

The adventures of



The Trient Bisse Trail

Trient Bisse

Trail

Water is fed into the 'bisse' irrigation channel at an altitude of 1,583 m, at the Chalet du Glacier. It is fed by the Trient River, which collects meltwater from the glacier of the same name. After taking a peaceful route through rocks and forests, it reaches the Col de La Forclaz, where it changes direction to enter the Martigny valley.



Water intake for the Trient bisse, a few dozen metres upstream from the café. The bisse takes 50 litres of water per second from the river that flows from the glacier.

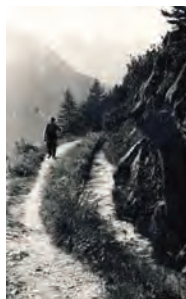
The bisse today

Abandoned in the 1970s, the bisse was renovated in 1986. In addition to its contribution to the irrigation network, it offers a magnificent hiking trail to the Trient Glacier.

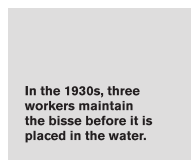
Both the bisse and the glacier remind us that water, the source of life, is a precious commodity!

Origin

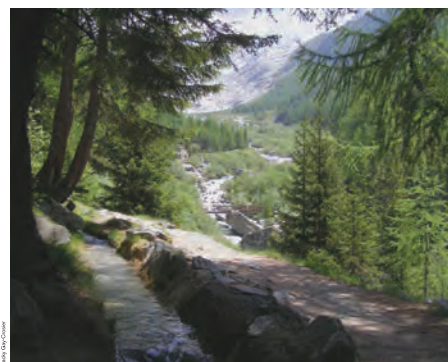
The canal was dug in 1895, and was an initiative by farmers in Martigny-Combe (a former municipality of Trient until 1900). In contrast to the Trient valley, Martigny-Combe suffers from lack of water from the beginning of summer onwards. Thanks to this additional water supply, farmers could irrigate meadows and orchards, and therefore ensure better yields. As the canal plays an essential role in agricultural life, its users have carefully maintained it for generations.



Since its construction, the canal has been monitored daily to ensure it is functioning properly.



In the 1930s, three workers maintain the bisse before it is placed in the water.



Since 1986, the Trient bisse has offered a place for relaxation and peace in a natural setting.

"Charlotte the Marmot", an educational trail for children

The Trient municipality and the Centre for the Study of Alpine Populations invite you to follow Charlotte the Marmot along the bisse, towards the Trient Glacier. Have fun with games and questions in 10 posts along the way: you'll learn different facts about the Trient bisse, as well as the upper Trient valley.

This trail has been specially designed for 8 to 12 year olds. To take part, simply call into the hotel in La Forclaz, or the kiosk at the Col, to pick up Charlotte's leaflet (trail map and questions). When you return, you can pick up the answer sheet from the same places.

Charlotte would like to wish you a lovely walk. Don't forget your pencil ! Be careful on the path, you are in the mountains: be careful !

Useful information

Length: about 4 km (8 Km round-trip)
Time required: approx. 2 hours from the Col de la Forclaz to the Chalet du Glacier (one way). Add an extra hour to play Charlotte's games on the way there or the way back.
Difficulty: easy; gentle and regular slope.
Recommended period: from April to October.

For more information

Centre for the Study of Alpine Populations: www.crepa.ch



Conception et réalisation
 Centre régional d'études des populations alpines
www.crepa.ch
 Graphisme P² Marc Fontaine

Financement
 Canton de Trient

Parrains de Charlotte
 Espace Mont Blanc
 Canton Valais
 Canton Valais
 Canton Valais



Rédaction des panneaux didactiques:
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www.crepa.ch

Avec la précieuse collaboration de:
 Simon Cortesani, garde du bisse | Hilaire Dumoulin, Collonges | Electricité d'Emosson SA | Jacques Ehinger, géographe, responsable des mesures du glacier du Trient | ETH Zürich, VAW, Réseau suisse des observations glaciaires | Jacky Gay-Crosier, Les Jurs | Médiathèque Valais - Martigny | Luc Moreau, glaciologue, Chamonix | Emmanuel Reynard, géographe, Université de Lausanne | Bertrand Savioz, Trient | Lucien Tête, Martigny-Croix | Olivier Torray, Martigny-Croix | Valrando, Association valaisanne de la randonnée

