

# The Materiality of School Culture in Europe Nineteenth-Twentieth Century

Renaud D'ENFERT

## ABSTRACT

The conditions and material organization of schooling continues to attract little attention from historians of education, despite the great importance it has held for stakeholders in education since the early nineteenth century, who have seen it as a key to the effective transmission of school learning. Classroom layout and equipment (furniture and teaching materials) received special attention beginning in the 1800s. The popularity of monitorial education, which spread throughout Europe at the time, was connected to an initial period in which the school space was ordered and rationalized. In the 1850s, teaching considerations and hygienist concerns led to a new series of transformations, with a concurrent industrialization and international circulation of school equipment. Finally, the period that began with the 1920s saw the renewal—at least in part—of the material environment inherited from the nineteenth century, and resulted among other things from a changed perspective toward the teacher-student relationship, as well as new possibilities provided by technical changes.



P. C. Klæstrup (1820-1882), Monitorial Education System, or the Bell-Lancaster Method. Source : Wikimedia Commons.

Often associated solely with the content of teaching, school culture cannot be entirely detached from the conditions and material environment in which it is transmitted and acquired. School furniture, teaching materials,

classroom organization, and even the architecture of school buildings are directly involved in the teaching and learning practices in effect during a particular period. They also contribute to the school experience for students (and teachers), which is not purely intellectual, but also sensorial.

Since the early nineteenth century, this materiality of schooling and school culture has undergone many changes, which are related to the development of “mass” schooling controlled by states. The arrangement and equipment of school sites, and classrooms in particular, underwent major transformations in various European countries, while material aspects became partly standardized.

### **The Impetus of Monitorial Education (1800-1850)**

Both written accounts and iconographic sources (paintings, engravings, etc.) attest to the often rudimentary material conditions in which teaching took place at the dawn of the nineteenth century, and even later in certain countries. Elementary schools were poorly equipped in particular, notably in rural settings where teaching essentially involved individual instruction: schools operating out of the teacher’s home, scarce and mismatched furniture, insufficient lighting, etc. However, secondary institutions were not always better off, as it was common for classes to lack tables, with students having to write on their knees.

The popularity of the monitorial system, which was adopted in England at the very end of the eighteenth century, and broadly diffused in Europe and beyond beginning in 1814, corresponded to an initial period in which the school space was ordered and rationalized. Educators from France, Spain, Italy, Switzerland, Germany, Sweden, Denmark, and Russia, among others, helped to introduce this new teaching method in their country, with varying degrees of success. The system gathered a few hundred students under the direction of a single teacher assisted by monitors, and required access to very large classrooms, for which France repurposed disused religious buildings, although schools specifically dedicated to this teaching method were also built.

Monitorial education was based on highly-codified spatial organization and material apparatus, thereby helping to diversify school furniture and teaching materials, ranging from bench-tables—whose size and arrangement (parallel to the width of the class) were the subject of very precise recommendations—to writing instruments and materials: tablets covered in sand, pencils and slates for beginners; pens, ink, and paper for more advanced students. Printed charts for reading, arithmetic, or linear drawing were attached to walls or mobile panels, and were used for “semi-circle” exercises under the direction of monitors, offering an economical alternative to textbooks, which were still rare at the time.

At approximately the same time, nursery schools, forerunners to the preschools that developed in various European countries, were also equipped with specific furniture. In England, France, and Italy (but hardly or not at all in German-speaking countries), this furniture included rows, lateral benches, and teaching boards, with the center of the classroom largely remaining unoccupied. The use of rows, which facilitated collective learning and student supervision, extended at the very least into the early twentieth century, as certain infant schools in London around 1900 were still equipped with them for actual schoolwork. It was also in nursery schools where abacuses were first used to help children learn counting and mental calculation techniques, with England being a pioneer in this respect.

