



# Reconstructing the Historic Landscape of Larochette, Luxembourg

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**Abstract.** Cultural Heritage education relies on a solid foundation of scientifically validated knowledge. This case study shows how different disciplines come together to source, combine, and interpret data for a landscape reconstruction of Larochette, Luxembourg. It is the initial stage of a larger interdisciplinary project to create an educational game that highlights the tangible and intangible heritage that can be traced in the town's structures even today.

**Keywords:** Cultural heritage · Interdisciplinary · History  
Reconstruction · Larochette · GIS · 3D modelling · Landscape  
Tangible vs. intangible CH

## 1 Introduction

The reconstruction of the town and castle of Larochette, Luxembourg is a case study that shows how our expertise combines to create and validate a scientifically accurate model of a historical cultural landscape. This is the initial stage of a larger endeavour: to design an educational game that reveals the connection between a town's past and the names of its squares, streets, and even car parks—a visualisation of its intangible heritage. Our interdisciplinary approach, which draws on history, heritage science, linguistics, architecture, and interaction design, reveals the town to be a palimpsest, with traces of its history preserved within its structure.

It highlights the importance of context in heritage. Our changing perspective on history acknowledges that the castle did not exist in isolation; rather, it is part of the cultural and socioeconomic construct that is a fortified medieval/early modern town. Our analysis will attempt a snapshot of the landscape ca. 1550 in order to provide a backdrop for a reconstruction of the castle at the peak of its development, before it fell into ruin, and the town continued to develop independently [1].

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The original version of this chapter was revised: Inadvertently the funding institution was not mentioned in the original chapter. A footnote for the explanation was added on the first page of the chapter. The correction to this chapter is available at [https://doi.org/10.1007/978-3-030-01765-1\\_34](https://doi.org/10.1007/978-3-030-01765-1_34)

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The town of Larochette is located in the centre east of the Grand Duchy of Luxembourg and was already settled during the Roman era. The castle and the House of Larochette later rose to prominence during the High Middle Ages, but became less significant in early modern times. [2] Due to many divisions of the estate and internal squabbles, the castle fell into ruin. [3] Until the 20th century, the town was well renowned for its cloth manufacture, but today, its main industry is tourism, the picturesque ruins of the castle attracting visitors with outdoor pursuits like hiking and camping [4] (Fig. 1).



**Fig. 1.** Larochette castle and town, seen from the watchtower.

The Grand Duchy of Luxembourg is known for its linguistic diversity, as French, German, and the native Luxembourgish are all national languages. Luxembourgish is usually a spoken language, while French and German are primarily administrative. As a result, French and German have a lingering influence on the naming practices of places. Major place names have up to three official names<sup>1</sup>, and minor place names were often transliterated into German rather than rendered in Luxembourgish when they were initially recorded<sup>2</sup> [5].

## 2 Data Overview

Our landscape—cultural or natural—is a *dramatype*,<sup>3</sup> an emergent pattern that evolves and adapts to its changing environment without ever being completely

<sup>1</sup> Such as the three official names for Larochette; *Larochette*, *Fels*, *Fiels*.

<sup>2</sup> We use the term *minor place names* or *micro-toponyms* for anything smaller than towns (e.g. fields). Their meanings are provided in idiomatic English for purposes of this article.

<sup>3</sup> In biology, a “dramatype” is an organism that adapts to changes in its environment directly, within the lifespan of a particular individual, as opposed to the phenotype, the expression of the genotype of a particular population that has developed within a particular environment. (See “The Principles of Humane Experimental Technique”, W.M.S. Russell and R.L. Burch, 1958).

destroyed and rebuilt, so that the structure of the original can be read in the traces that remain. While some elements can change drastically in centuries, decades, or even years—buildings, land use, and, historically, the courses of rivers, and others remain fairly constant. Of course, the most persistent feature is the underlying geomorphology, but major roads, property boundaries and landmark structures are also often remarkably slow to evolve—as a consequence, the landscape itself is our main primary source (Fig. 2).

