The troglodytic castles of the Northern Vosges (France) and Palatinat (Germany)

Luc Stevens[*]

Abstract

On both sides of the French-German border, the regions of Palatinat (Germany) and Northern Vosges (France) possess, in an area of approximately 400 km², more than 30 castles that have the peculiarity of being at least partly hewn into the rock mass. This high density of excavated developments has brought them the name of "troglodytic castle" although much of their structure was built above the ground. Their location at the top of long and narrow spurs of sandstone has also brought them the name of "rock-castle", which illustrates their specific situation and their potential to host troglodytic settlements.
Built from the end of the 11th century and the beginning of the 12th century, these castles have evolved up to the 16th and 17th centuries and show today an amalgam of built and hewn structures from various eras that make their interpretations often complex and subject to caution. We will try as much as possible in this article to highlight the hewn characteristics of these castles without going into all the details which would require much greater space.
In addition, the panorama that we will present will necessarily be truncated and will concentrate on the troglodytic aspects of the castles, putting aside voluntarily a large part of the built up structures. The latter will only be mentioned from time to time when it is considered to be useful to understand the rock-hewn structures or the castle as a whole.

Key words: troglodytic castle, Vosges, France, Palatinat, Germany.

Riassunto

I castelli trogloditici dei Vosgi settentrionali (Francia) e della Foresta Palatina (Germania)

Su entrambi i versanti del confine franco-tedesco, le regioni della Foresta Palatina (Palatinat, in Germania) e dei Vosgi settentrionali (Francia) presentano, in un'area di poco più di 400 km², più di 30 castelli che hanno la peculiarità di essere stati almeno in parte scavati nella roccia. Questa alta densità di sviluppo di scavo in roccia ha fatto guadagnare a tali strutture la denominazione di "castelli trogloditici", anche se va ricordato che la maggior parte delle strutture risulta costruita al di sopra della superficie del terreno. La loro ubicazione, inoltre, sulla sommità di strette dorsali in roccia o di speroni rocciosi di arenaria, ha fatto sì che essi vengano anche chiamati "castelli in roccia", il che illustra la loro specificità ed il relativo potenziale ad ospitare insediamenti trogloditici.
Costruiti a partire dalla fine dell'XI secolo e l'inizio del XII secolo, questi castelli sono stati in funzione sino ai secoli XVI e XVII, e presentano tutt'oggi un insieme di strutture costruite e scavatae in roccia nelle varie epoche, che rende particolarmente complessa la loro analisi e suggerisce di essere cauti nel trarre affrettate conclusioni. In questo articolo si cercherà di concentrare l'attenzione sulle caratteristiche di scavo in roccia nei castelli trogloditici, senza entrare troppo in dettagli ulteriori, che richiederebbero maggiore spazio e più approfondite analisi.
Inoltre, il panorama che si presenta sarà necessariamente limitato alle caratteristiche trogloditiche dei castelli, lasciando volontariamente da parte gli aspetti relativi alla parte costruita delle strutture. Queste ultime saranno citate di quando in quando, se considerate utili per una migliore comprensione dei caratteri trogloditici dei castelli.

Parole chiave: castelli trogloditici, Vosgi, Francia, Foresta palatina, Germania.

* Société Française d'Etude des Souterrains (www.souterrains.eu); author e-mail: troglo21@yahoo.fr

Introduction

On both sides of the French-German border, the regions of Palatinat (Germany) and Northern Vosges (France) possess, in an area of approximately 400 km², more than 30 castles that have the peculiarity of being partly rock-hewn (Fig. 1). This high density of excavated developments has brought them the name of *"troglodytic castle"* although much of their structure was built above ground. Their situation on the top of long and narrow spurs of sandstone has also brought them the name of "rock-castle", which illustrates their specific situation and their potential to host troglodytic settlements.

Built from the end of the 11th century and the beginning of the 12th century, these castles have evolved up to the 16th and 17th centuries and show today an amalgam of built and hewn structures from various eras that make the interpretations of these castles often complex and subject to caution. We will try as much as possible in this article to highlight the hewn characteristics of these castles without going into all the details which would require much greater space.

