

Trans-Yugoslavian 2010

Postojna (Slovenia) – Prilep (Macedonia)



Macedonian flag

*Marjan TEMOVSKI, Andrej MIHEVC,
Philippe AUDRA & Jean-Yves BIGOT*

Mission in Macedonia from 28 November to 9 December 2010

2 – Postojna (Slovenia)



28-11-2010

The meteorological conditions are disastrous, the snow was falling everywhere in Europe.

In Postojna (Slovenia), the snow also fell ...
It won't be easy to go to field trip in this conditions... However, Marjan, our Macedonian student, assure us that there are no problems in his field, in Southern Macedonia...



28-11-2010

3 – Marjan's Thesis

Marjan Temovski is 26 years old, he is student in the Nova Gorica University (Slovenia), specialized in Environmental Sciences. His thesis subject is: « *Evolution of Karst in the Lower Part of Crna Reka River Basin* ».

Of course, he does, like us, as a speleologist. He lives in Prilep in Macedonia. It's not a surprise for us that he has chosen his calcareous mountains of Prilep as studied area. The *Crna Reka* flows in the south of Macedonia. Marjan's thesis will oblige us to cross many former Republics of Ex-Yugoslavia before to reach our destination: Macedonia.



4 – Marjan Facing Examiners

This morning, Marjan gave an account of his progress to the board of examiners and in front of an Areopagus of Karstologists. He prepared well his speech, but the questions show that he will come back to his field...

KARST RESEARCH INSTITUTE



After the deliberation of the two assessors, the professors Andrej Mihevc (Inštitut za raziskovanje krasa, IZRK) from Postojna and Philippe Audra (Nice University), assisted by a board of examiners composed to Uroš Stepišnik, from the University of Ljubljana, Nadia Zupan Hajna (IZRK) and János Mógár from the Eötvös Loránd University, Budapest (Hungary), Marjan his authorized to follow through his researches.



Nadia
Zupan
Hajna

Philippe
Audra

Uroš
Stepišnik

János
Mógár

Marjan
Temovski

29-11-2010

5 – Karst Research Institute



KARST RESEARCH INSTITUTE

The *Inštitut za raziskovanje krasa* of Postojna is one of most famous institutes of karst research. We can find an important library, offices and laboratory focusing activities of more than 30 Slovenian researchers.



Library

30-11-2010



Ursus spelaeus

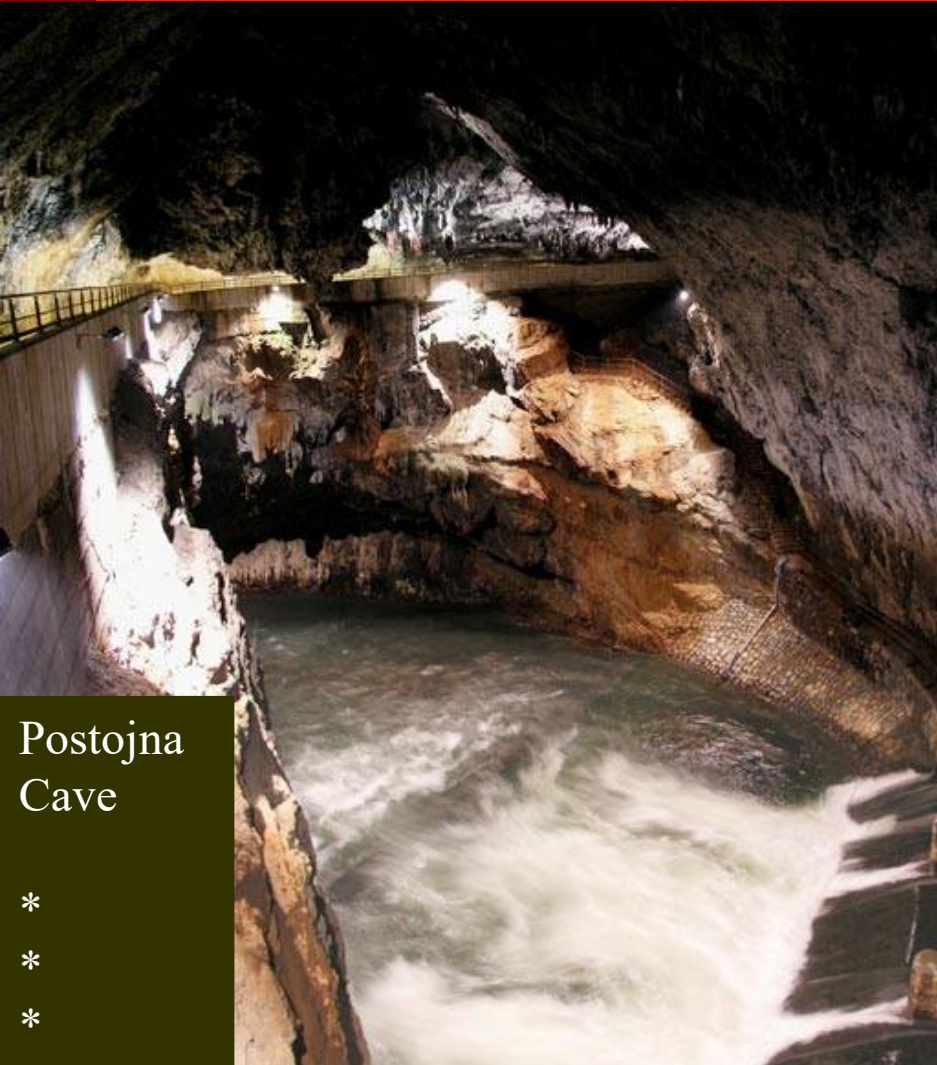
6 – Pivka River



The Pivka is a river sinking in the Postojnska Jama; it's a well-known cave explored for a long time.

30-11-2010

7 – Postojna Jama



Postojna
Cave

- *
- *
- *

Pivka underground river

Each speleologist should visit Postojna Cave. This cave bears a very strong historical connotation, because Speleology likely begun in this area called Kras (« Karst » in German language).

8 – The Team

The plan of the mission is to recognize the field of Marjan's Thesis located in the south of Macedonia, near the Greek border.

We will have tree days of travel to cross through the Ex-Yugoslavia from the north to the south.

The target is the Prilep town (Macedonia) and the *Crna Reka* basin where we will visit four caves studied by Marjan.



Jean-Yves
BIGOT

Marjan
TEMOVSKI

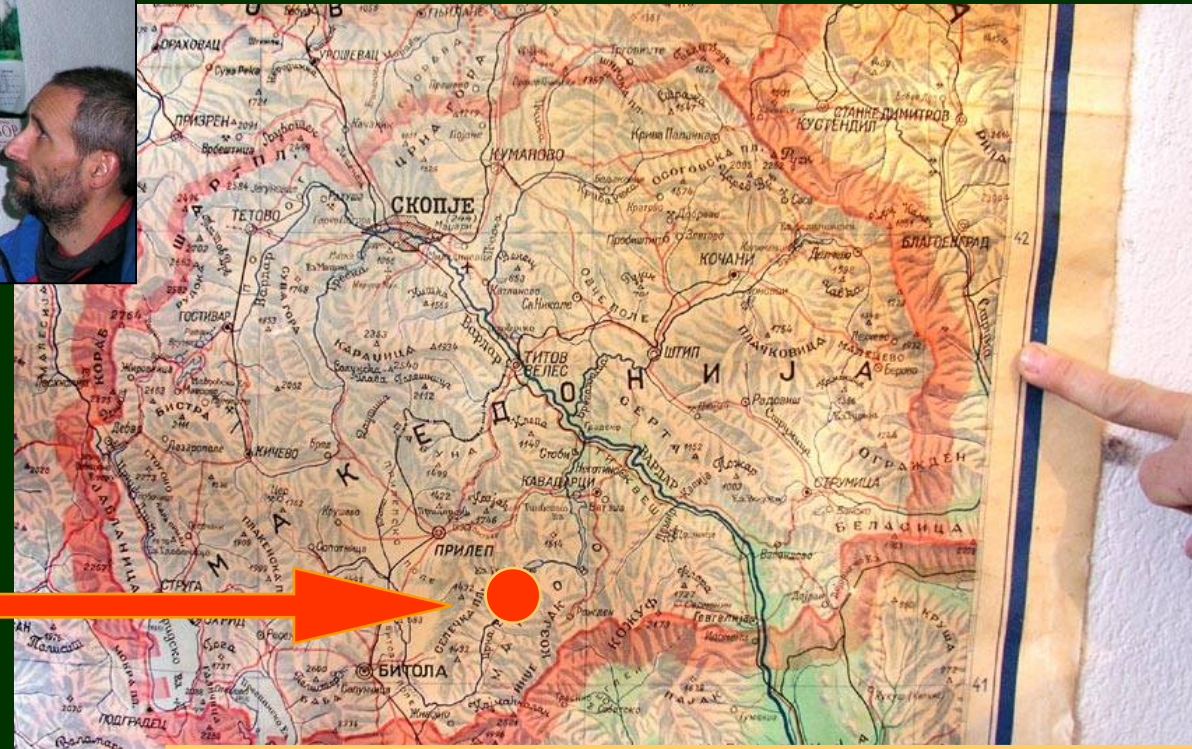
Andrej
MIHEVC

Philippe
AUDRA

9 – To Macedonia ?



But, where accurately is the field trip prepared by Marjan ?



It's there !

Map of Macedonia, Andrej's finger for scale

10 – The Route



We will cross through Croatia, Bosnia, Montenegro, Kosovo to reach Prilep in Macedonia where we are expected.

11 – Croatian Coast

We start from Postojna leaving the snow behind us. On the Croatian coast, the rain and the wind replaced the cold weather and the stress due to black ice.



We travel with a Volvo car belonging to Institute, nevertheless we will be arrested in the border by the police or customs officers. Marjan has brought his GPS recording our route. Andrej is at the wheel, and he will be very tired.