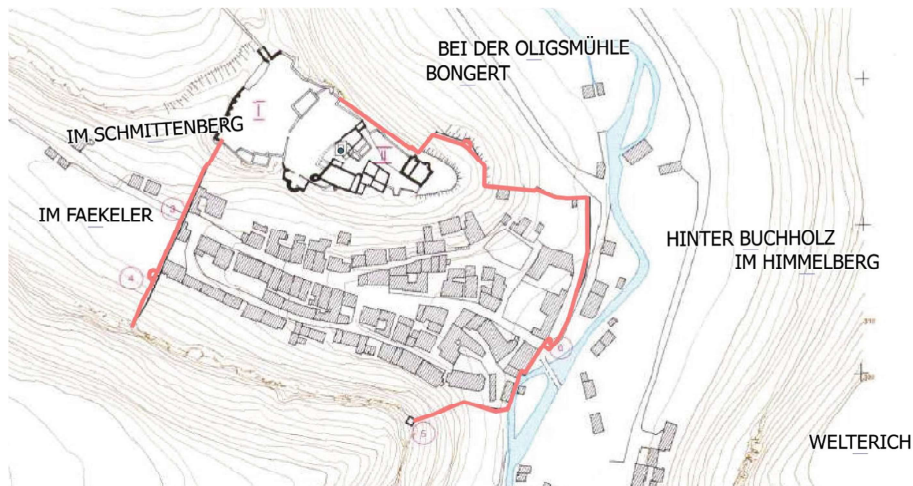


Fig. 2. Location of former town walls and place names.

Little scientific research pertaining to our case study has been published, so we amended our initial survey using other sources relating to historic landscapes. These include archaeology, place names, aerial and historic images, maps, local history and other related fields. As no official archaeological documentation was ever produced, we relied on the archaeological data on Larochette Castle provided in ZIMMER (1996), a book that includes surveys of the castle ruins, but also overview maps of the town walls and other landscape features. Primary sources on the castle, the town, or the House of Larochette are found in the form of legal treaties. The open data portal of the Luxembourgish state ([data.public.lu](http://data.public.lu)) and the website of the land registry office (<http://geoportail.lu>) gave us access to orthophotos, modern and historic maps, including the 1777 Ferraris map and historic cadastral maps, land use, toponymic and other geographic data. The two-volume special issue on Larochette of the journal *Cahiers Luxembourgeois* (1938), which includes articles on regional and local history and the toponomastic landscape, is a concise overview of secondary sources [6].

While much of this material dates from well after the period we are reconstructing, and although many descriptions are rather romanticising, rather than showing a contemporaneous reality, they were still useful in assessing the situ-

ation in Larochette, which has changed more significantly since the 1950s than in all the preceding centuries.

### 3 Methodology

#### 3.1 Desk-Based Study

Our initial overview was a desk-based comparative study, combining data from our individual disciplines. This yielded enough material for a rudimentary assessment of the castle of Larochette and its immediate surroundings.

To give our data a spatial context, we conducted a GIS analysis. This allowed us to define our study area. A pragmatic decision was made to limit it to what can be seen from the castle itself. A viewshed analysis of the official 5 m resolution digital terrain model using observation points on all of the castle's towers<sup>4</sup> revealed that, due to the hilly terrain, nothing outside a 5 km radius was visible from the castle, and all man-made structures shown on historic maps fell within 2.5 km. Since the study focuses on the cultural landscape, the smaller circle was the obvious choice. Our work mainly focused on the area that is both visible from the castle and within the bounds of the town as shown in the original cadastral map [7].

To help identify features, the first cadastral maps of Larochette (1824) were georectified and layered over modern maps and orthophotos. Finally, we added the local minor place names, land use data, and drew in J. ZIMMER's hypothesised town wall as a linear feature.