The blackboard was another element of school furnishings that appeared in classes starting in the first half of the nineteenth century. It was initially used to teach arithmetic, for instance in France where it was recommended for use in institutions run by the Brothers of Christian Schools starting in the eighteenth century, or in England as part of the monitorial schools founded by Joseph Lancaster in 1798. Its use was gradually extended to other disciplines. James Pillans, who directed a secondary institution in Edinburgh, used the blackboard to teach geography by using different colored chalk to draw maps freehand, which his students then had to reproduce. Around the year 1850, the blackboard was used by students and teachers for mathematics, grammar, drawing, and music (a musical

stave was drawn on it) in Belgium, the Netherlands, Prussia, and other German-speaking countries.

## **Diversification and Industrialization of School Equipment (1850-1920)**

During the second half of the nineteenth century, and sometimes even as early as the 1830s in certain countries, the desire to provide the teacher with a central space through the widespread use of simultaneous teaching to an entire class (already in use in some Catholic congregations or German-speaking countries) in place of monitorial education helped to decisively transform the class space and school equipment, as did hygienist concerns, diversified school materials, the renewal of teaching practices, and technical evolutions, although the pace of change depended on the country.

As the use of monitors was increasingly rejected and the centrality of the teacher affirmed, the long table-benches of eight to ten seats, which were not conducive to maintaining discipline, were gradually replaced by desks with one or two seats and an adjoining bench (with an integrated compartment). They were arranged in parallel rows facing the teacher's desk (and the blackboard), such that the teacher could easily move about the classroom, thereby facilitating interactions with the class as a group, as well as with each student in particular. Different European countries were inventive in designing this new school furniture, whose ergonomics (dimensions proportionate to student size, degree of desktop inclination, chair distance, location and design of inkpot, etc.) had to prevent risks of scoliosis, myopia, and student unruliness. In 1877, the French architect Félix Narjoux could distinguish between France's school furniture, the Kunz and Olmützer model in Austria, the Basel and Neuchâtel models in Switzerland, the Nogel models in Belgium, and those by Reydmayne in England and Rydberg in Sweden. While this furniture was generally appropriate for both boys and girls schools, special desks were nevertheless created, for instance in Spain in order for girls to learn sewing in good conditions. Hygienist reflections prompted architects to design classrooms that were better lit, ventilated, and heated, and whose size and ceiling height were calculated based on the number of students who would be present. Heightened control over education by states or local authorities imposed increasingly precise standards. For example in Italy, the desk's angle of inclination had to be 15°. In France, an 1880 regulation stipulated that construction of elementary schools must include rectangular classrooms with a minimum of 5 cubic meters per student, with preference being given to unilateral lighting coming from the student's left-hand side.

The development of certain fields of teaching, such as the sciences, geography, and drawing, in conjunction with desires for a more concrete, intuitive, and experimental teaching method, increased needs for equipment and teaching materials. In addition to textbooks, whose diffusion increased, numerous objects began to fill the school space: collections of weights and measures, physics instruments, specimens and models for the natural sciences or wall charts serving as substitutes, geographic maps, globes and planispheres, plaster casts for drawing, etc., along with the furniture to store them (glass cases, cabinets, etc.). In 1874, the English architect Edward Robert Robson noted that raised-relief maps were still broadly used in schools in Prussia, Saxony, Austria, and continental Europe, but not in England. Compendiums, which included within the same piece of furniture all of the supplies needed to learn reading, counting, or the metric system, were used in French schools in particular. New teaching methods "through images" were developed with the late nineteenth-century rise of light projections of images on glass plates or transparent paper. These teaching materials consisting of photographs, drawings, and maps, which were widespread in Europe including in post-school education generally came with an explanatory booklet or documentation for teachers. In addition, if the premises could accommodate it—especially in post-elementary institutions—specialized rooms were set up and equipped for teaching science, drawing, or the manual work that had spread throughout Europe since the final third of the nineteenth century. In Belgium, many schools were equipped with a music room in the late 1870s. The creation of technical and professional schools similarly led to the installation of workshops that had the same characteristics as "real" industrial ones, in an effort to meet the specific needs of the occupations for which they prepared students.

