
H-France Review Vol. 21 (December 2021), No. 219

Hervé Joly, *À Polytechnique X 1901. Enquête sur une promotion de polytechniciens de la Belle Époque aux Trente Glorieuses*. Paris: Flammarion, 2021. 437 pp. Bibliography, notes, and index. €23.90 (pb). ISBN 9782081512108.

Review by Daniel Ringrose, Minot State University.

Few French institutions are more closely associated with the mythology of state power and the persistence of elite privilege than the École Polytechnique, or l'X, and its graduates. Like its students and graduates, the École is a survivor, but not without transformation, particularly after the 1970s. More recently, public debate about the merits of France's Grands Écoles has drawn critical attention to the École's utility and function. Such debate, however, is not Hervé Joly's project in this new work. Instead, this detailed study of the cohort of 1901 largely avoids polemics to focus instead on the function of the institution in 1901, the career paths of this cohort, and the variety of ways their work contributed to French technology and industry during the first half of the twentieth century.

This study is organized in four broad sections. The first covers student origins and the educational experience at the École Polytechnique, with particular focus on the 1901-1903 curriculum. In this section Joly reviews the school's well-researched nineteenth-century history and finds strong continuity in the social origins of its students and those from previous eras. Candidates from Parisian *lycées* and from families that could afford intensive preparatory courses enjoyed significant advantages and were well represented. Scholarship-supported students, while also successful, were fewer in number. All had to complete a heavy workload to succeed in the school's rigorous and frequent ranking system. Against these familiar patterns, though, Joly contrasts the particularities of the curriculum in use in 1901, which was distinguished by an exceptionally heavy emphasis on military exercises, drills, and requirements that exceeded requirements in previous decades.

Three key themes emerge in this first section. Students faced a daunting workload with frequent exams, all which eventually affected their final class rank. Even so, it was also exceptional for a student to be expelled for poor performance. Joly's detailed analysis of the grades and scores for the 1901 cohort demonstrates a link between disciplinary issues and declines in an individual student's academic performance, but even in these cases, after comportment and the overall record was considered, no student did so poorly as to be expelled, not even a student involved in a potentially scandalous collective protest of the École's conditions and rigidity. Retaining but demoting students allowed school administrators protect the institution from the embarrassment of expelling any candidate who had only recently passed the admissions *concours*, arguably one of

France's most selective admissions examinations. Second, Joly's research demonstrates that the 1901 curriculum produced generalists with strong coverage of mathematics, physics, chemistry, and related sciences, but that it did not encourage experimentation, specialization, or laboratory-based lessons, since the school lacked such facilities. Joly concludes that the principal measure of rigor in the era of the 1901 cohort the quantity of work assigned, all of it scored, but not necessarily the difficulty of this work. Finally, his detailed analysis of the grades and scores of the 1901 cohort in both academic and military subjects reveals a curious paradox. Although graduates with the highest overall rankings earned access to the most desired positions in the state's prestigious civil *corps*, Le Corps des Mines and Le Corps des Ponts et Chaussées, achieving that ranking required earning some of the highest scores on the military elements of the École's curriculum. Counterintuitively, those who did poorly in their military exercises were the most likely to end up entering military service as future artillery officers or as military engineers.

The second section of this monograph examines the varied career paths of the cohort of 1901. The broad pattern differed little from previous generations: the top students entered Le Corps des Mines or Le Corps des Ponts et Chaussées, with those close behind accepting other state posts. Competition was intense, and from a contemporary reader's perspective arbitrary, for as Joly observes, the rank of the last of five students admitted to Mines could be as little as one tenth of a point higher than the next graduate who had to settle for a position in Ponts. Most of the rest entered military service, even if they were not enamored of it, and roughly 10% resigned from state service entirely. Where Joly's study shines, though, is in the details and nuance of how these careers unfolded. He explains that only a few Mines and Ponts engineers were "consecrated" as inspectors general and then traces other graduates for whom connections and experience for a few years in the state's *grands corps* "served as a trampoline" to lucrative positions as administrators or managers in the private sector (p. 152, translation by the reviewer). Lower-ranked graduates entered military service, but few X graduates stayed longer there than necessary and upon departure this group faced less certain careers.

Hindered by their generalist training, some eventually sought specialized training in less prestigious schools while others resigned themselves to frequent changes of position or slowly working their way upward in industries for which they lacked specialized training. Thus, smooth entry into a preferred career correlated closely with choices afforded by graduating rank, and while nearly all graduates of the cohort of 1901 eventually landed on their feet, for many their exact trajectory was far from certain at the moment of graduation. Perhaps the more important point to emerge from Joly's study is that, even accounting for the varied paths pursued by all members of the cohort, the overall trend was for the 1901 class to eventually enter established fields in mining, civil service, and heavy industry. Few, if any, struck out to create new, novel enterprises.

The final two sections of *À Polytechnique* consider, respectively, the family lives of the cohort of 1901 and how they navigated World War I, the Vichy regime, and post-World War II reconstruction. Family life, Joly reveals, was anything but private for X graduates. Continuing a tradition dating to the early nineteenth century, graduates submitted marriage approval requests to their superiors detailing the moral, social, and financial status of their prospective spouses. Ostensibly such details verified the character and propriety of the proposed bride, but Joly observes that the larger value to state and industrial employers was to expand their network of unofficial social and political connections. Engineering also became a family tradition, for many sons followed in their fathers' footsteps to attend Polytechnique or industry-oriented schools

such as the *École Centrale*. Noted briefly, the dynastic career aspect of these elite families merits additional study. The diversity of careers and family unions pursued by the cohort of 1901 is mirrored in Joly's assessments of affluence and wealth. A few X graduates who inherited or married into large fortunes, or who ascended to the top ranks of a *grand corps* or major corporation, were propelled to the highest ranks of elite society, while others had to settle for being merely affluent. This assessment is reinforced by a clever geospatial analysis that locates the majority of families in Paris's most prestigious neighborhoods and nearby suburbs.

