

Ulrike Ploner

Lilly and Tim



the Geologists



Dear children!

We welcome you in our information-center of the Bletterbach-canyon. We are glad about your visit and hope you will take pleasure in geology and in our hiking tours. To be prepared for this adventure, Lilly and Tim, our Bletterbach-specialists, will give you some tips and instructions. They already know everything about the canyon, about the rock's structure and about fossiles, but also about hiking in groups and about the right behaviour when wandering throughout nature.

On the last page of this booklet, you can test your knowledge by solving a riddle. If you find the right solution, you will get the "Bletterbach-certificate".

Have a lot of fun and good luck!



Here are Lilly and Tim, our Bletterbach-experts! They will lead you through the canyon and tell you everything worth knowing. But before you start, have a look at some good pieces of advice:

Lilly



Tim



How to behave in the forest and the canyon

Lilly and Tim show us how to do it:

Good shoes

Tim firmly believes that you can only enjoy hiking if you wear stable, robust shoes. This is why he prefers wearing climbing boots. Lilly likes her climbing boots, too. Although she cannot admire her polished toenails anymore, she knows: good shoes give you foothold and a sure step!



Dogs on the lead

When Lilly and Tim take their dog Bello with them on a hiking-tour, they put it on the lead. So no other hiker has to be afraid of the dog and Bello cannot chase other animals.



Bello



Outfit

For their hiking-tour both take a rucksack with them. They pack some food and drinks and also a raincoat into it. So Lilly and Tim are prepared for any kind of weather.



Behaviour

Lilly and Tim cannot stand hikers who wander through the forests screaming and being noisy. They make such troublemakers aware that noise frightens animals and it disturbs other hikers.



Footpaths for hiking

Lilly and Tim always remain on the marked footpaths so they do not create new beaten tracks. They always remain together, so nobody gets lost and in case of need they can help each other. This is especially important when making hiking-tours!



Rubbish

The children get very angry if they find rubbish in the forest or in the canyon, left behind by stupid, careless people. This can be very upsetting, after all everybody can take back home his or her own rubbish!



And now ...

... just one more remark: Enjoy your stay in the canyon. Take your time to play, too. The Bletterbach-canyon offers uncountable possibilities.



We have been arrived-

Lilly can tell us a lot:

Bletterbach, this is really a strange name which could cause some confusion.

Do we write the word *Blätter* (German: *leaves*) with an *e* instead of an *ä* due to the German orthographical reform? Do not worry: You still write it with the German *Umlaut ä*. The *Bletter* of the compound *Bletterbach* (German *-bach* means *brook*) is derived from the old verb *bletern* which means *to flow*.

