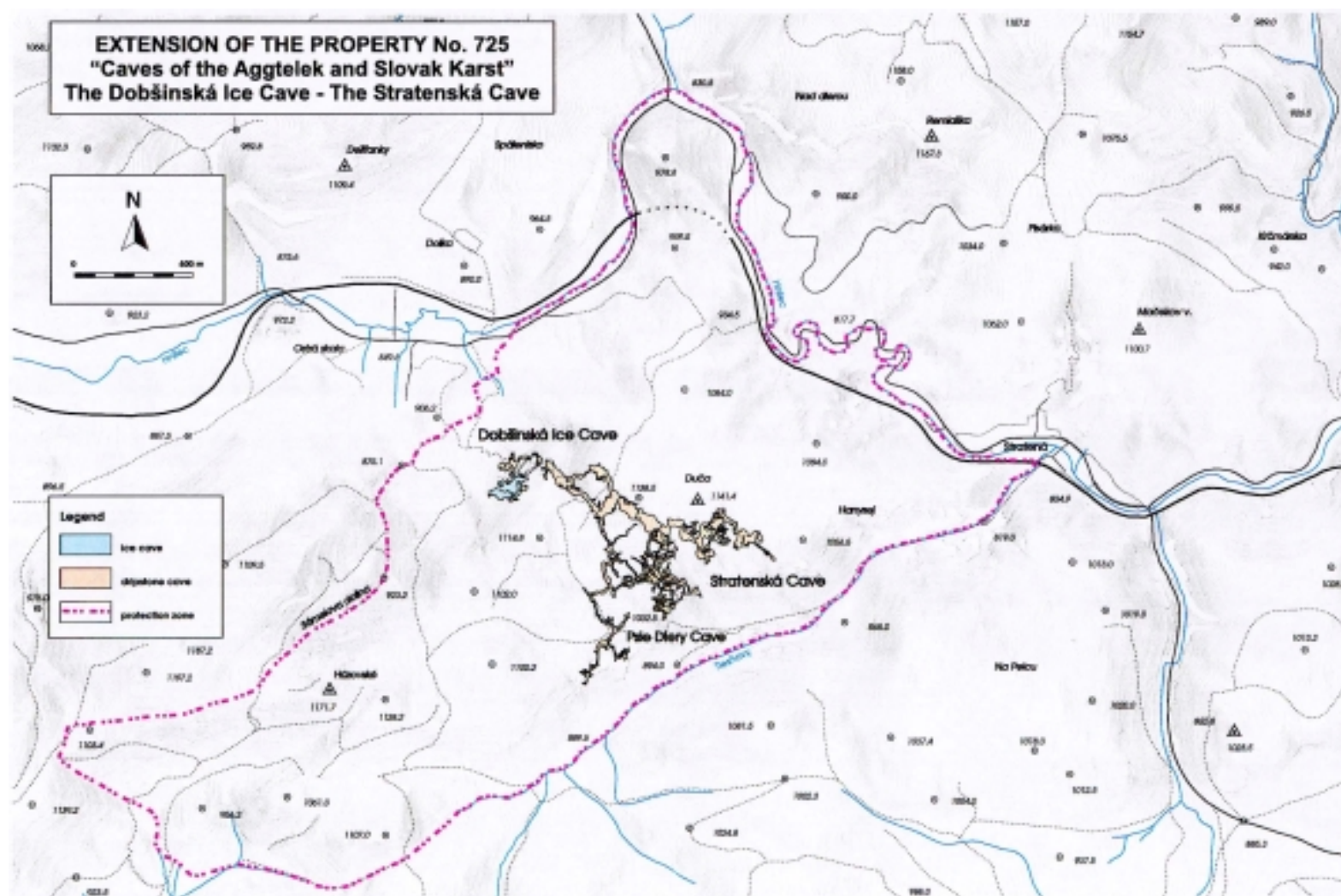
7. RECOMMANDATION

Le Bureau recommande au Comité d'inclure la grotte de glace de Dobšinská dans le Bien du patrimoine mondial des Grottes du karst aggtelek et du karst slovak. Le Bureau a noté que la si grotte de glace de Dobšinská est un élément relativement petit (6 km²) et spécialisé, elle ajoute toutefois de la diversité au site existant. Elle ne mériterait pas, en soi, d'être inscrite mais ses caractéristiques sont complémentaires à celles des Grottes du karst aggtelek et du karst slovak.

