

10. History through minerals

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1. Introduction: The origins

The *Centro Musei delle Scienze Naturali*, University of Naples Federico II, is composed of four Museums: Mineralogy, Zoology, Anthropology and Palaeontology. It holds a rich and heterogeneous heritage which testifies the scientific activity carried out in natural sciences at the Neapolitan University in the last two centuries, a world that was forgotten since the changes in speculative methodologies gradually excluded scientific collections from studies and researches. So, as in many other universities, the naturalistic collections of the University of Naples risked disappearing and the Centro Musei was thus founded, in 1992, just to avoid this waste. It was officially opened to visitors in 1994 [1]. All the museums are located in the historical buildings, built during the fifteenth to the seventeenth century, that hosted the university from the second half of the seventeenth century, when the young and up to date king Ferdinando IV di Borbone and his wife Maria Carolina, Maria Teresa's daughter, decided to move the University from the *Palazzo degli Studi*, where it had its seat from 1616 [2, 3]⁴.

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⁴ Starting from the last decades of the eighteenth century the Palazzo degli Studi was transformed in the main museum centre of the city, the Real Museo Borbonico (nowadays Museo Archeologico Nazionale), a large encyclopedic museum in which were gathered the vast and prestigious collections of arts

The four museums of the *Centro* were founded in different years, from 1801 to 1932: the Museum of Mineralogy in 1801, the Museum of Zoology in 1813, the Museum of Anthropology in 1881 and the Museum of Palaeontology in 1932. The first two are still housed in their original sites, with the same historic wooden shelves. It is not easy to deal with those institutions, so different from one another in many respects, and widely spread throughout the area of the University. Overall, the *Centro* occupies a large area of 2,800 square meters and houses more than 150,000 artefacts with about 35,000 visitors a year. Visitors are mainly pupils attending primary and secondary level schools and university students.

2. Centro Musei delle Scienze Naturali and its activities: Positive and negative aspects

After nearly 20 years, the *Centro Musei delle Scienze Naturali* is today a solid and modern reality, appreciated among scientific museums in Italy and abroad. A fame achieved through the multiplicity and excellence of the activities promoted, such as the dissemination of scientific culture in society through research and initiatives for the preservation of natural and scientific heritage; scientific and historical research on issues related to the collections; workshops, guided tours, but also technical training courses in the field of museology to educate highly skilled and specialized operators in the divulgation of science through objects. The *Centro Musei delle Scienze Naturali* is not just a static and unchangeable witness of the past, but also a lively and still very active scientific centre that never stops increasing its collections, studying specimens of historical and scientific interest, trying to understand how the knowledge about them and the interest they arouse have changed with time.

Notwithstanding, the collections are mainly related to the scientific interests of very specialized researchers who worked at the University of Naples in the last two centuries, and it is thus usually quite difficult for people to understand the topics the objects were related to and the goals these were used for. The *Centro Musei* thus has a major problem, shared by all scientific museums with historical collections: the problem of communicating widely and directly. Because only few «enlightened»

and antiquities coming from Farnese family and inherited by Carlo di Borbone, son of Elisabetta, last of this family, and all the objects – above all the famous mural paintings - coming from Herculaneum and Pompei excavations. In the first years of its foundation the Real Museo Borbonico also housed a few naturalistic items, as a big quartz coming from Madagascar donated to king Carlo di Borbone, father of Ferdinando, and the skeleton of an Indian elephant that came to Naples alive under the reign of that same king, in 1742. Those specimens left the Palazzo degli Studi in the first years of the nineteenth century, at the foundation of the scientific museums of the University.

people understand the real value of what seems to be a sort of «embarrassing» heritage, certainly important but not naturally seductive.

