

EUROPEAN CATHEDRALS

PLANNED CONSERVATION

PISA

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Research, Prevention and Conservation of Seville Cathedral

Alfonso Jiménez Martín

BACKGROUND

In the year 1146, the last bishop of *Hispalis*, successor of Saint Isidore, succumbed to the Muslim pressure and fled to the Christian kingdoms. Several decades later, in 1172, the Moroccan caliph decided to build a new mosque in *Isbiliya*, the European capital of his domains trying, although in vain, to match the scale of the Great Mosque of Córdoba. In December 1248 the crusaders conquered Seville and consecrated the mosque as a cathedral. Between 1433 and 1506, the largest Gothic cathedral in Europe was built on top of the mosque. Since that time and until the present day, the Cathedral has undergone constant modifications, all of which have fortunately been improvements.

Seville Cathedral is a Catholic church with an extremely active religious life. However, it is also a world-class cultural space and the greatest tourist attraction in the Seville province. For the archdiocese of Seville, which owns the building, the Cathedral is not only its largest place of worship but also its most reliable source of income. In 1987 the urban, architectural and artistic merits of the Cathedral earned it World Heritage status, along with the Reales Alcázares and the Archive of Indies. Today that status is threatened by the construction of a skyscraper.

The management of the building, its contents and its activities is the sole responsibility of the Metropolitan Chapter, and for the last ten years or more there has hardly been any external participation in this process. The Chapter relies on the services of a consid-



erable number of professionals and companies, which in the case of the heritage issues that have brought us together at this conference are coordinated by Dr. Teresa Laguna Paúl and myself. Teresa is responsible for the movable assets while I am in charge of the architecture. The resources at our disposal are as follows:

- At the recommendation of the two aforementioned experts, the Chapter's annual budget, which is 9,330,550 euros for 2012, includes various allocations for heritage conservation. This year the total sum available for this purpose is 2,646,294.02 euros, which can be spent by drawing up a simple estimate and justifying it *a posteriori*.
- We collaborate with a number of highly experienced specialist companies which have been working with the Cathedral for many years, and to this end we meet with the project managers at the so-called 'Works Council' on a weekly basis.
- The physical means at our disposal include auxiliary equip-

ment for inspection and works conducted at great heights (for example an articulated arm which can reach a height of 37 metres) and various industrial warehouses for storing materials and objects that cannot be exhibited and for which there is no room in the storage facility at the building. All these are owned by the Cathedral.

- There are devices designed to record the environmental conditions of the Cathedral, both in the areas where movable assets are exhibited and in other areas of the building. These are integrated with a general system for collecting structural data, connected to the internet, which continues experiments started in 1998. The public area of the site can be viewed at <http://catedral.kinesia.net/>.
- We have also a three-dimensional photogrammetric map drawn up in accordance with the *Carta del Rilievo 1999*. This was funded by the Cathedral Chapter and is regularly updated and reviewed in collaboration with the Spanish National Research Council. The map has been published in the form of a 60-plate portfolio and can be viewed online at <http://hdl.handle.net/10261/20324>.

RESEARCH AS MOTOR FOR SCHEDULED CONSERVATION

In our experience, in very old buildings like the Cathedral which receive so many visitors each year and are used for so many hours a year, the only way to preserve the heritage is to schedule conservation, which we do by using research as initiative and motor. We firmly believe that this research begins at the most elementary levels with simple recorded observation every day; in other words, research based on personal observation and research based on the use of automatic recording methods. It is only through the continued use of a system or, rather, of a custom of this type that we have been able to monitor the Cathedral's condition over the years.

Experience has also shown us that conservation through small but repeated interventions are the best guarantee for sustainable economic processes because, among other advantages, these mini-

mise collateral damage and avoid arousing commercial and propagandistic interests, which are invariably sugar-coated pills. In this respect, the Cathedral is a subject of research for external institutions and researchers, especially universities. Traditionally, it has been art historians, on an individual basis, who have consulted the archive and the artistic contents. The Cathedral facilitates these initiatives, even in the knowledge that only a few are actually put into practice. In recent years the architecture and its conservation have been, or will be the subject of the following research projects:

- An R+D+I project titled 'Seville Gothic Cathedral. Architecture and City in the Spheres of Influence of the Cathedral of Seville: Spain and Latin America'.
- An R+D+I project titled 'A Digital Information Model for Understanding and Managing Cultural Properties'.
- A project funded by the National Research Plan titled 'The Acoustics of Cathedrals: a Scientific Contribution for the Recovery of Cultural Heritage'.
- Participation in the ENPICBCMRED 'Multilateral cross-border Cooperation in the Mediterranean Sea Basin Programme', which aims at creating a geographic network and serving as a 'Cultural Heritage Laboratory'. The programme is run by researchers from the *Istituto per le Tecnologie applicate ai Beni Culturali* of the Italian National Research Council in collaboration with researchers from Cyprus, France, Portugal and Spain.
- We cannot expect much from this type of research because it is motivated by interests that have little to do with the Cathedral and the pace of work is often associated with teaching interests or personal development. Much more interesting is the research led either by the Cathedral itself as a collective organisation or privately by the people who work there. One example of this type of research can be found in the numerous publications by the two experts responsible for the Cathedral's heritage, based on their observations and the documents in the archive. Preventive research, aimed at compiling constant information about diverse aspects, is currently being conducted in the following fields:



- General inspection of the structure. Overall monitoring of the Gothic building is based on partial experiments which have been conducted since 1998 and involve the weather vane (1999-2005) and two pillars in the retrochoir (2007-2009). This system was installed in 2011 and currently uses 50 channels which have supplied 60,595 records, one every five minutes, relating to the size of cracks, the measurement of the longitudinal and transversal dimensions, the inclination of the supports, accelerometers and the environmental conditions. The initial project consists in maintaining this level of monitoring until 2016, with as many extensions as deemed appropriate. Thus, last March we installed six new sensors in the hitherto inaccessible cracks of a vault from 1504. Some of the public data can be viewed at <http://www.kinesia.net/>.
- Audit of the Colombine Library. The Cathedral library, which is situated in the building itself but, in keeping with modern institutions, is run by different staff members and with different opening times and entrances to the Cathedral proper, contains a vast collection including the archive of Christopher Columbus and his bibliophile son, Hernando. It was restored in the 1990s with highly unsatisfactory results in terms of the quality of the materials and installations. This year, 2012, the Cathedral has hired the services of a specialist company to undertake an audit of the library structure and installations and draw up a detailed schedule of the works required.
- Energy Efficiency Audit. The Cathedral has had external lighting since 1972 but nowadays the installation has fallen into an advanced state of decay – it is in fact a miracle that it has managed to survive in such appalling conditions, with very poor colour rendering index and zero energy efficiency. Following the recommendations of the 'Taxco Charter' on urban lighting, a document drawn up in Mexico with input from the author of this paper, the Cathedral has hired a specialist company to conduct an energy efficiency survey in an attempt to explore the complete renovation of

the installation with its owner and maintainer, Seville City Council.

- Safety Studies. Since the 1960s the Cathedral has been equipped with fire alarms and extinguishers and intruder detection systems, including video surveillance. Owing to the vast dimensions of the building, these systems are all one of the same type and tend to work independently; a project is therefore currently underway to integrate and renovate all these installations. At the same time, a series of surveys concerning the safety of churchgoers and tourists has been launched, following the completion of the compulsory safety surveys regarding in-house and external workers. As there have been problems with sick people and others who have suffered accidents in inaccessible parts of the building, the surveys underway also include evacuation measures for visitors to the roofs and bell-tower.

CONSERVATION PROGRAMMES AND INTERVENTION PROJECTS

The current budget for the Cathedral includes specific allocations for scheduled tasks which have been repeated on a regular basis for years, as indicated below. These tasks are the direct result of the research conducted, and are constantly improved and increased.

- Conservation of the pinnacles, crests and turrets on the Gothic roofs: since 1993.
- Conservation of the six old portals: since 1998.
- Conservation of the stained-glass windows, undertaken by a German company, and the surrounding stone tracery: since 2000.
- Conservation of the 25 bells, undertaken by a Belgian company: since 2000.
- Cleaning and reviewing the external structure of the building overlooking the public thoroughfare: every three months since 2004.

- Cleaning, every three months, and weatherproofing the roofs: since 2006.
- Conservation of the tower and bell-tower (the Giralda): since 2007.
- Sectoral conservation programmes and improvement of installations and furnishings used on a daily basis: since 2007.
- Systematic conservation of the 16th-century grilles, the only programme conducted by an independent Institution (the Spanish Ministry of Culture): since 2008.
- Cleaning the interior walls: since 2010.

This year's budget also includes specific allocations for undertaking special interventions which in the future will give rise to regular conservation programmes.

- Altarpiece. This involves complete cleaning, conservation and consolidation works, new lighting and various research projects, including the public viewing of the main altarpiece, begun in 1504 and last restored in 1979. The altarpiece is widely recognised as one of the
- finest sculptural groups in Spain. With an estimated investment of 734,740 euros, the work began on 16 January 2012 and is expected to last 28 months.
- Royal Chapel. This project involves the replacement of the general flooring in the chapel, pantheon of the Castilian monarchs from the 13th century and burial place of Saint Ferdinand. The existing floor dates back to the early 20th century, although a part of the floor belongs to the 17th century.
- The project has permitted extensive archaeological excavations and replacement of the installations. It was begun in September 2011 and will end in July 2012. The total investment is of 273,000 euros.
- North Façade. The façade of the old mosque is the part of the Cathedral with the poorest quality of material. It is also the lowest in height. However, it has extraordinary archaeological merit because it was completed in 1198 and still displays Muslim decorations which are virtually unique, such as areas of plasterwork, stucco arabesques and a splendid giant wooden

door clad with Islamic sheets of bronze, as well as several relief carvings and terracotta sculptures from the 16th century. The same façade also displays various appalling electrical installations.

An estimated 425,000 euros will be allocated between now and the end of 2013 on this largely archaeological conservation project which has already begun.