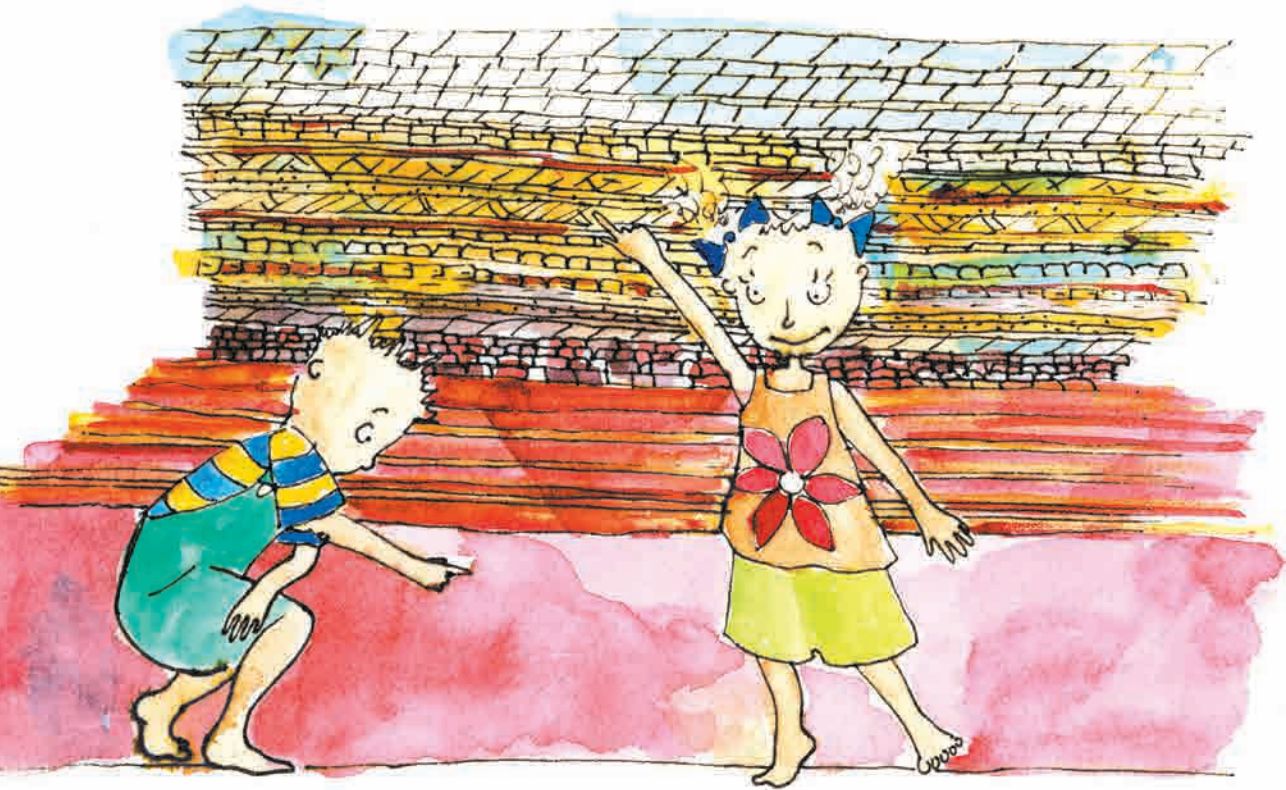


The background is a photograph of a deep, rocky canyon with reddish-brown rock walls and green vegetation on the upper slopes. Two cartoon characters are overlaid on the image. A girl with blue hair and glasses stands in the center, holding a red stick. A boy with a yellow face and a blue and yellow striped shirt is partially visible on the right side.

The stones of the Bletterbach-canyon

Hiking through the Bletterbach is like making a journey through time. When we get into the canyon, we are in the midst of very old stones called **quartz-porphry of Bozen**. This kind of stone developed many, many years ago (280-260 million of years), when gigantic quantities of magma explosively broke out from the interior to the surface of the earth.

The magma got cold, coagulated, grew stiff and became stone. The **quartz-porphry of Bozen** is the oldest stone we can find in the Bletterbach-canyon and it lies deeper than any other kinds of stone.




Older stones lie deeper, younger stone-strata lie above



What is magma?

The word magma comes from ancient Greek and means “moulded mass”.

Magma is a glowing liquid rock which is located in the deeper part of the earth’s crust and in the upper part of the earth’s mantle (the stratum below the earth’s crust). Magma is very important for the formation of rocks. As soon as the magma becomes stiff, it becomes stone (magmatite). If this happens in the interior of the earth, the magma cools off very slowly (plutonite). But if the magma emerges on the surface of the earth, it becomes lava and it cools off faster (vulcanites). Our porphyry, for example, is the result of this last process.



Where the quartz-porphyry ends, the **sandstone of Gröden** begins. It is not a volcanic stone like the porphyry, but it developed because of a river which deposited sand for a very long time (20 cm between 1000 years) on the stratum below it. The grains of sand remained together thanks to a binder and began to petrify. The name sandstone comes from this process. During the last years researchers found petrified footprints which belonged to reptiles that left their tracks 260 million years ago in the strata of sandstone of Gröden.



On the top of the sandstone there are other strata called **Bellerophon**. Like the sandstone of Gröden, the Bellerophon-strata are a kind of sedimentation stone, too. Their name derives from a kind of sea-snail and they developed in warm, flat coastal waters and in shallow lagoons.

Over the Bellerophon-strata began the deposition of the so-called **strata of Werfen**. They also have been formed on the ground of the sea, they are about 400 metres high and contain numerous fossiles (shells, snails, seaweed).

What are fossiles?

Fossiles are remnants, vestiges or also prints of animals and plants which lived during the geological period. Because of various reasons some of these living-organisms did not decay after their death, but kept and conserved their original form. This often happens by petrification. Living-organisms are buried under the mud, so that they cannot decay, and are interspersed by more and more minerals; so after a certain time they become stone. Sometimes a putrefying animal leaves a hollow space or a cavity in the rock, which is then filled with minerals. Although the animal is not there anymore, its form remains conserved. You sometimes find little animals locked in amber; in cold regions fossiles are also created by the freezing in of animals, for example of mammoths.