#### 3.2 Fieldwork

Although terrain maps and satellite images provide an overview, the importance of comparing data from primary and secondary sources to the modern terrain was immediately apparent when we visited the site. We acquired new data in the form of details not considered important by cartographers or impossible to reproduce in a map—the names of car parks, a GPS-tracked walk along the postulated town wall supplemented by photographs of turning points, a feeling for the steepness of the climb to the castle, details of watercourses, soil and vegetation.

#### 3.3 Cross-Validation

Our analysis shows a striking contrast between the areas inside and outside the town walls—while the building footprints, streets, and property boundaries within the walled town remain remarkably constant, the area just outside the original town gate on the eastern wall on the other side of the river is quite volatile. Two roads are combined into one, property boundaries disappear as

<sup>4</sup> The observer's height above the ground was roughly estimated from the number of stories in each part of the building.



fields become houses, the river is straightened and partially paved over, a new square is created, the town gate gives way to a wider bridge and a new road leading through the town, and a larger church is built along the eastern edge of the valley.

But how can we draw conclusions about the 16th-century town based on its 19th-century state? Industrialisation had a much larger and much more sudden impact on the landscape than previous developments. The town's population, reasonably steady throughout the preceding centuries [8], suddenly grew, farming gave way to industry, and a railway connected the town to the rest of the Grand Duchy. The landscape before the industrial revolution, which arrived in Luxembourg in the 1840s, is more similar to the 16th-century landscape than it is to the present day [9].

In fact, even the modern place names may not necessarily be historically correct. For cross-validation of our theories, we can refer to other data points. Minor place names are a good indicator of the previous use of a particular piece of land. The medieval town wall has angles built to accommodate an existing building. Surviving medieval documents refer to the town, its landscape, and its early industry.

The importance of cross-validation of sources to eliminate false conclusions can be demonstrated using the example of the place name *Schmittenberg* (i.e. smith's mountain) in Larochette town, near the western gate close to the castle, which at first glance implies a smithy. Its absence in the first map does not necessarily suggest that there was no such place, just that it might not have been important enough to be put on the map. However, the value of a field survey soon became apparent, as we found an inscription above the door of a nearby house that identified the owner as one *Johannes Schmitz*, who presumably lent his name to the street.

## 4 Historic Land Use

As in any medieval town, the majority of Larochette's landscape was dedicated to agriculture, primarily subsistence farming. Our knowledge of this comes primarily from minor place names designating fields, streams, hills, etc. Many of these indicate crops and the demarcation of certain fields set aside for planting. These include *auf dem fischten Stück* (i.e. on the forward-most plot), *in den Theilen* (i.e. in the section of fields). Others evoking the elongated shape of a plot—such as *Langfeld* (i.e. long field)—evidence crops like wheat, as they suggest ploughed fields [10]. The valley and river have names relating to wetlands, such as *auf dem Wasser* (i.e. on the wetland) or *im Weiher* (i.e. in the pond) [10].

Situated close to the city walls, *Bongert* and *Oligsmuehle*, also relate to agricultural production, the former referring to an orchard, the latter to an oil mill. The earliest evidence of these names is the first cadastral map that dates to the early 1800s, but the names themselves and their locations suggest an earlier usage.

Livestock farming is evidenced by names such as *auf dem grossen Driesch* (i.e. on the big common), *Platzwies* (i.e. a meadow) or *Bourenpesch* (i.e. pasture close to water, from lat. *pascua*, pasture), while others relate to woods, like *Weltrich* (i.e. rich in forest) or special trees, such as *Bürkelt* (i.e. birch field). Beyond such toponyms as *hinter Buchholz* (i.e. behind the cleared land), the oil mill that was formerly a sawmill evidences the production of timber [12].

Numerous mills in Larochette attest to early industry, but the most important by far is also the oldest, the *Bannmühle* (i.e. bound mill). The name attests to a mill soke (*banalité du moulin* in French), meaning that locals were required to use only that mill to grind grain. This law gave the House of Larochette economic control over the villages under its dominion. A 16th-century edict dictates a hierarchy for use of the mill, which was broken down by social status and rank, and gave first use to the town providing the millstones [11].

