

needs a concluding paper, one that in the light of these particular manuscripts pulls together the essence of educational historiography and speculates on its further cognitive and professional development. Such a task on doubt is difficult, since the variety of arguments presented by the authors cannot be easily assessed without repeating the already effective analysis in the "Introduction." Yet the reader in the end is left searching, wanting to know in the light of all this expertise where in a more substantial way the discipline is going, even though such an expectation exceeds the original purpose of the book.

Nevertheless, the Gordon and Szreter anthology is a thoughtful examination of educational historiography that in itself is a signpost in the growth of the discipline. From a Canadian perspective it points to the widespread influence of British and American historiographic traditions, telling us not only about the road we have travelled but, perhaps more importantly, of our identity as historians and teacher educators.

Henry W. Hodysh  
University of Alberta

**Charles R. Day.** *Education for the Industrial World: The École d'Arts et Métiers and the Rise of French Industrial Engineering.* Cambridge, Massachusetts: MIT Press, 1987.

*Education for the Industrial World: The École d'Arts et Métiers and the Rise of French Industrial*

*Engineering* is an important and definitive study of technical education in France since 1800. It reveals how social conditions, technological necessity, and an expanding educational system interacted to produce in the private sector a new managerial group drawn from working-class origins.

Day's book makes a number of related but distinct contributions. First, he writes a definitive history of the *écoles d'arts et métiers*. He demonstrates that those schools provided avenues of mobility to their graduates, technical training essential to industry, and an institutional framework by which France accommodated social demand while preserving its rigid, formal educational structure. These findings turn upside down common historical notions in general histories of French education and science about lagging technical education and a static French society.

Another contribution is in the area of the history of technology. This synthesis is impressive. Levels of schooling, their relationship, and their impact on the economy and society are all discussed intelligently. That contribution is unique. The major history of technical education in France has been that by Frederick Artz, *The Development of Technical Education in France 1500-1850* (Cambridge: MIT Press, 1966), and it makes no attempt to relate schooling to society, as Day does.

The author also paints a vivid picture of student life among the *gadzarts* (as graduates of the EAM were called), and how it contributed to lifelong ties among the graduates, who

established flourishing and influential alumni organizations. Chapter 10 draws on both school and alumni records, and there Day considers careers and social origins of the *gadzarts*. His work is unique in its ability to trace both the origins and careers of a group. As a quantitative historian I am impressed with his process of selection and am convinced that his sample is representative. This chapter shows that there was substantial, albeit limited, social movement in French society. It has importance for general theories of social mobility—both in France and, comparatively, in other countries.

Moreover, Day contributes to an understanding of French governmental structures with his analysis of the conflicting jurisdictions of the Ministries of Industry and Education. His ability to carry the tale to the present adds to its value, although the material on recent developments is thinner than that for the nineteenth and early twentieth centuries.

The first four chapters offer an excellent survey of the history of technical education over the last two centuries in France, of interest to historians of education, science, and technology alike. The chapters bring clarity to a complex hierarchy of schools from the famous Polytechnique to intermediate ones like the *écoles d'arts et métiers*. Day demonstrates that the attention paid by historians to the *grandes écoles* has led to an undervaluation of the host of humbler schools which produced far more graduates, promoted social mobility, advanced technical education, and contributed to

economic growth in France. The most important of these schools were those of *arts et métiers* whose history Day writes in the next three chapters.

Officially created by Napoleon in 1803 to train foremen for industry, these schools had their roots in the 1780s in a trade school established by the Duc de la Rochefoucault-Liancourt for sons of soldiers. Originally there were three schools—seven today—founded in the provincial but not industrial towns of Chalons-sur-Maine, Angers, and Aix-en-Provence. These schools were training about one-fourth of all French engineers by 1920. Only in 1907 did graduates receive an official engineering degree but many were performing the function of engineers in the private sector throughout the nineteenth century. By 1945 they had elevated their status to the university level and are now part of the system of *grandes écoles techniques*, although the traditional elite schools of Paris remain the most prestigious. This rise of the *écoles d'arts et métiers* within the educational system is itself an important tale that describes how social and technical demands affected government policy and altered the centrally-directed and hierarchical educational structures of France. The powerful alumni organizations of the *gadzarts* successfully lobbied for this advanced status, but such efforts would not have prevailed had not the *gadzarts* themselves made important contributions to French industry and advanced to positions of social influence.

