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Before 1870, most engineers in North America were educated through apprenticeships in workshops and drafting rooms. By 1900, most learned in college classrooms and laboratories. Educational institutions formed new schools or colleges for this purposes, and many of these have celebrated recent centennials and arranged for special histories. Richard White's account of engineering education at the University of Toronto is the most recent such study. Like other institutional histories, White focuses primarily upon the events of the Faculty of Applied Science and Technology and its predecessor, the

School of Practical Science. Yet his history is set against a general background of the development of the larger University, events in Canadian history, and the general patterns of engineering. In common with the best centennial histories, White offers a useful case study that expands our general knowledge of the development of engineering education in industrial nations.

Engineering education at Toronto emerged in the 1870s, against the backdrop of a growing industrial and technological economy in Canada and North America. The province of Ontario agreed to establish an independent School of Practical Science (SPS) to teach courses in engineering, mining, geology, and analytical and applied chemistry. Funding was authorized in 1873 and instruction, loosely connected to the University, began in 1878. The timing of these developments matches similar steps in the United States, although Canadians still looked more naturally to England for guidance on technical issues. The manner in which the Arts Faculty sought to control the SPS, with its independent funding from Ontario, and eventually achieved its incorporation into the university in 1889, provides an interesting example of the more universal tension between university administrators and governmental patrons. But the main lesson is that both internal and external factors shaped the history of this institution of higher education.

White tells the Faculty's history in several chapters he divides into generations of about twenty-five year's duration. Partly this structure is determined by external events, such as the World Wars of the 20th century. But other important demarcators were the leaders of the Engineering Faculty. One was the key figure who set the SPS in motion, John Galbraith. The initial engineering instructor hired in 1878, Galbraith directed the SPS and oversaw its incorporation into the University in 1889 and transformation into the Faculty of Applied Science and Engineering after 1899. By the time of his death in 1914, he had established crucially important traditions, including the expectation that the training of young men — and it was for a very long time only men who attended SPS — should be practical. Galbraith recognized that the Faculty had to provide academic programs, but in fashioning the curricula, his vision of utility reigned. Large amounts of time were devoted to engineering drawing, and the problems students tackled were drawn from the real world of industry. Research in the usual academic sense of advancing knowledge was almost completely absent. A tendency to hire SPS graduates reinforced this tendency. The impact of these emphases showed in a final pattern the Faculty inherited from Galbraith — a sense of separation

from the rest of the university. This showed in struggles over course content, such as physics, and in the attitude and behavior of engineering students, who were rougher at the edges than other students and more willing to engage in physical pranks. The popularity within recent decades of the in-house term “Skule” as the name for the Engineering Faculty remains a sort of inside joke about the differences between engineers and other students.

The remaining chapters of the book follow the Engineering Faculty forward in three steps — the interwar years (1914–1939), World War II through the 1960s, and the 1970s through the 1990s. White tracks several continuing themes while avoiding a formulaic style. He covers changes in student life, the nature of engineering instruction, the relationship of teaching and research, and the connection between the Engineering Faculty and the larger university. An issue of continuing importance in this last category should perhaps be singled out — the struggle for buildings and facilities.

White tells a reasonably interesting story about these and other changes related to Toronto engineering. The central educational issue was keeping abreast of the general tendencies toward more scientific and less hands-on and common-sense driven base of knowledge. Practical utility remained more strongly entrenched at Toronto than at some engineering schools, but after World War II this change elbowed its way into the Faculty. The emergence of faculty research and of graduate instruction were two corollaries to the shift from Galbraith’s vision of practical instruction in an academic setting. Many other specific events were part of the Faculty’s history as well, including the impact of the two World Wars, the Depression, and the need to cope with the massive influx of students after 1945. This last situation led the University to develop a temporary satellite campus in the Ajax aircraft factory complex outside the city. Another consistent element of the Faculty’s history involved student life, which included skits on School Night and a student paper. All were tinged with male boisterousness that occasionally included bursts of rowdiness that caused physical damage to the campus. Slowly this gave way by the 1960s to concerns for public service, as well as to new issues completely, such as the achievement of greater gender, racial, and ethnic diversity among students. The outcome of these accumulated changes was apparent in the final chapter of White’s account, which showed that by the 1990s, Toronto’s Faculty of Applied Science and Engineering was largely indistinguishable from the leading engineering educational institutions elsewhere in the United States and western Europe.

Institutional histories rarely are spell-binding reading, but White's prose flows smoothly, and he weaves together the different themes into a brisk story. He avoids the common pitfall of the genre unconnected recitations about prominent people. He also does not bog down in the details of individual departments and curricula. White has authored a good history, for even while he never loses sight of the campus, he places the development of engineering education at the University of Toronto against various larger backdrops — the University itself, Canadian industrial and economic development, the general history of engineering, and the stage of historical events. Things have come a long way from the School of Practical Science of 1878!

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