Larochette was known even in the 20th century for its textile industry, whose roots date at least as far back as the 14th century. King John the Blind of Bohemia (\*1296-†1346) granted the right to erect four looms with frames suitable for cloth with a length of 25 ells (a Parisian fleece ell was about 0.61 m). Four looms were a significant asset at this time, with most towns being granted only one [13]. Among the town's many mills were a fulling mill (Luxembourgish *Follmüllen*) for the production of good woolen cloth or fine leather, dating at least into the 15th century [11].

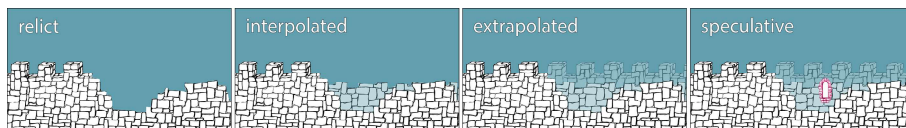
Medieval town life centred around the market and the church. Today's church is located well outside the walls, along the eastern slope of the valley. However, older maps and depictions of the town show a small church and adjoining graveyard in the southeastern corner of the old town. A further clue is, once again, in the name: the street leading through it is the *Rue St. Nicolas*, and the car park itself is named *Kierfecht* (i.e. graveyard) [14].

There is no room for a market within the bounds of the former city wall, the only open space being a walled garden on the northeastern corner, nor is one shown on the 19th-century maps and engravings. Instead, most commercial buildings cluster around the road leading to the bridge across the *Ernz blanche* (White Ernz) river and into the main gates of the town, suggesting that the wide meadow in the east was in use as a market. One engraving shows a high-ceilinged non-residential building in the middle of a square, which could well have been a covered market.

#### 4.1 Certainty of Results

We apply a four-tier hierarchy of certainty to our reconstruction work:

*relict-interpolated-extrapolated-speculative*



“Relict” covers elements for which evidence survives from the time of their creation. “Interpolated” refers to consulting several nearby data points, e.g. filling a gap in a wall along an existing foundation. Where this “interpolated” result is a line between two points, an “extrapolated” one is a vector, using a solid point of reference augmented with secondary and tertiary sources. “Speculative” results are obtained using only secondary and tertiary sources, e.g. comparing with similar sites or drawing on expertise from other fields, like estimating heights of walls using engineering knowledge.

Our conclusions fall into the third to fourth tier; we are using existing data points to draw conclusions about former states, and presenting the results as our working hypothesis. Comprehensive documentation is a critical element in the development of our reconstruction. It summarises research decisions, tracks sources, and affords the opportunity to re-examine our conclusions if new, contradictory information comes to light. Grounding the reconstruction within the scientific method guarantees a duplicable process and an adaptable model.

## 5 Prospects for Virtual Reconstruction

Moving beyond the traditional “artist’s impression” toward a reconstruction that is researched, validated, and documented, we support a broader movement that integrates emerging technologies into heritage science, providing tools for the outreach and dissemination of knowledge to the public.

We are developing the Larochette learning game using A-Frame<sup>5</sup>, a web framework for virtual reality applications. Players will be positioned inside a reconstruction of one of the rooms in the Criechinger Haus on the eastern side of the castle, overlooking the valley below. They will be tasked with combining graphic representations of the name elements of local minor place names in Luxembourgish (e.g. Bann + Mühle) and locating them on a map of the valley. Correctly combining and placing the names will reward players with a three-dimensional symbol in the virtual landscape. Suitable names were chosen based on visibility, variety, and natural separation into distinct elements.

Drawing on learning models designed for cultural heritage, such as the *Sandbox Serious Games* (SBSG) model described by BELLOTTI ET AL. (2012), the Larochette game will engage users while simultaneously encouraging the creation of “well-connected knowledge structures representing relationships among facts and concepts” [15]. This approach, based originally in cognitive science and reconceptualised for use in cultural heritage contexts, extends the project’s reach to general audiences and brings the cultural landscape and its tangible and intangible heritage to life.

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