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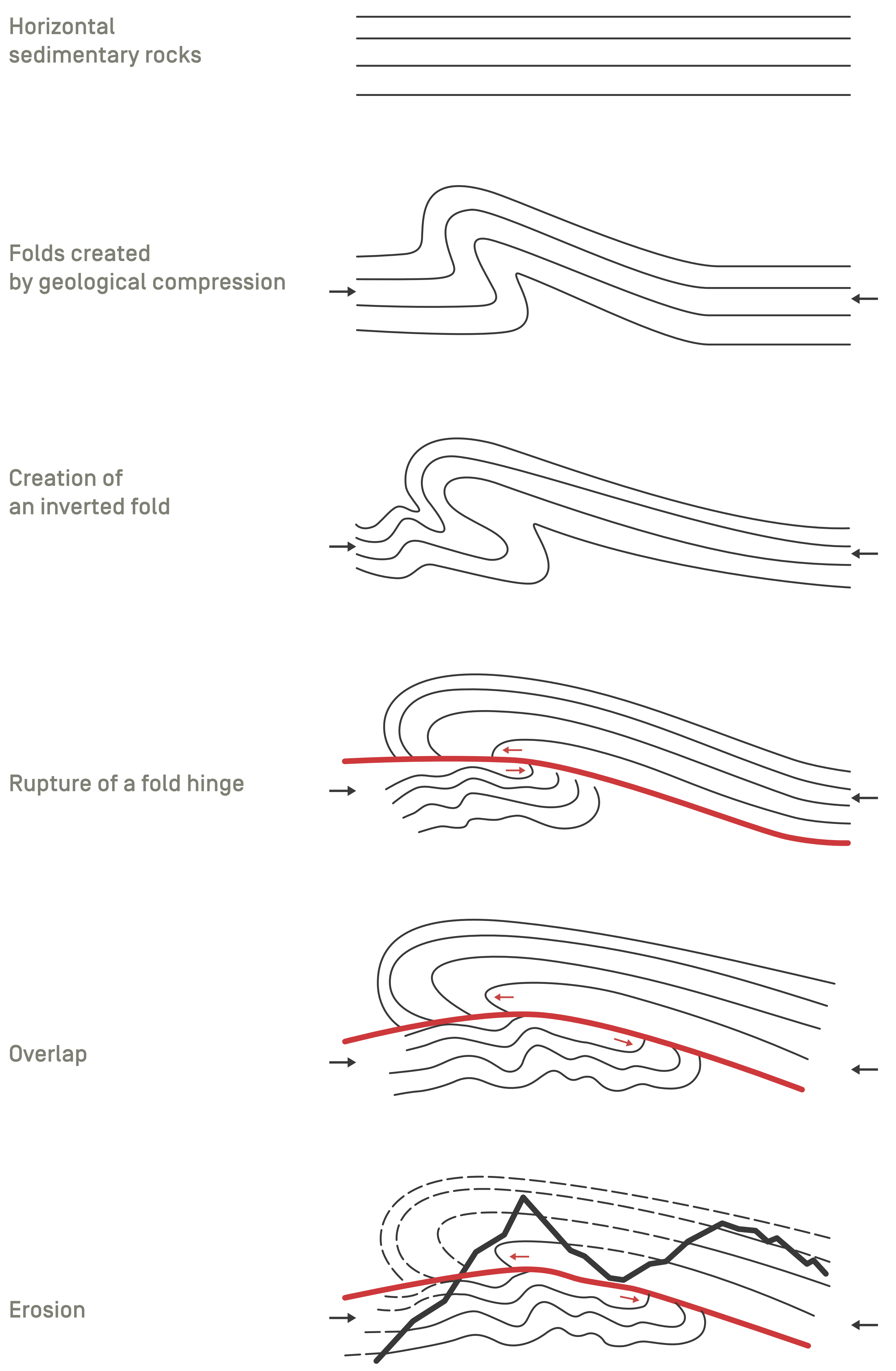


GEOLOGY

THE FORMATION OF THE ALPS

The Alps are the happy by-product of a collision between the African and European continental plates 30 million years ago, although the first bumpy folds in the prehistoric terrain appeared some 70 million years before that. Given that the earth is 4.5 billion years old, on a geological scale the Alps are actually quite young. Today, our mountains continue to rise a few millimetres per year. However, constant erosion due to the multiple onslaughts of rain, wind, running water and seasonal freezing and thawing thwarts their dreams of grandeur.

FAULTS, FOLDS AND OVERLAPS

The colossal forces of compression that birthed the Alps created extraordinary geological deformations ; folded overlaps that moved some rocks over distances of several kilometres. Geologists call these formations «nappes», from a French word and in reference to a rumpled tablecloth. In our region, these overlaps fell right over on top of the remains of ancient mountain ranges made up of crystalline rocks.

