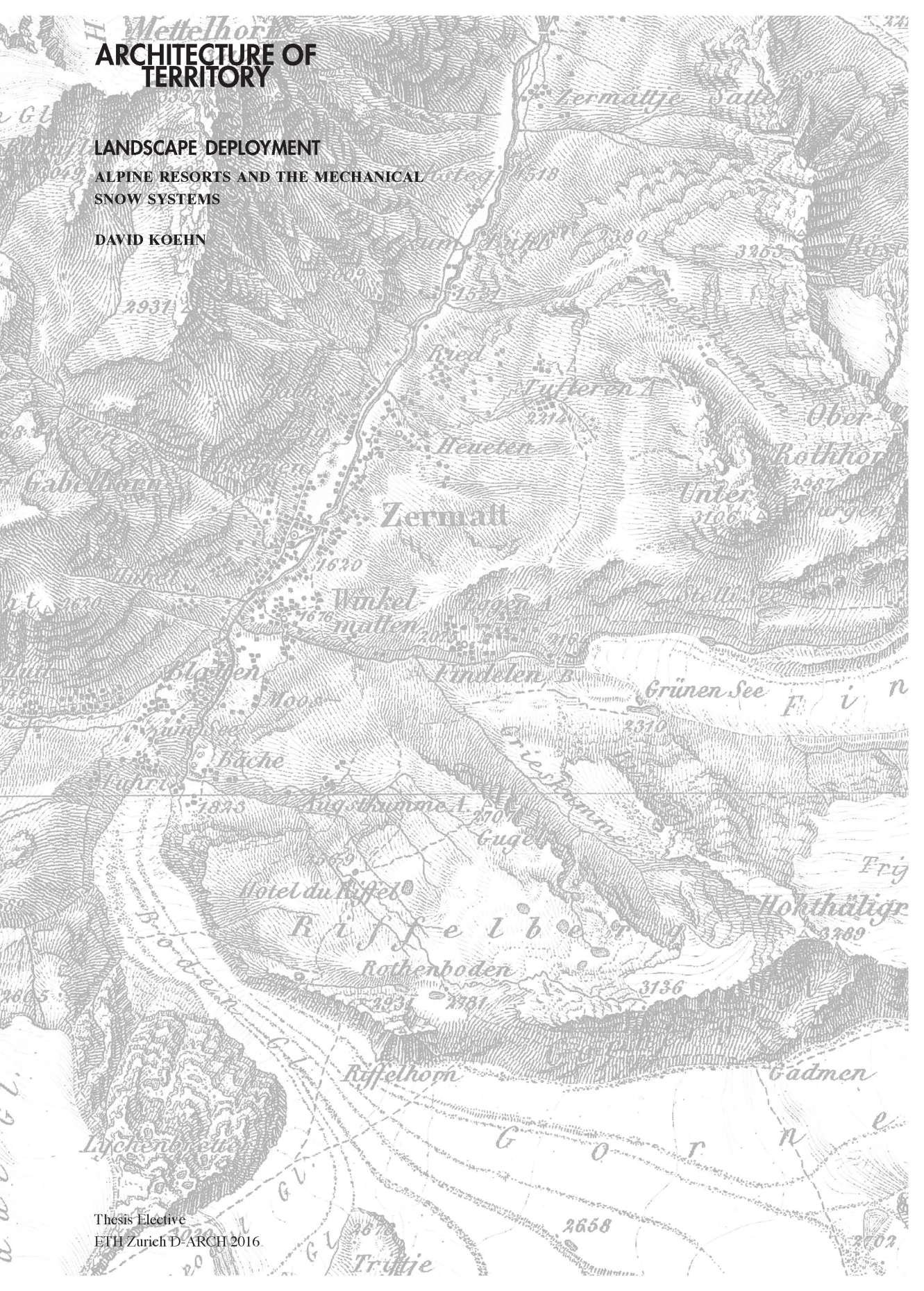
ARCHITECTURE OF TERRITORY

LANDSCAPE DEPLOYMENT

ALPINE RESORTS AND THE MECHANICAL SNOW SYSTEMS

DAVID KOEHN



Thesis Elective
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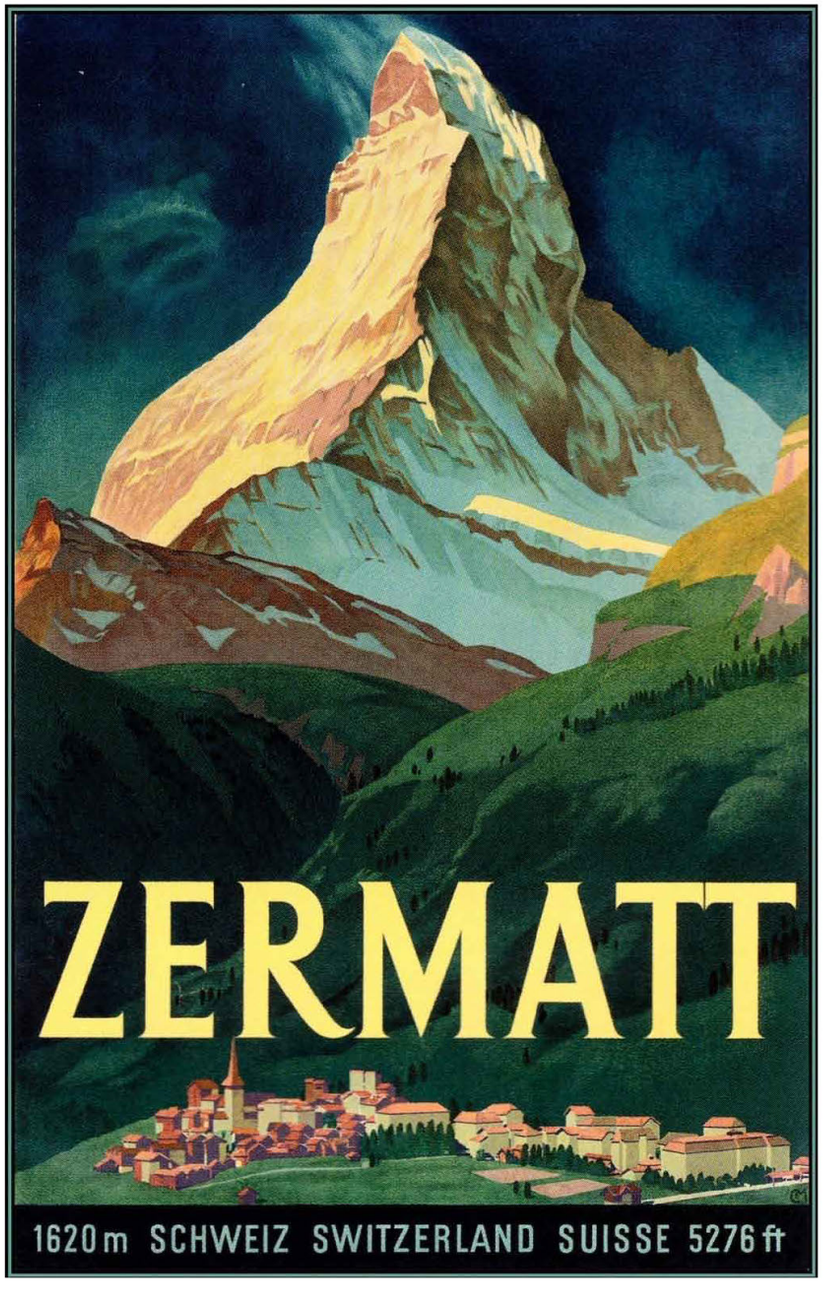


p. 2 Touristic promotional poster for Zermatt, Carl Moos, 1932

Foreword

A few months ago, coming back from a trip abroad, my plane landed in Zurich Airport. The small subterranean train of the airport, was taking us from one terminal to the other when the music started. Cow bells and yodeling singers welcomed us, natives and tourists alike, to Switzerland. Obviously, the idyllic alpine country seemed to be still the main marketing strategy for Switzerland. Getting out of the train, and later in the city, the musical postcard depicted to inbound travelers seemed still very far away.