12 – The *Vruljes* Of Dalmatian Coast

Thanks to the hard rain falls on the area, we can see *vruljes*, submarine springs of fresh water pouring in the sea.

Rings indicated *vrulje* near Starigrad



01-12-2010



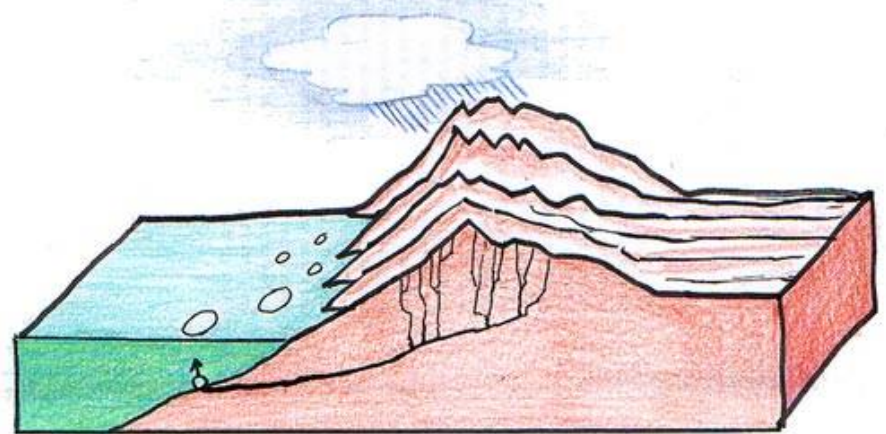
Senj's harbor

01-12-2010

This *vrulje* is an outlet of the Velebit Massif; the waters of calcareous mountains mix with sea water and appear on the surface of the Adriatic sea near the coast.

13 – Mechanism Of *Vrulje*

It exists many *vruljes* along the Dinaric coast.



The *vrulje* can be located by a simple ring, but also by gurgling and foam. Modric *vrulje* was very noisy.

14 – Bridges Over The Sea

Bridge near Maslenica,
in the vicinity of Zadar (Croatia).



01-12-2010

01-12-2010

Many peninsulas of the Dalmatian coast are surrounded by long “fjords”. It’s the reason why bridges are built (or reconstructed after the war) as the bridge of Maslenica.

15 – The Krka River



Andrej knows well all the landscapes of Croatia that he has studied. Despite the bad weather, we can admire the travertine dams of the Krka River. Its canyon entrenches the Kistanje surface, which is perfectly plane.



01-12-2010

Philippe and Andrej front of the Brljan Lake on the Krka River.

Waterfalls of Manojlovac, near Knin (Croatia).

01-12-2010

16 – Krcic Waterfall

At nightfall, we just got time to catch sight the Krcic waterfall (near Knin) on the Krka river.

The huge rain have changed the little river in an impressive waterfall.



17 – Mostar



We stopped overnight in Mostar (Bosnia) where we visited the famous bridge destroyed in 1993 by Croatian shellfire and reconstructed with the help of UNESCO.

With the flooding, the Neretva level reaches a critical height.

Мостар

18 – Neretva River



02-12-2010

Mostar

The Neretva flooding.

19 – The Effects Of The War



In Mostar City (Bosnia), we can see destroyed blocks, less symbolic than the old bridge. These buildings are remaining as ruins.



20 – Radimlja Graveyard

The medieval cemetery of Radimlja (Bosnia) occurs amazing engraving. Visibly, the calcareous stones were recently cleaned.



21 – Ljubinje Polje



The lower part of Ljubinje polje (Bosnia) is partly flooded.



22 – Popovo Polje Flooded

Farther up, the huge Popovo Polje (Bosnia) has changed in a lake.

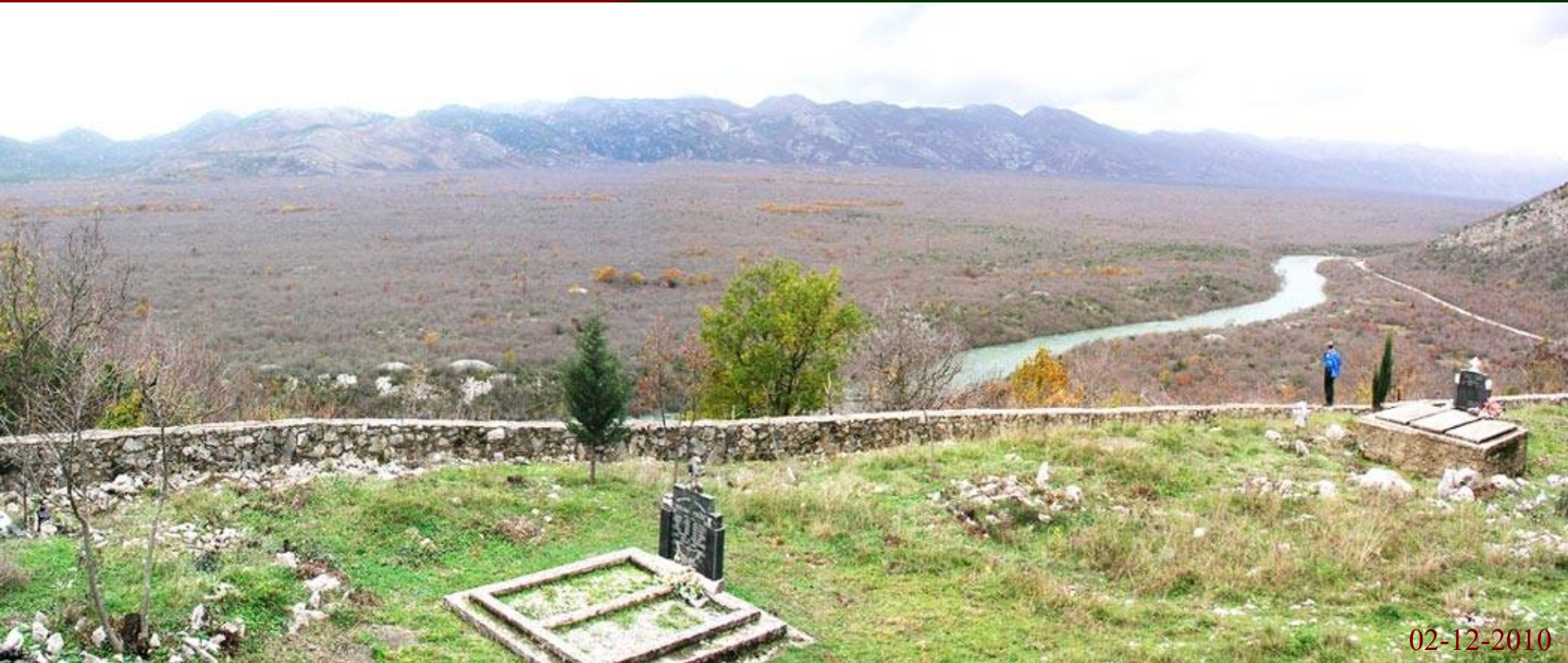


02-12-2010



This situation is exceptional and shows the enlargement mechanism of this type of forms, which are very common in Dinaric karst.

23 – Popovo Polje



02-12-2010

From an old cemetery, we can estimate the dimensions of the huge closed depression of Popovo Polje.

24 – Trebinje City



The Trebinje city is settled above the bank of the Popovo Polje, which could be flooded.



The city fortifications show Turkish occupation.

25 – Sopot Spring



Sopot Spring is located in the Kotor Bay, near Risan (Montenegro).



26 – Sopot Throws Up



Sopot Spring throws water up; it's very impressive. Those waters come from Orjen Massif dominating the sea almost 1000 m high.