Le Bureau recommande aux deux États parties de réglementer les activités dans le bassin versant qui pourraient affecter l'intégrité du Bien du patrimoine mondial des Grottes du karst aggtelek et du karst slovak.



Carte 1: Localisation - Grottes du karst aggtelek et du karst slovak (Hongrie/Slovaquie)
Extension pour inclure la grotte de glace de Dobšinská (Slovaquie)



**Carte 2: Carte du site – Grottes du karst aggtelek et du karst slovak (Hongrie/Slovaquie)
Extension pour inclure la grotte de glace de Dobšinská (Slovaquie)**

Minor boundary modification of the World Heritage site “Caves of Aggtelek and Slovak Karst”

1. Area of the property (clarification of names are indicated in red letters)

a) AREA OF THE PROPERTY AS CURRENTLY INSCRIBED:

Serial ID	Site element	Core zone (ha)	Buffer zone (ha)
	<u>THE AGGTELEK KARST (HUNGARY)</u>		
725-001	Component including Aggtelek	16.365	
725-002	Component neighbouring Szalonna and Martonyi – instead: Component of Szendrő-Rudabánya Hill	3.325	
725-002bis	Component of Esztramos Hill – separate component, not contiguous with 002!	107,2	
	TOTAL SURFACE AREA IN HUNGARY	19.797,2	
	<u>THE SLOVAK KARST (SLOVAKIA)</u>		
725-003	Component neighbouring Jasov and Plešivec	36.165,57	38.334,33
725-004	Component neighbouring Rožňavské Bystré		
725-005	Component neighbouring Gemerská Hôrka (including Ochtinská Aragonite Cave)		
725-006	Dobšinská Ice Cave (extension of 2000)	600	19.763
	TOTAL SURFACE AREA IN SLOVAKIA	36.765,57	58.097,33
	TOTAL SURFACE AREA OF TRANSBOUNDARY SITE	56.562,77	58.097,33

b) AREA OF THE PROPERTY AS PROPOSED TO BE MODIFIED:

Serial ID	Site element	Core zone (ha)	Buffer zone (ha)
	<u>THE AGGTELEK KARST</u>		
725-001	Component including Aggtelek	16.365	28.700
725-002	Component neighbouring Szalonna and Martonyi – instead: Component of Szendrő-Rudabánya Hill	3.325	
725-002bis	Component of Esztramos Hill	195	
	TOTAL SURFACE AREA IN HUNGARY	19.885	28.700
	<u>The Slovak Karst</u>		
725-003	Component neighbouring Jasov and Plešivec – instead: Component neighbouring Silica and Jasov	27.555,13	11.741
725-004	Component neighbouring Rožňavské Bystré – instead: Component of Plešivec plateau	5.476,14	
725-005	Component neighbouring Gemerská Hôrka – instead: Component of Koniar plateau	1.579,73	
725-006	Dobšinská Ice Cave (inscribed in 2000)	498,80	264,24
725-007	Ochtinská Aragonite Cave	0	65,29
	TOTAL SURFACE AREA IN SLOVAKIA	35.109,8	12.070,53
	TOTAL SURFACE AREA OF TRANSBOUNDARY SITE	54.994,8	40.770,53

2) **Description of the modification:**

ON THE HUNGARIAN SIDE OF THE PROPERTY:

A **new buffer zone** is established flanking the site from the South. The external boundary of the new buffer zone runs along the administrative boundaries of the following settlements (from West to East): Szuhafő, Zádorfalva, Trizs, Imola, Kánó, Szőlősdó, Alsótelekes, Szendrő, Szalonna, Martonyi, Tornaszentandrás, Komjáti, Tornanádaska, Hídvégardó.

The **core zone of the Esztramos Hill Component (002bis)** is **extended** by the following territories (a total of 87,8 ha – 81,9 %) belonging to two villages (cadastre numbers are given):

- Bódvarákó 028/1, 028/2, 028/3, 028/4
- Tornaszentandrás 073/1 and 073/2

For the coordinates of the new boundaries, see the attached sheet “Coordinates of the World Heritage Site after the minor boundary change”.