On top of all these different kinds of stone (like on a throne) there is the **Dolomite of Sarl**, a stone which has formed the Weißhorn (the name of the white mountain, translated into English it means White Horn).

The Dolomite of Sarl is nearly snow-white and has been formed – like the last stones mentioned above – in the sea. In this case chalk/lime-algae played an important rule.



Prints in the sand (-stone)

The Bletterbach-canyon is a paradise for scientists. In the strata of sandstone, petrified footprints of at least 20 different kinds of animals were found till now.



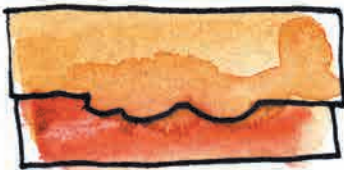


Lilly and Tim will show you how it is possible that such kinds of prints could develop: Lilly searches a place where the soil is a bit wet and muddy (like on a wet sandbeach). She leaves her footprints there.



Now the soil has to dry out and to get hard. After this the footprint will be filled up with new mud, which has been washed ashore by a brook. Our footprint is now covered with a new stratum of mud. It will also dry out and get as hard as stone in time.

If we divide the two petrified strata, we get two prints of Lilly's foot: a depression on one stone slab and an elevation on the other, positive and negative.



Lilly's footprint seen from a lateral perspective, filled up with sediment (mud).