02-12-2010

27 – Kotor Bay

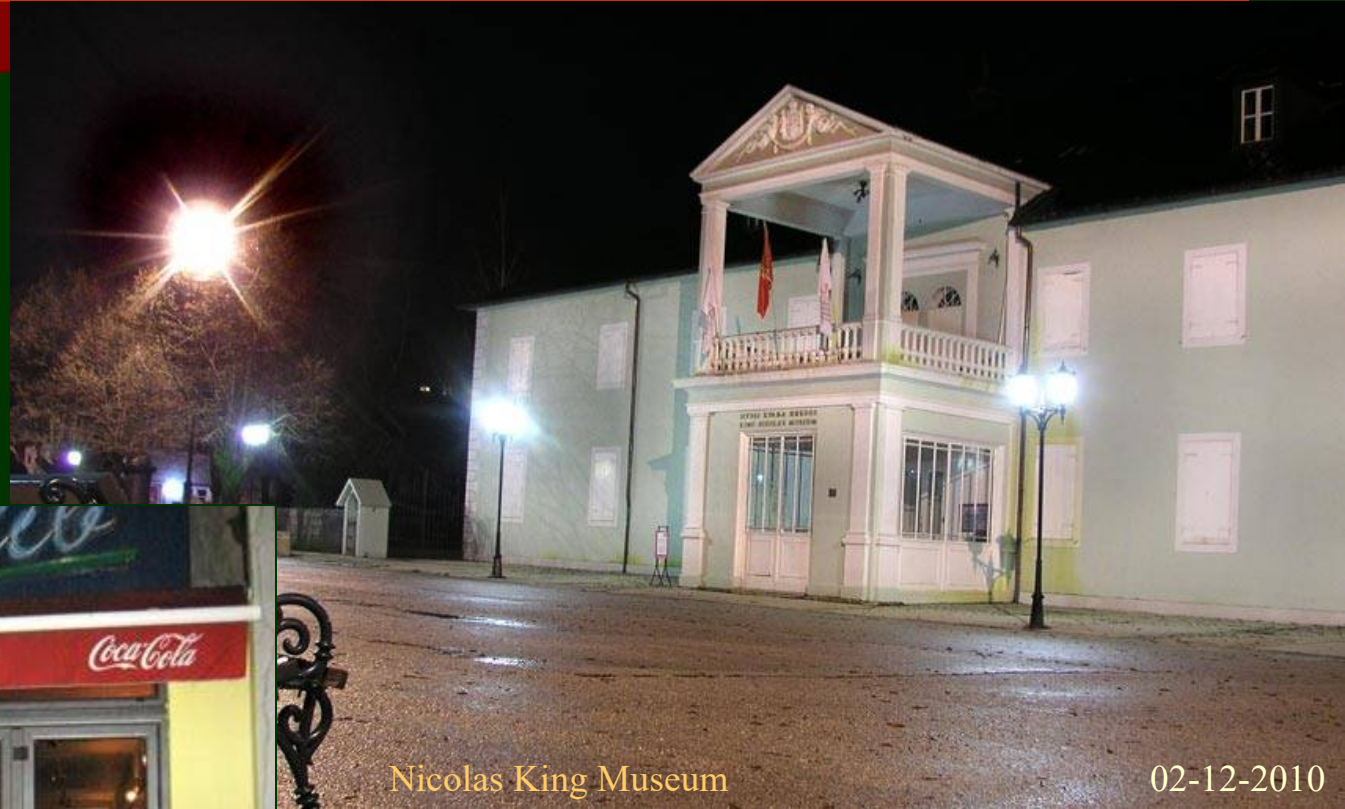


02-12-2010

From the upper part of Lovćen Massif (Montenegro), we can see amazing sceneries on the Kotor Bay.

28 – Cetinje

In coffeehouse with very French name of Cetinje city, Andrej told us about a great cave close to the town...



Nicolas King Museum

02-12-2010

We immediately decided to go, since night is not a real problem for us...

29 – Lip Cave

We take helmet
and follow Andrej
in *Lipska Pecina*.



30 – Lipska Pecina



02-12-2010

It's true, Lip Cave partly fitted as a show cave.

The rains give life to the speleothems: the water flows everywhere.

31 – The Printer Of Kolašin

We continue overnight to the north of Montenegro. But the rains destabilized the slopes of the mountains; there are many collapses and in the night road works are difficult. The police arrested trucks but fortunately the car could go.

After a few hours, we reach Kolašin, where we find a printer who proposes accommodations at a low price.



03-12-2010

32 – Unexpected Routes

On unexpected routes, there are always something or caves to see.



Before to reach Kosovo plain, we have to cross through mountainous area. Some roads and passes being closed, we are diverted by unexpected routes and sometimes by dirt track.

33 – Marsenica Rijeka Bridge

Near Berane (Montenegro),
the Lim River is flooding.



03-12-2010



The Marsenica Rijeka bridge is closed.
One of the piers means moved as shown
by the twisted guardrail.

34 – Albanese People



We arrived in the language area of Albanese people, which are majority in this part of Montenegro.

There are many minarets and mosques in the vicinity of Berane.



35 – Kosovo

The Kosovo plain seems richer than the mountains crossed before.



03-12-2010



We stop in the restaurant where we are aware that we are in foreign country. Andrej, of Slovenian nationality, speaks fluently Serbo-Croatian language but cannot manage to speak with Kosovo people... We have to speak Italian to choose our menu. Formerly, this country located in the middle of the « Great Serbia ».

36 – Albanese People Of Kosovo

Sale of cabbage



The Kosovo country is relatively poor. Potatoes, cabbages are the basic food of Kosovo people.



The oldest Kosovo People wear still the traditional Albanese hat : the white *plis* of Kosovo (*plis* = felt). It's amazing because this hat was worn by the ancient Greeks... We can see on the statues or old coins.



37 – Albanese Language



It could believe that the Kosovo language is easy to learn and it is possible to deal with in this country the people hasten to forget the language of Tito...

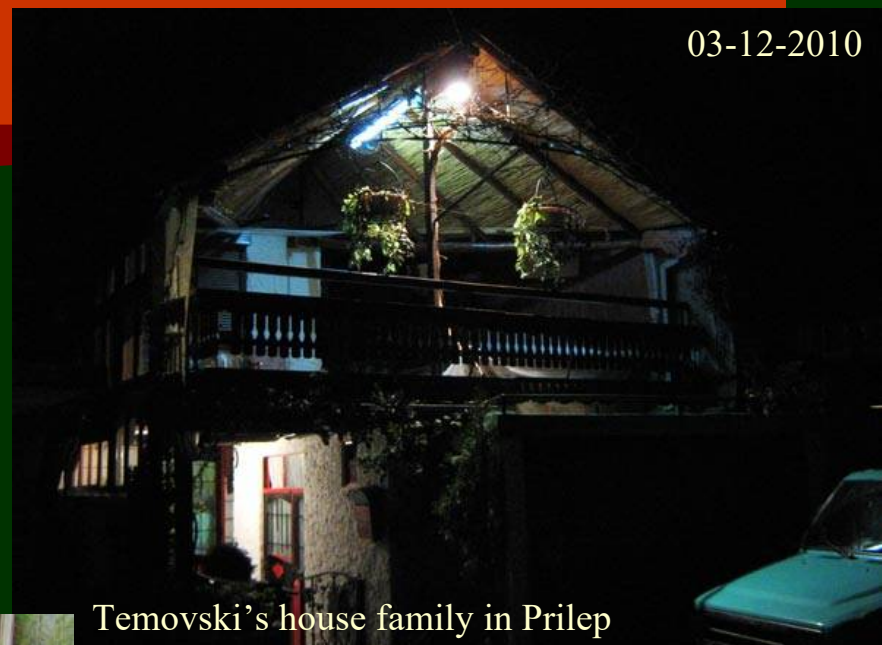
Of course, we can read « *Banka për Biznes* ». It's meaning is evident, but the Albanese language does not resemble to any other language... Except the Illyrian language, which was its ancestor.



38 – Prilep

In the evening, we arrived in Prilep (Macedonia) by Marjan's parents. Marjan's father, Dragan Temovski, is surgeon, but is also a painter and a draftsman. Dragan excels in portrait technique ; Mrs. Temovski excels in culinary art, in particular in the *Tava*, a Macedonian course made up of potatoes.

03-12-2010



Temovski's house family in Prilep



Dragan Temovski

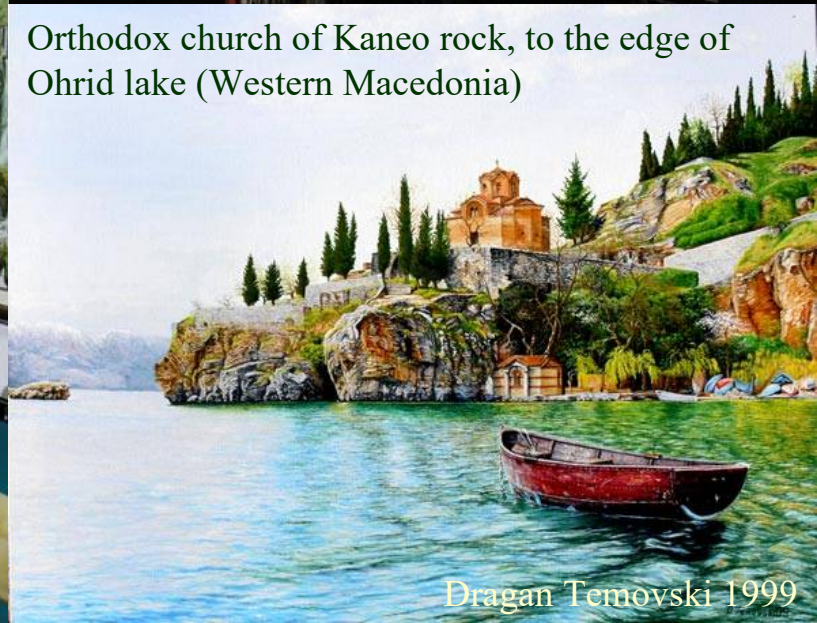
Philippe Audra

Jean-Yves Bigot

Andrej Mihevc

Very good *Tava* !

Orthodox church of Kaneo rock, to the edge of Ohrid lake (Western Macedonia)



Dragan Temovski 1999

39 – Total Improvisation

In Prilep, we change our spacious Volvo for Marjan's small 4-drive wheel and leave again toward the south, to the St Ilija Monastery where we could stay during the week...



St Ilija Monastery



« Hello, where is the key ? »

03-12-2010

This monastery has been destroyed by Turkish people long time ago. The buildings seem to ghostly blocks to reconstruct. But the St Ilija Monastery is unattended and we couldn't find the keys on the indicated place...