Post 1



Trient village

Trient village had around a hundred inhabitants living there year-round, in the ten hamlets dotted in the bottom of the valley. In the main hamlet, Gilliod, impressive buildings bear witness to the tourist boom in the region during the Belle Epoque : wealthy foreigners stayed in these hotels, coming to relax in unspoilt natural surroundings. Because of its location, Trient remains a holiday destination and a stopover today, and is much appreciated by hikers on the Tour du Mont-Blanc.

Did you know?
Thousands of years ago, The Trient glacier shaped the sides of this valley, giving it its U shape. Around 11,000 years ago, the glacial tongue completely covered the site where

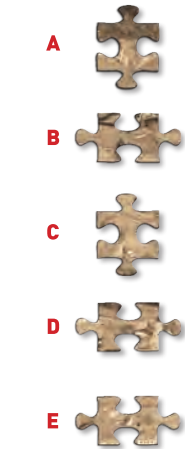
Trient would later be built. As it retreated, it left a magnificent end moraine here: the villagers chose to build their church on it in 1888.



Trient, 1902

Médiathèque Valais - Martigny

In the puzzle below,
A few pieces are still missing. Find the right place for each one by observing the view in front of you, and you will find different aspects of Trient village.



CREPA

The Trient Bisse Trail

Ice exploitation

Origin of the bisse trail

When the inhabitants built the bisse in 1895, Martigny-Combe farmers took advantage of a route that already existed: it was a wide and regular path created some thirty years earlier to allow exploitation of the Trient Glacier.



In front of the impressive glacier snout, you can make out the wooden installations used for mining operations.

Archives communales de Trient

The ice industry

In the 19th century, before the invention of refrigerators, many Alpine glaciers provided the raw material for food preservation.

The Trient glacier was mined on an industrial scale until 1865. Facilitated by the development of the railway linking Martigny to major French cities, mining was easy thanks to the position of the glacier snout (edge), just a few hundred metres from where the café is today. Ice mining, which could be dangerous, provided employment for some fifteen workers in the region.

To improve transport conditions,



Wagons loaded with ice at the start of the track. The workers were fed and accommodated on the second floor of the stone building.

M. H. Schaller - 1895 - Archives communales de Trient

the concessionaires, Mr Robatel and Mr Bompard, built a «Decauville road» between the current café and the Col de la Forclaz around 1883. On these rails, there are wagons loaded with ice. One of them is still visible here. After thirty years of irregular activity, the «ice industry» of the Trient definitively ceased in 1900.

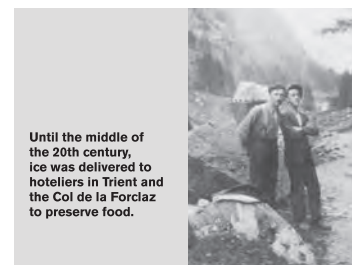
From Trient to Paris

Ice mining has several stages: Using explosives and various tools, the glacier is split and cut into blocks weighing several hundred kilograms each; the workers then load them onto long larch «slides»; they then store these blocks in a reservoir covered with fir branches (the current bar).



Loading ice at the Col de La Forclaz, before the wagons depart for Martigny station.

1899 - Photo: Pascal Tardieu, Montblanc Massif - Martigny



Until the middle of the 20th century, ice was delivered to hoteliers in Trient and the Col de la Forclaz to preserve food.

Archives communales de Trient



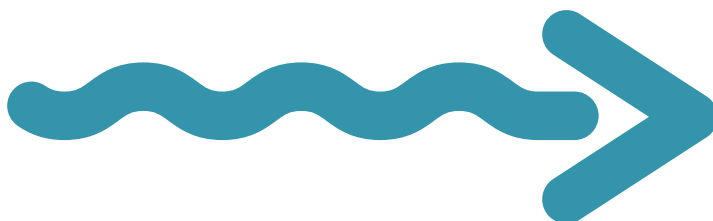
Workers mining ice. One of them, perched on a slide and equipped with a long stick with an iron hook, is ready to push an ice block.