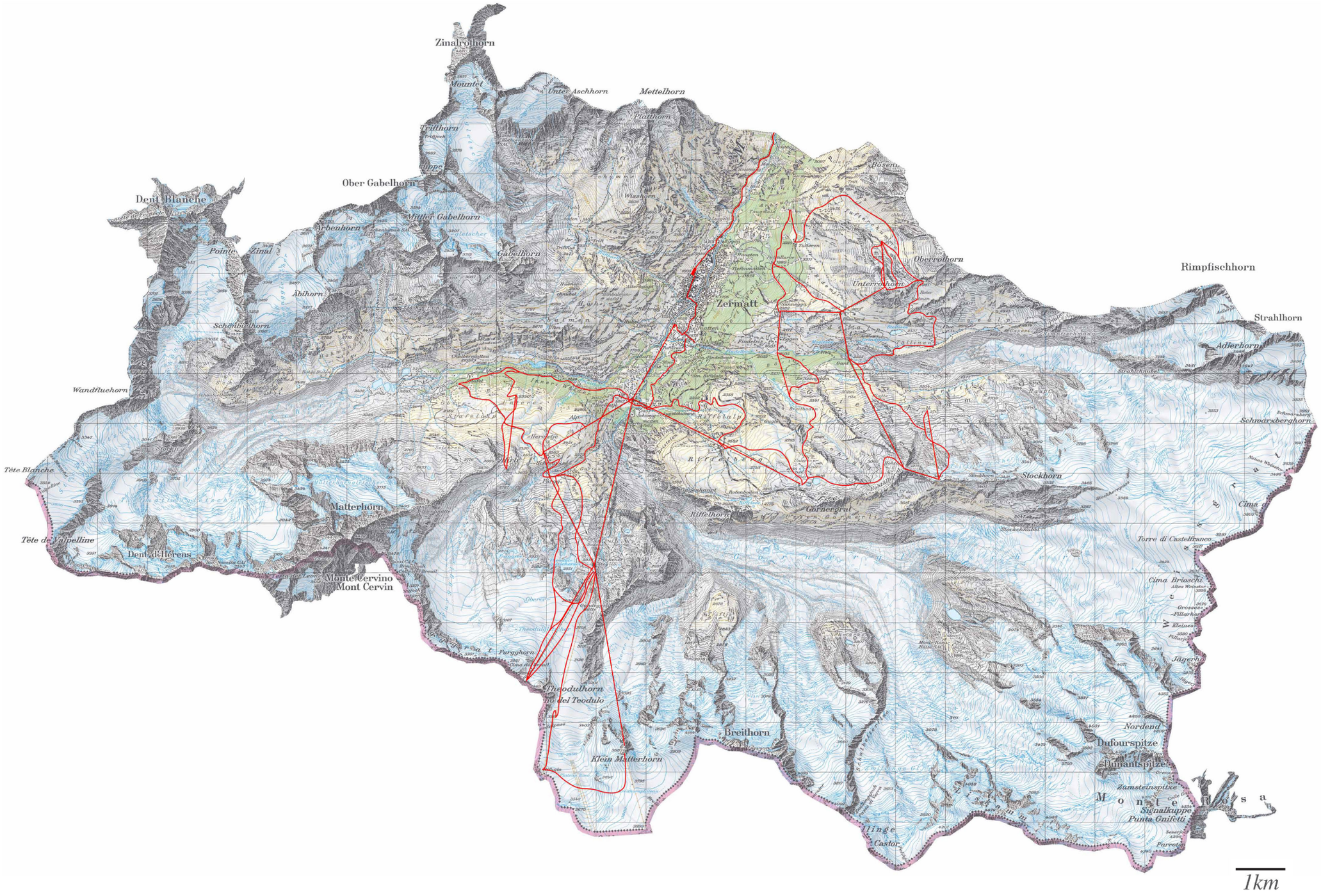
Trying to get a better understanding of Switzerland and its territory, I read for the first time the Swiss Urban Portrait by the ETH Studio Basel. From there emerged a specific interest in one of the 5 types of territory defined in the book: Alpine Resorts. Although their importance on the national level is relatively small, they may still be the base of a national feeling. The myth at the foundation of the country relies on this pastural image of independent, autonomous alpine families. And still today, this myth is a milestone of the Swiss identity, through stories like Heidi, Schellen Urseli and William Tell. It is interesting to confront that seemingly still functioning narrative with the reality of the Swiss alpine territory.