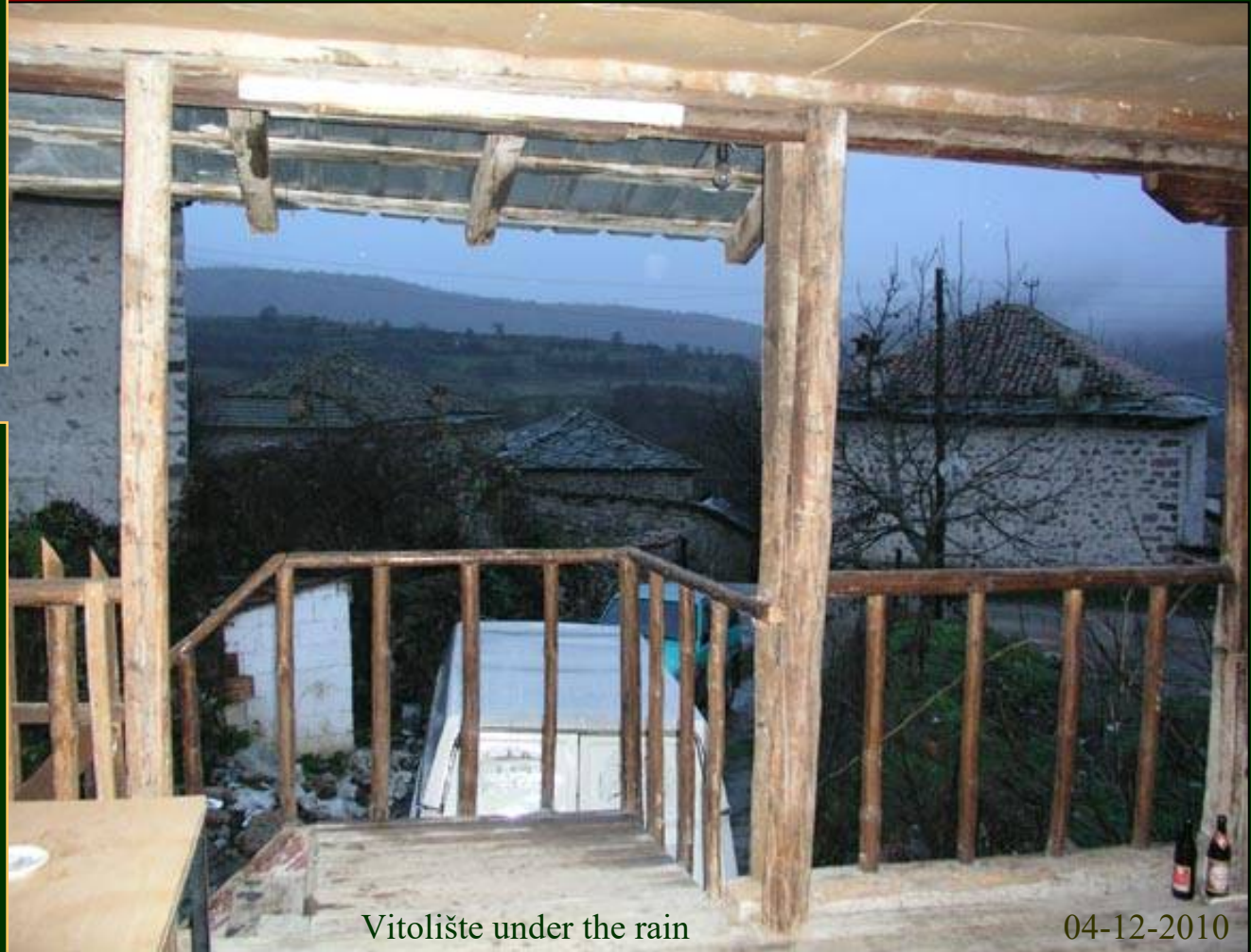
40 – Vitolište Village

Finally, an inhabitant of Vitolište Village, close to the monastery, accepts to accommodate us in his home. It's one o'clock in the night and we feel sleepy.

This inhabitant tells us that, three days ago, he saw a female bear followed by its two cubs crossing the streets of the village.

Outside, it's raining cats and dogs...

It's a really bad weather for bear, isn't it ?



Vitolište under the rain

04-12-2010

41 – Under Pouring Rain



« *My tailor is rich* », Marjan makes a suit and measures with knife.

It's pouring rain, the walking takes 20 to 30 mn. Since we have not raincoats, we have to improvise.



Vitolište Village

04-12-2010

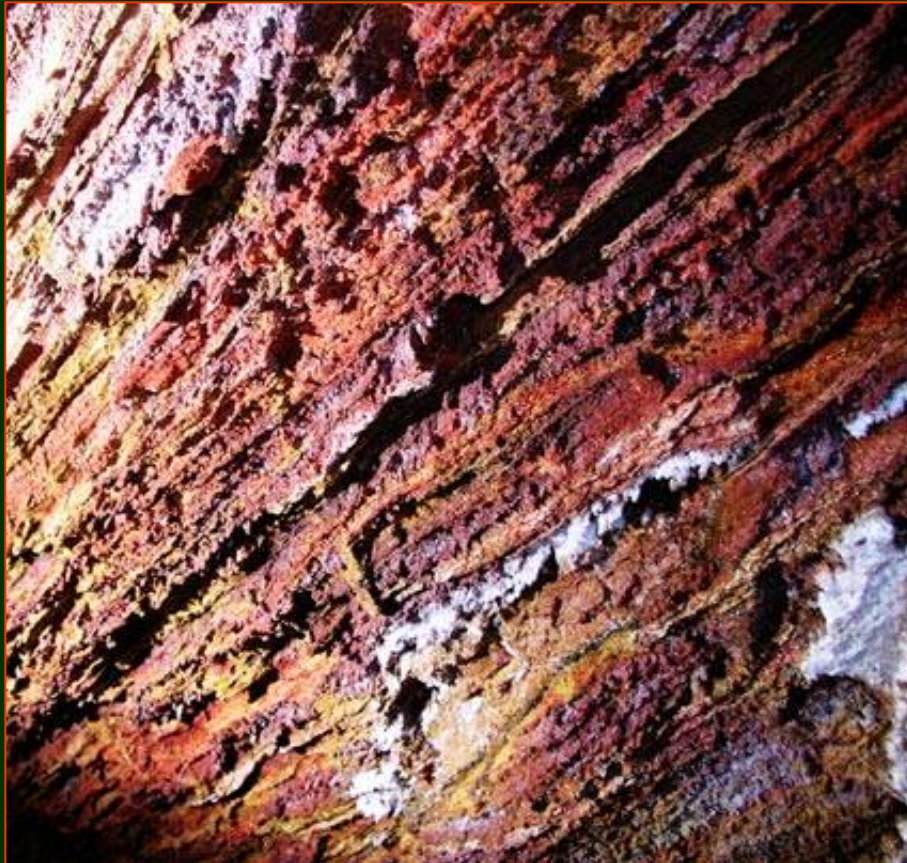
42 – Provalata Cave

In the cave, we will be sheltered to survey.

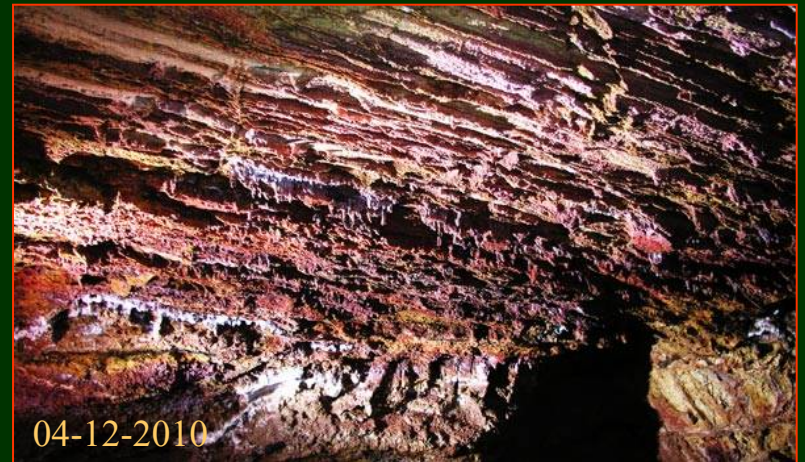


43 – Weathered Walls

The cave walls have been deeply weathered by the acid vapors that escaped from fissures of the rock.



