

Introduction

In this poster I will illustrate the case study of the Natural History Museum of Genoa and in particular its situation after the 2014 flood. This is a significant example from my Ph.D. research, where the main focus is on museum storage solutions and conditions in Italy. Museum storages are usually located in the underground levels of antique palaces, often without any concerns for climate system controls. This problem must be addressed; in fact, museums should be equipped with an adequate storage system capable of dealing with different types of artefacts according to their nature, and should also be prepared to face problems caused by natural disasters.

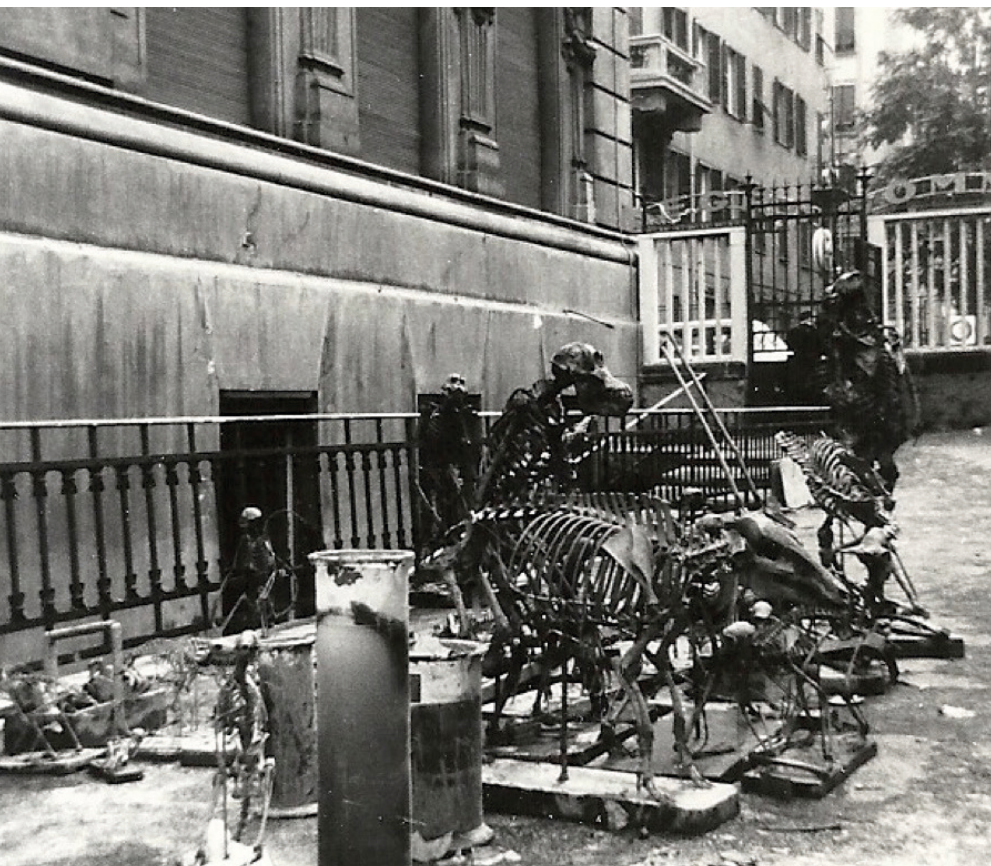


Museum façade in 2015

Context

Genoa is the main capital of Liguria, a north-western Italian region. Situated between the mountains and the sea, it is a city full of history and with a glorious past. In 2006, part of the old town, Le Strade Nuove and the system of the Palazzi dei Rolli, was inscribed on the World Heritage List (UNESCO). In the last 20 years Italy, as well as other countries, has witnessed serious climatic changes affecting not only people's life, but also its environment and cultural heritage. The Natural History Museum, named after the naturalist Giacomo Doria, was founded in 1867. It contains over four million and a half samples such as botanical, zoological and geological collections. Like many scientific museums it exhibits only a part of the collection (about 6000 samples), while the rest is available for study. The permanent exhibition is located on the ground floor and the first floor. In the basement and on the second floor there are laboratories, storages, offices and study rooms. The fate of the museum and the many problems it suffered since it was build, but mostly over the last 40 years, is connected with to the Bisagno stream that runs nearby.¹ The stream is covered by two streets (Viale Brigata Bisagno and Viale delle Brigate Partigiane), which are near the museum. Nowadays, heavy rains are more frequent than in the past: many litres of water accumulate in a short time. For this reason it is very difficult to call the state of emergency and organise proper precautions. During the flood of 2014, the water came as a fury from the overflowed spring of the Bisagno to the city, followed the slant of the hill and completely devastated the museum basement. Furthermore, water seeped through the floor and reached a height of 3,20 meters.

¹ The history of the stream is well described in the recent book: Rosso R., *Bisagno. Il fiume nascosto*, Marsilio Ed., 2014.