M. H. Schaller - 1895 - Archives communales de Trient

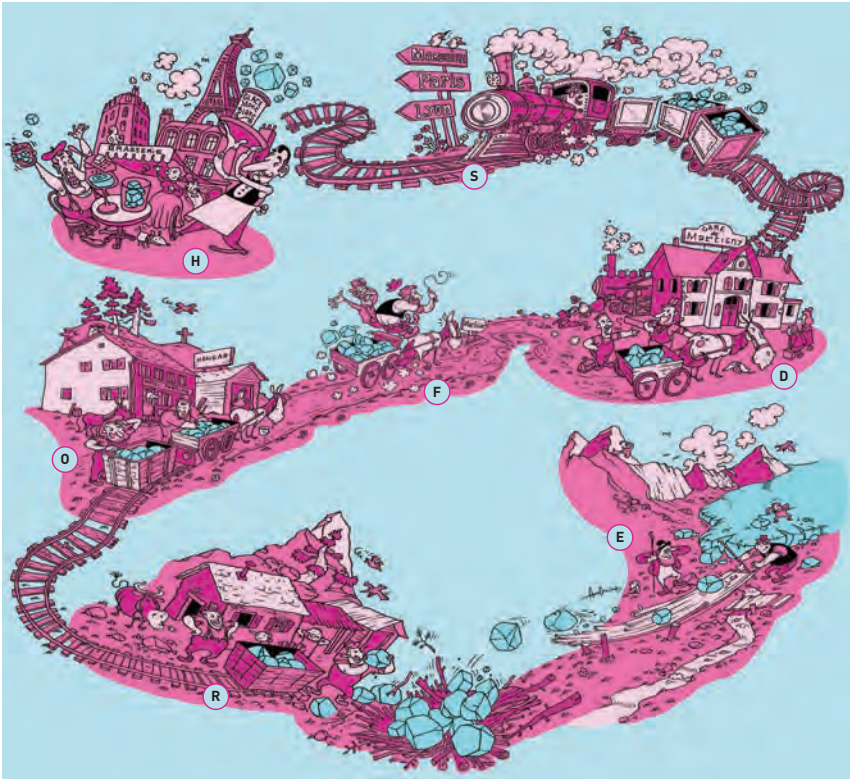
From there, the ice was loaded into wagons that transported it to the Col de La Forclaz. A telephone signalled the departure of trains every hour. From the Col, ten to fifteen wagons transported 20 to 30 tonnes of ice blocks daily (at the height of production) to Martigny station by road, where they were stored in sawdust.

Once a week, a train transported the ice to Paris, Lyon and Marseille. Once on site, it was sawed to size for breweries. The shavings were delivered to confectioners for ice cream production, and called «Petits Mont-Blanc».

Direction of flow



Post 4



* Which part of the main picture is each of the details below taken from?



Write the matching letters in your leaflet (in the same order) and you will find out why ice was mined.

Post 5



Maintenance of the bisse

The bisse and the path require regular maintenance. Restoration work has to be carried out regularly, particularly at the end of winter. The Trient bisse crosses many avalanche paths.

In the past, users of the bisse also carried out maintenance.

All farmers with water rights had to join the association that grouped together those who used the irrigation channel, this was called the consortium. In spring, the consortium organised particular duties or 'manoeuvres' (workdays), which were distributed proportionally, in relation to the area each person watered.

Today, these consortia are still active. They are linked to

maintenance of the bisse, and are in charge of stocking water in the spring, as ordered by the caretaker. The municipality of Trient is responsible for the maintenance and security of the road.

From June 1st to September 15th, the caretaker is in charge of supervising the channel on a daily basis, ensuring it is working properly.

Damage to the Bisse du Trient (2011-2012)



picture: Olivier Tomay



picture: Bertrand Savoz



picture: Bertrand Savoz

Renovation work



picture: Bertrand Savoz



picture: Bertrand Savoz



Post 7



Post 7



The work of the caretaker

Every day, **the caretaker** ensures that the irrigation channel is functioning properly. He also determines the water flow rate. To do this, he uses **the main sluice**, located at the start of the bisse.