The final sections of this monograph establish a collective social history of the cohort of 1901's public activities. Compared with their late-nineteenth-century peers, these X graduates were far less likely to engage directly in politics, a role largely ceded to those trained in law. We learn which members of the cohort perished at the front in World War I and how others contributed to the essential management and organization of the war effort in both the public and private sectors. Joly offers a thorough and uncommon presentation of the isolation and exclusion of Jewish graduates during the occupation, a theme that complements his earlier research on French businesses under Vichy and related archival sources.^[1] Although the cases are not numerous, this section offers a lucid presentation of Jewish engineers' strategies for survival, participation in resistance efforts, and the extent to which they were reintegrated into state service after World War II. The collective experience Joly reveals for the cohort of 1901, both in their private lives and across major events of the early twentieth century, stands as an engaging, collective social history. Moreover, each of these sections, richly illustrated with individual vignettes, could easily serve as a starting point for additional research among other X cohorts.

Methodologically, this book breaks new ground in several ways. This meticulously researched study draws on the *École Polytechnique's* student files, on personnel files and related materials from the country's richest state and military archives, and on regional and private collections to build a meticulous collective history of the cohort of 1901. Expiration of chronology-based archival restrictions on personnel dossiers for these early twentieth-century actors clearly facilitated the task of assembling such detailed narratives for so many members of this cohort. This study's research design also allows Joly to demystify the superficial mythology of the *École Polytechnique* as a black box that uniformly and automatically imparted success to its elite graduates. Instead, he shows that the individual career choices for the cohort of 1901 diverged widely and that for many upon graduation their immediate future was uncertain. Although few members of the 1901 cohort acquired the reputation of industrialist and oil magnate Ernst Mercier, a member of the cohort of 1897, nevertheless they fanned out into administrative and leadership roles in the public sector, private industry, family affairs, and military service. In this respect Joly makes a strong case that the *École's* status, reputation, and function at the dawn of the twentieth century differed little from preceding decades. He asks whether the institution's influential position in the late nineteenth century had waned in the years before World War I and concludes that while the 1901 cohort's career choices had their own particularities, the types of careers pursued suggest continuity with patterns from prior decades.

Ultimately, Joly demonstrates that success was not automatic for the *École Polytechnique* students he studied, but nonetheless attendance conveyed tremendous social advantages. While those graduating below roughly the top third of the class faced less certain employment choices, even the least apt graduates eventually did well. Here the limits of the cohort approach become evident. Connections, job offers, or other opportunities facilitated by prior cohorts of X graduates or through other networks of professional, social, and familial contacts might reveal the strength

or perhaps dilution of such networks across the first half of the century. Tracing such connections and the place of X graduates within these networks is beyond the scope of this work, but would tie in well with Joly's encyclopedic 2013 study of the networks that bound together the leading members of France's industrial elite.[2]

Overall, this careful work eschews hyperbole and controversy about elitism and the role of privileged institutions in contemporary French society. Instead, Joly's study successfully examines the education and lives of the cohort from 1901 to offer a strong historical assessment of their contributions in the first half of the twentieth century. As such, this work is neither polemic nor defense of the *École Polytechnique*, but rather a thoughtful historical discussion of the formative role of this institution and lives of its graduates at a particular moment in time. Joly's research shows that the *École Polytechnique* of the early twentieth century functioned much as it had in previous generations, a fact critics might identify as perpetuating a selective cultural and social elite, but this study also argues convincingly that the graduates it produced pursued careers that made long-lasting and broad-based contributions to the state and to French industry. Nevertheless, for many X graduates, particularly those who exited military service quickly, the generalist nature of their training raises the harder question of the nature of these contributions, particularly whether their contributions were managerial and administrative rather than focused on innovative engineering. Joly's conclusion that most of the careers studied led to positions in established industrial sectors, rather than new or experimental enterprises, leans toward the former.

As a social history, Joly's cohort analysis shows that marriage, family, and wealth simultaneously accompanied and facilitated career success. This creative and thoroughly researched work is deliberately forward-looking in its assessment of the role and contributions of these X graduates in the public sphere, industry, and society up through the 1950s. Readers should also take note of the generous and thoughtful preface by Antoine Compagnon, which sets Joly's rich work in context. In combination, these narratives contextualize the impact of this storied institution and one group of its graduates in the first half twentieth century. Together these narratives present both a historical snapshot of the *École Polytechnique* and its early twentieth century alumni as well as a baseline understanding of an institution that evolved significantly during the latter half of the twentieth century.

NOTES

[1] Hervé Joly, ed., *Faire l'histoire des entreprises sous l'Occupation: Les acteurs économiques et leurs archives* (Paris: Comité des travaux historiques et scientifiques, 2004) and *Les archives des entreprises sous l'Occupation: Conservation, accessibilité et apport* (Lille: IFESHI, 2005).

[2] Hervé Joly, *Diriger une grande entreprise au XXe siècle: L'élite industrielle française*, (Tours: Presses universitaires François-Rabelais, 2013).

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ISSN 1553-9172