In addition, the panorama that we will present will necessarily be truncated and will concentrate on the troglodytic aspects of the castles, putting aside voluntarily a large part of the built up structures. The latter will only be mentioned from time to time when it is considered to be useful to understand the rock-hewn structures or the castle as a whole.

Historical context

The emergence of rock-hewn castles takes place in the heart of the Middle Ages, at the end of the 11th century and at the beginning of the 12th century (1129 for the Castle of Fleckenstein, 1135 for the castle of Lutzelhardt).

At that time, tension arose along the border between the Duchy of Lorraine (to the west) and the German Holy Empire (to the East) where the Hohenstaufen dominated. On the one hand, the tension was related to the control of Alsace that had already been separated from the High-Lorraine to be integrated in the Souabe in 1079. On the other hand, there was also tension for the Hohenstauffen to secure the freedom of circulation along the road between Trifels (Palatinat) and

Fig. 1 - Distribution of troglodytic castles in Northern Vosges (France) and Palatinat (Germany).
Fig. 1 - Distribuzione dei castelli trogloditici dei Vosgi settentrionali (Francia) e della Foresta Palatina (Germania).

Haguenau where the Emperor held his court.
The struggles to hold power and control this region gave place, on both sides of the border and on the whole territory of the Northern Vosges and Palatinat, to the origin of the castles. These castles control the border, roads and valleys and provide the occupier with prestige and wealth. So, while the Hohenstauffen built a Castle at Fleckenstein, on one side of the border, the Dukes of Lorraine built another one at Lutzelhardt on the other side. In the Northern Palatinat, the Hohenstauffen countered the building of the Dahn Castle by building the Berwarstein Castle (Herreman & Salch, 1998).
The reign of the Hohenstauffen is interrupted in the middle of the 12th century and gives place to a chaotic interregnum. The death of Frédéric II, in 1250, is not followed by a strong central power and gave the freedom to local lords. In 1273, the arrival of Rodolphe of Habsburg as the central power interrupts the domination and the disorganised expansionism of the local seigniors. The latter are made, by force (siege) or by dissuasion, to again swear allegiance to the king.
Over the ages, the inheritance of castles becomes a source of dispute within families: castles are then split into several parts that can, in some cases (e.g. at Wasigenstein), be in opposition against each other. The second half of the 15th century is marked, on the one hand, by a loss of power by the small local lords whose revenues decrease due to successive division and, on the other hand, by the increase in power of a small number of lords who have succeeded in keeping their influence at the various levels of power.
The decrease in power of the minority nobility classes continues up to the 15th century and is accompanied by an increase in the power of cities with their new production centres (and therefore wealth), as well as by a growing share of the population. Cities are fortified and have war and defence mechanisms that are much more developed than can be afforded by the lords owning small castles.
In addition, rock-castles that were developed in the Northern Vosges and Palatinat during the 12th century are not suitable any more for the new warfare techniques. Heavy machines cannot be easily manipulated on the top of these narrow spurs and the arrival of the powder reduces significantly the efficiency of these high buildings.
However, all existing castles do not disappear. Some of them are modernised (Fleckenstein, Lichtenberg) to counter these new warfare techniques. These works include the building of new walls that are lower and which can better defend the entrance and the bailey. New lower towers with wider arrow slits situated at the height of the enemy are built during the 15th century. All these transformations are accompanied by the embellishment of the castle in order to adhere to the new aesthetical canons of that time.
Other castles acquire a role of prestige and are converted into comfortable houses as required by the emerging Renaissance (Nouveau Windstein, Petit Arnsberg). In those cases, the existing defences are not removed, so that they maintain some prestige, but they remain completely outdated.
The fortress becomes a residence which includes luxury to a greater or lesser extent.
At the end of the 15th century and during the 16th century, some castles are for the last time improved after the Hundred Years war.
At the end of the 16th century, the castles are not adapted to the heavy artillery. Many of the castles cannot resist attacks by cannon and become obsolete. The only structure able to resist such assaults are half-buried underground fortresses that include ditches and are shaped like a star in order to surprise the enemy from the rear. In the Northern Vosges, only two castles, not hewn into the rock, will be adapted to this evolution: Lichtenberg and Herrenstein.
In the 17th century, the French troops destroy the less strategic castles and modernise the others situated along the roads and the borders.