Halfway along the bisse, **the hammer** lets him know if there is a problem: if it stops, or if the "knocking" noise slows, it is a sign that something is not right! The caretaker must then resolve the problem quickly.

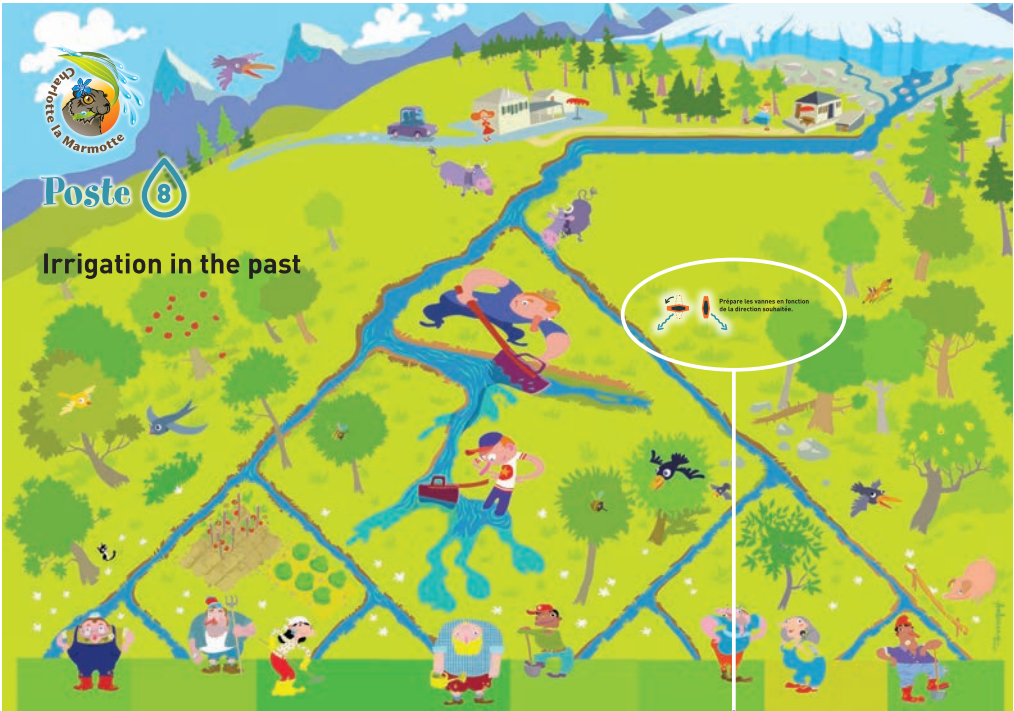


Solution

Effect on the bisse

Problem

Poste 8



Prepare the floodgates, and choose the direction in which you want the water to go.

Post 2

How to understand markings on pedestrian trails?

There are different types of trails. Some are more practicable than others. Two kinds of arrows are used to show the difficulty of the path:

«Yellow indicates a hiking trail. It is generally enough just to be equipped for walking, as the path does not present any particular difficulties!»

«White-red indicates that it is a mountain path; the path can be narrow and steep. You need to be familiar with the mountains, as well as being suitably equipped and fit!»



The "Tour du Mont-Blanc" is a 60-hour walk (7 to 10 days), 170 km, 10,000 m altitude difference.



Alptrekking is 200 hours, or 40 days of walking, 500 km as the crow flies, 32,000 m altitude difference.



«6-Chemin des cols alpins» is a 34 stage route, 600 km, 39,600 m altitude difference.



Now let's play!

On the map below, you will find the path taken by a young hiker, Mr Malo Molet. This arrow indicates his starting point: ➔

Malo passed five stages, from one blue point (●) to the next, without turning back. Below he tells you what the path was like: «I left from where you are now.



Step 1: First of all, I walked on a hiking trail.

Step 2: I continued on a mountain path, and then stopped in a mountain pasture, where I had a picnic in the shade of a building. 🏠

Step 3: After an hour and a half of walking, I reached an open area, above the forest line; the views were superb!