ON THE SLOVAK SIDE OF THE PROPERTY:

The Components of 003-004-005 (Component neighbouring Silica and Jasov, Plešivec plateau and Koniar plateau):

- **Core zones are reduced** by 1554 ha (4.3%). The new boundary is modified slightly East of Hrhov, around Silica, around Silická Brezová, and East of Dlhá Ves.

- The unified **buffer zone** around 003-004-005 is reduced by 26.593.3 ha (69%). Going from East to West: the buffer zone is kept West of Medzev, is slightly modified West of Lipovník, South of Jovice and Brzotín. A new buffer zone is created between Turnianske Podhradie and Hrušov. The buffer zone is kept between Gemerské Teplice and Rozložná, South of Gemerský Sad and East of Dlhá Ves. The former core zone around Silická Brezová, Silica and East of Dlhá Ves become buffer zones.

- **A new buffer zone** is created containing Ochtinská Aragonite Cave and its immediate surroundings (the Cave itself is considered as core zone).

The Dobšinská Ice Cave component (006):

- The **core zone is reduced** by 112 ha (17 %) around the village of Stratená.

- The **buffer zone is reduced** by 19.498.76 ha (98.7%) flanking the core zone from South-West.

For the coordinates of the new boundaries, see the attached sheet “Coordinates of the World Heritage Site after the minor boundary change”.

3) **Justification for the modification:**

The need for the modification of the boundaries of the transboundary site emerged through intense consultations between the two States Parties concerned (Hungary and Slovakia) in the framework of the Retrospective Inventory Project. As a result, the Parties came to an enriched and shared understanding of the site. Thus, buffer zones have been identified modified or established where necessary, minor modifications to the respective core areas were introduced wherever necessary for a consistent conservation and management of the transboundary site as a whole.

ON THE HUNGARIAN SIDE OF THE PROPERTY:

The **extension of the core area at Esztramos** is motivated by the rich geological, speleological, botanical and zoological value of the part that is to be included in the site. It thus completes the integrity of the site. The extension is now possible due to changes in ownership: the Hungarian State has become the owner of this property after the closure of the stone-quarry and the closure of the mine. The property is now managed by the Aggtelek National Park Directorate. Due to this new situation in ownership, the Directorate can now present to the public and provide access to caves such as the Rákóczi Cave number 1, Rákóczi Cave number 2, and Földvári Aladár Cave.

The **creation of a new buffer zone** on the South of the property is made in order to ensure a more efficient conservation of the WH site as a whole and of those caves in particular that are to be found in the new buffer zone.

ON THE SLOVAK SIDE OF THE PROPERTY:

The Components of 003-004-005 and 007

The proposed boundary modifications reflect changes in the designation of protected areas and their reclassification. At the moment of inscription, the proposed site was protected as Slovak Karst “protected landscape area”. In 2002, the area was designated as National Park (which ensures a higher level of protection) but certain modifications were introduced in the delimitation of the area to be protected. These modifications take into account the world heritage values of the site and the need of their conservation. Although the total area is reduced but the level of protection is increased. The reclassification into national park was required to reach the same level of protection on both the Hungarian and Slovak sides of the property in order to ensure a consistent level of protection in both States Parties.

The Dobšinská Ice Cave component:

The experience of the management of the site shows that for the protection of the Ice Cave as an element of the World Heritage property, a much smaller core and buffer zone is sufficient. The original buffer zone was the area of the Slovak Paradise National Park which, of course, remains a national park.

4) **Impact on Outstanding Universal Value:**

The proposed modifications **do not have** an impact on the outstanding universal value of the property.

5) **Implications for legal protection:**

The modifications make possible a more efficient and more sustainable protection of the outstanding universal value of the site.

ON THE HUNGARIAN SIDE OF THE PROPERTY:

The legal of the protection of the extended part of the core area and of the new buffer zone are guaranteed by the relevant legal provisions pertaining to the protection, conservation and management of caves as well as by the Management Plan of the Aggtelek National Park:

- Law LIII of 1996 On the Protection of Nature; Concerning **the creation of the buffer zone** the law provides for the *ex lege* protection of the caves themselves in the buffer zone and gives administrative authority to the Aggtelek National Park over all intervention that may affect the integrity of the caves (involvement in issuing buildings permits). Concerning the extension of the core zone at Esztramos, the same law applies but, of course, the ownership of the area by the State (cf. above, point 3) guarantees an even stronger control over the integrity and conservation of the caves.

