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OUT OF THE DARK: ASTRONOMY AS UNIFYING THREAD FOR CULTURES.



Visiting the Monastery of San Lorenzo del Escorial

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Introduction

In this last activity in Spain, we resumed the humanistic character of the presentations made during our visit to Gualdo Tadino. There, the Spanish team talked about our country's contribution to the knowledge of the universe and the development of astronomy.

In our meeting we mentioned the School of Translators of Toledo, as a link between Arabic and European knowledge in the Middle Ages, and also the contribution through the development of navigation instruments during the reign of Philip II, in full Renaissance.

The Royal Site of San Lorenzo de El Escorial, commonly known as “Monasterio del Escorial”, is a historical residence of the King of Spain, in the town of San Lorenzo de El Escorial, about 45 kilometres northwest of the Spanish capital, Madrid.

It is one of the Spanish royal sites and has functioned as a monastery, basilica, royal palace, pantheon, library, museum, university, school and hospital.

Located next to Mount Abantos in the Sierra de Guadarrama, this monumental complex was ordered to be built by King Phillip II to commemorate the victory of San Quintín on August 10, 1557 over the troops of Enrique II, King of France, and to serve as a place of burial of the remains of his parents, Emperor Charles I and Elizabeth of Portugal, as well as of his and his successors. The king entrusted the monastery to the Order of Saint Jerome. Currently it is run by the Augustinians.

Philip II engaged the Spanish architect Juan Bautista de Toledo to be his collaborator in the design. Juan Bautista had spent the more significant part of his career in Rome, where he had worked on the basilica of St. Peter's, and in Naples, where he had served the king's viceroy, whose recommendation brought him to the king's attention. Philip II appointed him architect-royal in 1559, and together they designed El Escorial as a monument to Spain's role as a centre of the Christian world.

The building's cornerstone was laid on 23 April 1563 and was completed in 1584, in less than 21 years, with so much success that his work gave origin to the one denominated in architecture school

herreriana. To this day, la Obra de El Escorial ("the work of El Escorial") is a proverbial expression for a thing that takes a long time to finish.



The first design of El Escorial was extensively modified to accommodate the additional functions and purposes Philip II intended the building to serve. Beyond being a monastery, El Escorial is also a pantheon, a basilica, a convent, a school, a library, and a royal palace. All these functional demands resulted in a doubling of the building's size from the time of its original conception of "simplicity in the construction, severity in the whole, nobility without arrogance, majesty without ostentation."

Aside from its explicit purposes, the complex is also an enormous storehouse of art. It displays masterworks by Titian, Tintoretto, Benvenuto Cellini, El Greco, Velázquez, Rogier van der Weyden, Paolo Veronese, Alonso Cano, José de Ribera, Claudio Coello and others.

Materials

PowerPoint presentation, a document made from the information search and informative book of El Escorial.



Procedure

We consulted the teachers of History of Spain and History of the contemporary world, and the teacher of Geography about the place and we asked them for information about it and how we could properly make the guide for that place.



Results

We boarded all the places that could be visited at the Monastery. We also gave information to our international classmates and guests about the area that we were observing at every moment. We highlight some of them related with our project.

The Library

The Royal Library was the starting point of the design by both Juan de Toledo and Juan de Herrera. It constituted, along with the basilica, the heart of the entire project and the whole exterior and distribution of the project was redrafted several times to accommodate changes in the organization of the library itself.

As it was usual for Juan de Herrera's work, it was the most advanced of its kind in Europe. It was **the first library on the continent that broke with the medieval design**. Domenico Fontana inspired himself, if not copied, Herrera's design after a visit and used it for the Vatican's Library.



The Library, like everything else in El Escorial, forms part of a larger symbolic structure and has symbolic meaning functioning within it. It is located between the public area of the palace and the church. The books of the most "profane" subjects, such as History, Geography or Botany, are located next to the entrance, and as the corridors advance towards the basilica the subjects turn into more abstract forms of themselves like Poetry, Grammar or Mathematics.

Currently, the Library has **more than 40,000 volumes**, This Library was a Renaissance statement of power, majesty, prowess, and intellectual world leadership designed for both the preservation of the old (binding multiple cultural histories into a single Catholic Spanish culture) and discovery of the new (imprinted by that culture).

The vault of the library's ceiling is decorated with frescoes depicting the seven liberal arts: Rhetoric, Dialectic, Music, Grammar, Arithmetic, Geometry, and Astronomy.

In the final part of the Escorial library, almost next to the exit, is the so-called **armillary sphere**, which, at first glance, is a set of metal hoops in whose centre is a representation of the Earth. Those circles (where the Latin name "armilla" comes from, which means circle) inserted into each other, represent the celestial equator, the ecliptic, the horizon, the zodiac, etc. Pointing the sphere towards a star, you could read their celestial coordinates on graduated scales and thus establish their exact location in the celestial sphere.

In this armillary sphere, the Earth is at the centre because it represents Ptolemy's conception of the solar system (everything revolved around the Earth) that would be replaced by Galileo's theories, which discovered that the sun was the centre of the system. Antonio Santucci built the armillary sphere in Florence around 1582 for Cardinal Fernando de Medici, who, in the same year, sent it as a diplomatic gift to King Philip II. He initially placed it in his rooms in the Alcazar of Madrid, but later decided to send it to the Monastery of the Escorial and from 1593 appears as part of the furniture of the library.



The sundials

In the Palace of Philip II. In reality they are not sundials, but meridians, and there are two, built by the Hungarian mathematician Juan Wendlingen in 1755, one in the King's Courtroom and one in the next room. They are like two rectangular lines about 5 meters long by 15 cm wide, inserted into the ground next to a window. Above them, about 2 meters high, there is a hole through which the sun enters and at noon it hits a certain point of the meridian.

They are used to set the mechanical clocks (because it says exactly when it is twelve in the morning). If you look, that hole (called gnomon) is now blinded, so that the meridian is no longer in use.



The Basilica



The Basilica is the faithful reflection of the spirit of the counterreformation. Its purpose was to spread the "truths" of the Catholic religion that the Protestant reform had called into question: Eucharist, Virgin Mary, the cult of the saints and the sacraments. Hence the whole iconographic ensemble of the Basilica is based on the principles maintained by the Council of Trent.

We take this point to remember the hard process that Galileo went through to defend Heliocentrism in this same historical moment in which science was held back by religious beliefs. (On the flat vault with 8 concentric strands of stone that serve to displace the entire weight of the choir, some stones mark the 4 cardinal points).

Conclusion

After visiting the monastery, we concluded that everyone left knowing more about our history and culture than they did when they got there.



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