

Breathing new life into dormant academic heritage in Spanish universities and secondary schools

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Abstract

Old and prestigious universities and secondary schools are linked historically, as evidenced by their heritage, which talks about the people and luminaries who studied or taught in their classrooms. A significant scientific and educational heritage created or acquired for the teaching of science and art is present in both contexts. The original use of the heritage may have disappeared, but new interpretations have been generated that enrich its value and extend beyond material existence. The aim is to find current connections between school and university to facilitate the production and sharing of new knowledge through projects that will give life to what is at present a 'dormant heritage'.

Introduction

At the Complutense University in Madrid, Spain, we have recently been working on the connections between the university and the public it serves. We intend to rebuild the educational and cultural landscape of the capital through the study and dissemination of the rich academic heritage preserved in certain educational institutions. There are close parallels in their origin and function between the historical collections in the oldest higher education institutes in Madrid and the ones kept in public universities. When studying the collections and their history, we searched for common ties with the aim of offering a wide and comprehensive view of the history, the objects and their potential. It is usual for institutions to carry out research into their own history and development, but rarely do they connect with other institutions unless there are joint interests. The discovery of common origins has provided the opportunity to trace the generation of similar collections in two educational contexts framed in different academic levels today. In the past, however, this was not accentuated as both were held in the same respect and with similar consideration.

Their common history starts in the nineteenth century. The study of these emblematic institutions gives a clear indication of the evolution of the Spanish educational system. This sought excellence in the training and was subject to extensive discussions that flowed from numerous legal initiatives during the century. The laws changed rapidly due to an unstable political situation.

There are many references about the need to match European institutions. In those debates France is the country that inspired many of the proposals. The liberal thought influence of the French revolution proposed an education system capable of generating an egalitarian, just and free society where the responsibility of education fell on the State, moreover education was a right that should be guaranteed to all citizens. There are direct allusions to the Condorcet report of 1792 (REAL 2012).

It is common in Spain not to give credit to its own achievements. In this case we should, as we consider it necessary, assert the relevance of the historical academic institutions. Inside the secondary school walls important scientific debates took place and many of the teachers achieved great importance and public presence. Also, these institutions were able to gather significant teaching collections with great historic and scientific value. The collections were similar to the ones found at the University, although we recognized that their significance is better preserved.

The secondary education schools, as they are known today, were established in most Spanish provinces between 1836 and 1845. From that date two areas of knowledge existed: Humanities and Sciences, the latter included mathematics, physics, chemistry and natural history (geology, botany and zoology) disciplines aimed to strengthen the observational capacities of the students, singularly centered in their own environment. The teaching of science sought to stimulate material progress and facilitate the development of future professional scientific careers. The trend was to intensify the teaching of sciences, creating pedagogical laboratories and seeking human progress, cultural actions and the development of individuals (RODRÍGUEZ 2009). In 1845 only 25 per cent of class hours were dedicated to science, however, by 1873 there was a greater recognition with a total of 44 per cent of the class hours dedicated (SANZ 1985).

Regarding the University there are references in 1821 about the establishment of a major University (called Central University) offering comprehensive studies required for the full knowledge of the sciences. This was extended to the universities of Lima, Mexico and Santa Fe in Bogota which will offer the same studies as the Spanish one. (Decree LXXXI of June 29, 1821 General Regulation of Public Instruction). In 1836 Central University moved to Madrid and in 1845 a Royal Decree established that only this University in the capital will award the doctoral degree and offer the programs needed to obtain it (article 77). At that time there were only ten universities: one central and nine in different districts.

