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The Walls of Hondarribia

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Abstract

Since ancient times Hondarribia location, close to the Spanish French border, has defined its strategic value.

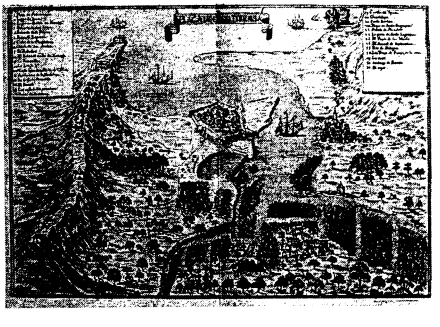
Hondarribia was founded over a promontory on the bank of the Bidasoa river. Wars and military skirmishes combined with biological erosion, sea salt environment and modern atmospheric pollution have degraded the Walls in different ways. Unfortunately the repair activities have been neglected during the last years basically due to the Government lack of interest.

Today new efforts to integrate the Walls in an avenue should include a deep investigation on their history construction and repairs in order to guarantee their structural integrity.

1 Introduction.

Hondarribia also known as Fuenterrabia takes its name from the Basque words "ondar" and "ibaia" which means sand and river. This designation is easily understand considering the geographical position of the city, in the Bidasoa river mouth to the Bay of Biscay.

Hondarribia has an obvious military strategic position thanks to the proximity of the French border. It is surrounded by the Jaizkibel mountain, the Oiartzun valley and the Bidasoa river. Previously the river even reach the Walls of the old town built over an small promontory.



This particular characteristic has imposed a military character to the city. The Carlos V castle (built in the Xth century), Santa Maria's Church (finished the XVIth century) and the Walls themselves are good examples of this character.

2 Town and its fortifying history.

Some historian consider that the city could have been founded by the Goth King Recaredo I (586 - 611). However this opinion is not so unanimous as the affirmation that the Goth King Wamba (672 - 686) ordered the fortifying works. An, actually demolished tower, with his name witnessed it.

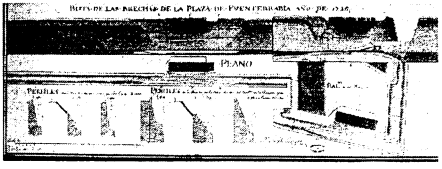
Nevertheless, Hondarribia could be older. Some hints suggest a Roman settlement which some identify as Flaviobriga and others using Ptolomeo's description believe that is Easo, sited on the Olaso (Jaizkibel) foothills bathered by the river Magrada, which Basque name "Bide Easora" (the way to Easo) helps to support this opinion.

The actual name appeared for the first time in the constitution document of the San Sebastian city given by the King of Navarre Sancho el Sabio in 1150. He ordered the fortification of the city in 1194.

Since then different misfortunes have devastated this city. Among them stand out the sieges of 1280, 1476, 1521, 1638, 1719, 1794, 1836 and the fires of 1461 and 1498. The siege of 1521 in which French troops fighting for the King of Navarre took the city was specially serious.

In 1638, 27.000 French soldiers besiege the city for two months shooting 16.000 bombs over 300 survivors, destroying almost the whole town.

In 1639 Felipe III rebuilt the Walls that were destroyed another time in 1794 by the French, during the Convention war declared in 1792 to France. The whole part of the Walls looking at France was destroyed besides the Queen and Felipe's strongholds. The remaining of the Walls escape miraculously of the destruction thanks to the signature of the Peace Treaty of Basilea in 1795.



Thereafter the changes in military tactics made the walls unuseful, therefore they become a quarry for the villagers.

The nineteenth century fashion for history renew the interest in the old village, specially in its Walls. Thus several digs and proposals were made in order to give the walls their previous magnificence.

As a result of this stream of actions the architect Manzano Monis wrote a General Project for the whole village. However it was so strict and inflexible that it never gained the villagers' support. Therefore it was put aside.

The last intervention was done in the 1960 and included the partial reconstruction of about one hundred meter of Walls belonging to the Queen's Fortress.

3 Damages.

The walls present damages of different kind and nature. These can be classified into the followings:

3.1. Historic damages.

Involved in many wars and sieges, previously mentioned, the Walls have suffered numerous bombs impacts, mine explosions and other military damages. After the year 1795 the general decadence of the city imposed its pace to the Walls that become a quarry for the nearby buildings.

3.2. Damages due to the framework.

Water, phone, electric and drainage networks reach the town through the Walls. It is specially worrying the faecal and runoff waters flow through the Walls stretches.

3.3. Degradation of the masonry.

The proximity of the sea is extremely important to understand the degradation process of the stones, its chemical attack on the Walls specially on their foundations provokes faster degradation than dryer environments. Close marshes, rain water and, of course, atmospheric pollution also contribute to the degradation of the stones.

3.4. Biologic degradation.

Micro-organisms, plants, bushes and small birds nested on the Walls harm seriously their integrity. There are even old big trees which roots are embedded between the ashlars moving them and weakening the structure.

3.5. Human action.

The inhabitants of Hondarribia have built their homes close or sometimes on the Walls creating new problems like the construction of gardens by filling the spaces of the Walls. These damages can be considered as very serious altering the structural integrity of the whole Walls.

We are dealing with them by establishing a computer record of all of them with periodic updates and tracing their origins, by analysis, to establish acceptable corrective measures.