Under the category Alpine Resorts, we would find amongst others St-Moritz, Gstaad, Verbier, Davos and Zermatt. They're defined as « Mountain urban regions (…) whose only important economic activity is tourism ». Other key features are the quality of the infrastructure, similar to those in a city, and their temporary nature, given that tourism depends on the seasons. Those entities are also a big part of Switzerland's fame world-wide, the Davos World Economic Forum, the Menuhin Festival in Gstaad or l'Extrême de Verbier are events, in their own fields, of international importance that echo far beyond their local draw.

It's through a newspaper article that the question of mechanical snow systems arose. The last few winters have seen many smaller ski resorts struggling with very little snowfalls, showing the precarious economic balance of some alpine communities. Since the early nineties, we implemented what we called « mechanical snow systems » or « snow-culture » to provide skiing slopes with snow when needed. The recent dry and hot winters created a segregation between resorts with and without artificial snow. That difference is what the following essay tries to investigate.

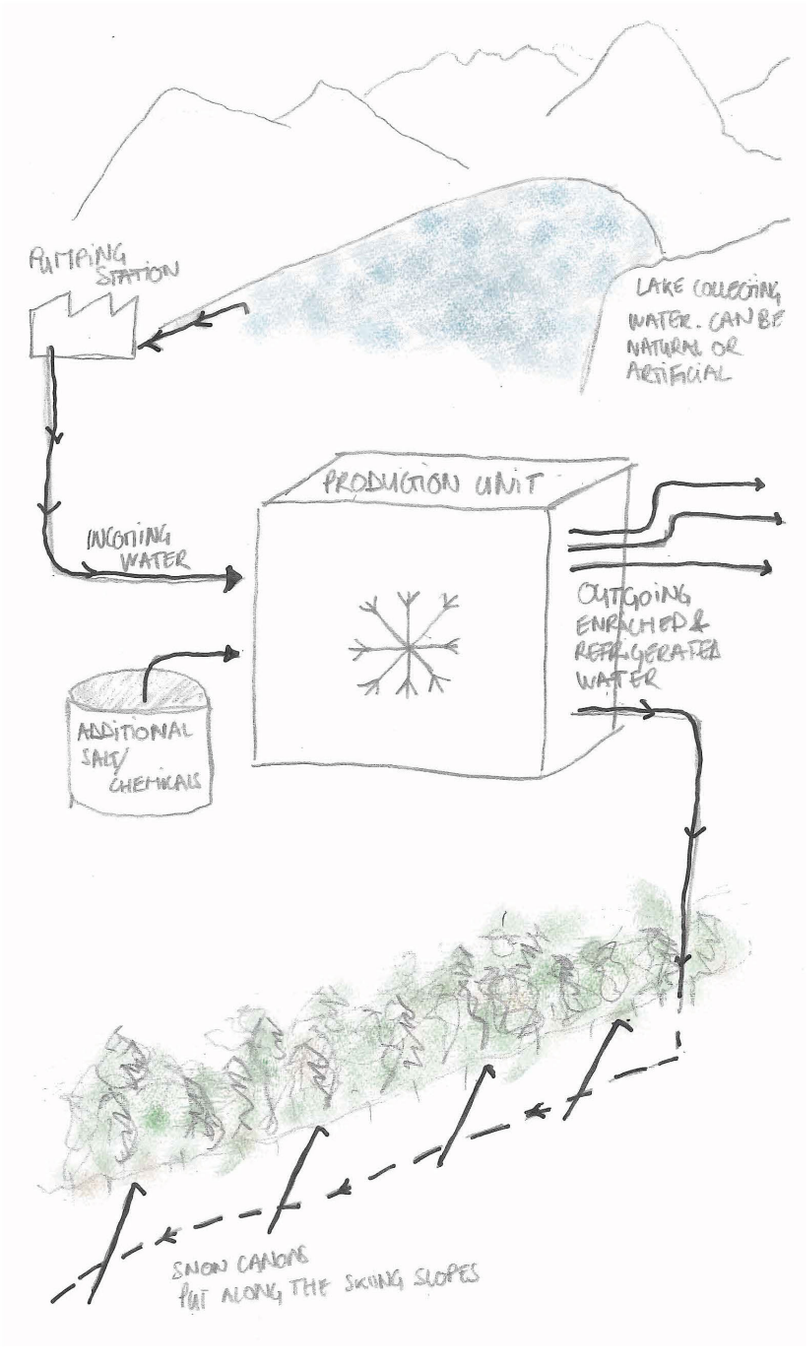
What is the impact of mechanical snow systems on Alpine Resorts?