The need to produce more school furniture and materials, especially due to mass elementary schooling, had an impact, prompting the creation of specialized industrial companies for this mass production. In Germany, the Ramming & Stetter company created around 1890 set up a “steam-powered joiner’s workshop” to produce school furniture, and later joined the manufacturer P. Johannes Müller, who produced the Rettig table-bench that was diffused in millions of units. In Italy, the V. Toffoli & Figli company created in 1898 for the production of wooden toys almost immediately began to manufacture school furniture, and eventually extended its activity to teaching materials as well. Other companies specialized in the construction and sale of projection equipment, such as Mazo in Paris, which could produce up to 1,000 images per day. Textbook publishers such as Paravia in Italy or Hachette in France had already begun to diversify their activity through the large-scale sale of geography maps, botanical models, and anatomical models, among others, as well as the great number of accessories needed for student work and copying: notebooks and (henceforth affordable) pens, pencils, dip pens, ink, blotting paper, stars, medals, etc. Some publishers also began to produce school furniture, such as France’s Delagrave, which had its own factories. The publication of illustrated catalogues and advertising in educational journals allowed these companies to promote their products and expand their clientele.

The international dimension of this phenomenon should be emphasized. Like the knowledge relating to national educational models, school objects crossed borders in the form of prototypes, patents, and high-volume exports. World Fairs were a powerful driver of this transnational circulation. Beginning with the International Exhibition of 1862 in London, there were sections dedicated to education that presented student work and textbooks, in addition to materials and elements of school furnishings and construction. During the International Exposition of 1867 in Paris, Prussia presented a building that reproduced a school in Silesia, with all of its equipment. Sweden did the same at the 1873 Vienna World’s Fair. At the same time, architects such as those mentioned above, or the Spaniard Enrique María Repullés, published works that presented national and foreign productions in this field. Multiple factors contributed to the circulation of these objects that constituted the material environment of schooling: the creation of national museums of education open to foreign innovations in Berlin, Brussels, Budapest, Copenhagen, Madrid, Paris, Saint Petersburg, and Zurich, among other places; the missions and foreign study trips made by teachers and educators; and international congresses such as the International Congress on School Hygiene starting in 1900. Manufacturers sought to sell their products abroad through distributors, and adapted where necessary, as with the Rettig table-bench, or the natural history teaching charts and models from the Paris-based Deyrolle or the Berlin-based Brendel, which were translated into other languages. It is important to keep in mind that this new school equipment was not evenly distributed across national territories. Some rural schools were still using very old materials in the early 1920s, and sometimes even lacked a blackboard, as in southern Italy. Finally, some teaching materials were not necessarily manufactured, and could be produced by the teachers or students themselves (such as geological or botanical collections).

### **Toward a Renewed School Space (1920s onward)**

Beginning in the 1920s, the material environment of teaching began to free itself from the standards gradually imposed during the nineteenth century, along with their resulting constraints. This trend, which affected both school architecture and furniture, actually began to emerge in the early twentieth century, for instance with Maria Montessori’s denunciation of the traditional school bench in 1909, which was blamed for restricting students’ freedom of movement. This desire to make the school space more welcoming, bright, and pleasant was driven by teaching methods that were more centered on the child, new requirements in matters of hygiene, and changes in construction techniques. Multi-wing schools, consisting of single-story buildings with classrooms that had large French windows, opening wide onto the outside (green spaces in particular), were built in England, Switzerland, and Germany, thereby breaking with the “school palaces” of the preceding period. The powerful and international open-air school movement, intended primarily for children threatened by tuberculosis, also led during the 1930s to particularly innovative school construction, as in Amsterdam, Copenhagen, and Suresnes, near Paris. New building capabilities made possible the construction of rooftop terraces, equipped with areas for play and gymnastics. In

different European cities, such as Edinburgh and Paris during the 1930s or Aarhus in the 1950s, special emphasis was placed on decorating interior spaces (halls, covered playgrounds, refectories, etc.), and monumental murals were painted in some schools, sometimes with contributions from students. After the Second World War, the construction of a large number of more or less standardized school buildings using prefabricated elements—to meet the needs of reconstruction and mass post-elementary education—gave rise to different productions from one country to another, including modular and dispersed low-rise buildings in England, Switzerland, and the Netherlands, and long multi-story rectangular buildings in France.