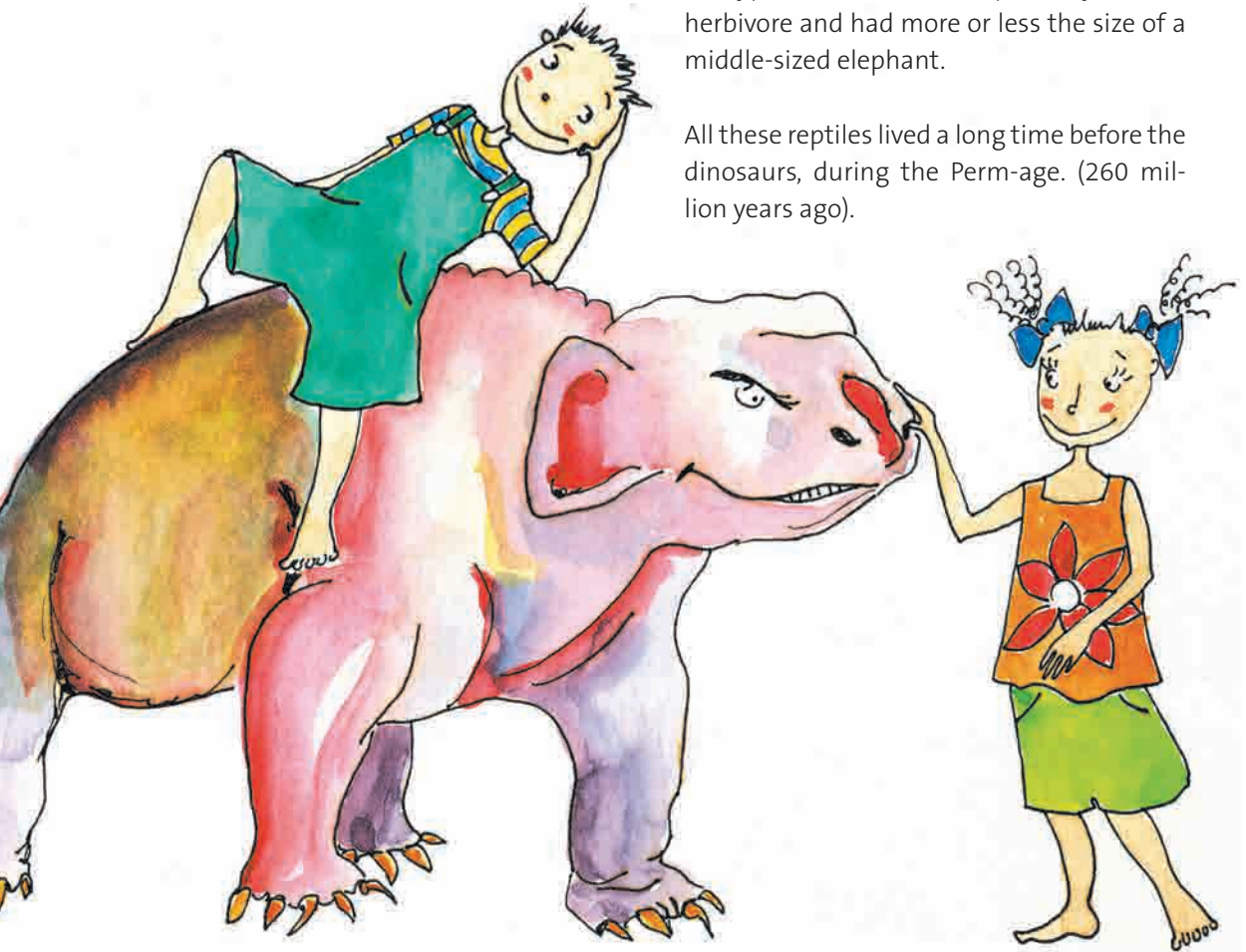
positive footprint



negative footprint

The biggest reptile of the Bletterbach is the *Pachypes dolomiticus*. It probably was a herbivore and had more or less the size of a middle-sized elephant.

All these reptiles lived a long time before the dinosaurs, during the Perm-age. (260 million years ago).



The Pachypes dolomiticus maybe could have had this look.



At that time our world looked a bit different. Our continents were united in a single gigantic primary continent which today we call Pangea. At the end of Perm-age – 250 million years ago – the majority of all animal-species suddenly died out. There is general a lot of disagreement between scientists about the reason of this wide-spread dying-off. But they agree on the fact that the gigantic continent Pangea began to break at the end of Perm-age. Because of this the climate changed and this might have had negative effects on all of the living-organisms.



Those who have been attentive and who understood everything, surely have no difficulties in solving our short quiz. So let us snap a pen and show what you know! The one who is able to solve the riddle is a real Bletterbach-pro and gets a certificate in the information-center in Aldein or in the museum of geology in Radein. In any case, a visit is worth your while!

A tricky

Lilly and Tim now will ask you some tricky questions. Those who have been attentive, surely have no difficulties in solving the following riddle. With the right solution, Bletterbach-specialists even get a certificate in the information-center in Aldein or in the museum of geology in Radein. We wish you therefor good luck and a lot of fun for your hiking-tour through the Bletterbach-canyon. We hope to see you soon in the information-center!

1. What is the name of our canyon?

- ☐ Aldein
 - ☐ Bletterbach
 - ☐ Dolomites
-

2. How do you call the rock where many footprints of reptiles were found?

- ☐ Bellerophon
 - ☐ quartz-porphry
 - ☐ sandstone
-

3. Shoulder-strap bag for hiking

- ☐ handbag
- ☐ rucksack
- ☐ basket

4. Ideal footwear for hiking-tours

- ☐ climbing boots
 - ☐ high-heeled shoes
 - ☐ slippers
-

5. Mountain near Aldein

- ☐ Marmolada
 - ☐ Weißhorn
 - ☐ Ortler
-

6. Name of the gigantic continent

- ☐ Panacea
- ☐ Pandemonium
- ☐ Pangea

quiz

7. What is the word for the age of 250 million years ago?

- ☐ Perm
 - ☐ Trias
 - ☐ Jurassic period
-

8. Oldest stone of the Bletterbach-canyon: ... of Bozen

- ☐ dolomite
 - ☐ sandstone
 - ☐ quartz-porphry
-

9. Biggest reptile of the Bletterbach-canyon

- ☐ Pachypes dolomiticus
 - ☐ lizard
 - ☐ Triceratops
-

10. Most important clothing for hiking (you put it into the rucksack)

- ☐ tutu
- ☐ dinner-suit
- ☐ raincoat

11. Youngest stone of the Bletterbach-canyon: ... of Sarl

- ☐ granite
 - ☐ dolomite
 - ☐ gneiss
-

12. What kind of fossiles were left in the Bletterbach-canyon by almost 20 different kinds of reptiles?

- ☐ petrified eyes
 - ☐ petrified footprints
 - ☐ petrified bones
-

13. What is the name of the glowing liquid rock?

- ☐ magnesia
 - ☐ magma
 - ☐ crevasse
-



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GEOPARC Bletterbach
ON THE TRAIL OF PREHISTORIC REPTILES