MATERIAL CULTURE OF SCIENCE TEACHING IN 19TH CENTURY ARGENTINA.

THE ACQUISITIONS OF MODELS AND INSTRUMENTS FOR HUMAN ANATOMY STUDY

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The objective of this paper is to give a review of the material culture for science teaching in the Argentinean context (1). The study focus is the acquisition and use of models and instruments in the secondary education in the last third of the 19th century for human anatomy study. These materials were also acquired for natural history teaching up to beginning of 20th century when the change of the teaching methods and the start of the World War interrupted its commercialization from Europe. The teaching collections and the various documents associated with its acquisition that are preserved in many institutions, provide insight into the various aspects of material culture, ideas and proposals generated around the organization of science education in our country.

Using documentation like institutional reports, inventories and state archives, among others, it was possible to know that teaching materials, like anatomical models and physiology instruments were acquired by recommendation of both teachers and directors, introduced by local brokers with European links, and paid by the Ministry of Public Instruction. Also, these collections were like those used in universities to teach medicine or natural history. In 1872, for example, the Buenos Aires University president requested to the local government to buy an Auzoux model of man body for its incorporation at the Natural History Cabinet and to be used in legal medicine course, initiated at the Law School that year (2). In this case, the Auzoux model

arrived through Dr. Etchepareborda's bookshop, a French immigrant dentist, who taught in the College of Medicine at Buenos Aires University.

The acquisition of this kind of material was mainly related to the reorganization of education and implementation of a modern educational system in national scale during the last decades of 19th century (3). During this period, a new politic order and economic growth promoted that public education was nationally encouraged, and this drive resulted in a quick expansion of educational institutions with the intention of unification and normalization of the educational process. Under Bartolomé Mitre's government and Domingo Faustino Sarmiento presidency, efforts were focused on organizing a national school of secondary education in each province capital of the Argentinean territory. Between 1863 and 1874 fourteen national schools were organized in the cities of Buenos Aires, Córdoba, Concepción del Uruguay (Entre Ríos), San Juan, Tucumán, Catamarca, Mendoza, Salta, San Luis, Corrientes, Santiago del Estero, La Rioja, Jujuy and Santa Fe. Along with this endeavour, since 1880s there was also an expansion in Normal education institutions for teaching training, schools of commerce and technical education (4).

National schools were conceived in a similar way that French *lycées* and German *gymnasiums*: public and secular education colleges where a general and preparatory education for the university was given. These schools combined in different proportions the so-called "classical education" -Latin, philosophy, literature, history and geography- with teaching of modern languages -English, French or German- and of the exact sciences: mathematics, physics, chemistry and natural history (5). Science education in national schools was thought as a tool to face the challenges of modern societies and was oriented to a useful practice by training students in multiple skills and practical guidance through its implementation in local development. Thus, educational practices focused on demonstrative and experiential methods prioritizing the use of auxiliary teaching objects that stimulated a reflective learning (6). Such devices were integrated into the practices of orality, reading and writing (7).

Human anatomy study was included in the study of natural history and specific zoology contents were oriented to the description of human body, their structure, organs, systems, functions and comparative studies with other animal orders. The material culture associated was principally related to models, skeletons, illustrations and some apparatus and instruments. Around 1870, the demand of cabinets promoted the growth of commerce and the presence of European teaching products in the region, especially from France and Germany.

Secondary schools were equipped with different materials such as: anatomical models of Dr. Auzoux bought through the Paris concern Hachette & cia.; plaster models of Emile Deyrolle factory; wall charts of Achille Comte, Paul Gervais edited by Parisian Victor Masson et Files bookstore and others edited by Germany J.F. Shreiber printing and W.K. Johnston from Edinburgh; skeletons and bones of human body and preparations. The National School of San Juan, for example, registered in 1892 a complete human skeleton articulated "Beauchêne" (8). The anatomist and surgeon Edmé François Chauvot de Beauchêne was pioneering an innovative anatomic preparation (9). Many instruments were incorporated for human physiology studies like cardiograph, myograph, microtomes, and other instruments for the preparation of histological preparations, vivisection, among others. The National School of Buenos Aires 1903 inventory indicates, for example, that there existed apparatuses such as the Gad apparatus, Marey's cardiograph, sphygmograph "Judgeon", vertical myograph and some tools to realize preparations (10).

Teachers were acquainted with the existence of these objects and its uses in Europe and recommended their purchase to the school directors and public officers. The Ministry of Public Instruction oversaw sending catalogues of foreign supplier companies to the institutions so that teachers could have an exact knowledge of the range of collections, instruments and utensils. That Ministry granted a leading role to teachers for the acquisition of teaching materials abroad, requesting the preparation of lists of materials that would be taken as a reference to equip the schools in the country.

In order to make an approximation to the geographic distribution of foreign teaching material devoted to human anatomy in Argentina we started by using the information obtained from documentary sources. Results indicate that wall charts and articulated skeletons were most widely distributed in national and normal schools. Anatomical models in papier-maché of Auzoux were distributed in many institutions around the country (Buenos Aires, Córdoba, Corrientes, Entre Ríos, San Juan, Tucumán, La Rioja, and Santa Fe) in 1870s and 1880s. Furthermore, even cheaper plaster anatomical models of Deyrolle were introduced in cabinets. In the turn of the century, a major interest on experiments and demonstrations on physiology facilitated the introduction to cabinets of new apparatuses and instruments.

The scope and development of these cabinets and their collections varied in each institution, determined mainly by local interests, teachers and managers according to their own pedagogical and scientific practices. Today

many of these materials are preserved in education institutions and valued as cultural heritage for a use in lessons or to be exhibited in new museums and old cabinets. The distinction of these objects as cultural heritage involves both their didactic and cultural value (11).

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