These changes also affected the class space, which opened up more to the outside, and now had lighter and more modular furniture, initially in preschools and later at higher levels. Tables with one or two seats, horizontal desktops, tubular metal legs, and independent chairs—inspired especially by the Bauhaus—made it possible to arrange the class into islands or semi-circles rather than parallel rows, as well as to promote group work and exchange between students. During the 1950s, new materials such as plywood, Formica, stainless steel sheeting, and cast aluminum brought variety to models. These furnishings, which in the end were modern variants of late-nineteenth-century models, were slow to take hold. For example in France, the table with its adjoining seat was banned in the 1930s, rehabilitated in 1950 to prevent poor posture among the youngest students, and ultimately set aside in the final decades of the twentieth century. The development of new writing materials, fountain and ballpoint pens in particular—those produced by the BIC brand were available in Europe and the world starting in the 1950s—led to the disappearance of inkpots, while grooves to hold pencils were also abandoned. The arrangement of tables in parallel rows nevertheless remained a dominant feature in many countries, especially in secondary education.

Teaching materials and educational tools also presented both stability and novelty. Certain objects were used throughout the twentieth century (and still are today), such as large wall maps for geography, and especially the blackboard, which became green and later white, and continues to have a central role in both the class and teacher-student relations. On the other hand, technological evolutions brought change to the tools used for teaching. The glass plates used for in-class projections were replaced in the 1920s by “fixed films” consisting of a few dozen images, and in the 1950s by series of slides, a medium often preferred to animated films because teachers retain control over the advancement of the lesson. The rise of new education methods and the renewal of didactics specific to a particular discipline led to the introduction, with mixed success, of highly specific tools, such as Montessori materials for the first years of school, and the “colored numbers” of the Belgian Georges Cuisenaire or the logic blocks of the Hungarian Zoltan Dienes in connection to the “modern” mathematics movement of the 1960s. With the development of electronics and information technology, the pocket calculator and personal computer gradually made their way into the classroom starting in the 1970s, making it possible to virtually produce geometric figures or scientific experiments. Today the whiteboard has become interactive, and digital tablets with touchscreens are replacing textbooks. Even though the high cost of these new digital tools is a major obstacle to their wide availability, no one doubts that the materiality of the schooling experience has radically changed as a result.

Despite sometimes pronounced differences between national school systems in Europe, the organization and transformation of the material environment for transmitting school culture during the nineteenth and twentieth centuries are in keeping with a thoroughly transnational dynamic, one that consists of the circulation of ideas and actors, as well as practices and objects.

---

## BIBLIOGRAPHY

CHATELET, Anne-Marie, ed., *Paris à l'école, « qui a eu cette idée folle... »* (Paris: Picard, 1993).

CHATELET, Anne-Marie, LE COUR, Marc, eds., *L'architecture scolaire. Essai d'historiographie internationale*, special issue of the journal *Histoire de l'éducation* 102 (2004).

FIGEAC-MUNTHUS, Marguerite, ed., *Éducation et culture matérielle en France et en Europe du XVI<sup>e</sup> siècle à nos jours* (Paris: Honoré Champion, 2018).

LAWN, Martin, GROSVENOR, Ian, eds., *Materialities of Schooling: Design, Technology, Objects, Routines* (Oxford: Symposium Books, 2005).

MEDA, Juri, *Mezzi di educazione di massa. Saggi di storia della cultura materiale della scuola tra XIX e XX secolo* (Milan: FrancoAngeli, 2016).

MÜLLER, Thomas, SCHNEIDER, Romana, *Das Klassenzimmer : vom Ende des 19. Jahrhunderts bis heute / The Classroom : from the Late 19th Century until the Present Day* (Tübingen-Berlin: Wasmuth, 2010).

---

**Source URL:**

<https://ehne.fr/encyclopedia/themes/education-teaching-and-professional-training/local-global-educational-circulation/materiality-school-culture-in-europe>