4 Analysis.

In order to establish the Walls real condition various analysis have been carried out. The most important ones are :

4.1. Topographic analysis.

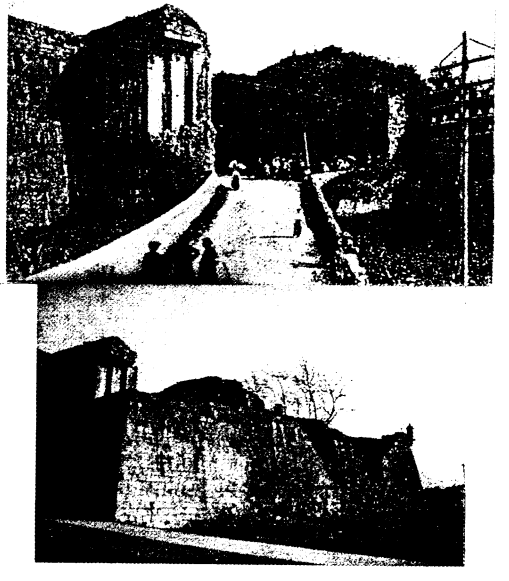
The absence of an accurate topography has imposed the requirement for a topographic survey on digital tachymeter. The three dimensional process has been done by means of field survey corrected with aerial photogrammetry. The obtained cartography has enough quality for the foreseen research task.

4.2. Historic and documentary research.

In this work has been of the highest importance the deep knowledge of ancient cartography and chronicle from the Walls origin until actual times. Specially interesting was the Spanish military documentation about sieges and other military ups and downs of the Walls particularly during he seventeenth and eighteenth centuries.

The main sources of documentation have been:

Simancas General Archives.
Hondarribia Council Archives.
Army Geographic Survey Historic Cartographic Archives.
Royal Library of San Lorenzo de El Escorial Monastery.
National Library of Paris.



4.3. Geological analysis.

This analysis has been carried out by means of a perforation 17 meters long. It has been possible to determine that the bedrock is at 15 meters from the highest part of the Walls.

Besides a series of samples allowed the determination of the state of the foundations and which part of the Walls remain buried by the fills and level of the water surrounding them.

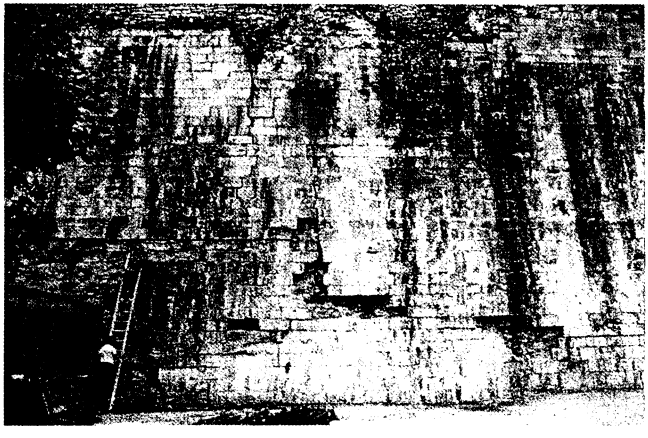
These data is required to estimate the structural integrity and constrain future actions.

4.4. Stress analysis.

Prior to perform this analysis a typical ashlar of the Walls was used to obtain its characteristics in a load test. The stress state has been obtained using the Hole Drilling method. This study reveals that the most stressed points of the Walls are the most damaged ones.

4.5. Tracking of the cracks.

Our research group decided to track during a long period the evolution of the big cracks of the north stretch of the Walls to establish if they are growing or not. Therefore groups of strain gauges with thermometers were installed. They measured the big oscillations of the cracks specially with the temperature, they are more significant when there is direct exposure to the sun light. Nevertheless the cracks are not growing due to these oscillations and the geometry is the same for similar climatic conditions.



5. Diagnostic

As a whole, the structural health of the Walls is good, except for the north stretch and the San Nicolas' stronghold. These parts were particularly damaged by the French army in 1719 and actually are the ones in which the effects of the big trees roots is worst. The most important factors related with the degradation are the pollution and biological attack in a near maritime environment.

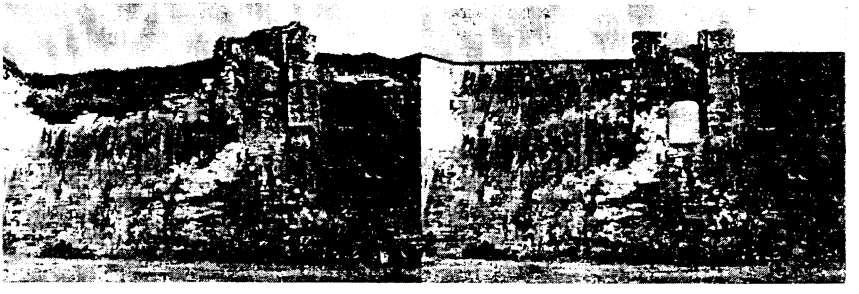
6. Proposals

We consider the solution of the problem through three interdependent and simultaneous fronts, as follows:

The first one should stop or minimise the damage on the material itself by protecting the ashlars from the atmospheric attacks, pollution and plants or animals. It would be required, as well, to reduce the impact of the necessary framework networks and recover the blind part of the Walls to waterproof them and strengthening of their crowns.

The second front is related with the structural stability of the Walls and, thus, we recommend a continuous monitoring of the installed strain gauges to establish the suitable anchoring and strengthening techniques.

The last but not least front to tackle the problem consists on an urbanisation effort that will recover the Walls as monument and avenue. This will require the reconstruction of part of the Walls and suppression of some urban furniture or even buildings that harms their appearance. Modern technologies can help to decide which parts of the city should be modified to recover the Walls of Hondarribia.



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