Other relevant regulations are:

- Government decree no. 347/2006. (23rd December) on appointing relevant administrative and official bodies in the field of environment and nature protection and water management;

- Decree no. 13/1998 (6th May) of the Ministry of Environment and Nature Protection on the registers of caves, on their access, research and on building facilities.

ON THE SLOVAK SIDE OF THE PROPERTY:

Generally, the implications are that the territorial protection was increased due to the designation as “National Park”. The relevant legal provision is the Government decree no. 101/2002 on establishing the Slovak Karst National Park. The protection of caves and natural areas are guaranteed by the Law 543/2002 On the Protection of Nature and Landscape.

6) **Implications for management arrangements:**

ON THE HUNGARIAN SIDE OF THE PROPERTY:

All caves on the World Heritage Site are the property of the Hungarian State and they cannot be sold as guaranteed by the Law LIII of 1996 On the Protection of Nature. The administrator of the caves is the Aggtelek National Park Directorate. The Esztramos area, where the core zone is to be extended, belongs also to the Hungarian State and is managed by the Aggtelek national Park Directorate. The extension of the core zone allows for an enhanced protection of the property namely the conservation/protection of caves, plants, animals and related sites (for

example: bone breccia) and thus completes the integrity of the site. It makes possible the presentation and interpretation of outstanding values of the added site in a coherent manner within the whole WH site.

ON THE SLOVAK SIDE OF THE PROPERTY:

The management of caves in Slovakia continues to be assured by the Slovak Caves Administration.

- 7) **Maps:**
See the two attached maps.

8) **Additional information**

FOR THE HUNGARIAN SIDE OF THE PROPERTY:

See photos on CD-ROM

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73. Kollár K. Attila: Vízalatti barlangkutatás / Kollár K. Attila.-Budapest, 1980. *Delfin Story*, p.39-52.
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Caves of Aggtelek Karst and Slovak Karst (Hungary and Slovakia)

Coordinates of the World Heritage Site after the minor boundary change

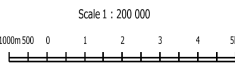
(The points defined are the extremest points of the WH Site – cf. the map)

Locality	latitude	longitude	local CS x	local CS y
Slovak_Aggtelek_Karst_West	20:15:55.254	48:36:27.832	-336594.79	-1248246.88
Slovak_Aggtelek_Karst_South	20:41:04.593	48:20:34.175	-307325.6	-1279410.7
Slovak_Aggtelek_Karst_East	20:59:05.230	48:38:08.299	-283476.18	-1248057.13
Slovak_Aggtelek_Karst_North	20:51:46.523	48:42:43.103	-292005.28	-1239124.14
Slovak_Dobšinská-_West	20:17:07.108	48:51:35.153	-333464.72	-1220362.1
Slovak_Dobšinská_South	20:18:26.614	48:51:18.171	-331878.29	-1220981.48
Slovak_Dobšinská_North	20:18:52.304	48:53:19.169	-331135.55	-1217281.84
Slovak_Dobšinská_East	20:21:45.477	48:52:24.866	-327712.39	-1219162.73
Esztramos_North	20:44:40.068	48:31:42.815	-301658.86	-1258995.03
Esztramos_East	20:44:11.060	48:30:57.686	-300063.23	-1259964.28
Esztramos_West	20:44:08.977	48:30:57.244	-302370.97	-1260366.48
Esztramos_South	20:45:09.069	48:30:38.211	-301170.94	-1261019.25

The World Heritage Site of "Caves of Aggtelek and Slovak Karst" (Hungary and Slovakia)

Minor boundary modification: indicating the change (2008)