***Pas d'Encel** : The name Pas d'Encel comes from the word in local dialect «passadzo d'etchile», meaning «passage equipped with a ladder».*

THE HELVETIC NAPPES

The Dents du Midi mountain range is part of a geological formation called the Helvetic Nappe. This particular fold is made up of a layer of sedimentary rocks more than 1,000 metres thick that were deposited at the bottom of the ocean during the Mesozoic Era between 250 and 65 million years ago.
The «rumpled tablecloth» effect that created the Dents du Midi was so enormous that the younger rocks actually rolled right over and, paradoxically, eventually wound up underneath the older rocks. A formation that presents this unusual reversal is called a «nappe en pli couché» **[1]**. The folds, in this case, are wrapped in a rock called flysch, which is contemporary to the era in which the folding occurred.

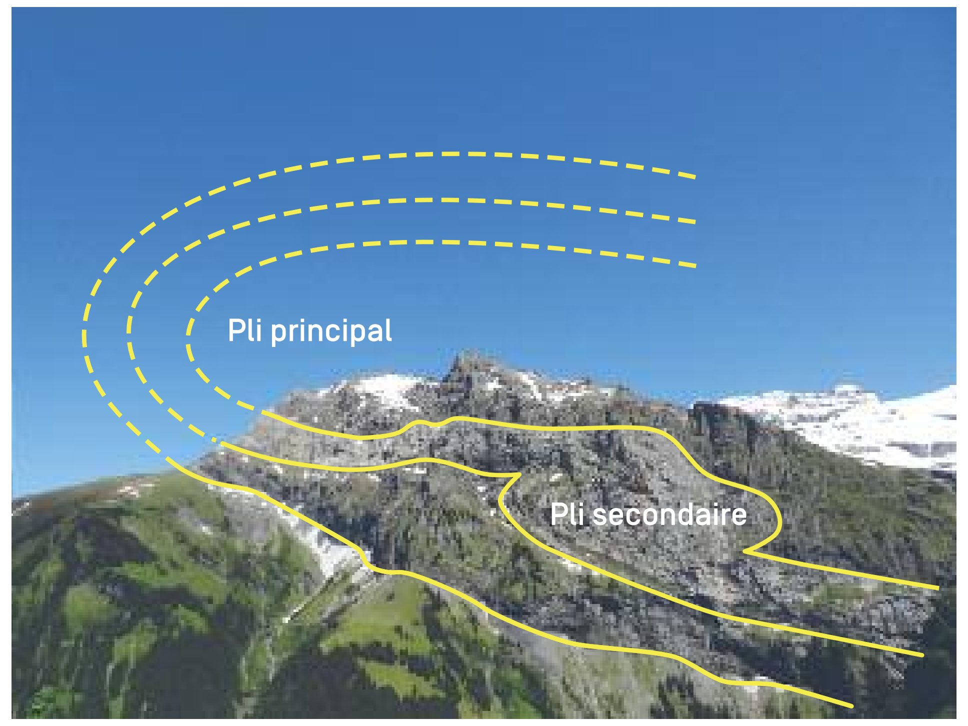
Our local nappe extends from the Dents du Midi to the Dents Blanches **[2]** mountain ranges. Due to erosion, the entire upper part of the fold is no longer visible **[3]**. However, several hundred thousand years ago, the Val d'Illiez probably had peaks over 4,000 metres high.

A HIKE BACK THROUGH TIME

As the chronological order of the layers of rock in our mountains are upside down, the path that leads to the Susanfe Hut via the Pas d'Encel literally goes back in time. The trail begins on Eocene flysch, which is about 40 million years old, and climbs upward towards the Susanfe hut, which sits on a bed of 140 million-year-old Lower Cretaceous limestone. Each step on the trail takes you back in time some 15,000 years !

THE «VIRES»

A «vire» is a narrow, shelf-like ledge, which projects from a rock wall. These ledges are a striking characteristic of sedimentary rocks, where the soft strata undergo a more pronounced erosion than the harder strata. Our ancestors wisely used the vires to forge passage through the rough alpine terrain. These trails are still frequented today and include the Grande-Vire to the Dent de Morcles, the Galerie Défago, Roc-Coupé and the infamous Pas d'Encel*.



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1 Diagram of a «nappe en pli couché».
2 Geological panorama.
3 The Dent de Rosseten with a visible secondary fold in addition to the primary fold.

It is better to limp slowly along the right path than to walk stridently in the wrong direction.

St Augustine

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