Map of Switzerland
Zermatt is located at the red dot



Zermatt political territory

The red line represents the trip I made in April 2016



p. 8 *Snow-making process*

Mechanical Snow Systems

At the beginning of the ’90s, a new technology allowed us to create snow on demand. Making snow is not so easy as it sounds. The microscopic structure of snow crystals is something very complicated to reproduce in vitro. The temperature, humidity and pressure parameters are still today to some extent not fully mastered. Nevertheless, for the last 25 years, we’ve been able to produce snow with a similar quality to natural snow, making it useable for skiing.

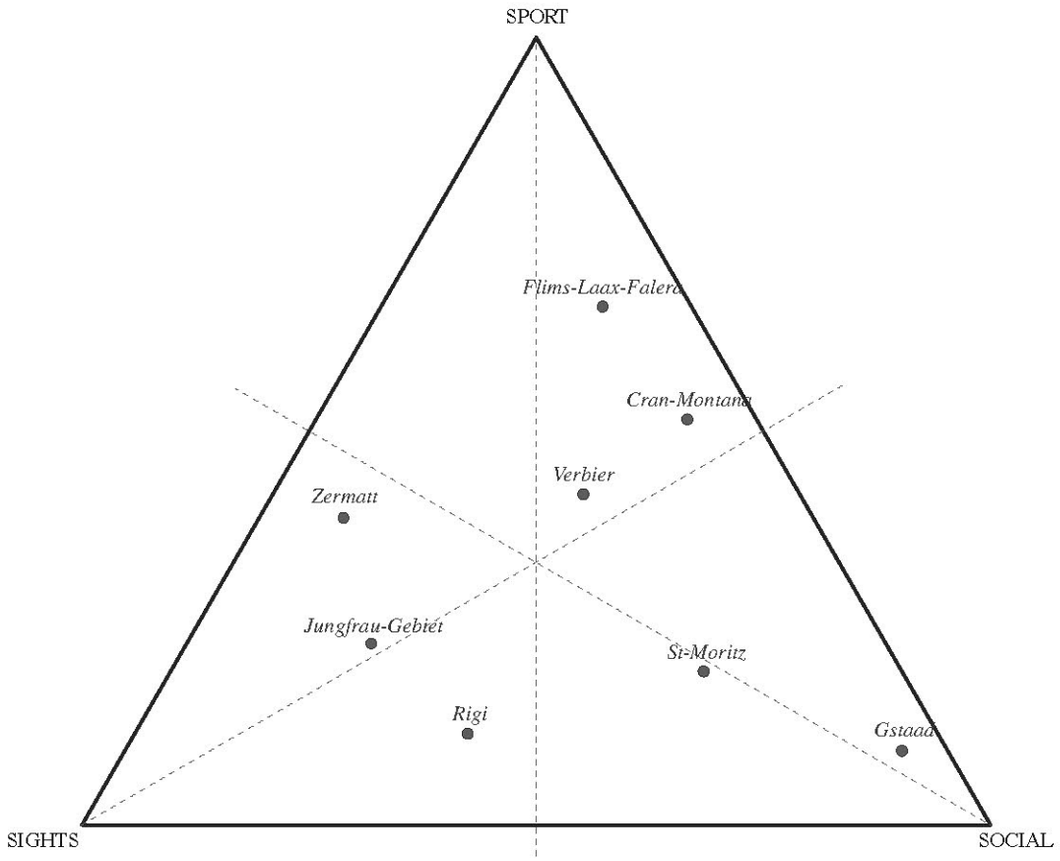
Nowadays, along most slopes in the Swiss Alps, skiers can see tall steel poles on the side of the slopes approximately every 20 meters. Those are call « snow-guns » or « snow-canons ». They’re the visible part of the mechanical snow systems. In deed, the infrastructure needed to produce snow is much bigger and is spread across a much larger area.