The *écoles d'arts et métiers* were unique among European technical

schools in having students (the *internat*) board at these schools at public expense from 1803 to 1964 rather than training them in day schools or on the job. The *internat* had a long educational tradition from the middle ages, in seminaries, in Jesuit schools, and in the public secondary schools of the time, although there were also day students in the last. The *internat* fit Napoleon's military mentality, but the Duc de la Rochefoucault-Liancourt had experimented with a boarding school in the eighteenth century with the intention of forming a "new industrial man." Furthermore, most students were from the lower classes and, increasingly, the idea of controlling students became the justification for maintaining the *internat*. Day refers both to Durkheim and Foucault to explain the notion of social control that dominated the schools. The evidence is rich enough that he is able to tell us about curriculum, daily life, and a seemingly constant struggle between the administration, who feared the "revolutionary tendencies" of students, and the students themselves.

The harsh Napoleonic discipline changed little during the century, leading to serious riots during the Restoration and the Third Republic. Half of the students were expelled in 1826, funding was cut after the Revolution of 1848 because of demonstrations by the *gadzarts* during that year, and students died in riots in both 1880 and 1898. Day describes a "culture of refusal" surrounding students' resistance to authority. Students regularly escaped over school walls during the night with

grappling hooks and passkeys forged in the schools' own shops. At Angers, they broke into administrative offices, changed grades, bound and gagged proctors, and punished "stool pigeons." One could easily think that this chapter describes a prison rather than a school.

In reaction to the regimen of the *internat* and to the work discipline, a student solidarity and culture developed. Hazing, passwords, and mockery of the administration united students. Day argues that the common experience of those years led to the strong alumni association, begun in 1847, that kept students in contact after they graduated and served both as a kind of employment bureau and as a lobby group able to raise the status of the schools in the twentieth century.

The strength of the alumni association and their diligent record-keeping provides what may be a unique opportunity to examine mobility patterns of graduates of nineteenth-century technical schools. The records include the social origins of 661 graduates between 1810 and 1890 and 600 from the class of 1978, the career patterns of 1370 graduates between 1820 and 1920, and linkages among these to provide inter-generational patterns. Day takes full advantage of those records, analysing them in a statistically sophisticated manner in chapter 10. Although French secondary schools were hardly as elitist in their clientele as many scholars have maintained, it was only the rare student who came from a working-class background. About half came from the *petite bourgeoisie*—shopkeepers', farmers',

and clerks' sons. The *grandes écoles* continued to draw the vast majority of their students from the *notables*. *Arts et métiers*, which took students out of elementary, not secondary, schools, uniquely recruited students from the working or artisanal classes. Those schools allowed sons from these groups to climb the social ladder. In their first years, a majority of students were sons of the military or other public employees. From 1830 onward, they were directly linked to industrial society. Seldom sons of the impoverished, they were closely tied to the world of machine work.

Three patterns of mobility clearly emerge. The first is from father's occupation to son's first job. Most graduates began with modest positions in private industry—basically a shift from traditional occupations to those consonant with the growth of French industry. Their career mobility was dramatic. Beginning as mechanics or foremen, they became shop supervisors and, after about twenty-five years, plant managers. *Gadzarts* had skills and training that few others in the society did and they advanced within the company. Many assumed significant roles as industrial engineers, managers, or entrepreneurial pioneers. With success, the social level of the schools' clientele rose as manufacturers sent their sons to the schools for practical training. Modest but consistent mobility patterns meant that the grandchildren of workers became senior executives.

This history of the *écoles d'arts et métiers* has revisionist implications for fields beyond education. Specifically, it demonstrates that France was

producing a large number of technical specialists. The schools provided foremen and managers sufficient for the needs of French business and industry during the nineteenth century. French scientific and technical education was not lagging behind that elsewhere in Europe. Day's findings thus support revisionist studies of French science and industry.

*Education and the Industrial World* is meticulous in its research, sophisticated in analysis, and informed by the best and most recent research in a variety of areas. It is and will remain the standard history of technical education in France.

Patrick J. Harrigan  
University of Waterloo

**Reed Ueda. *Avenues to Adulthood: The Origins of the High School and Social Mobility in an American Suburb*. Cambridge: Cambridge University Press, 1987.**

By most accounts, public schooling has played a crucial role in American social organization for well over a century. For not nearly so long, but for several academic generations, American scholars of various disciplines and persuasions have attempted to identify the roots of the common school movement, to understand public schooling's place in sustaining the Republic, and to measure the importance of formal education for individual success and class formation. Today American historians of education seem engaged