Step 4: I then went down to a mountain pasture where I had a bite to eat. 🏠

Step 5: In the last section, I met experienced walkers who were doing the «Tour du Mont-Blanc.»

When you find the path that Malo took, don't forget to answer the question in your leaflet!





The Trient Bisse Trail

Water in Trient

Function of the 'bisse' irrigation channel

Until it reaches the Col de La Forclaz pass, the glacier water is channelled gently and evenly down a slope, mainly into a channel or wooden gutters. From the pass onwards, the irrigation channel changes direction, and flows down to fulfil its main mission; irrigating meadows in the Martigny valley.

In the past, this water was distributed fairly between farmers who were members of the "bisse consortium". They in turn directed the stream towards their own properties using iron plates called «tornieu» (diversions). Once the water reached the top of their meadow, the channel overflowed, and the water was used to carefully irrigate the whole plot. Surface runoff watering was a tedious task that required time and expertise.

Since the 1970s, sprinkler irrigation has replaced the old method of irrigation. The bisse du Trient now feeds the Saint-Jean torrent, whose water is collected in a reservoir in Le Fays, before being pressurized and distributed by sprinkling on the properties of the municipality of Martigny-Combe.



At the Col de la Forclaz, the bisse enters the Martigny valley.



Traces of ancient gullies can still be seen today in some meadows in Martigny-Combe.

Thanks to the bisse, water from the glacier which is collected at an altitude of 1,583 m, is carried to crops as much as 1,000m lower down for irrigation.

Turbine operations in Trient

In addition to irrigation, water from the Trient river is also used by the Electricité d'Emosson SA company. Water from the Trient and La Fouly (Ferret Valley) is collected via a gallery. The water then flows into the Esserts basin (above Châtelard). From here, the water either goes to the Vallorcine plant and on to La Bâtiaz plant in Martigny, or it is channelled to the Emosson Dam.

The Trient water intake. The water from the river is also used for hydroelectric production.

The educational trail along the bisse can be done in both directions. If you set off from the Col de la Forclaz, then you're nearly at the end of the path. Well done! On the other hand, if you are starting from here, Charlotte the Marmot is here to guide you.

"Charlotte the Marmot", an educational trail for children

The municipality of Trient and the Centre for the Study of Alpine Populations invite you to follow Charlotte the Marmot along the canal pound, in the direction of the glacier of Trient. Have fun with the games and questions in 10 posts along the way: they will allow you to discover the different facets of the Trient bisse, as well as the high valley of Trient.

This trail has been specially designed for 8-12 year old children. To participate, simply call into the hotel in La Forclaz, or the kiosk at the Col, to pick up Charlotte's leaflet. When you return, you can pick up the answer sheet from the same places.

Charlotte would like to wish you a lovely walk. Don't forget your pencil! Be careful on the path, you are in the mountains: keep an eye out!



Useful information

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Time required: approx. 2 h from the "Col de la Forclaz" to the "Chalet du Glacier" [one way].
 Add an extra hour to play Charlotte's games, either on the way or on the way back.
Difficulty: easy; gentle and regular slope.
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 Centre régional d'études des populations alpines
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 Graphisme P5 Marc Fontaine

Financement
 COMMUNE DE TRIENT

Parrains de Charlotte
 Espace Mont Blanc
 CANTON DU VALAIS
 KANTON VALLES

crepa

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Musée des Bisses

Rédaction des panneaux didactiques:
 Centre régional d'études des populations alpines, 2015
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The Trient Bisse Trail

The Trient Glacier

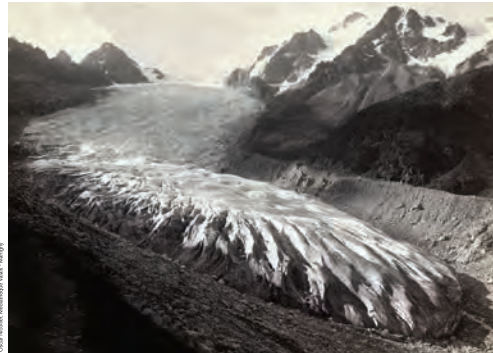
Location

The Trient glacier is in reality much larger than the glacial tongue present here. Its birthplace is at an altitude of over 3,000m, on a vast 3km² plateau. This is where the snow from surrounding peaks accumulates: Pointe d'Orny, Aiguilles Dorées, Aiguille du Tour. Little by little, the snow masses are transformed into ice by successive accumulations, and gravity means that they flow into the Trient Valley.