Provalata Cave

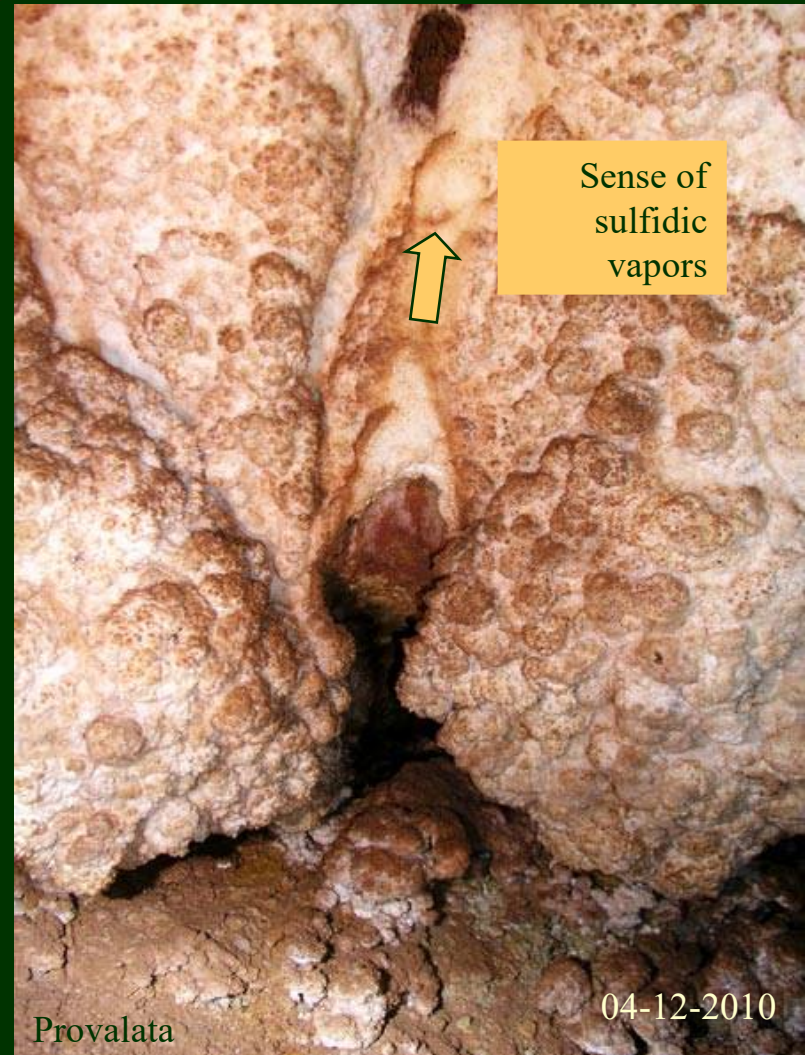


04-12-2010

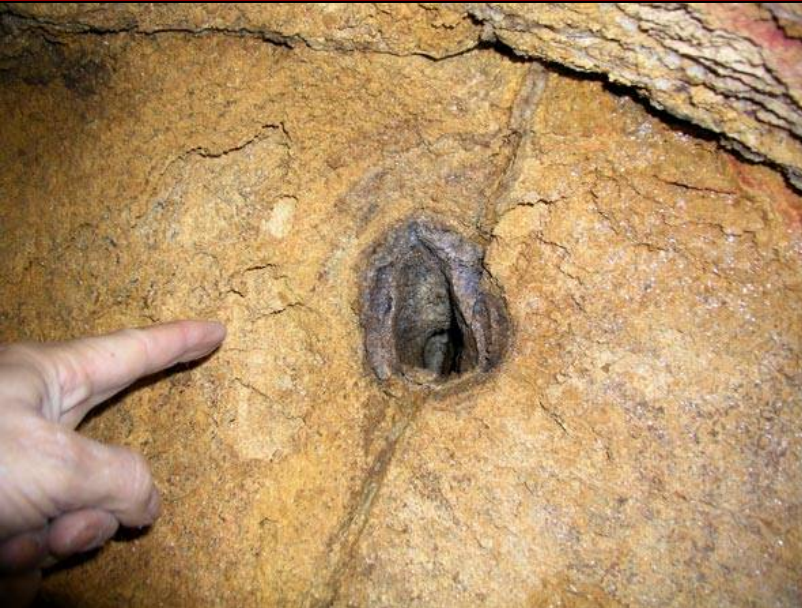
44 – Hypogenic Origin



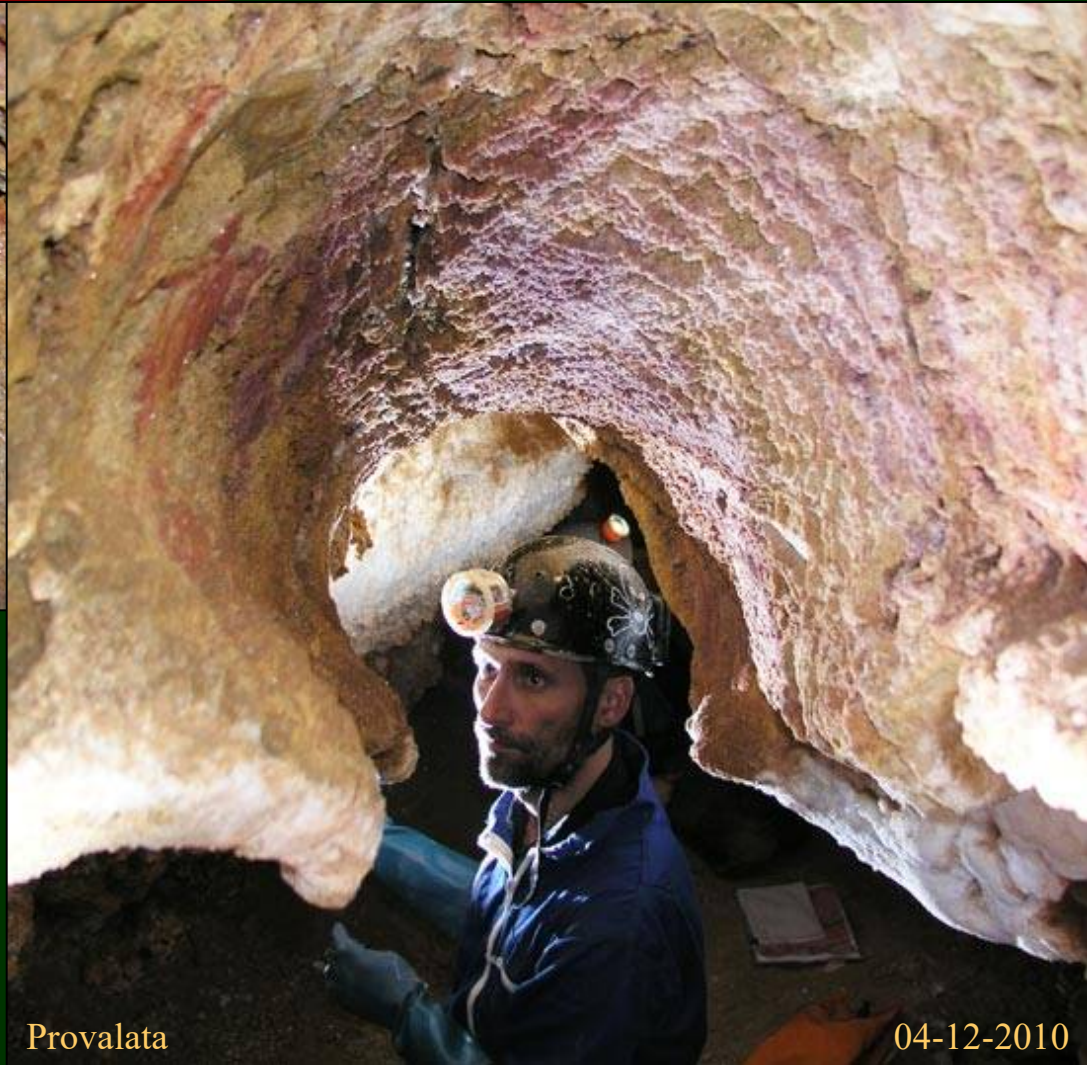
The Provalata Cave is a rare hypogenic cave. Its origin is hypogenic, since its formation is due to acid vapor. We suppose that these gases were very hot and rose up from depth. This phenomenon is not so different from the thermal baths in fitness centers.



45 – Cave Morphology



Water and most of all sulfidic gases are risen along the fissures, and have carved out the roof of cave.



Provalata

04-12-2010

46 – Dark Calcite

The dark calcite and
boxworks are amazing.



47 – Gypsum



Provalata

By a narrow passage, we can arrive in gypsum part. The white gypsum crusts are parting of the walls.



04-12-2010

The gypsum mineral is a good indicator to determined the nature of gases at the origin of the cave.

Gypsum ($\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$) is the result of limestone dissolution by sulfuric acid.

48 – Rescue



A paw and one another...

A Rhinoloph is fallen on the floor, still hanged at a piece of rock. Andrej replaces the piece of rock with bat near the others and patiently waits for. After a few seconds, the bat hangs on the roof with its claws.



49 – Go Out



04-12-2010

50 – Sun Is Back

Of course, the weather has changed, it's better without rain.

But, un another surprise waits for us...

With the sun, other problems arrive.



51 – Bad Surprise

We go up to the top of hill for sight landscape; then we are aware of the discharge of Buturica river, which is abnormally high.

We made a mistake with our 4 Wheel Vehicle, while crossing the river to park the vehicle on the other side...

Buturica Valley near St Ilija Monastery



04-12-2010

52 – Buturica Flooded

The Buturica river is flooded. Now, we know that we won't cross... Despite several attempts of diversion, we have to leave our vehicle and find a bridge to cross by foot.



04-12-2010

53 – Back To Prilep



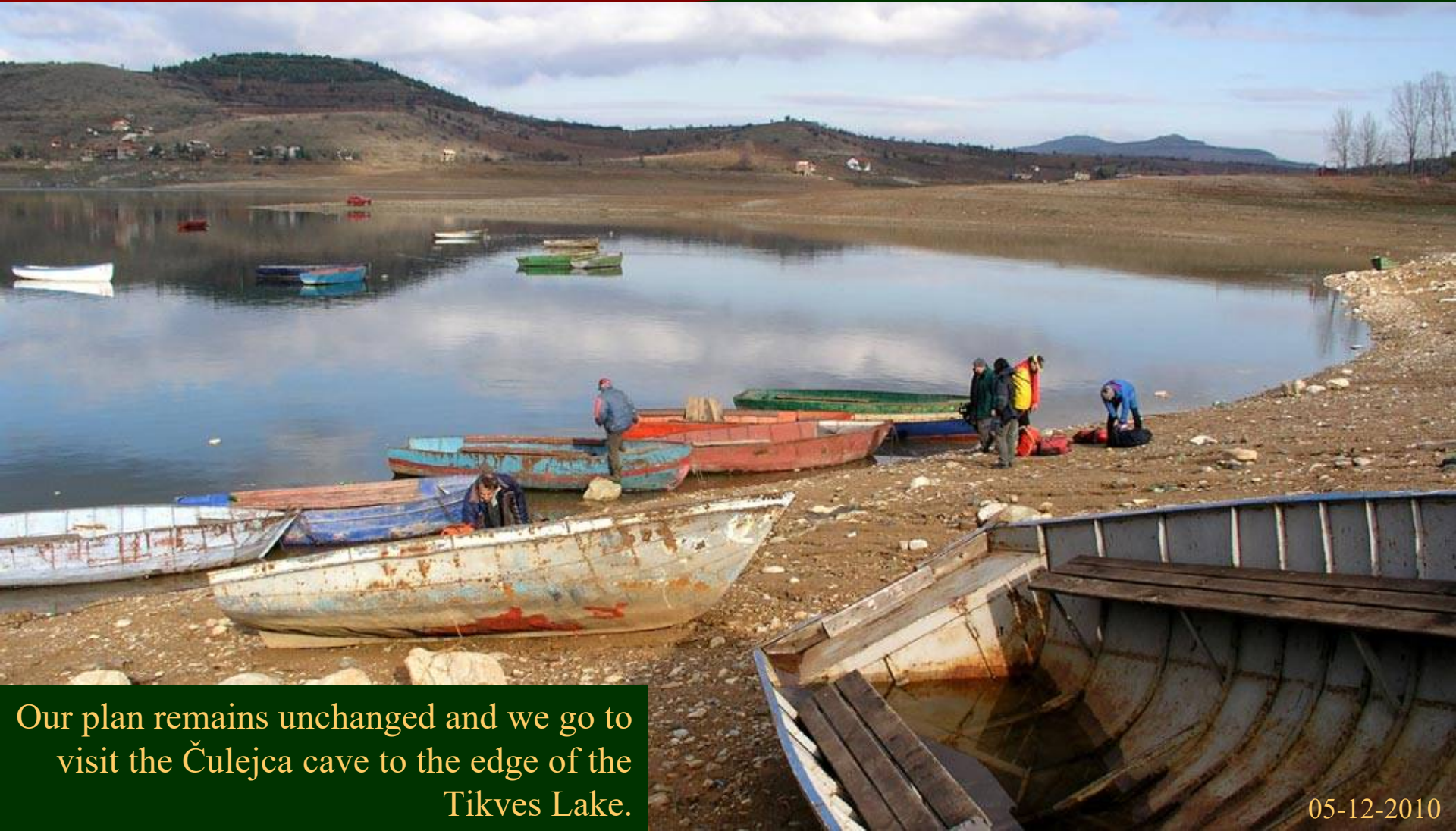
Thanks to the mobile, Marjan's father came to pick us up and bring us back to Prilep.