3. Don't' erase history, stress it! A solution to the obsolescence of university museums of science

If such a problem is without any doubt widely diffused and central, a solution may be simpler than we might suppose. In fact, if we look at those objects as scattered words of an ancient language, the solution may simply lie in a translation, or better in a reconstruction, of its lost grammar [4,5]. In other words the challenge is to reveal and explain the importance of scientific historic collections as origins of our current scientific culture, signs of a past time, material and tangible evidences of how science has been evolving in the last three centuries. We have to make those ancient museums appear to the visitors' eyes as real «time machines» through which they may enter in another era, when modern science was developing [6]. And in doing this, it is very important to leave each visitor free to look at the museums and to their collections in his own personal way: it is essential that people do not feel themselves forced to learn every notion that the curators have set up for them. On the contrary, people have to feel free to increase their own scientific knowledge, according to their interests and preferences.

To transform a historical scientific museum from a place that might seem boring to a very exciting one, through not only to pass scientific information on but also to elicit emotion, we have to avoid trying to erase history. On the contrary we have to stress it as the main feature of such museums, it is precisely that that makes them special and unique, as each of them is indissolubly linked to its territory and to the scientists who created it. Those museums have to be regarded above all as a means to encompass Science and History at the same time, showing how Science is not something cold and abstract, out of this world, but a fascinating enterprise that has been shaping the world, something which men and women have been developing to improve human life through daily effort, changing the history and our own stories. That is why we have designed a virtual tour based on the idea of a «time machine», in which new technologies will allow, in a sense, a «rearrangement of museums» collections without changing anything in the historic display, leaving visitors free to choose (and change) perspectives and themes. It will be available via internet, on the *Centro's* website, and on DVDs, which will distributed to primary and secondary schools, as well as to anyone interested in these museums, on demand, as it is thought to be an invitation and an introduction to the *Centro* and its collections.

4. The experiment of the Real Museo Mineralogico: A brief history to understand

A small team of scientists – most of them specialists in the history of mineralogy and historians specialised in seventeenth to nineteenth centuries – decided to launch this project, starting from the *Real Museo Mineralogico*, the oldest museum of the *Centro Musei delle Scienze Naturali*. This Museum is located in the beautiful rooms of a seventeenth century Jesuit School (*Collegio del Salvatore*). In particular the main room of the Museum was the library of the *Collegio*, whose original shelves, at least in part, were used to store the minerals. The exhibition area, of about 800 square meters, includes a wide *Vestibule*, the *Monumental Hall*, and two smaller rooms where volcanic minerals from the Vesuvian and Campania area are displayed. Through its story, this institution is deeply rooted in this territory, as a real symbol of the prestigious scientific tradition of the Neapolitan Kingdom in the eighteenth and nineteenth centuries.

Opened to visitors by decision of Ferdinando IV of Bourbon in 1801, it was intended by the mid-eighties of the eighteenth century as a modern research centre, set up to contribute to the discovery, exploration and evaluation of the mining resources of the Kingdom of Naples. As a matter of fact, the first mineral collections of the museum came from the researches of six young and very skilled scientists, selected through a careful examination. These were assigned the task to tour Europe, especially Germany, but also Hungary, France and England, to observe and learn mining techniques in the most important plants, in order to introduce these in the Kingdom of Naples [7]. One of the scientists of this group, Matteo Tondi – particularly important both for his cultural and politic role – became one of the first directors of the *Real Museo Mineralogico* [8].

The high quality reached by science in Naples from the end of the eighteenth century did not decline, but even improved during the 10 years passed under the Napoleonic dominion, first with Joseph Napoleon and then later under Joachin Murat. This scientific excellence continued after 1814, with the return of the aged king Ferdinando IV di Borbone and shortly after with his son, Francesco I, who was particularly interested in promoting science and aware of its strategic importance to improve the economy and the quality of life of the kingdom. Neapolitan science drew the attention of the whole Europe and also because of the specificity of its prevalently volcanic territory. In particular, the intense eruptive activity of Vesuvius attracted in those years many learned visitors. Some of these, such as Charles Lyell and Charles Babbage were central figures for the development of the most cutting edge theories of Earth proposed at that time. They both visited Vesuvius and appreciated its history, partly through the activity of Teodoro Monticelli, a complex figure of scientist and patriot, rector of the

University of Naples from 1825 to 1827, who played a leading role in diffusing news about Vesuvius and its mineralogy [9,10]. He possessed a vast minerals and rocks collection, above all Vesuvian products, famous in all over the world and partially sold by his heirs to the *Real Museo Mineralogico* in 1851. This Museum reached its highest point of prestige in 1845, when it hosted the VII International Congress of Scientists⁵.