As noted above, Spain looked to France as a model for the emergence of university faculties (HERNÁNDEZ 2008) although incorporated some modifications in educational law (Public Instruction Law. September 9, 1857). In general terms, the Spanish system applied the reduction of universities and gave the State complete control of the study programs (ÁLVAREZ 1972, 329-340). The increasing interest in science learning was established in article 14 of the Law of 1857: "As effective means to expand and complete the progress of science, the Administration will seek the growth of academies, libraries, archives and museums, and will create new schools for the higher levels of science, linking its organization to the existing ones as much as possible". In 1857, the academic and administrative sides of the secondary and tertiary institutions were permanently separated, however, San Isidro High School was aggregated to the University, and in 1874 depended only on the State. In the twentieth century German universities were also a model to complete the reforms that Spanish higher education needed. The German system proposed the integral development of the human being, promoted the acquisition of knowledge and enhanced research capacities, all this was present in the Spanish Project of University Reform of March 17, 1933. The Spanish government also granted numerous scholarships to study in Germany (GÓMEZ 2009).

The oldest High School and the biggest university

The center of Madrid and Spain is where the history of the oldest high schools and the biggest University emerged. San Isidro High School holds the honor of being the oldest educational center in Spain, inheriting a long and rich history from the fourteenth century, first with the so called Estudios de la Villa, and afterwards with the foundation of Imperial College (1603) and the Centre for Royal Studies (1625) by the Jesuits. In 1725, the Seminary of Nobles was created to train the ruling elite of the country. In 1767, King Carlos III drove out the Jesuits and recast the Centre for Royal Studies as a secular institution to boost renewal of the country.

The University completed the move to Madrid in 1837 becoming the central university and the two most important secondary schools were part of it. The University shared classrooms, cabinets, laboratories, teaching materials, scientific collections and teaching staff with the San Isidro Institute. The school of architecture, the faculties of philosophy, medicine and arts at the University of Madrid were located in their classrooms. As CORBACHO (2004: 34) stated, "Complutense University of Madrid (formerly the Central University) is the true heir to Imperial College since, in its transfer to the Moncloa campus, it took much of the cultural heritage of the Estudios". Among these collections, there is a large part of its bibliographical assets.

Teachers at the school taught basic secondary education classes, and the lecturers at the university taught the advanced classes. Both institutions were supervised by the Dean of philosophy and the Professor of political economy. Being a teacher at a high school was a preliminary step to becoming a lecturer at the Central University but it was an outstanding recognition when achieved. An example is the natural history Professor and Director of the Institute Sandalio de Pereda. He started his career as a lecturer at the School of Medicine, two years later obtained the natural history Chair at the University of Valladolid. After six years he became a professor at the San Isidro institute where he taught in thirty three courses and was the Director for sixteen years. He was an essential character in the development of the natural history cabinet and was the author of various textbooks. He was also a member of the science, medicine, natural history academies in Madrid, Barcelona and Mexico.



Fig. 1

Central University

Façade, 1920-1930

Complutense University of Madrid

General Archives

AGUCM SG/1497,01

Regrettably, after 180 years, very little of the common origin is identifiable. Most faculties moved from the center of Madrid to the University City. The university has kept part of the historic buildings in the center of Madrid where its historic library and the old assembly hall is located, as well as some of the collections.

Teaching sciences, common collections

Although some of the teachers lectured in schools and university, it is easier to use the collections to establish links between the institutions. We will focus on the teaching of the sciences, in the gathered material culture and the initiatives to promote the preservation and dissemination of cultural heritage.

Historically, the creation of educational collections and museums is evidenced more clearly in secondary schools. These were kept in the same place where they were conceived. Their historical and academic heritage can be divided into four large sections: firstly the building, secondly the library, thirdly the natural history cabinet and finally the physics and chemistry cabinet. In the university the collections grew in different locations; faculties and departments, but the cabinets were lost during relocations.

‘Good education’ was the aim, which had to be practical and based on intuitive, active and experimental teaching methods, “...due to the young age of the majority of students, it is required that, in order to obtain good results in instruction, the classes are essentially practical, and this is impossible since there are not adequate and abundant means of demonstration. Make theoretical a subject that must be experimental oblige the student to remember only words and not express ideas, leading to discouragement, and interfering in the development of their privileged intelligences”, (Instituto San Isidro Memorias: 1860-1861, 53).

There was an urgent need for teachers to count on the best scientific materials, thus encouraging the creation of cabinets. Firstly, the physics and chemistry collections were gathered. BERTOMEU et al. (2010, 2011) have studied them extensively.