The first piece of the system are the lakes. A large quantity of water is needed to cover up the slopes with snow. Knowing that for instance Zermatt has 360km of skiing slopes, we can imagine the volume of water that it represents. All that water is taken from lakes. Some are natural, more are artificial lakes, filling up in summer with the melting of the glaciers. The water is then pumped from the lakes to production units. Depending on the size of the domain, it’s possible to have one central facility, or several.

In those snow-plants, water will be mixed with different chemicals or salts. The legislation concerning the use of such additives varies from country to country and we sometimes lack distance to judge from the effect of a product. In Switzerland, it seems one product is allowed, based on dead bacterias. It allegedly betters the quality of the snow produced. (Some ecological groups are concerned that although the bacterias are dead, when the snow is melting, the concentration of biological matter within water sources rise to an alarming level. But so far it seems the local community are not suffering from side effects.) At that stage of production, water is also refrigerated, the water temperature needs to be close to zero degrees Celsius before it is sent to the snow-guns.

Finally, the cold and enriched water is provided through kilometers of pipes to the snow-guns. There it is sprayed into the air and will end up on the skiing slopes as snow. The snow-gunsare mostly used during the night because the lower temperatures make it easier. But at the beginning of the season, during the first weeks when the climatic conditions are fulfilled, it’s not a rare thing to see the system running night and day.

It is to be mentioned that this snow-guns benefit from a wide support throughout the population. It doesn’t make noises, it’s almost invisible in the landscape, and if one skies while it’s sprinkling snow, it’s rather a magical thing than a nuisance. But although its use isn’t really contested, we think it’s fit to study the way the introduction of that technology changed our perception of the landscape. Or rather, how it is maybe the symptom of a deeper transformation of the territories surrounding the Alpine Resorts. And to begin with, the next chapters will study this interaction through three keywords: Tourism, Seasonality and Territorial Control.



Non-exhaustive ranking of Swiss Alpine Resorts

1: Tourism

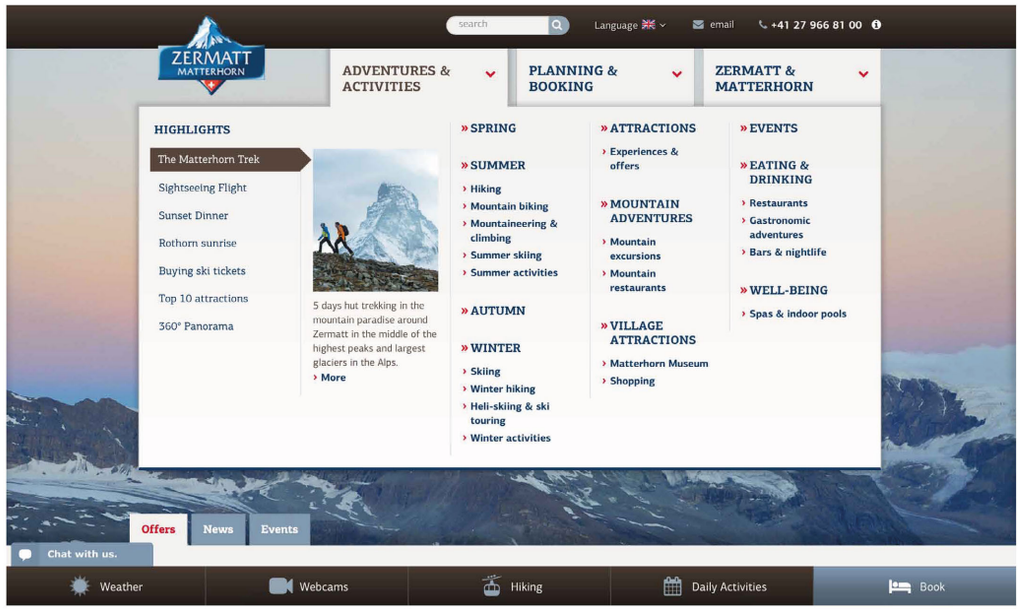
The first subject to address when looking at the mechanical snow systems is tourism. In deed, it's the essence of the Alpine Resorts. To begin with, an analysis needs to be made concerning the kind of tourism expected in those Resorts. In the following chart, the touristic profiles of the Alpine Resorts are defined as a combination of three marketing arguments : Social, Sights and Sport.

Social refers to the character of some Resorts that attract certain types of people. For instance, Gstaad, in the canton Bern has not much else to offer than it's social scene, but it's enough to attract every year some of the most rich or distinguished people in Europe. It's a mark of prestige at the same time for the Resort and the tourist. The politicians have little influence on that aspect. The renown of a Resort usually stands on a long tradition that one cannot improvise. Two tools the cities have, nevertheless, could be the fiscal policies (to attract rich citizens) and festivals (classical music, opera, jazz, …).

Sights stands for the specific natural features that would attract masses to a certain destination. The Matterhorn in Zermatt or the Jungfrau, are the most famous examples in Switzerland. Of course, all Alpine Resorts, because of their locations have a Sight aspect, but some panoramas have become so famous that they justify the trip. Here too, the politicians have few tools to generate a bigger Sight coefficient outside ensuring access to the views.