Temovski's house in Prilep



This night, Marjan, his father and a friend could bring back the 4 Wheel car thanks to the lowering of Buturica river.

54 – Tikves Lake



Our plan remains unchanged and we go to visit the Čulejca cave to the edge of the Tikves Lake.

05-12-2010

55 – Cruise On The Lake

Lac de Tikves

Two friends of Marjan, belonging to the Speleo-club of Kavadarci, came with us. One of them brought a bottle of Raki, a local eau-de-vie.



They brought a motor boat and diesel oil. There is no roads, Čulejca cave is only accessible by boat.



05-12-2010

56 – Cruise On The Lake

The Tikves Lake is artificial, a dam on the Crna Reka have flooded the valley.

Marjan
Temovski

Blagoj
Lazov

Philippe Audra

Andrej Mihevc



05-12-2010



Nikola
Minčorov

After one hour and half of boating, Nikola Minčorov announce our arrival. We stop near a small fishermen hut.

57 – Cruise On The Lake



From the hut, it takes twenty minutes to reach Čulejca cave. The wooded slopes are steep and the footpath is not well marked.



58 – Cruise On The Lake

Upstream, the lake becomes more and more narrow in the canyon of *Crna Reka* (« the Black River »).

The basin of this wild river is the Marjan's field ...

Huge program.



05-12-2010

59 – *Crna Reka Valley*

Crna Reka Valley flooded by the artificial lake



05-12-2010

60 – Čulejca Cave



Great caves
often have
small
entrances: *Ad
augusta per
angusta.*



61 – Bat Guano



Rhinoloph in Čulejca Cave

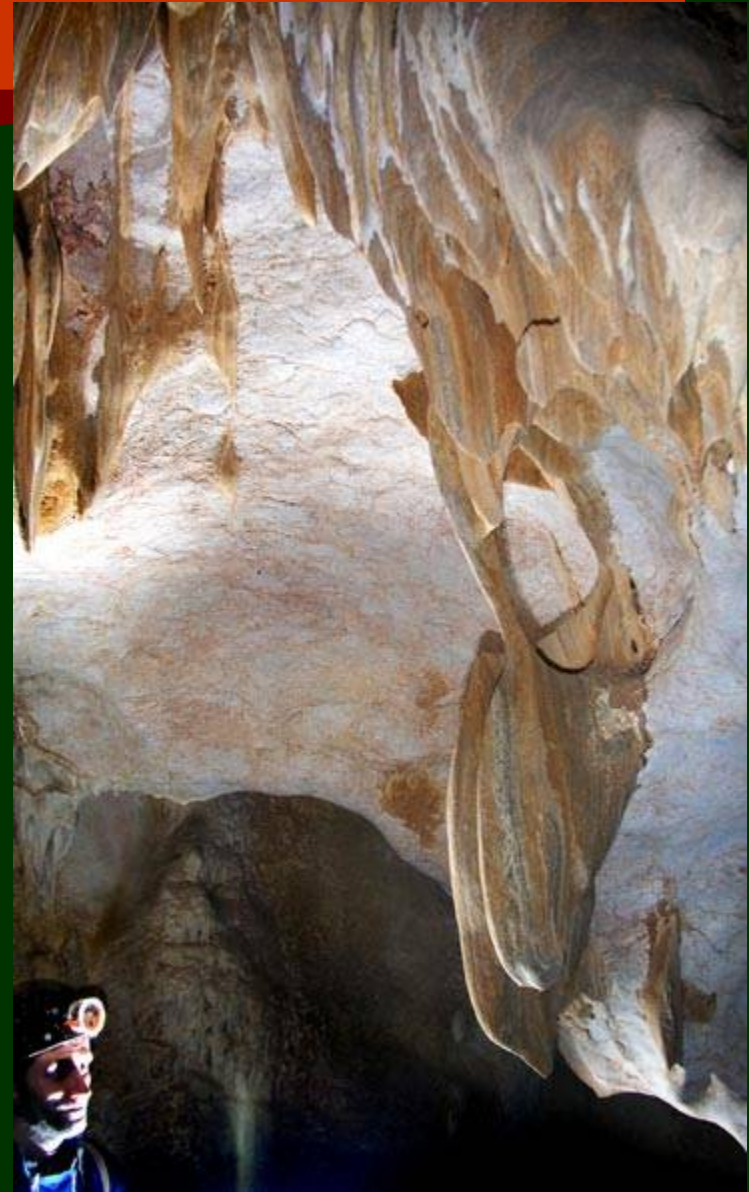
Guano shows that colonies of bats used the cave.



05-12-2010

62 – Čulejca Cave

The wall morphology shows a normal type cave (i.e. epigene), that is to say formed by the surface waters coming from nearby mountains.



63 – Poolfingers



Poolfingers or chenille spar lines
(20 cm high) in Čulejca cave



In Čulejca cave occurs “chenille spar line” or “poolfingers”. These are bacterial threads developed in aquatic environment : it’s the evidence that extreme life exists in the darkness of caves.

64 – Aquatic speleothems

Speleothems of Čulejca cave



The bowl forms also show bacterial presence in the formation of this subaqueous speleothem type.



05-12-2010

65 – Meeting In Kavadarci Club

05-12-2010

Blagoj Lazov

Nikola
Minčorov

Marjan Temovski

Marjan and his friends in Speleo-club of Kavadarci (Macedonia)



66 – Another Place Of Club

Because of inaccessible monastery, an old police station dating from Tito's time will be our new place. As well many other blocks building from this period, these blocks are unoccupied and sometimes used by associations.



Old police station of Mrežičko



Here at Mrežičko, nothing changed ; Tito's portraits decorating the walls of police station remained in the same place. It was yesterday...



05-12-2010



67 – Mrežičko Village



In the uninhabited mountains close to the Greek border, the mining extraction is the only economic activity.

Village almost uninhabited of Mrežičko

06-12-2010

06-12-2010



68 – Vultures of Dragožel



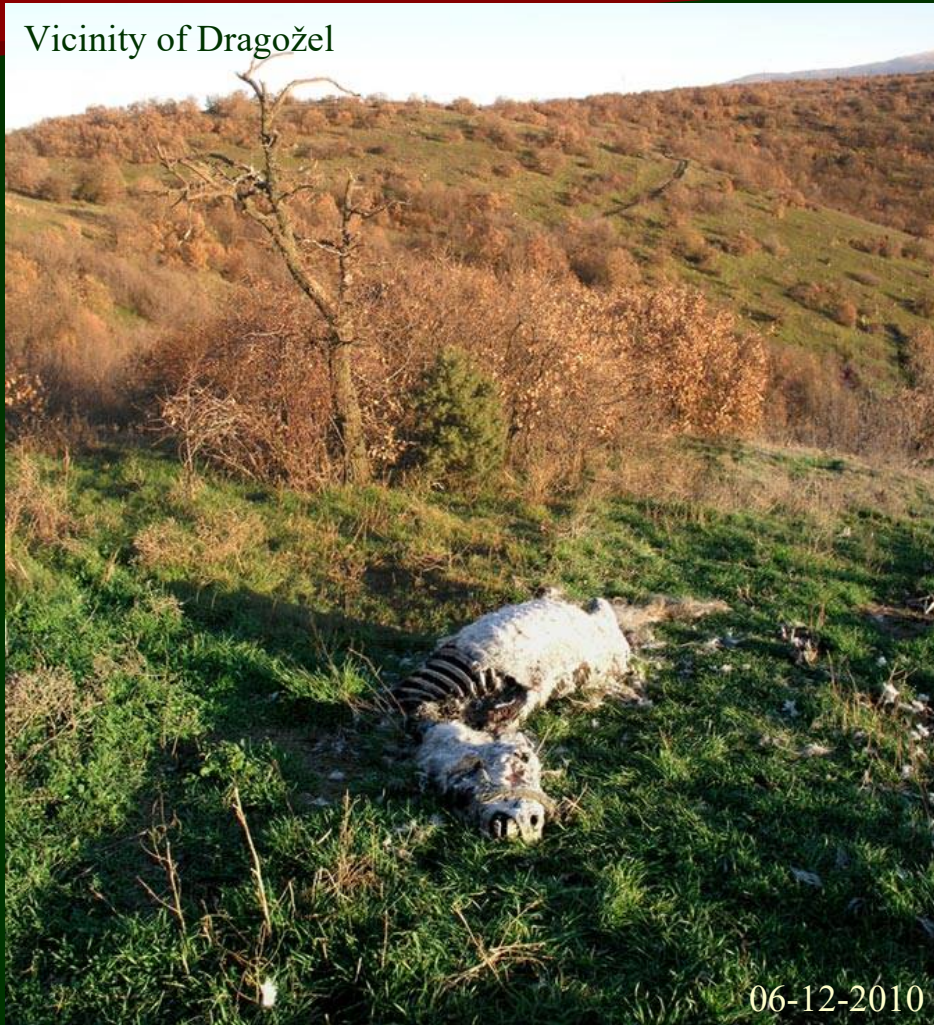
The Dragoželska Propast (shaft) is located in the Kamenica valley, a tributary to Crna Reka.