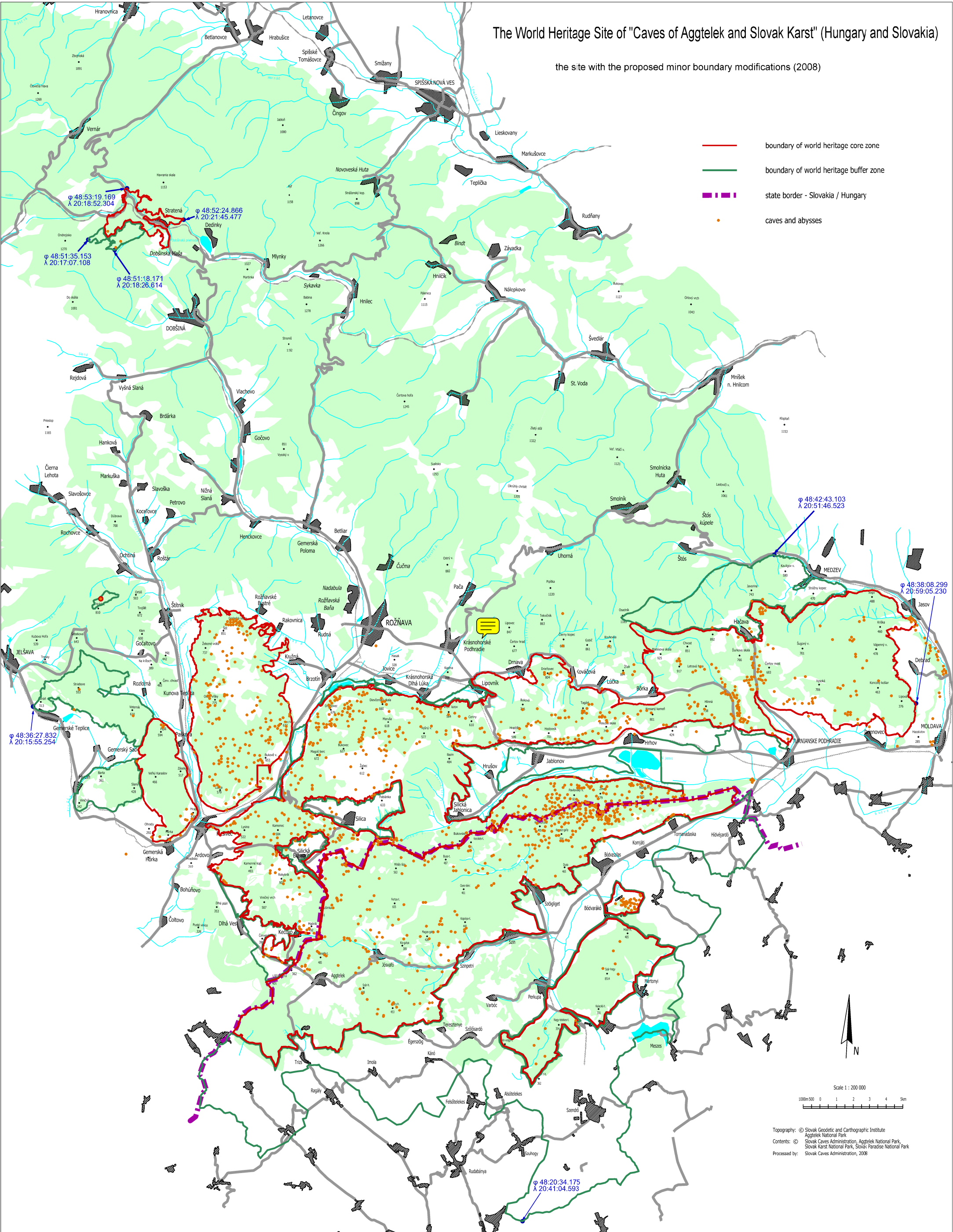
- boundary of world heritage core zone - new
- boundary of world heritage buffer zone - new
- state border - Slovakia / Hungary
- caves and abysses
- boundary of world heritage core zone - old
- boundary of world heritage buffer zone - old



Topography: © Slovak Geodetic and Cartographic Institute
Contents: © Slovak Caves Administration, Aggtelek National Park, Slovak Karst National Park, Slovak Paradise National Park
Processed by: Slovak Caves Administration, 2008

The World Heritage Site of "Caves of Aggtelek and Slovak Karst" (Hungary and Slovakia)

the site with the proposed minor boundary modifications (2008)



WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

CAVES OF AGGTELEK KARST AND SLOVAK KARST (HUNGARY / SLOVAKIA) – ID No. 725 Bis

IUCN carried out a desk review of the proposed modifications to the boundaries and buffer zones of the Caves of Aggtelek Karst and Slovak Karst, Hungary / Slovakia, taking into consideration comments from eight external reviewers.