Finally, Sport, and especially winter sports, are at the heart of the tourist attractions at the Alpine Resorts. But if they all have skiing infrastructures, some have made it their specialty and have focused their offers on that. It's needed here to separate between summer sports and winter sports. On the one hand, the summer sports demand generally relatively little infrastructure with little maintenance. On the other hand, winter sports that we could summarize to skiing, require slopes, ski-lifts, restaurants, etc. Another distinction to be made is the communication on alpine sports and the actual practices of the tourists. Most images linked to sport-tourism will depict extreme athletes walking on a glacier, falling down in a wingsuit from a peak, or climbing vertical granite walls. The rhetoric is fully focusing on adrenaline, spectacular feats and untamed nature. Somehow, the tourists must relate to the extreme sports, although their own skiing trip will be probably more about hot chocolate and röstis.

Nevertheless, Sport is probably the easiest category of the three to manipulate. Mechanical snow systems are typically an investments that will increase the Sport attraction of a resort and will give him arguments in the fierce battle with the other resorts.



Zermatt's website
Activities are listed under Summer or Winter, Fall and Springs are empty sections. Furthermore, we basically find the same sports under Summer and Winter

2: Seasonality

Historically, mountain stays were more or less equally frequent in winter or summer. It's only in the Post-War period, and the extreme development of skiing that Alpine Resorts became essentially winter destinations. The hotels were being progressively left empty from March to December. Multiple initiatives were made to increase the summer activities, with relative success. But winter is still the high-time for Alpine Resorts. The reasons are diverse and don't all relate to the resorts themselves: it's a well anchored idea that summer vacations stand for beaches and winter ones for skiing slopes. It's also justified by the fact that it's economically much more interesting to host tourists in winter: more gear rental, ski lifts passes, expensive high-altitude restaurants, etc.

For the rest of the domain, the tipping point between summer and winter happens in October. When the temperatures hit the proper level, the mechanical snow system start functioning, producing snow that will prepare the slopes for Christmas, the official start of the ski season. They will keep being used throughout the season to make sure that the slopes have sufficient snow covering. In certain year, such as the winter 2015-2016, the weather conditions would almost made it impossible to open the ski domain without the help of artificial snow. The Easter vacations are usually the end of the season.

Summer is time for checkups and inspections of the mechanical snow infrastructure. The snow-guns are removed from the landscape and stored away, new conduits might be dug, lakes are filling up. But that period of rest only vaguely overlaps the climatic seasons. As long or as soon as clients are ready to pay their day pass, the engine keeps going or starts. It tends to stretch the « winter » far beyond the would-be skiing season without mechanical snow systems.

The Snowmaker.
The unique process developed by Zermatt and an Israeli company to make artificial snow production more efficient.

3: Territorial control

Let it be said: the Alps have been transformed, exploited, curated by men for long centuries. Farmers living in so called alpages (summer estates) cut trees, built barns, cultivated the soil and made paths all over the Alps. In recent periods, the national agricultural policies underlined the importance to maintain a farming activities in the mountains, defining even the farmers as the gardeners of the Alps. Well before massive built structures such as dams or trains got built in those areas, we could argue that it was already a man-impacted landscape.

The real difference brought with the mechanical snow systems is the centrality of the territorial control. When the landscape was divided between the small alpages, decisions were taken individually by farmers. The result was a decentralized process of transformation. Nowadays, in order to organize the ski industry, and even more so with mechanical snow systems, the territory surrounding the Alpine Resorts are monitored by a central organisation.

The new link between the village itself and the surrounding territory is also the result of the new dynamics of tourism. The visitors are not travelers in search for serendipity, they're groups that follow pre-organized tours. The stays are carefully timed and activities must fit into this frame. Resorts have then the duty to provide such groups with itineraries, a condensed experience. Artificial snow is only one element of the mise-en-scène.

With mechanical snow systems, resorts moved from a model where they used the landscape, organized its exploitation, to one where they produce a landscape. The central planning creates a good that one can shape, modify, adjust following the demands and needs of the tourists.

Photographs taken in April 2015.
The snow guns are visible only because of the orange protecting mats. The slopes are clearly visible in the landscape because the natural snow was very scarce this year.

The case of Zermatt

In the Swiss Urban Portrait, Marcel Meili uses Zermatt as a case study for Alpine Resorts: they have to be looked at with an urban perspective because their history has always been the history of the bigger urban centers and their tourists. Tourism is a city-dweller activity and touristic destinations have been thought and conceived as a counterpoint or at least a complement to cities. The once almost autonomous villages living off herding cows and small scale agriculture are long gone and the few remains of that age are protected for marketing purposes. Zermatt is a at the same time a perfect example of that dynamic and a special case. The fame of the resort thanks to the Matterhorn is worldwide and guarantees a certain touristic success.

When considering artificial snow, Zermatt is unique. It was amongst the first resorts to implement mechanical snow systems on its skiing slopes and ever since, it remained a major actor in that field. In the mid 2000 it even developed a partnership with an Isreali company to improve the technology. But when it comes to marketing, a unique artificial snow production process is not convincing. We only witness and praise the result but not the cause itself: very few people are aware of the infrastructure deployed throughout the territory, but everyone will notice the white and spotless slopes.

To come back to the Alpine Resort attractiveness chart, Zermatt has one of the biggest Sights component. The Matterhorn pulls countless crowds of tourists coming to admire one of the most famous mountain profile of the world. The other mountains surroundings Zermatt go almost unnoticed although they're amongst the highest in the Alps. And thanks to those other summits, Zermatt is also a base camp for many iconic alpinism routes.