Geological context

The geological bedrock of the Northern Vosges is mainly composed of a thick layer of sandstone that dates back to the Primary and Secondary era. The geological undulation of the Tertiary era and more specifically the collapse of the Rhine Rift Valley as well as the formation of the Alps have exerted high pressure on the sandstone leading to the creation of faults. These latter have favoured erosion to create a landscape with many wide valleys, hills and mountains whose altitude varies between 200 m and 600 m a.s.l. At the top, spurs and the collapse of rocks have led to the creation of large pinky/red cliffs that dominate the valleys.
These spurs and cliffs, difficult to reach, have been used at several times in the past as shelter and control for the local populations.
From the end of the 11th century and the beginning of the 12th century, those spurs of red sandstone will be used to build the cliff castles, a large part of which is hewn into the rock (Fig 2).

Fig. 2 - Fleckenstein: view of the northern face (bailey side) of the castle. To be noted: on the left, the tower of the water well with its base of the 13th century and, on the right, the tower of the staircase.
Fig. 2 - Fleckenstein: vista della facciata nord (lato bastioni) del castello. Da notare, sulla sinistra, la torre del pozzo, con base del 13° secolo e, sulla destra, la torre delle scale.

Characteristics of northern Vosges troglodytic castles

The large spurs of sandstone constitute a perfect substratum for the creation of rock hewn facilities, be it defensive or utilitarian. Among the latter, we will distinguish between facilities that aim at managing water, hoists, stables and other areas hewn into the rock.

Defensive facilities

The spur has a mandatory passage to reach the top and the heart of the castle; it has been hewn from the 12th and 13th centuries to facilitate the access to the castle and also serves to control it. All defensive works are certainly not rock-hewn: baileys are generally protected with walls, towers, doors and other defensive buildings.

If the access to the bailey is largely built, that leading from the bailey to the castle is generally hewn into the rock: either inside the spur (Wasigenstein, Fleckenstein; Figs. 3 and 4), or in the rock face (Lutzelhardt; Froensbourg; Fig. 5).

In almost all cases, the access path that leads to the castle does not immediately reach the top platform, but rather it reaches first a network of cellars just below the platform (Figs. 6 and 7).

Fig. 3 - Petit-Wasigenstein: access inside the spur.
Fig. 3 - Petit-Wasigenstein: accesso all'interno dello sperone roccioso.

Fig. 4 - Fleckenstein: Roman entrance (12th century) hewn into the rock.
Fig. 4 - Fleckenstein: ingresso romano (12° secolo) scavato nella roccia.

Fig. 5 - Grand-Wasigenstein: access to the castle along the cliff.
Fig. 5 - Grand-Wasigenstein: accesso al castello lungo la parete.

In the case of Ramestein, the access path that is hewn in the rock face of the spur suddenly turns inside the spur by means of an open-air trench that split the spur into two parts.
The bottom of this trench gives access to an underground room defended by a door whose closing system is still preserved in the rock. It is only via this underground room that we can reach the top platform from where it is particularly easy to control access to the open-air trench.
The paths hewn into the rock-face of the spur are generally protected by walls breached with holes to bring in light, at the same time providing control outside of the castle. The existence of such walls is testified by postholes situated at close intervals and hewn into the sandstone.
The access path to the top was also closed by several doors that are still noticeable by the holes that housed the hinges, by the closing system hewn into the rock (Fig. 8) and by a recess in the rock to allow the door to fully open.
In addition, the access path to the top is sometime defended by *glacis* or cut-off corners that interrupt the path (Fig. 9). Some removable footbridges were probably used to cross these obstacles. A door situated directly behind the *glacis* can further reinforce the defence of the access. In the Vieux-Windstein, the first underground room can only been reached after two ditches, both of which are followed by a door (Fig. 10).
Finally, in the Castle of Lutzelhardt, the access path is also protected by a vertical murder hole situated just in front of a door which was managed from the top of the castle. The hole has been hewn into an existing fault of the sandstone that has been widened (Fig. 11).

Fig. 6 - Fleckenstein: view of several rock-hewn (open to the sky) cellars situated just below the top platform.
Fig. 6 - Fleckenstein: vista di diverse cantine a cielo aperto, scavate nella roccia, site proprio al di sotto della piattaforma sommitale.

Fig. 7 - Fleckenstein: view from within of a rock-hewn cellar.
Fig. 7 - Fleckenstein: vista interna di una delle cantine.

Fig. 8 - Drachenfels: closing system hewn into the rock.
Fig. 8 - Drachenfels: sistema di chiusura scavato nella roccia.

Fig. 9 - Vieux-Windstein: glacis or cut-off corners protecting the access to the castle.
Fig. 9 - Vieux-Windstein: ripido pendio che protegge l'accesso al castello.

Utilitarian facilities

Water management

Water conveyance in mountainous areas is one of the key challenges for castle designers. The water table is sometimes at more than 100 m under the top platform where the castle is situated; water supplies alternative to wells have also been implemented.

a. Water wells

The water well is the most traditional and probably the most efficient way to provide water to a castle (Fig. 12). In the Castle of Berwarstein, the water well reaches a depth of 104 m. It has probably been excavated by miners with specific mining techniques. In such works, to ensure air circulation for the miners, the well was divided vertically into two parts. A fire was kept burning on the top of one of the shafts which created a downdraft toward the bottom of the well where miners were working (Herreman & Salch, 1998).

In the castle of Lemberg, the water well has been dug up to a depth of 94.8 m without reaching the water. To avoid loosing such a huge work, a horizontal gallery, 131 m long, has been hewn from the depth of 60 m towards the castle's springs in order to provide the well with water. Archaeological excavation between 1933 and 1966 has allowed water to be restored to the well and to understand its mechanism (http://www.burg-lemberg.de/).

Finally, to limit digging works, water wells could be started at the foot of the spur (in the bailey) or in the middle of it rather than at the top of the platform. In the castle of Fleckenstein, the water well has been dug from the middle of the cliff and saved 13 m of digging.

Fig. 10 - Vieux-Windstein: double ditch that defends the access to the castle.
Fig. 10 - Vieux-Windstein: doppio fossato di difesa per l'accesso al castello.

The water well has next been encased in a walled tower up to the top of the castle.

b. Cisterns

It is not always possible to dig water wells in mountainous areas. In such circumstances, rainwater and spring water are collected and stocked in cisterns within the castle. In the Castle of Hohenfels, an archive indicates that cisterns hewn into the rock were supplied with water derived from springs in the valley carried up by mules (Biller et al., 2003).

Fig. 11 - Lutzelhardt: vertical murder hole.
Fig. 11 - Lutzelhardt: pozzo verticale per sacrificare le vittime.

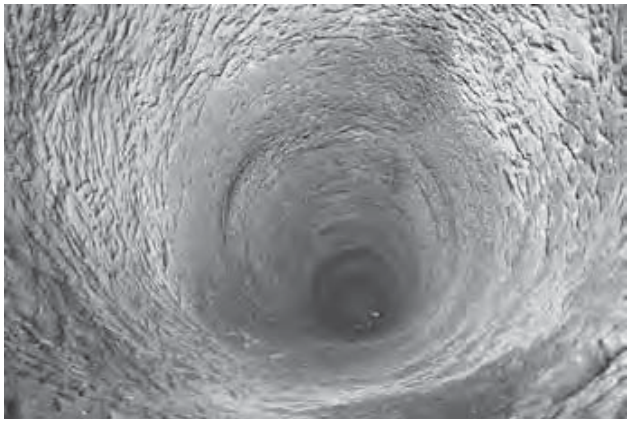


Fig. 12 - Vieux Windstein: water well.
Fig. 12 - Vieux Windstein: pozzo per acqua.

Rainwater falling onto roofs was collected by gutters and drains leading toward the cisterns.

c. Filtration cisterns

Filtration cisterns constitute a specific case of cisterns that can be found in almost all castle of the Northern Vosges and Palatinat and which have been revealed by R. Kill (Biller et al., 2003). The filtration cistern allows the water to be purified and collected in the castle before its consumption. The walls of the ditch, dug into the rock, are firstly covered with clay in order to make the reservoir waterproof. In the middle of the ditch, a well is built with blocks, while the remaining part of the ditch around the well is filled in with sand and small stones to be used as the filtering mechanism. The water collected is first brought to the large reservoir and it is allowed to filter slowly into the central well where the water can be drawn for consumption (Figs. 13 and 14).

This system was in place in the 12th century in the troglodytic castles of the Northern Vosges and Palatinat and constituted for most of them the only water supply to the top platform and also sometimes to the bailey.

Fig. 13 - Drachenfels: filtration cistern emptied out of its filtering filling.
Fig. 13 - Drachenfels: cisterna di filtrazione svuotata del suo riempimento.

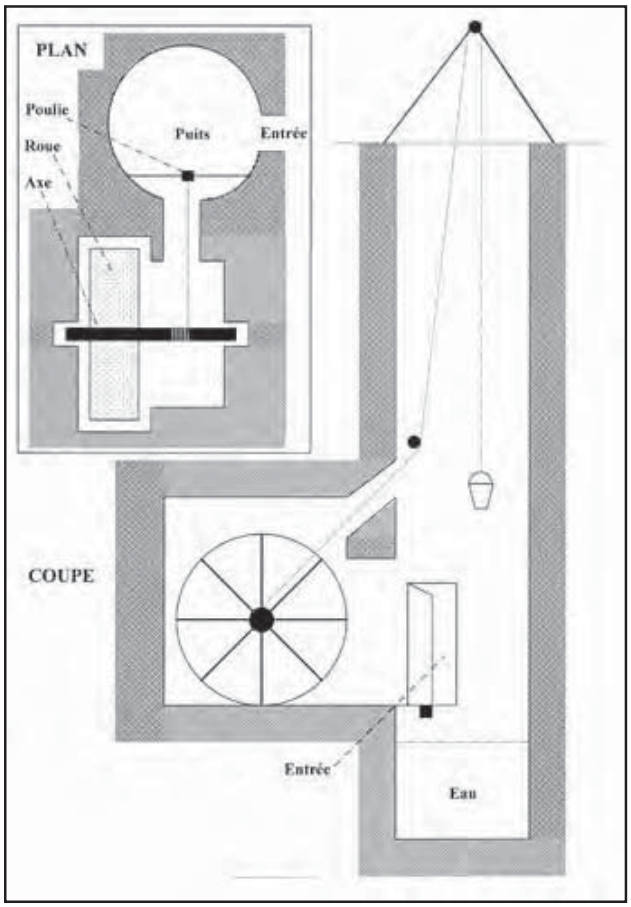
d. The dripstones

Dripstones constitute a network of channels cut into the cliffs and walls in order to collect run-off water. These channels, sometime more than 10 m long, bring water toward the cisterns, filtering cisterns or directly toward watering places for animals.

In the Castle of Wasigenstein, the dripstones hewn into the wall of the ditch all converge towards the cistern that is protected by a door. The water was drawn via this door and next placed into a niche from where another dripstone fed the water to the animal watering place (Fig. 15).

Hoists

Spurs with castles at the top are locally more than 30 m high and have been specifically selected for the protection they can offer to the inhabitants. However, the building of a keep, walls, houses and other buildings is not an easy task given the difficulty to access to these



high platforms. Staircases hewn into the rock of the spur have certainly facilitated bringing some building material to the top, but they are often very narrow, and further presents some bends (Fig. 16).

To facilitate the transport of goods and materials to the top of the castle, hoists with treadwheels have been built at the foot or the top of the spur (Fig. 17).

The base of the spur is generally wider than the top and it has generally been cut in order to allow the hoist to be as vertical as possible up to the top edge of the platform. Today, we can easily recognize, hewn into the rock, the rounded traces of the treadwheels, as well as the hole in which the axle of the treadwheel was fixed (Fig. 18).

In the Castle of Fleckenstein, in order to reach as close as possible the edge of the top platform, the hoist has been placed into the column of the water well.

The treadwheel has been placed into a blind troglodytic room that can be reached from the bailey through a small corridor that crosses the water well by a foot bridge and leads to this underground engine room (Fig. 19).

Fig. 14 - Principle of functioning of a filtration cistern as established by R. Kill.
Fig. 14 - Principio di funzionamento di una cisterna di filtrazione, come stabilito da R. Kill.

Fig. 15 - Wasigenstein: dripstone collecting the water along the cliff towards a cistern protected by a door. The water of the cistern was next drawn via this door and placed into a niche from where another dripstone led the water to the animal watering place.
Fig. 15 - Wasigenstein: solco in roccia per la raccolta dell'acqua lungo parete, e immissione verso una cisterna chiusa da porta. L'acqua della cisterna era trasportata attraverso tale apertura in una nicchia dalla quale tramite un'ulteriore scanalatura giungeva all'abbeveratoio per gli animali.

At the extreme southern end of the Castle of Falkenstein, the rising column of the hoist has been created by digging into the rock along its total height, thus crossing the primitive staircase that was modified (Herreman & Salch, 1998; Fig. 20).

Stables

Horses have received specific attention in Northern Vosges and Palatinat castles. The bailey has special facilities to house them.

Fig. 16 - Fleckenstein: spiral staircase.
Fig. 16 - Fleckenstein: scala a chiocciola.

Fig. 17 - Dahn: treadwheel of a hoist recreated.
Fig. 17 - Dahn: ruota di un argano ricostruito.

Fig. 18 - Froensbourg: place of a former treadwheel.
Fig. 18 - Froensbourg: sito di una non più esistente ruota per argano.

In the Castle of Falkenstein, Herremann & Salch (1998) have identified two stables. A first one from the 12th century can be recognized with its mangers, together with a round pit which was probably used to drain the slurry. A second one dates back to 1575 and has been created in what was described in 1474 as a wine cellar. The ten mangers have been realized in a former cupboard so we can assume that this room had another function before being used as wine cellar and stable. The tradition mentions it as a guard room.

In the castle of Alt-Dahn, the artillery tower of the 15th century built along the cliff gives access to a troglodytic stable (Fig. 21).

We find here again mangers and drains leading to a slurry pit. The room is totally hewn into the rock and is lit by a small window splayed towards the inside in order to maximise the light penetrating the room.

In other castles, like Fleckenstein and Windstein, stables are not troglodytic, but simply constructed in the bailey. They are recognisable thanks to the rings hewn into the rock (Fig. 22) and the watering place.

According to Herremann & Salch (1998) the stables of the castle belonging to the Stauffen were generally outside in the bailey, while those belonging to Lords were generally hewn into the rock.

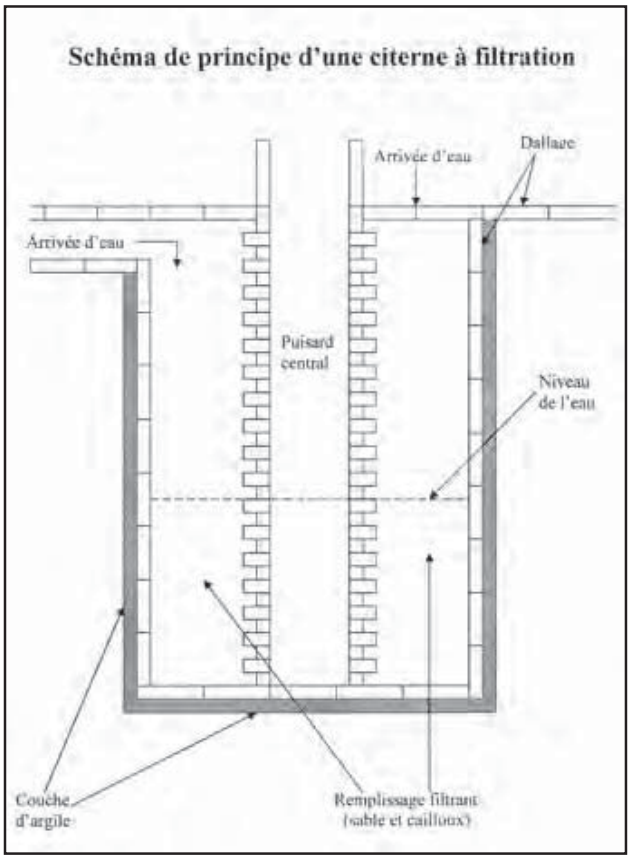


Fig. 19 - Fleckenstein: functioning of the treadwheels within the water well of the castle.
Fig. 19 - Fleckenstein: funzionamento della ruota all'interno del pozzo per acqua del castello.

Fig. 20 - Falkenstein: rising column of the hoist crossed by the stair.
Fig. 20 - Falkenstein: colonna di risalita dell'argano, attraversata dalle scale.

Fig. 21 - Dahn: horse stable hewn into the rock.
Fig. 21 - Dahn: stalla per cavalla scavata nella roccia.

Other facilities

To finalise this overview, we need to mention some further facilities that characterise all or some of the troglodytic castles of the Northern Vosges and Palatinat. Some of these facilities are not specific to troglodytic castles, but rather to all troglodytic settlements.

We find in all castles many niches that were used to receive objects of daily life.

The castle of Fleckenstein also includes a dungeon: totally dug into the sandstone, it looks like a trapezoid ditch with a slot to receive a door.

The limited space on the top platforms due to the narrowness of the spurs has led to creation of oriels (Fig. 23) that are still recognisable as the parallel slots cut into the rock.

The Castle of Tanstein (Dahn) has the peculiarity to have a chimney whose back and jambs are carved into the sandstone (Fig. 24). Next to it, in the Castle of Alt-Dahn, traces of silos are still recognisable.

Finally, in many places, scaffolding support or putlock holes are the last reminder of a widespread semi-troglodytic architecture.

Conclusions

The overview of the most frequent troglodytic facilities in Northern Vosges and Palatinat castles has tried to outline the occurrence of these facilities in the castles and their possible evolution over time.

We can highlight the high prevalence of rock-hewn elements for access to the top platforms. The castle and the keep are not hewn into the rock but solidly built on the top platform in the form of long and narrow buildings.

Defensive facilities hewn into the rock are generally concentrated on the door that is, in turn, often hewn

Fig. 22 - Vieux-Windstein: ring hewn into the rock.
Fig. 22 - Vieux-Windstein: anello scavato nella roccia.

Fig. 24 - Dahn: back and jambs of a chimney.
Fig. 24 - Dahn: retro e montante di un camino.

Fig. 23 - Grand Wasigenstein: place of an oriel.
Fig. 23 - Grand Wasigenstein: finestra dalla parete rocciosa.

into the rock (up to the 12th century) and in the access path to the top. Utilitarian facilities such as hoists, cisterns, rooms and stables are generally concentrated in the bailey and just under the top platform which is literally mined by a network of "cellars".
This overview concentrates on rock-hewn facilities and voluntarily does not assess all built facilities. Further research should help to better understand the relative place of troglodytic facilities compared to those that are built-up, as well as the evolution of the role of troglodytic facilities in the organisation of the castles.

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