1. BACKGROUND INFORMATION

The transnational property was inscribed on the World Heritage List in 1995 under natural criterion (viii). A buffer zone was identified at that time in Slovakia only. The property was extended in 2000 by adding Dobšinská ice cave in Slovakia and identifying a surrounding buffer zone. In response to the Retrospective Inventory, the World Heritage Centre received on 28 January 2008 a proposal from the States Parties for a number of modifications to the boundaries and buffer zones of the property, which was transmitted to IUCN on 14 February 2008 for review.

With their proposal the States Parties submitted topographic maps clearly showing the boundaries of the World Heritage property and the proposed modifications. The States Parties also provided information on the surface area of the World Heritage property as inscribed and as proposed to be modified. The States Parties note that the World Heritage property currently comprises three components with a total surface area of 19,797.2 ha in Hungary and four components with a total surface area of 36,765.57 ha in Slovakia. Two buffer zones with a total surface area of 58,097.33 ha exist in Slovakia, which are not part of the World Heritage property.

2. SHORT SUMMARY OF PROPOSAL

On the Hungarian side of the property it is proposed to extend the surface area of the Esztramos Hill component from 107.2 ha to 195 ha to strengthen the integrity of the component. This extension has become possible due to changes in tenure: ownership of the extension area has been transferred to the Hungarian State, following cessation of quarrying activities in this area, and the Aggtelek National Park Directorate is now in charge of managing the extension area. The area provides access to additional caves and associated values. It is also proposed to create a 28,000 ha buffer zone on the Hungarian side of the property to help to protect the natural values and integrity of the property by preventing and reducing negative human impacts on the delicate cave systems.

On the Slovakian side of the property it is proposed to reduce the total surface area of the property from 36,765.57 ha to 35,109.8 ha and to reduce the total surface area of the buffer zones from 58,097.33 ha to 12,070.53 ha. As a result the number of components of the property in Slovakia would rise from four to five. The State Party explains that the Slovak Karst protected landscape area became a national park in 2002, with certain changes to the delimitation of the protected area, and the proposed boundary modifications reflect these changes. The substantial reduction in the Dobšinská ice cave component (17% reduction) and its buffer zone (98.7% reduction) is justified by management experience that shows a much smaller area is adequate to protect this component.

3. IMPLICATIONS FOR OUTSTANDING UNIVERSAL VALUE AND INTEGRITY

Given that the Outstanding Universal Value and integrity of the delicate cave systems within the property are highly sensitive to changes in their environment, any changes in the protection and management of their environment need to be carefully assessed. This applies also to the proposed modifications to the boundaries and buffer zones of the property, in particular within Slovakia, where substantial reductions are proposed in the total surface area of the property and buffer zones.

IUCN considers that the extension of the Esztramos Hill component from 107.2 ha to 195 ha strengthens the integrity of the component through improved protection of caves and associated values. The creation of a 28,000 ha buffer zone that encompasses all the components on the Hungarian side of the property will also help to protect the natural values and integrity of the property by preventing and reducing negative human impacts on the delicate cave systems. Protection is afforded to the caves in the buffer zone by Hungarian Law LIII of 1996 On the Protection of Nature and the Aggtelek National Park Directorate has administrative authority over all activities that may affect the integrity of these caves.

IUCN considers that the proposed modifications on the Hungarian side of the property are minor and

strengthen the integrity of the World Heritage property, and should therefore be approved.

accepted as minor modifications or will require a full re-nomination including a field evaluation.

IUCN considers, however, that it is not possible, based on the information provided, to adequately assess the implications of the proposed reductions in the surface area of the property and buffer zones in Slovakia for the Outstanding Universal Value and integrity of the property. More detailed information on the proposed reductions, including large scale topographic, geological, and in the case of Dobšinská and Ochtinská caves also hydrogeological maps, and their implications for the Outstanding Universal Value and integrity of the property is required. Based on this information IUCN will consider whether the proposed modifications can be accepted as minor modifications or will require a full re-nomination including a field evaluation. At this stage IUCN considers that, given their scale, the proposed reductions are unlikely to represent a minor modification.

IUCN considers that, based on the information provided, the proposed modifications on the Slovakian side of the property appear to be significant and should not be approved at this stage.

4. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following decision:

The World Heritage Committee,

1. *Having examined Documents **WHC-08/32.COM/8B** and **WHC-08/32.COM/INF.8B2**,*
2. *Approves the proposed extension of the Esztramos Hill component from 107.2 ha to 195 ha and the proposed creation of a 28,000 ha buffer zone on the Hungarian side of the **Caves of Aggtelek Karst and Slovak Karst, Hungary / Slovakia**, in order to strengthen the integrity of the World Heritage property;*
3. *Refers the proposed reductions in the surface area of the property and buffer zones on the Slovakian side of the **Caves of Aggtelek Karst and Slovak Karst, Hungary / Slovakia**, back to the State Party of Slovakia to provide further justification and information;*
4. *Requests the State Party of Slovakia to provide more detailed information on the proposed reductions, including large scale topographic, geological, and in the case of Dobšinská and Ochtinská caves also hydrogeological maps, and their implications for the Outstanding Universal Value and integrity of the property. Based on review of this information, IUCN will recommend whether the proposed modifications can be*

Map 1: Boundaries of the property and buffer zones and proposed modifications

**GROTTES DU KARST D’AGGTELEK ET DU KARST DE SLOVAQUIE
(HONGRIE / SLOVAQUIE) – ID No. 725 Bis**

L’UICN a réalisé une étude théorique de cette proposition de modification des limites et des zones tampons des Grottes du karst d’Aggtelek et du karst de Slovaquie, Hongrie / Slovaquie, en tenant compte des commentaires de huit évaluateurs indépendants.

1. CONTEXTE

Ce bien transnational a été inscrit sur la Liste du patrimoine mondial en 1995, au titre du critère naturel (viii). À l’époque, seule la Slovaquie avait défini une zone tampon. La superficie du bien a été étendue en 2000 par l’ajout de la grotte de glace de Dobšinská, en Slovaquie, et la définition d’une zone tampon autour de la grotte. En réponse à l’Inventaire rétrospectif, le Centre du patrimoine mondial a reçu, le 28 janvier 2008, une proposition des États parties concernant plusieurs modifications aux limites et aux zones tampons du bien qui a été transmise à l’UICN le 14 février 2008 pour évaluation.

Avec cette proposition, les États parties ont soumis des cartes topographiques montrant clairement les limites du bien du patrimoine mondial et les modifications proposées. Les États parties ont également fourni des informations sur la superficie du bien du patrimoine mondial inscrit et modifié selon la proposition. Les États parties notent que le bien du patrimoine mondial comprend actuellement trois éléments dont la superficie totale est de 19 797,2 ha en Hongrie et quatre éléments dont la superficie totale est de 36 765,57 ha en Slovaquie. Il y a deux zones tampons dont la superficie totale atteint 58 097,33 ha en Slovaquie, qui ne font pas partie du bien du patrimoine mondial.

2. BREF RÉSUMÉ DE LA PROPOSITION

Dans le secteur hongrois du bien, il est proposé d’agrandir la superficie de l’élément constitué par la colline d’Esztramos de 107,2 ha à 195 ha pour renforcer son intégrité. Cette extension est possible en raison de modifications apportées au régime foncier : la propriété de la zone correspondant à l’extension a été transférée à l’État hongrois après la fermeture de carrières dans la région et la direction du Parc national d’Aggtelek est désormais en charge de la gestion de la zone de l’extension. Cette zone donne accès à des grottes supplémentaires et aux valeurs qui leur sont associées. Il est également proposé de créer une zone tampon de 28 000 ha dans le secteur hongrois du bien pour aider à protéger les valeurs naturelles et l’intégrité du bien en empêchant et atténuant les

impacts négatifs des activités anthropiques sur le délicat système de grottes.

Dans le secteur slovaque du bien, il est proposé de réduire la superficie totale de 36 765,57 ha à 35 109,8 ha et de réduire la superficie totale des zones tampons de 58 097,33 ha à 12 070,53 ha. En conséquence, le nombre d’éléments du bien, en Slovaquie, passerait de quatre à cinq. L’État partie explique que la zone du paysage protégé du karst slovaque est devenue un parc national en 2002 et que la délimitation de l’aire protégée a subi des changements qui sont reflétés dans les modifications proposées aux limites. La réduction substantielle de l’élément de la grotte de glace de Dobšinská (17% de réduction) et de sa zone tampon (98,7% de réduction) est justifiée par l’expérience en matière de gestion qui montre qu’une zone beaucoup plus petite suffit pour protéger cet élément.