For less adventurous tourists, Zermatt developed one of the biggest ski domains in Switzerland, (and of Europe if we include the slopes in Italy). The size of the infrastructure is such that it's almost impossible to visit it all in one skiing-day. It is clearly a magnet for skiers coming from all over the planet. But Zermatt has another unique asset: the Théodule Glacier, sprawling from the Matterhorn to the Klein Matterhorn along the Italian border. This glacier is open year-round to skiers. Only a couple of such glaciers exists in the Alps, and even in the world, making it possible for professional athletes to come and train, even in summer. Here too, mechanical snow systems are being considered to slow down the melting of the glacier.

The glacier puts in question the definition of skiing as a winter sports, but nevertheless, the summer landscape is clearly identifiable. The real confusion takes place in spring and autumn when skiing slopes still endure despite the temperature. The landscape is then brown-green from the sprouting plants with some white stripes, chiseled by the artificial snow.

But summer reveals also parts of the infrastructure such as retention lakes and dams, pumping stations, major water tubbing, etc. It's in summer that we can really take the measure of the management of the territory surrounding Zermatt. From here, it becomes then obvious that organization was a key aspect. The contrast to a resort such as Les Diablerets is substantial. There, the slopes cross different plots of land used by farmers in summer and each owner agrees to his land being used for recreative purpose. But because of that fragmentation, decision making is long and arduous. In Zermatt, on the opposite, the power of the Zermatt Bergbahnen AG (the company owning and running the ski lifts, restaurants, ski schools, etc) is visible and it doesn't seem there is any sort of resistance from the locals.

The life buoy is quiet an unusual encounter on the skiing slopes. The explanation is that the white flat area next to it is an artificial lake for the snow production.

A south-exposed mountain side exemplifies the lack of natural snow during the 2015-16 winter. Slopes are maintained only thanks to the artificial sow systems.

Landscape Deployment

In our research, to describe the impact of the mechanical snow systems on the landscape, we used the term « Landscape Deployment ». It refers to an intervention on an at-war territory to protect specific interests. Through the three topics developed earlier, we can define the landscape deployment as being the reinforcement of a specific climatic condition on a territory to ensure its economical exploitation. The military vocabulary, is for us justified because of the scale of this intervention: zoomed out to have an overview of Switzerland, the map of the artificial snow systems recalls the maps of bunkers and the famous Reduit National strategy of World War II. The transformation, although concentrated in the Alpine Resorts, is happening at a scale that so far, only state-driven organizations had reached.

The urgency that appears to be the driving force behind recent changes on the Alpine Resorts results of different factors that one could summarize as economical survival. In deed, Alpine Resorts are before anything else production spaces; it's even in the very definition that the ETH Studio Basel gives of them. So before being a social, cultural or even geographic reality, Alpine Resorts are businesses. The cultural identity that once defined the different valleys, regions, although being still at the heart of the marketing strategies, seem to have already been diluted, probably with the development of mass tourism. This is true for Switzerland and also probably for most modern Ski Resorts. For example in the USA, Resorts such as Aspen have been created to host skiers. Those didn't arise from a pre-existing village, they were planned and conceived as a place for leisure (and maybe health).

Amongst the sources of this crisis, one that is often mentioned is the globalisation of touristic destinations. The democratization of airborne travels allowed people to go to touristic destinations that would a few decades ago require days, weeks or even months to be reached. This directly impacted the touristic market in Europe. At the same time extended the possible client pool, but it also gave more opportunities to the same client pool. In the case of the Swiss Alpine Resorts, it seems that the new client are still not enough to keep all the Resorts alive. Year after year, the ski industry is being concentrated in few big Alpine Resorts. That situation is also part of the ETH Studio Basel analysis: They divided the Swiss Alps in two categories: Alpine Resorts and Fallow Lands. The latter represent areas where the population (and the economic activity) is dwindling. They're a powerful counterpoint to the Alpine Resorts because they represent the vast majority of the Alpine Territory. It's also thanks to them that we can really measure the speed of the transformations in the Alpine Resorts.

Another aspect of the Landscape Deployment is a paradox: every intervention, every new installation that takes place in the territory surrounding an Alpine Resorts is supposedly beneficial for the economic activity, but at the same time, it's also a threat. In deed, we all witness how the marketing strategies have two axis: one is based on the mythical alpine village, remote and preserved from the perversion of modernity, the second one is the scenery. It's useless to try to explain how crucial is the Matterhorn for Zermatt. So the question, is until when can we keep building infrastructure, devices in a landscape before it has lost its worth? When will the people perceive the mise-en-scène more than the actual scene?

Conclusion

The Alps have undergone major transformations in the last Century. It's not necessarily a surprise as the same could be said of pretty much anywhere on the planet. What makes the Alps so specific in Switzerland is that ambiguous place they hold in our society. They're at the very heart of our national idea, they're our pride and our visit card, but they're also quite peripheral. Very few are the Swiss who are dealing everyday with that territory. I guess Zurich is a good metaphor: one knows that we could see the mountains from Bürkliplatz, but the weather being mostly grey, it's quite a rare sight.