The activity of the Museum continued to improve thanks to the highly valuable scientific work of Arcangelo Scacchi [11], pupil of Tondi and Monticelli, an acute observer of Vesuvius and director of the *Real Museo Mineralogico* from 1844 to 1893. The museum also played an important role in the socio-political history of the Kingdom of Naples first, and of Italy later. In 1848 the Monumental Hall housed the first meeting of the Chamber of Deputies and, in 1860, the same room housed one of the twelve polling stations for the vote on the annexation of the Kingdom of Naples to the newly created Italian Kingdom [12].

5. A history of mineralogy through the stories of scientists: A virtual documentary

The «virtual tour» we are developing intends to underline as much as possible the historic importance of the *Real Museo Mineralogico*, both in terms of building and collections. Virtual visitors will thus be guided by three scientists of the past who played a central role both for the development of the museum and of mineralogical studies – Matteo Tondi (1762-1835), Teodoro Monticelli (1759-1845) and Arcangelo Scacchi (1810-1893) – and they will be given the opportunity to explore the Museum browsing by subject, chronology or objects. A series of brief reports – one for each object whose historical meaning has been selected as an exemplar – have also been «translated» into colloquial language, in order to provide visitors not only with scientific details but also with maybe unexpected ones about history, history of science and technology and the history of the collection. With the help of the agency MEDIAS, specialised in technical devices, an interactive documentary will be made, leaving the virtual visitors free to choose how long, in what order and from which point of view they will visit the museum or learn more about its history, discovering

⁵ This date coincides with the beginning of the decline of science in the Kingdom of Naples. In fact Monticelli died that same year, just during the days of the congress, and this event marks the end of a golden era. The reasons of the decline are many and various. After the death of Francesco I, still young, his soon Ferdinando II, was not able to continue the cultural policy of his father; moreover the economic crisis and the continuous rebellions for the national independence (1820, 1830, 1848, 1860), which involved many scientists, did not facilitate Ferdinando's task.

the objects and the stories that they have to tell, the stories of scientists who contributed with their journeys and studies to the creation of the collections.

The protagonist of this documentary is a boy called Ruben, an Erasmus project student coming from Spain. He has just arrived in Naples and, being interested in Mineralogy and Earth Sciences, he visits the *Real Museo Mineralogico* of the University of Naples Federico II. He enters and, while touring around, touches an ancient machine. Then he notices a strange person, a curator, who is just a fantastic character symbolizing the historical memory of the museum. The curator is friendly, smiling and sometimes a little bit strange as sometimes people are in dreams. He explains to the student that he is still in the *Real Museo Mineralogico* of the University, though no more in the twenty-first century, but in the middle of the nineteenth century. The boy is astonished at first and also scared by this strange man, but he soon understands that he has a unique occasion to meet science and scientists of two centuries ago, so that he decides to follow his guide. From this point, virtual tourists will be free to choose which of the three scientists, Monticelli, Tondi or Scacchi, they meet first, without being forced to follow an established chronological order. Of course it is essential not to provide visitors with false information, notwithstanding the fantastic narrative frame. That is why to make Tondi, Monticelli and Scacchi not simply old and cold pictures but real men with their particular behaviours and different natures, *ad hoc* studies were carried out to investigate their habit of mind, their political ideas, even their gestures in some cases. As a result we now can reveal to visitors the practical and sometimes brusque Monticelli [13], the tolerant and understanding Tondi [14] or the smiling and funny Scacchi [15, 16].