3. INCIDENCES POUR LA VALEUR UNIVERSELLE EXCEPTIONNELLE ET L’INTÉGRITÉ

Sachant que la valeur universelle exceptionnelle et l’intégrité du délicat réseau de grottes du bien sont extrêmement sensibles aux changements qui se produisent dans l’environnement, toute modification de la protection et de la gestion de cet environnement doit être soigneusement pesée. Cela vaut aussi pour les modifications proposées aux limites et aux zones tampons du bien, en particulier en Slovaquie, où des réductions substantielles de la superficie totale du bien et des zones tampons sont proposées.

L’UICN considère que l’extension de la colline d’Esztramos de 107,2 ha à 195 ha renforce l’intégrité de l’élément par une protection améliorée des grottes et des valeurs associées. La création d’une zone tampon de 28 000 ha qui comprend tous les éléments du secteur hongrois du bien aidera aussi à protéger les valeurs naturelles et l’intégrité du bien en empêchant et atténuant les impacts négatifs d’activités anthropiques sur le délicat réseau de grottes. La Loi hongroise LIII de 1996 sur la protection de la nature accorde protection aux grottes de la zone tampon et la direction du Parc national d’Aggtelek a autorisé

administrative sur toutes les activités qui pourraient affecter l'intégrité de ces grottes.

L'UICN considère que les modifications proposées au secteur hongrois du bien sont mineures, renforcent l'intégrité du bien du patrimoine mondial et, en conséquence, devraient être approuvées.

L'UICN considère, cependant, qu'il n'est pas possible, d'après l'information fournie, d'évaluer correctement les incidences des réductions proposées dans la superficie du bien et des zones tampons du secteur slovaque sur la valeur universelle exceptionnelle et l'intégrité du bien. Des informations plus précises sur les réductions proposées – y compris des cartes topographiques, géologiques et, dans le cas des grottes de Dobšinská et d'Ochtinská, également hydrogéologiques, à grande échelle – et sur leurs incidences pour la valeur universelle exceptionnelle et l'intégrité du bien sont indispensables. Avec cette information, l'UICN examinera si les modifications proposées peuvent être acceptées comme des modifications mineures ou si elles nécessiteront une nouvelle proposition complète ainsi qu'une évaluation sur le terrain. Pour l'instant, l'UICN considère que, compte tenu de leur échelle, il est peu probable que les réductions proposées représentent une modification mineure.

L'UICN considère, d'après l'information fournie, que les modifications proposées au secteur slovaque du bien semblent être importantes et ne devraient pas être approuvées à ce stade.

4. *Demande à l'État partie Slovaquie de fournir des informations plus détaillées sur les réductions proposées, y compris des cartes topographiques et géologiques – et dans le cas des grottes de Dobšinská et Ochtinská, également hydrogéologiques – à grande échelle et sur leurs incidences pour la valeur universelle exceptionnelle et l'intégrité du bien. Après examen de cette information, l'UICN recommandera soit que les modifications proposées peuvent être acceptées comme des modifications mineures soit qu'une nouvelle proposition complète s'impose ainsi qu'une évaluation sur le terrain.*

4. RECOMMANDATIONS

L'UICN recommande que le Comité du patrimoine mondial adopte la décision suivante :

Le Comité du patrimoine mondial,

1. *Ayant examiné les documents **WHC-08/32.COM/8B** et **WHC-08/32.COM/INF.8B2**,*
2. *Approuve l'extension proposée de la colline Esztramos de 107,2 hectares à 195 hectares et la création proposée d'une zone tampon de 28 000 hectares dans le secteur hongrois des **Grottes du karst d'Aggtelek et du karst de Slovaquie, Hongrie / Slovaquie**, dans le but de renforcer l'intégrité du bien du patrimoine mondial;*
3. *Renvoie la proposition de réduction de la superficie du bien et des zones tampons dans le secteur slovaque des **Grottes du karst d'Aggtelek et du karst de Slovaquie, Hongrie / Slovaquie**, à l'État partie Slovaquie en lui demandant un complément de justification et d'information;*

Carte 1: Limites du bien et zones tampons ainsi que modifications proposées