Another aspect of that attachement to the Alps in the Swiss identity is the image of stability. It's even a fundamental posture of Swiss politics. (There the line blurs with passivity, but that's an other discussion). To come back to Bürkliplatz, we assume that overtime the clouds will go away, we will be able to admire the majesty of the Alps reflecting on the waters of the lake. A beautiful metonymy for a sort of ever lasting pristine world, where we could always go back for a sunday hike or a ski trip.

And precisely, that love we feel for the mountains and the feeling of duration they give us is in our opinion the very reason why we are so blind when it comes to think about the Alpine Territory today, and even more tomorrow.

The future of the Fallow Lands is taking place nowadays at the parliament. A state-supported economy seems to be the only vision we were able to have. It's no more a question of development, but we're trying to maintain a status-quo, to conserve communities living there. The dependance resulting is vicious. It's only a matter of time before we decide that subsidies, mostly coming from economic centers would be better spent supporting a city-related issue rather than helping cow herds to survive. Nevertheless, at least in Western Switzerland, no alternative has been proposed, not even did the Fallow Lands try to create a common project for their future.

Concerning Alpine Resorts, the story is quiet different. The only way seems to be into further developing the touristic offer. Bigger, more efficient, more confortable, more spectacular, the only economically sustainable strategy is to remain at the very top of the global touristic destination. Artificial snow systems are part of that approach. Although it seems shortsighted, seeing that the overall frequentation of Swiss Resorts is decreasing year after year and that the potential for skiing is already well exploited, it's not easy here again to find an alternative to the Landscape Deployment today in Switzerland.

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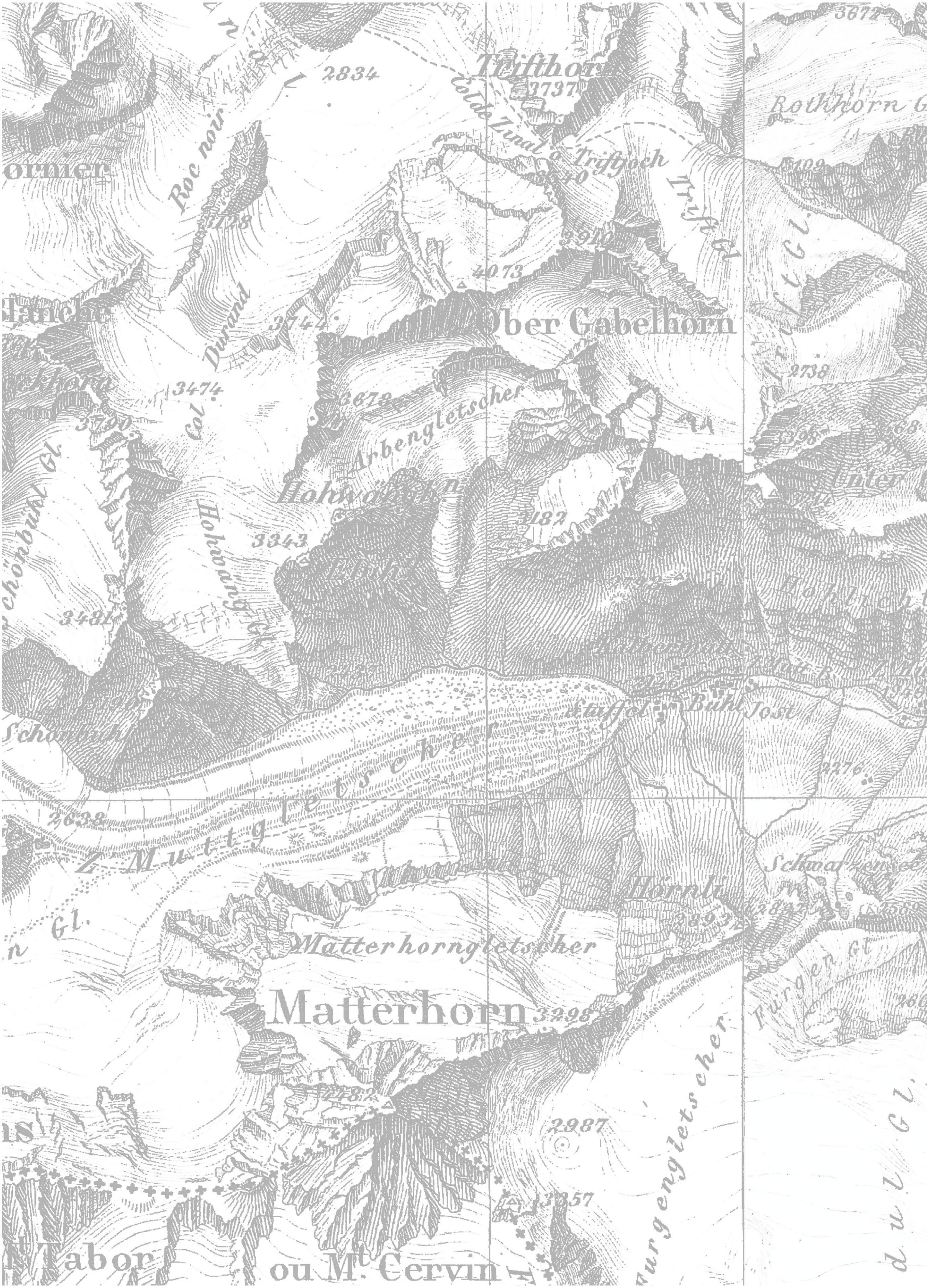

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