We have to cross the Kamenica river and straight on the Dragožel village to reach the cave. At distance, the vultures fly around rotting carcasses.



69 – Rotting Carcasses

Vicinity of Dragožel



The rotting carcasses attract the Griffon Vulture (*Gyps fulvus*), in Macedonian known as “*Beloglav Orel Mrshojadec*”, meaning whitehead eagle vulture.

70 – *Dragoželska Propast*



The entrance shaft is 50 m deep.



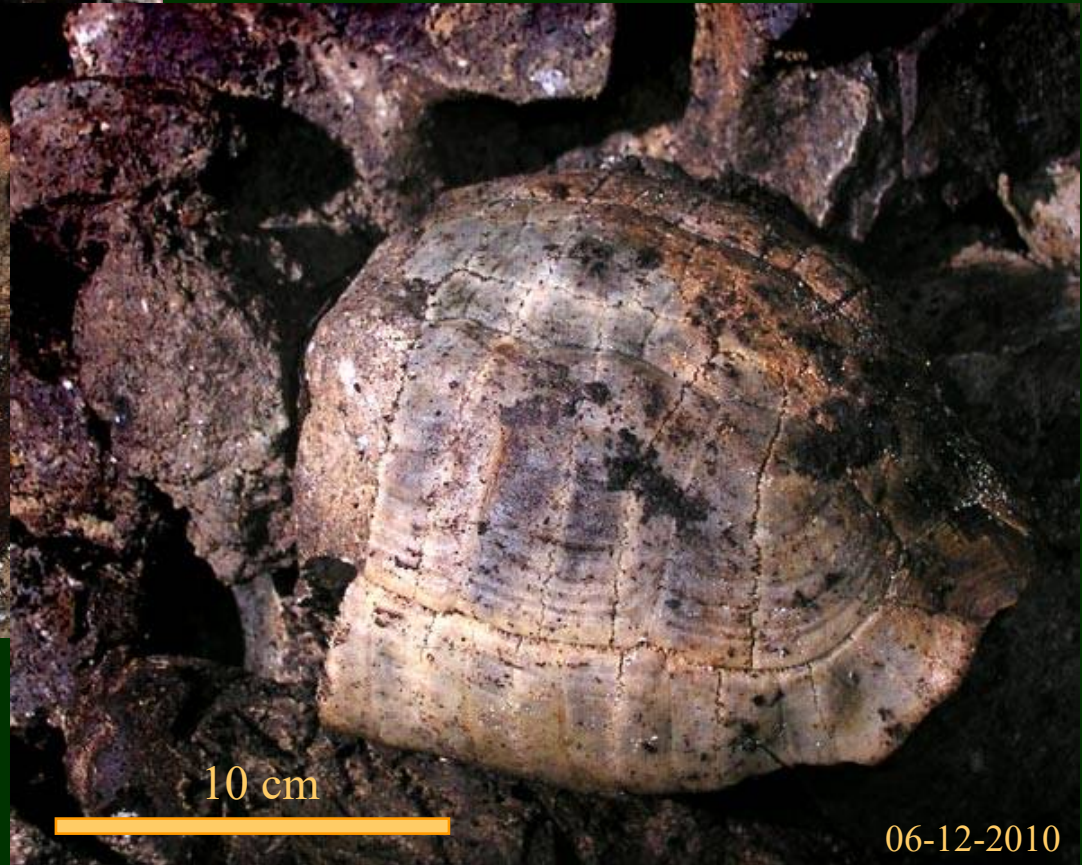
Watch your step! Other people could dead in this place...

71 – Natural Trap



Dragoželska Propast

Some turtles for example...



10 cm

06-12-2010

The oriental sub-specie of Hermann Turtle (*Testudo hermanni boettgeri*) is larger than occidental sub-specie.

72 – Natural Grave



Dragoželska Propast

06-12-2010

For the ones pushed into...



06-12-2010

In Slovenia, Andrej knows well the sad fate that awaited opponents when there were mass executions in Yugoslavia.

73 – Respect For Slain

Dragoželska Propast



06-12-2010

Andrej does not accept this situation and decide to gather the skulls in a dedicated place.

Two other people share sad fate.



06-12-2010

74 – Story Of Two Men

Vicinity of Dragožel



06-12-2010

On the surface, we met a local herdsman. He told us he knows the story of two men pushed in the shaft. Here, in the years following the World War II, there were many settling of scores...



The herdsman of
Dragožel

06-12-2010

75 – Vitacevo Plateau

06-12-2010



Vitacevo Plateau and at distance the mountains between Macedonia from Greece

Volcanic tuffs near Mrežičko



The Kamenica basin has been completely filled with volcanic tuffs forming the Vitacevo plateau.

06-12-2010

76 – Potatoes And Sausages

We decided to prospect the wooded slopes of the Kamenica where we found an unroofed cave and a sheepfold cave.



06-12-2010



Marjan
Temovski

Nikola
Minčorov

Blagoj
Lazov

Andrej
Mihevc

06-12-2010

Then, we came back to Mrežičko where Nikola Minčorov et Blagoj Lazov were waiting for us with a very good dish made of potatoes and sausages.

77 – Kavadarci As Guest



In the evening, we are surprised to see all people from Kavadarci Alpine Club. For the occasion, we drank a few glasses of home-made raki. Some of one, very enthusiasts vine and wine production, even brought our bottles of « Cabernet-Sauvignon ».

For this event, the local TV wanted to interview Philippe, the « Professor » mentoring Marjan's studies.



78 – Kamenica Valley



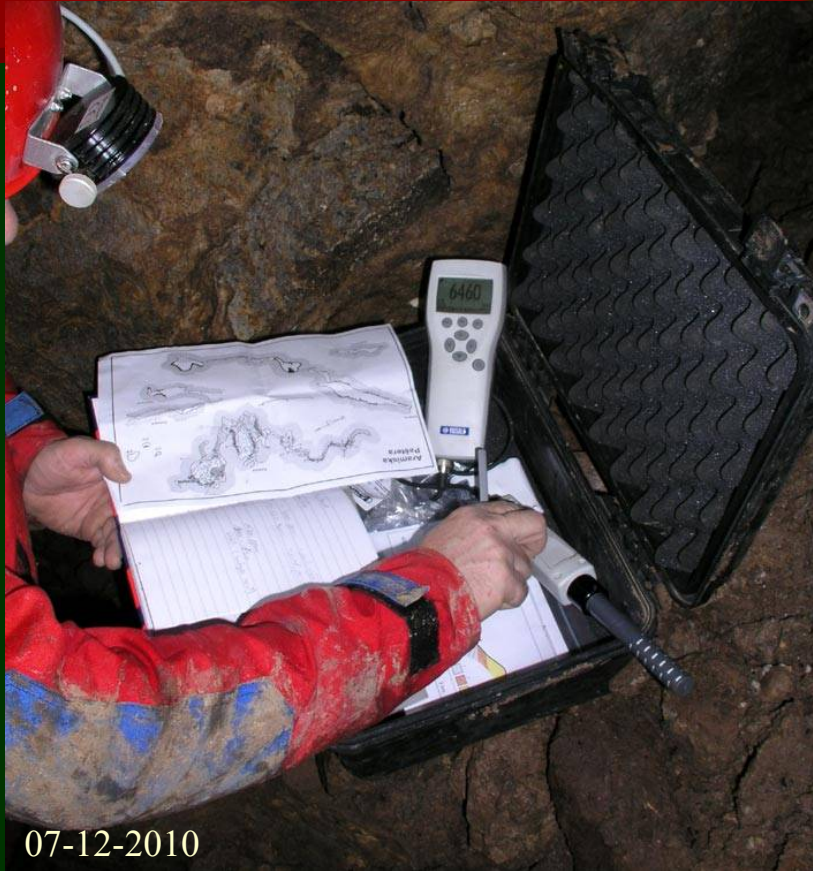
07-12-2010

We were following upstream the Kamenica river, when Andrej located the entrance of Aramiška Pestera.

79 – Andrej's Suite Case

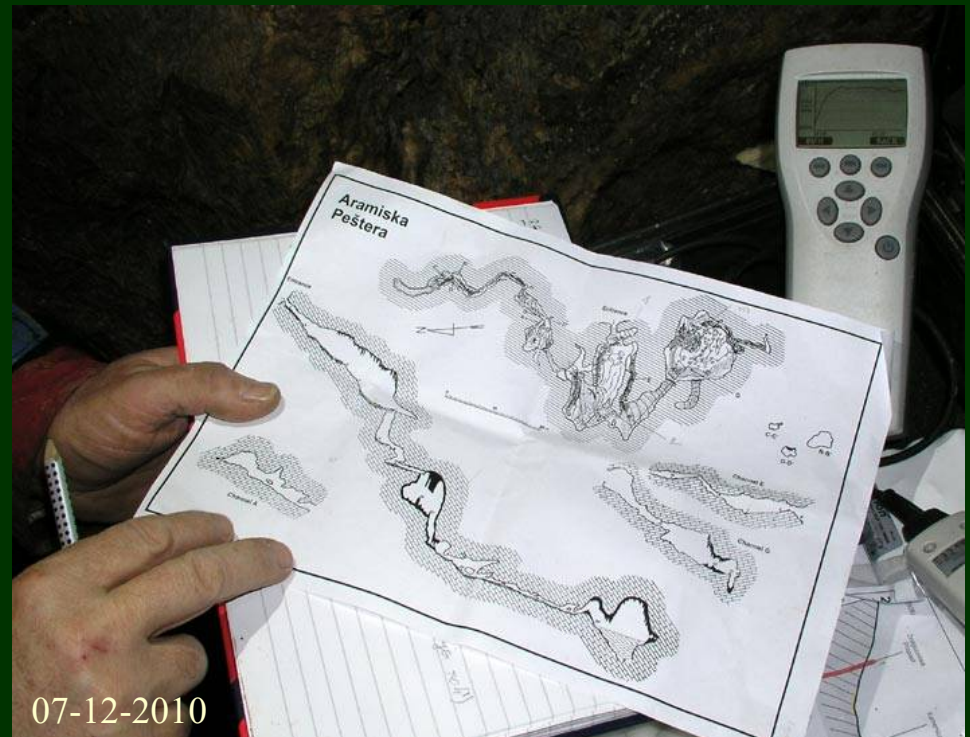


Andrej brought his scientific suitcase. He wants to measure the concentrations of CO₂ in the cave.