Glacial erosion

The glacier is a remarkable erosion agent: it has sculpted the U-shape of the valley, polishing rocks and creating moraines, like the one on which the café has been built. It has sometimes swept away enormous blocks of rocks in its path, which were carried on its back before being deposited as it melted, kilometres away from the place they fell (hence their name, 'erratic blocks').

Scientific collaboration with:
Jacques Ehringer, geographer, responsible for measurement of the Trient Glacier ETH Zurich, VAW, Glacier Monitoring in Switzerland
Luc Moreau, glaciologist, Chamonix
Emmanuel Reynard, geographer, University of Lausanne



The Trient glacier in 1891



The Trient glacier in 2009. The viewpoint is identical to the one in the photo above, taken one hundred and eighteen years previously.

A changing glacier

Since the end of the Little Ice Age (around 1850), there have been phases when the Trient glacier has advanced, alternating with phases when it has retreated, as shown in the table opposite. However since 1988, it has seen the biggest decline ever recorded since the beginning of measurements (1878): so whilst the snout of the glacier was around 1km from the café in 1988, it has retreated 1,040m between 1988 and 2014. Simultaneously, this retreat has been accompanied by a considerable loss of thickness of the glacial tongue.

The glacier, a giant that has to be monitored

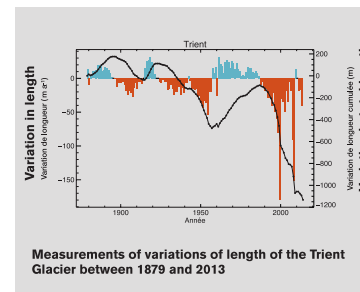
Until 2010, a subglacial pool of water known as La Tine drained almost every year into the right bank of the glacier. This reservoir of water disappeared following the sharp retreat of the glacier. However with global warming and glacial retreat, other dangers emerge around the glaciers: moraines and deglaciation means rock faces can collapse, causing devastating mudflows during heavy rains.

Water supply for the bisse

In 1895, after eighteen years of advancing, the snout of the Trient glacier was 765m from the current café. Those building the 'bisse' irrigation channel tapped the water supply in the glacial torrent, via a channel that diverted part of the flow to the bisse. A few metres away, a sluice allowed the flow to be adjusted. Silt and gravel transported by the flow decanted into a de-silting basin.



Figure close to the sluice, beginning of the 20th Century, with the Trient glacier in the background.

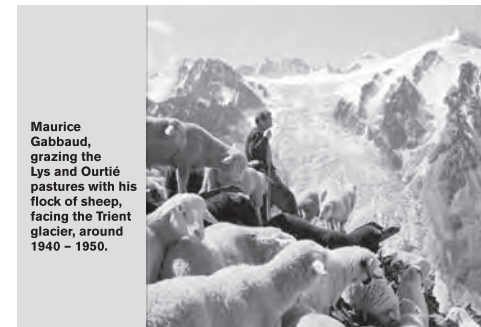


The old café surrounded by farm buildings used for the mountain pastures, around 1970. This building was initially built to accommodate workers mining ice.

The café in days gone by

The first building was constructed in 1883, in order to accommodate workers extracting ice. Since 1914, this building has been run as a café. For almost sixty years, it was run by « Madame Adèle », who was married to « fayerou », Maurice Gabbud, who, every summer, at the end of a long journey of transhumance, would graze the high mountain pastures with some 500 sheep. A few buildings relating to these high mountain pastures can still be seen: the milk cellar, to the right, with its wooden door, as well as a little cheese cellar (under a roof on one side, to the right of the café).

After the original was destroyed in 1978, the café was rebuilt ten years later, as the Chalet du Glacier.



Maurice Gabbud, grazing the Lys and Ourtié pastures with his flock of sheep, facing the Trient glacier, around 1940 - 1950.

Find out the adventures of Charlotte the Marmot on the following educational trails:

