The Structure of Valsesia’s Walser Houses

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Summary

"Walser" is the name for a group of Alemans, Germanic people that settled in Valais, Swiss Alps, from the 9th century A.D and later migrated to the Italian Alps. Walsers developed a strong identity since they occupied inhabited valleys at high elevations and kept in contact with their motherland. Their culture has survived up to the present day. The extraordinary architecture of their houses offers a unique example in the world. This paper examines the structure of typical Walser houses in Valsesia, a valley in Piedmont, located in the northwestern Italian Alps. As not often seen in alpine construction, the use of timber prevails over stone. The blockbau technique allows connecting elements of side walls without nailing. The house represents an amazing synthesis of functionality, durability, structural soundness and architectural elegance.

1. Introduction

“Allhier wo wir sind fremde gaeste baven wir gar stief und feste wo wir aber sollen ewig sein baven wir gar wenig drein.” Here, where we are temporary guests, we build soundly, but there, where we will be forever, we build weakly. This statement is wood carved on the main rafter of a Walser house of Safien, Switzerland (Gillardon, 1952).

1.1 Historical Notes

It is not possible to understand the schematic of the Walser houses without referring to the historical, social and cultural context in which they were built (Castagno, 1984). Walser is the name of Germanic people (Alemans) that settled in the Goms valley in the Upper Valais during 800 and 900 A.D. Presently the Valais is Swiss territory. The Goms valley offers weather conditions more suitable to agriculture than other Alpine environments. However, due to its altitude of about 1500 m, it presented challenges to the Walsers. They faced a harsh climate, a short growing season, and scarcity of farmlands. Therefore, they learned to select the seeds that would best survive in these conditions, to obtain farmlands and pastures for their cattle from the forest. The Walsers were the first peasants that inhabited regions at such an altitude to make them their permanent residence. By the end of the 1200 A.D. they settled in all the valleys in the Upper Valais. At this time, Europe was experiencing the booming of agriculture and the possession of lands became a measurement of wealth. Perhaps because the Valais was getting overpopulated, or because they desired to improve their economical status, the Walsers moved to new territories. Cultivating new lands would have also assured them freedom from the feudal lords. So they migrated towards the Italian Alps, first in the Gressoney Valley and then in
Valsesia. Until the 16th century, they kept migrating to many valleys in the Italian, Austrian, and French regions. Although the Walsers were subjects of the feudal lords, they were able to maintain their autonomy. Tenants obtained hereditary rights and liberties in exchange for cultivating the lands (Swiss National Tourist Office, 1991). The Walsers were welcomed by the land owners because of their ability to utilize lands that would have been otherwise abandoned. As an example, the Counts of Biandrate, who ruled over the territories in Valsesia, encouraged the Walser migration in this valley. Walsers created colonies at high altitude and kept in touch with their motherland. In this way they formed a strong identity. This is reflected in their idiom (Tisch) that is still spoken, in their traditions that are still vibrant, and in their architecture that is unique in the world.

1.2 Sources of Information

In order to prepare this paper, the authors resorted to many on-site sources of information to complement the available literature. They visited the Walser Museum in Alagna and conducted personal interviews with experts of the Walser heritage. Most of the peer reviewed publications on the Walser people are in Italian and German. Scarce are the ones in English. Some websites in English will be referred to here for those who want to obtain more information.

In 1976 the Walser Museum of Alagna was opened to the public (Reverdini, 1984). The initiative of establishing it was taken by the citizens of Alagna that wanted to preserve their heritage. The museum is hosted in a Walser house built in 1628 that was acquired and restored to its original shape. The citizens of Alagna contributed significantly to the museum’s restoration by donating money, objects representative of the Walser life, and labor. Besides hosting a library, the Museum demonstrates how a Walser house was organized to optimize the activities of the inhabitants.

Among the founders of the Walser museum is Mr. Emilio Stainer (2005) who is still a resident of Alagna Valsesia. During summer 2005, the authors visited the Walser museum of Alagna and Mr. Stainer (2005) a few days later. He is not an engineer, but he is a witness of the process of conservation of the Walser culture that he himself initiated in Valsesia. Mr. Stainer is a descendent of the Walsers that founded Alagna and he is able to speak their idiom. The conversation with him was very helpful in obtaining further information on the Walser houses. He referred us to Mr. Bruno De Gasperis, a carpenter specialized in restoring Walser houses. Mr. De Gasperis contributed to the restoration of the Walser Museum.

The literature presents several publications centered on Walser houses in Valsesia. One of the better well known is by Daverio (1983) which gives a detailed description of the house, tying it to the culture and the daily life of Walser people. This publication contains detailed drawings of the house. Engineer Daverio was instrumental in convincing the local government to declare Walser houses cultural resources worthy of preservation. For his advocacy we can now enjoy the Walser architecture in its pristine nature. Among one of the most recognized experts in Walser culture is Enrico Rizzi who has several publications on the topic. In his book (Rizzi, 2003) an entire chapter is dedicated to the house and its functionality. Michela Mirici Cappa (1987) published a study that closely looks at the construction materials used by the Walsers. These materials needed of course to be available locally. This study is particularly interesting because it provides the strength of the construction materials and their manufacturing process. The book also analyzes the structural joints of Walsers houses.
The reader that would desire exploring references in English can refer to (Swiss National Tourist Office, 1991) for a description of the Walser migrations and their culture. Websites that illustrate the Alagna territory and contain some information on Walser houses are also available in references number 9, 10, and 11 of this manuscript.

1.3 Walser Life

As mentioned earlier, one cannot understand the layout of the Walser house without knowing about its inhabitants, their traditions, and the challenges that they faced as colonists of high altitude lands. To this day, Walsers are the highest-living people in Europe. They were the pioneer of high-mountain settlements and established themselves in territories that were never before occupied. Their economy was based on agriculture and farming. They resorted to commerce only for products that they could not themselves manufacture, such as iron and glass. Their battle against the elements depended on their ability to optimize the available space, the use of local materials, and the functionality of their constructions.

The Walser villages in Valsesia are constituted of ten to fifteen houses grouped together. The houses are adjacent to each other and there is very little room between them. This saves precious space for pastures and helps locate the village in an avalanche safe area. The façade of the houses faces south and the pastures are located so that they receive the most sun light. A main road crossed the village that lead to the worship place. The church that opens on a small square, the fountain, the oven and the mill were communal property. Bread was one of the primary sources of food and interestingly enough it was baked only twice a year, in the spring and in the fall. Bread was stored for two entire seasons and had to be cut with an axe and softened in milk before being consumed. Because erecting each house required an extraordinary effort, the whole village participated in it (Comoli Mandracci, 1984). The men were engaged in the workmanship necessary and skilled labor provided help where needed. Collaboration within the community has been a key to success for Walsers.

The staple of Walsers is the house and the architecture of their villages. The villages, being built with local wood and stone, blend in the natural setting. The villages give a sense of harmony and they are eye-pleasing with their simple and yet carefully studied balance of geometric lines. Daverio (1983) notes that this esthetic effect is the expression of the harmony, solidarity and ethical values that characterize the Walser people.

2. The Walser House

Unfortunately, the first Walser houses that were built in Valsesia do not exist anymore. The architecture of Walser houses in Valsesia is distinct with respect to other settlements. Each Walser house in Valsesia is unique, but displays elements that are common to all others. The main building material is wood, contrary to most alpine constructions where usually stone prevails. In Valsesia, unlike in other Walser settlements, humans and animals lived under the same roof. This had the double purpose of saving space and providing an area where heat could be preserved. A peculiar architectural feature of Valsesia’s houses is the wrap around porch. The porch runs up to the roof and extends on at list three sides, leaving the backside open. It is used in summer and fall to dry the hay. In fact, Valsesia has a very humid climate that would not allow leaving hay in the fields to dry. The porch serves also to connect the stories since there are no internal stair cases. It is supported by columns that are connected by horizontal beams. These together form a grid that characterizes the house. The roof is another distinctive element
of Valsesia’s houses. The eaves project outside the perimeter of the house. This guarantees the protection of the house from the elements and allows the walkways to be free from the snow that is abundant in winter. The roof is massive, built of natural stone slabs (beole) laid one on top of the other. Its simple and well defined lines frame the house (Fig.1 and Fig. 2).

In the Walser houses of Valsesia, functionality is the paramount requirement. The structural typology adopted stems from the functionality. The repetition of structural elements in a symmetrical and geometric fashion produces a harmonic ensemble. The architecture is driven by the layout of visible structural elements. The Walsers have been able to accommodate the functionality of the house together with reaching superior results in structural soundness and architecture. Daverio (1983) notes that Walser houses are built using a standard module, a length of approximately 1.80 m, that is repeated throughout the house. For example, this is the spacing between the porch columns and the length of a built in bed. This module can form a square that contains a man with open arms, like in Leonardo’s famous drawing.

2.1 The House Layout

The typical Walser house in Valsesia is scheduled on three stories. The daylight basement, Fig. 3, is built in natural stone at times connected with mortar. It has a square floor plan. It hosts the stable which is annexed to the living room, the kitchen, an outhouse and storage places. The loom is often located in the stable. Only one stove is present in the whole house, and it is shared between the living room and the kitchen. The kitchen is also used for the preparation of food that needs to be preserved for the entire winter. It is not provided with a chimney but just with a window. In this way it serves also as a smoking room. Most of the furniture is built in to preserve space.
The main and first floors are built of wood using the blockbau technique described later. The main floor, Fig. 4, is divided in four sectors. Each of them includes a bedroom with a built in bed and closet. The first floor, Fig. 5, is dedicated to store the dried hay and has a room that serves as a food cellar.