07-12-2010

He is very surprised because the data are very high in particular in the bottom of the cave where the gas is trapped.



07-12-2010

80 – *Aramiška Pestera*

The cave was formed
by sinks of the
Kamenica river.



Andrej with his scientific suitcase in the cave.



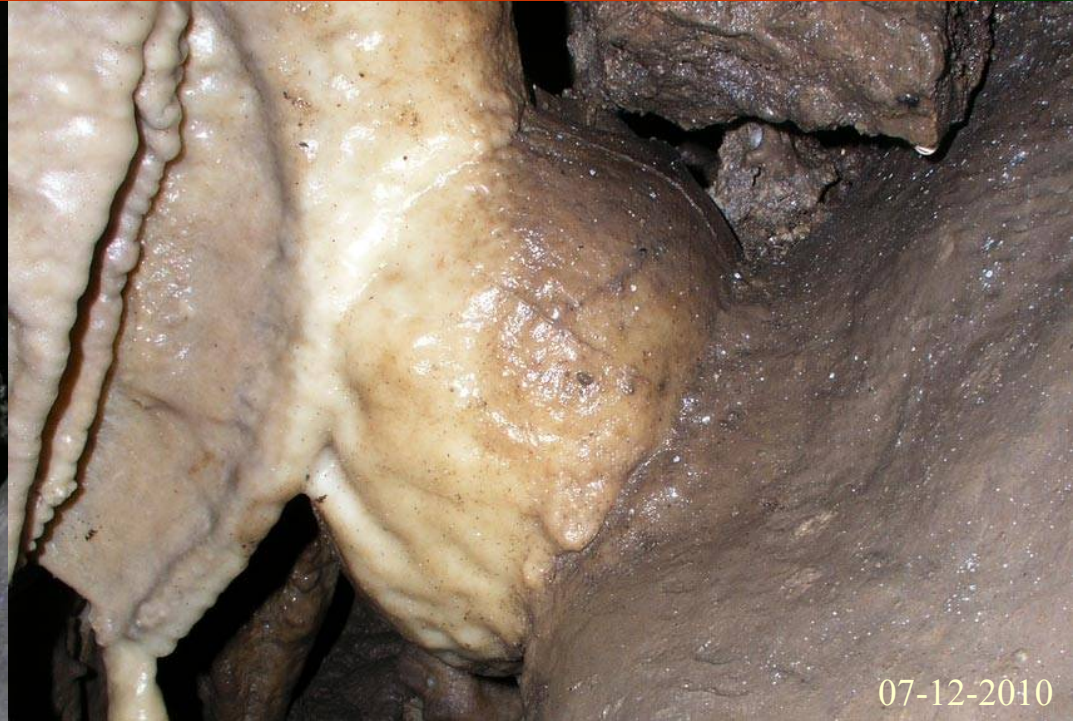
81 – Sepulchral Cave



Some clues indicate that the cave has been used as a sepulchral cave, likely in the Neolithic times.

Human vertebrae encourage Philippe to look around...

82 – Human Skull



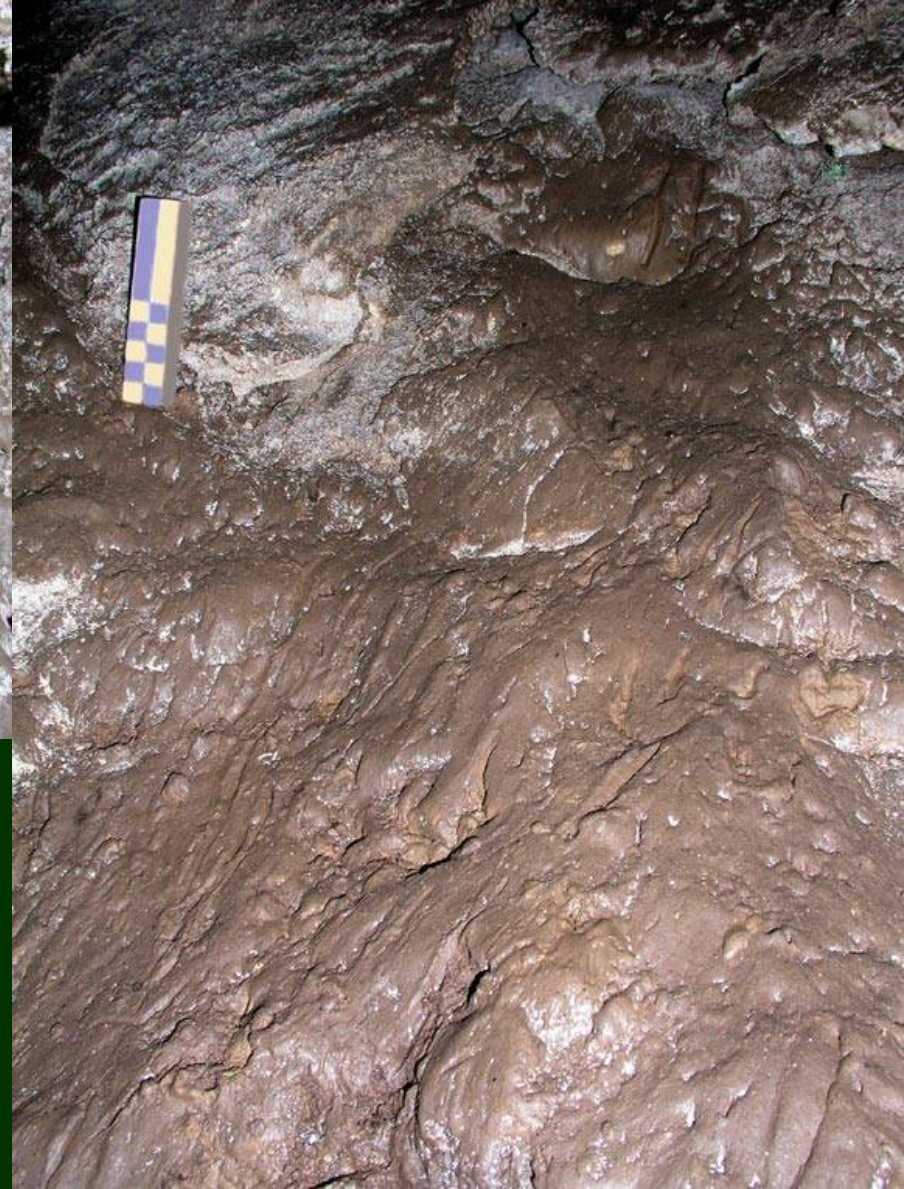
07-12-2010

A circular stone, caught between wall and rock, draws Philippe attention to this strange bowl. It's a human skull covered with calcite. We even guess sagittal suture, but we have to stop here because this skull is strongly fixed to the rock; and it must be left inside: the Aramiška Pestera is the real grave.

83 – Following Bear Track



07-12-2010



Along the slope toward the bottom, Jean-Yves notices big tracks of claws. These tracks belong to a brown bear; it left the marks of its claws and also its hairs in the clay !

This is the track of bear used when it came to hibernate into the cave.

84 – Kavadarci



Some coffee, yes of course...
but Turkish fashion.



Кавадарци

07-12-2010

En Kavadarci, we found our friend Nikola Minčorov, an experienced caver and mountain man. He's very interested in archeology. We can see in his garden some parts of millstone.



07-12-2010

85 – Ferronickel



Nickel oxide ore is extracted in the quarry near Mrežičko close to the Greek border. It's transported toward the ironworks of Kavadarci by treadmill system. Regularly, intensive flash castings of ferronickel illuminated the night.



07-12-2010

Nickel ore transformed by the ironworks.



07-12-2010



Kavadarci in the « Nickel Valley ».

86 – Prilep City

The old Turkish wall in Prilep.

We just take the time to visit Prilep city (Macedonia), and to see the wall of Turkish baths, the clock tower and the statue of Alexander the Great before to seat in the restaurant.



87 – Some Nickel and Wine



08-12-2010

Miners' terraced houses near Trojaci.



08-12-2010

88 – Raec

Our geological field work leads us in small and poor villages in the vicinity of Prilep. Our main goal is the Pliocene sediments that we look for but we won't find.



The poor life of inhabitants is discernible by the state of houses covered by plates of opened out drums.

Some paprika hanged from wooded drier of tobacco show the agricultural activity.

89 – In The Vicinity Of Veles



08-12-2010



08-12-2010

Near Veles, we find some deposits that could be Pliocene sediments. We know that the canon of Vardar river link together formerly the Mediterranean see to the Black See...

Of course, the context lacks but the inclined stratification shows a Gilbert delta filling an old valley, maybe the Vardar or one of its tributary...

90 – Skopje

The old Turkish bridge on the Vardar river is a rare building that survived to the 1963 earthquake.



Panoramic view point on Skopje City from Turena Hotel.

91 – The End



The End

Senj (Croatia)