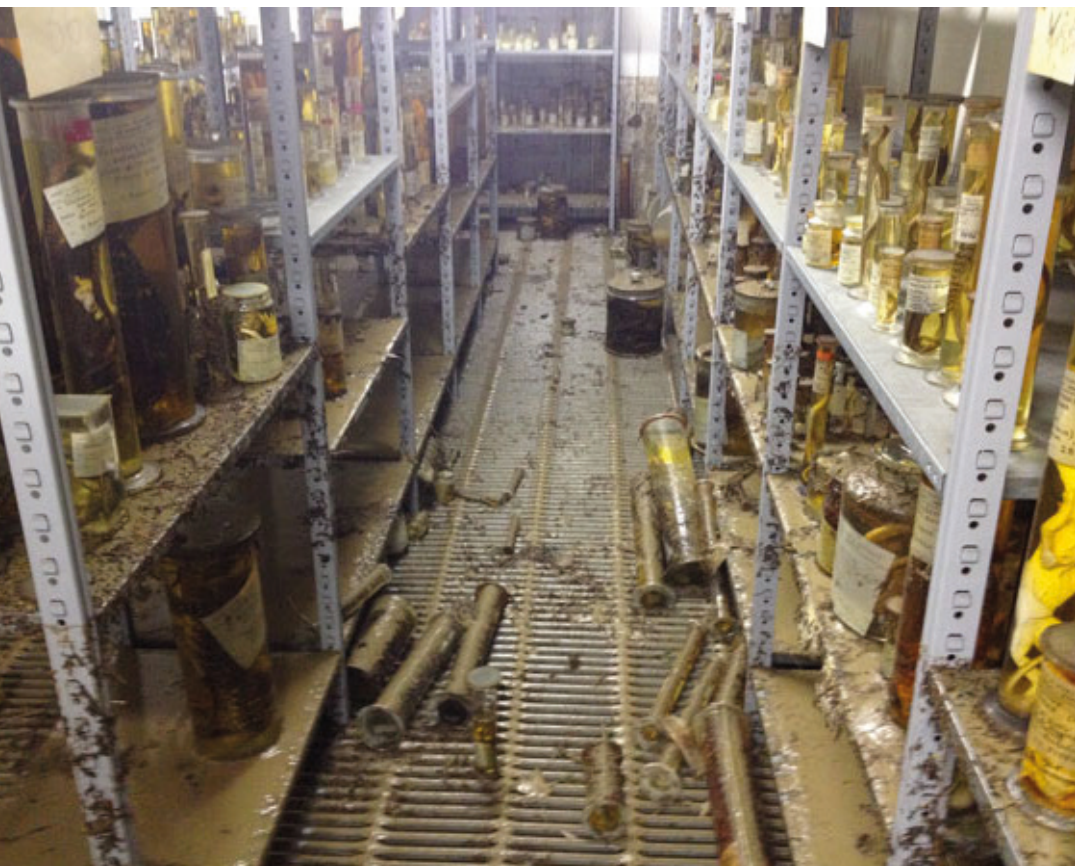
1970 - After the flood: samples outside the museum.



1992 - Basement after the flood.



2014 - Mezzanine before the flood.



2014 - Mezzanine after the flood.

Methodology

As mentioned before, this was not the first time the museum struggled with floods. In fact, before 2014, the latest were in 1970 and 1992. The basement is undoubtedly the risky area of the museum. It is 2.500 square meters of storage and laboratory for researchers. Since the flood of 1970, many changes have been made such as:
1970: Furniture improvement with the application of grates that trap the samples and let the water flow. The huge problem after this flood was to collect and recognise the samples, which without this grates spread all over the basement.
1992: Flood was more severe and it was necessary to build a mezzanine, situated in the basement at 3 metres above the floor. The furniture was moved to this mezzanine with the same grates system installed after the flood of 1970.
2014: Water reached 3,20 metres, thus even the 1992 solution was ineffective to protect the whole collection. Among the damages to the building (doors and windows, flooring, electrical and lighting system), the big losses were the instrumentation, such as microscopes and computers. Also, some samples collocated for study reasons on tables in the basement, were lost into the mud.
Part of the collection was moved to the third floor where a new storage area was created. Due to lack of space it was not possible to move everything, thus only the lowest part of the furniture in the mezzanine was cleared. Now the level of the first shelf starts at 4 metres above the basement floor.



2014 - One of the sample recovered from the mud.



2014 - Volunteers working in the museum basement.



2014 - Basement after the flood.



2015 - Basement after renovation.

Conclusions and challenges

The museum never stopped being operative, only ten days after the flood a National congress was held. The structure recovered in a very short time and in June 2015 the basement was fully restored and the organisation of the new storage area began. None of this was possible without the financial assistance from the Municipality of Genoa, a crowd funding project and the Genoese transport agency, which donated 20.000€. Moreover, the museum staff, fire-fighters, local associations, 100 volunteers per day (about 1000 volunteers overall) helped remove the mud, securing the safety of the area and the samples. The recent study *WorldRiskReport 2012*, presented in Brussels by the United Nations University within Alliance Development Works and The Nature Conservancy took into consideration each country's risk factor of being affected by a natural disaster. Among the 173 countries in the world considered, Italy occupies the 116th place and only the 5th in Europe. Genoa's case is just one of the many case of studies concerning similar issues. Unfortunately, due to many causes such as the growth of the city, the impossibility of expanding the museum, the lack of financial help for cultural heritage, the hydrogeological instability created by the Bisagno stream, climate changes and so on, the museum and its heritage are at risk. The municipality is working to create a solution to manage the stream so that, in case of another overflow it will discharge its water into the sea and not into the city. Most of the time, management solutions like those applied at the Natural History Museum of Genoa originated as the reaction to a natural disaster, as a subsequent action required to put the pieces back together, instead of a pre-emptive action. Similar cases were experienced in Italy after the earthquakes of L'Aquila (2009) and the Emilia Romagna region (2012). So far the government efforts have been concentrated on repairing the damages more than elaborating a prevention plan. Hopefully this will change in the future.

Acknowledgments

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