In 1860, San Isidro School installed the first natural history cabinet associated with the natural history Chair. The cabinet grew and in 1877 gained the highest recognition when Sandalio de Pereda was the director. At that time, the famed professor of natural science, Manuel María José de Galdo López de Neira, worked on the establishment of the cabinet and travelled to Paris to purchase educational materials. The academic institutions had a basic catalogue provided by the State but big institutes could purchase more pieces and more expensive items. In Paris he bought a complete model of Auzoux man and numerous reproductions of zoological and botanical models (ARAGON 2012: 105-107). Galdo also published the Manual of Natural History that was used in teaching for almost half century. The collections he acquired went in parallel with writing the textbook inspired by French works of the time. San Isidro Institute had a proper space for the natural science collections. The cabinet was equipped with two rows of glass display cases with stuffed animals and teaching models. In the center, two large table cases contained minerals and fossils. In the middle a tall display case stood containing the Auzoux man as the central piece. The history of the evolution of the collections in their different stages has been studied by MARTÍN (2012, 2013). Regrettably, in the 1970s, the cabinet underwent an unfortunate reform, which modified the cabinet layout and the collections were dispersed to other locations.



Fig. 2

Natural Science Cabinet. San Isidro

School nineteenth century

Photo: IES San Isidro

In the University, gathering educational and scientific collections came later. In 1860, the Central University had six faculties and nine colleges. The Faculty of Science was organized into three sections: mathematics and physics, chemistry and natural science. Years later, a fourth one was added when mathematics and physics separated. The teaching of sciences in general lacked practical work, only the natural history section had suitable practical classes, which were taught at the National Natural History Museum. However, if we compare the collections of both institutions, we find the same concept. The same catalogues were available but in the case of the university the number of pieces was greater.

Schools and universities were also related to important scientific institutions such as the Museum of Natural Science, the Spanish Society of Natural History, the Royal Observatory and the Royal Botanical Gardens. The Royal Spanish Society of Natural History, founded in 1871, was an association created by school teachers, which assembled the leading naturalists in Spain. Its main objective was to promote the research and study of nature, the dissemination of knowledge generated, the defense of natural heritage and the training of natural science teachers.

The Museum of Natural Science also played a key role. The museum was born as a Royal Cabinet of Natural History in the 18th century, an institution dedicated to the advancement of science. From its origin until today, teaching was its fundamental purpose having a close relationship with secondary education centers and universities. It was also a vital element for the formation and distribution of collections of specimens and natural samples destined to these educational centers, especially from the second half of the nineteenth century. Thanks to this collaboration, cabinets and museums were created all around Spain becoming essential in practical teaching of the natural sciences (MARTÍN, 2014).

In 1885, the Royal Society of Natural History proposed an important educational reform to improve the natural sciences studies in Spain that was ignored until 1900. Until this year only the practical classes of natural sciences section were held in the Museum, botanical garden and in the departments of the university. The other sections of the science faculty took longer to offer the demanded practical lessons (BARATAS & FERNÁNDEZ 1992). The Royal Society also proposed measures to foster scientific research within the University and the Museum of Natural History.

Today, the national natural science museum is one of the major research institutions in Spain and works jointly with the university. Moreover, the Royal Spanish Society of Natural History has been located in the museum building since 1910. Concerning the university collections those have been dispersed and developed separately in different faculties.

Defense of heritage

The rich and varied heritage is undeniably important for its historical, educational and scientific value. Commonly, the cabinets were named as museums, an indication of significance. The collections bear a great similarity to what is found in other countries, however, the idiosyncrasy of the history of educational reforms in Spain has propitiated a reality of its own. Among other issues it has taken a long time to realize the importance of this heritage and the need to preserve it. It is certainly surprising that, for its survival, we have to talk about its defense, and not about its promotion.

In the case of schools, it was necessary to create the National Association for the Defense of the Heritage of Historical Schools. Although the first conference was organized in 2007, the Association was founded in 2010. Its objectives include work to recover their assets, whether documentary, bibliographic, scientific, or architectural; the restoration and inventory of such assets, as well as fostering cooperation among schools for scientific and educational activities.

Unfortunately, the Association has not been able to meet the objectives of heritage protection. They are very active, but as we have learnt, the real defense comes from within the institutions, which face difficult challenges in keeping the collections in their original context and guaranteeing their conservation. In addition, a more extensive awareness campaign is required, and support from public institutions provided that they understand the importance of this heritage for the history of the country and agree that it should be kept in its original context and in more suitable conditions.

The museum of education and science

These days, the dormant heritage has started to come to life. In the 1990s, there was a proposal at San Isidro school to build an exhibition space to show the collections that were in poor condition. The main problem was finding a proper space for it. Twenty years later, in the twenty first century, the school achieved its major goal of opening the Museum of Education and Science. The initiatives, enthusiasm and energy came from inside the institution, supported by the administration and carried out by teachers and students. The space chosen was the historical seventeenth century staircase, which had fallen into disuse.

Two associations and a project were essential in the development of the museum; besides the National Association for the Defense of the Heritage of Historical Schools, there is ARCE (Agrupaciones y Redes de Centros Educativos / Groups and Networks of Educational Centers), which groups educational centers, sponsored by the Ministry of Education. Its program aims to establish collaborative channels enabling clusters or networks of schools and public institutions in the field of education in Spain to work together. The purpose is to develop joint projects carried out by all the centers or participant institutions.

The project, called CEIMES (Science and Education in Madrid Secondary Schools through their Cultural Heritage 1837-1936), is a program of activities among research groups in the Community of Madrid, mostly university groups, financed by the Ministry of Innovation and the Community of Madrid for three years (2008-2011). The aim was to safeguard and enhance their scientific and educational heritage using new information and communication technology to advance the knowledge of educational innovations when experimental science was seen as essential for teaching. Most of the collections were catalogued and are accessible through the web. Thanks to this project, a very valuable book was published, titled *Science, education and heritage in historical schools in Madrid (1837-1936)* (LÓPEZ-OCÓN, ARAGÓN & PEDREZUELA 2012). This volume is divided into two parts, the second *New life for a forgotten heritage* is especially significant.

The historic royal staircase houses the school's permanent exhibition detailing its educational heritage. Books, maps, photographs, school records, illustrations and examples of student's work are on display – along with objects from the biology and physics laboratory: the Tree of Life, an array of animals stuffed by the famous taxidermists, the Benedicto Vives brothers, as well as anatomical models of plants and animals from the nineteenth century made by Dr. Auzoux. As MARTÍN stated (2012, 154) the staircase escaped the reforms of the twentieth century to serve as organizer of museographic discourse. Display cases and documents are set out in a metaphor for the ascending path to knowledge and wisdom. It is not a straight road, but a spiral that opens various perspectives and culminates with one of the most important piece in the history of the collections, the Auzoux Man.



Fig. 3

Permanent exhibition at the
Museum of Education and Science

San Isidro High School

Photo: Luis Mayo

There have been diverse initiatives to use their heritage for teaching purposes, thus creating emotional links between the students and their environment. In recent years, activities have been organized which seek the students' involvement in the care and study of the heritage of their school so that they can assess its importance and the historical significance of their educational center (MARTÍN 2012, 130-131). The most recent is a joint project to study, restore and disseminate the Auzoux models kept in San Isidro School and at the Veterinarian Museum of the Complutense University.

The extension of the museum

In reality, it is more a dispersion, rather than an extension of the Museum, probably due to declining importance of the collections as teaching elements and the lack of awareness of these as heritage collections. BERTOMEU et al (2011) pointed out that the most outstanding educational collection was the one belonging to San Isidro School. Some pieces date from the eighteen century and were produced by the school teachers so they are unique. Despite the richness of this heritage some unfortunate events have happened in recent years.

In 1995, the herbarium with the plants of the Community of Madrid moved to the Royal Botanical Gardens. In 1985, the collection of around 850 devices from the physics and chemistry cabinet was transferred to the Ministry of Culture for care and restoration. The reasons cited for this were lack of space and maintenance. Later in 1998, the collection unexpectedly became part of the newly-created National Museum of Science and Technology; most of the pieces were in storage. With the passage of time, reference to the origin of the pieces is being lost, including the original educational purpose. Some of those pieces are now part of the permanent exhibition of the museum called cabinet room opened in 2014.