Walser houses are an outstanding example of sustainability. This is derived from the fact that energy conservation was important and resources scarce. The Walser house is a passive system of heat conservation. As already mentioned, only one stove, located between the living room and the kitchen, was available. The living area was heated both with the stove and by the presence of the adjacent stable hosting cattle (Mirici Cappa, 1997). The thick walls of the basement helped preserve heat. The main floor was not heated but it was kept warm by the heat rising from the basement. The wooden walls of the main floor were sealed using moss placed where the log assembly was not tight. The hay storage on the first floor provided thermal insulation for the whole house. As demonstrated, the need of building an energy efficient house is another factor that influenced its layout and structure.

2.2 The House Structure

The structure of the house was conceived as a means of protection from the environment. The challenges of building in high mountains are heavy snow fall, avalanches, strong winds, and earthquakes. In addition, as was already mentioned, the house needed to satisfy functionality requirements. As an example, the wrap around porch with hay drying racks was necessary because Valsesia is subject to high levels of precipitation.

In construction, wood prevails over stone. Both materials are available locally. Walsers were experts in woodworking. Wood is subject to two decay agents: pests and fungi. To avoid decay the wood needs to be cut at the proper time and seasoned before it is put in place. Walsers were aware of the care that wood requires and that is why their houses are still standing. Procurement of stone was achieved by cutting notches in the rock. In these openings wood wedges were
inserted and later soaked. Because the wet wood increased in volume it split the rock (Mirici Cappa, 1997).

The house rests on a basement built with local stones of various shapes and sizes. Mortar, also manufactured with local components, was at times used. The thick basement walls served not only as a foundation for the house, but also as barrier to the moisture coming from the ground. The thickness of the walls varied between 48 and 60 cm. The basement was paved with stone slabs. The basement perimeter was usually a square.

The upper stories used a wood structure. The technique used to build the bearing walls is the blockbau system (Fig. 6 and Fig. 7). Squared-off larch trunks were assembled without nailing with joints at the corners. The blockbau technique was also used by other Germanic people but the Walser refined it.

For the main floor, hosting the bedrooms, the trunks were cut in a half longitudinally and finished on the inside. Because of the shrinking of the wood after placement, gaps were filled with moss to insulate the bedroom from air drafts. To the contrary, the first floor, dedicated to hay and food storages, was built with whole unfinished trunks. Gaps between trunks were left unsealed so that air drafts would keep hay dry. The floors were built using Norway spruce wood decking that rested on inverted T-beams carved in a wood trunk. The decking was secured to the bearing inverted T-beams by wooden pegs. Walsers did not have iron available from their mines and they tried to minimize its use. The wrap around porch (Fig. 8) is a grid built with main beams and columns and subdivided with thinner wood beams (the racks). Attention to details was given for this part of the structure as many members intersect each other. The columns run all the way to the top to support the heavy roof. The balconies, about 2 m wide, are supported by columns and beams (Fig. 9). Staircases are accommodated to permit access between stories.

The roof is sloped and is built with stone slabs. The weight of a modern roof of this kind is 300 kg/m². Due to the unevenness of the slabs cut by wooden wedges the weight of the roof on a Walser house is between 400 and 1000 kg/m². The structure supporting the roof is a grid of beams, the main ones being parallel to the ridge. The roof projects beyond the perimeter of the house for protection and in front of the house this projection can reach up to 3 meters in length.
The Walser structure is definitively resistant to heavy snow fall and winds. Mr. De Gasperis, an expert carpenter in restoring wood houses, thinks that Walser houses are earthquake proof. To sustain this thesis is the fact that their structure rests on a stone basement and is mainly made out of wood. It is well known that, wood is a good energy dissipater and a ductile material (Laner and Barbisan, 2001). The wood floors act as flexible diaphragms because they are well connected to the rest of the structure. Credit to the soundness of these constructions is also given by the regularity of their floor plan. However, the mass of the house is concentrated at the roof level and during an earthquake this would generate high forces. A more detailed structural analysis is necessary before making further comments on the behavior of Walser houses under dynamic loading.

3. Discussion, Conclusions and Acknowledgements

Walsers, originally Alemans from Germany, came to Valsesia from the High Valais starting in 1200 A.D. They kept a strong cultural identity. In fact, they colonized only high territories that no one else knew how to make their own because of the hostile environment. The feudal lords welcomed them because they were able to collect rent on the territories that they occupied. Walsers were granted liberties that guaranteed a certain freedom.

The house is the most visible trace of Walser colonies. Walser houses display a unique architecture. The architecture is derived by the visible structural members that are arranged in a geometric manner and create a pleasant visual effect. The employment of local materials like wood and stone allow Walser villages to blend in with their surroundings. The wrap around porch and the heavy stone roof frame the house in the background. The structure is derived by the need for functionality and protection from the harsh environment. The house offers an admirable example of sustainability since the available resources were scarce. Walser houses have proven to be sound for heavy snow fall, strong winds and earthquakes through the centuries. They provide a magnificent example of adaptation to the environment without sacrificing the aesthetics.

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4. References