Once the virtual tourists have chosen their favourite scientist, they can listen to what he has to say about the history of science, the condition of the Neapolitan Kingdom, Italy and Europe at his time, and he will talk about his life, scientific activity, discoveries and interests. So Matteo Tondi will speak of his exciting experience in Germany, where he collected most of the rocks forming the «Great Collection» of the Museum, but also of the story of his permanence in France after the revolution of 1799, where he had the occasion to meet René Just Haüy and to collaborate with him. As for Monticelli, he will tell the story of his adventurous and long life, starting from the ten years passed in Favignana, a little island near Sicily, where he was jailed under the accusation of Jacobinism. He will explain the reason why he refused to be freed by his companion patriots at least three times, maybe because he was really in love with the magnificent nature of that place or politically unsure about the republican project they had in mind. But he will also talk about his numerous and prestigious friends, among the most important scientists of his time. And he will show to the young student a little sculpture, a sort of head of satyr in Carrara marble with a jaline quartz on his mouth, which was most probably donated to Monticelli by his close friend, the famous sculptor Antonio Canova [17], to underline his deep

interest in art and his relationship with some of the most important artists of his period. Finally, Scacchi will speak about his discoveries and his activity, more similar to contemporary scientific practice, and will refer to his apprenticeship both with Tondi and Monticelli.

Other protagonists of this project are without any doubt the objects, the minerals in our specific case. In fact, guided by curator Tenzi, the virtual visitor might decide to make a more traditional tour, looking at the different specimens displayed, with a particular attention to those more interested in the history of science. In this case basic scientific information will be offered as well, focussing mainly on details about the sites where the objects were found, the scientist who collected them and the reason why they were collected and then displayed in the Museum.

At the end of his trip in the history of eighteenth century science and mineralogy, the boy wakes up all alone in the museum and goes away, very happy for what he has learned but also a little disappointed. Was it all just a dream? Maybe not: in a pocket of his jeans he still finds the business card that Monticelli has given him.

6. The «time machine» project as a challenge to promote social

To properly interpret the original identity of the museums and collections that developed with the university and are still part of it, any kind of exhibition, – real or virtual – thought to give back the complete sense of these institutions, needs to enlighten both sides of their essence, as they are both a repository of the past and places in which the future will take its place. It has to reconcile past and future, communicating scientific information without ignoring its long history, but using it to catch the visitors' attention and emotion [18].

In particular, the first and more direct goal of this project is, of course, to try to arouse interest in science by eliciting emotions, showing the ancient fascinating rooms of the museum as places where history has been going on for centuries. But the second – not secondary – indirect goal is to try to open wide this particular kind of museums to a public far larger than the university's elites represented by people who already attend it, as students or staff, showing the «friendly» face of university no more closed in its exclusive *templa serena*, but appropriating again its former role of cultural heart of the city and its public heritage for every citizen and visitor to the city [19]. Stressing the excellence of Neapolitan science and the way the history of science determined the history of the territory and that of the common people living in there (studies of mineralogy determined the birth of a certain number of mines) is fundamental to make the local community – not only tourists! – feel encouraged to enter university museums as their own home, a place where to discover a lost part of

their identity. Forward social inclusion is particularly important in a city like Naples, where cultural and economical issues are largely diffused, with rich and cultured people living side by side with poor and uncultured ones without any real contact. The gap between different classes and quarters is like a precise cut across the city and really determines two separate worlds, which is one of the fundamental problems of the town. The special challenge of this project is thus to promote a process of fusion between the different souls of this difficult and formidable city.

This social goal of the «virtual tour» project should be one of the main aims of any museum, and we believe we will achieve it by emotively involving all kinds of visitors, and none should ever be a passive observer but an active part of the museum and its history. This is possible by trying to elicit wonder as Bruno Bettelheim so truly said:

The greatest value that a Museum can have, above all for children, is to stimulate and fascinate imagination; excite curiosity in order to make them penetrate deeper and deeper the sense of the objects displayed; give them the occasion to admire, anyone in his own times and ways, things which go beyond their knowledge; and above all, communicate a sense of veneration for wonders of the world. Because a world without wonder is not worth living [20].

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