This space of the Museum exhibits a large number (166 pieces) of the type of objects that were used in experimental sciences - mainly in the nineteenth century - providing a journey through the study and teaching of various scientific disciplines, such as meteorology, heat, electromagnetism, optics, sound, mechanics, etc. The pieces come from the San Isidro High School and from the Faculty of Physics at Complutense University of Madrid. This may seem a positive encounter for both institutions. They seem to find the spirit of continuity in showing complementary collections in common spaces to present similar ideas in science education after almost 180 years. Nevertheless, the collections are not treated in the same way.

The labels on the university exhibits read "Lent by the Faculty of Physics". At San Isidro school, it only says, "Comes from..." Sadly, it can be interpreted that this means that the pieces do not belong to the school any longer although the collections were on display in the museum. There is a general feeling at the school that they have lost part of their identity, because those objects will probably not return. According to the school's teachers, the Museum has also lost its original assignment, unitary character and pedagogical usefulness, and runs the risk of losing its history (MARTÍN 2012, 154)

The future

The museum project has been successful, since other historical schools either have permanent exhibitions or occasionally organize temporary shows to highlight their historical, artistic and scientific heritage, but clearly, these initiatives are not enough. There is a need to address the question in a more comprehensive manner, in colloquial parlance, to get together with the rest of the family and work on the continuity of educational levels. By recognizing the importance of the institutions, we need to find and work out the connections in order to bring their history and collections to life.

In order to establish the ties, the true cornerstones making a real contribution in education and science must be sought out. The objective is not to lose the link with the past and the goals achieved by teachers and students. Favorable circumstances have promoted meetings that can lead to lasting cooperation. Collaboration on work with the natural science collections at the San Isidro museum and the Fine Arts Faculty at Complutense University of Madrid has just started. This conveys a complementary but different view to the scientific one. In both institutions, there is the solid belief that it is necessary to strengthen links between secondary education and university. Students, teachers and researchers are working together helping to bridge the gap between institutions.

Work in the learning spaces on studying real objects, contextualized within the framework in which they were used, are a wonderful tool to generate a social conscience committed to humanistic knowledge (GONZÁLEZ & BARATAS 2012, 97). Once positive results have been produced, this work must continue and extend its spatial limits to other national and international institutions.



Fig. 4
Snake head
Auzoux anatomical model
collection
San Isidro High School
Photo: Daniel Rivera

Conclusion

The secondary schools have played an important part in educating and inspiring the elite of Spanish society. San Isidro High School was the first to be created and the best in reflecting the history of secondary education and history in general. Numerous students have become a significant part of Spanish history: politicians, scientists, philosophers, musicians, journalists, writers, including four literature Nobel Prize winners. In addition, some of their teachers were prominent science figures. This human potential is reflected in a very valuable historic and educational heritage.

Moreover, between the mid-nineteenth and to mid-twentieth centuries, the university model remained very stable, and the Central University was the benchmark for other Spanish universities and the political and social landscape at the time. Many of their teachers also had political responsibilities (SAN ANDRÉS 2015, 17). The relationships between the tertiary and secondary educational levels have been diverse, but a common ground concerning heritage, docents and text books can be recognised.

In the last years there is a growing interest in the history and heritage of education at all levels. One hundred and fifty years after the creation of the secondary institutes, in 1995, various activities and exhibitions were staged to celebrate this important anniversary. From then on, a commitment was made to continue working on preserving, defending and disseminating the valuable architectural, scientific and documentary heritage that they treasure. We saw some interesting results but many initiatives have not progressed very far and have been unable to rouse the dormant heritage as yet. Only projects that go beyond the walls of the institutions can help in this task. It is clear that many disciplines merged that can offer many stories and points of view to enrich this historical material. For this reason it is important to recuperate the relationships between educational environments with proposals that are durable over time.

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