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Damer, Eric. *Discovery by Design: The Department of Mechanical Engineering of the University of British Columbia. Origins and History: 1907-2001*. Vancouver: Ronsdale Press, 2002. Pp. xv + 226; illus. CDN\$29.95 (cloth). ISBN: 0-921870-95-7.

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Engineering, a critical and innovative professional field that historians of higher education have too long neglected, receives thoughtful examination in the work of Eric Damer. His detailed account of the development of the engineering program at the University of British Columbia (UBC) recounts the challenges and successes that have marked its nearly one-hundred year history. Drawing upon institutional archives and personal interviews, Damer offers readers insight into the world of Canadian higher education and how engineering research served the interests of both the industrial sector and the national government. While the case study approach is fitting to this type of inquiry, the author skillfully highlights several broader historical and social changes that shaped Canada during the twentieth century.

Although other universities such as McGill, Manitoba, and the University of Toronto offered engineering degrees, professionals from British Columbia were convinced that the local community would benefit from establishing a program in the region. Henry Marshall Tory, Professor of Mathematics, played a central role in establishing the university by appealing to well-noted academics and successful businessmen in the British Columbia region for educational and financial assistance in the venture. Upper-class residents from Vancouver who lived in the suburb of Point Grey, the site of the new institution, showed keen interest and believed the school would provide opportunities for their sons who had professional aspirations (25).

Dr. Walter Munn, who trained at McGill University in both science and mathematics, served as the primary catalyst in promoting mechanical engineering at the new college. Determined to cultivate popular support for the university as well, he urged the school to adopt an open admissions policy and recruit young men from all class backgrounds in order to foster the image of meritocracy.

While the onset of World War I "redirected government priorities away from higher education," in 1915 UBC opened its doors to a small number of students interested in an intensive academic program in mechanical engineering. The following year, anticipating the

need to educate returning soldiers and the chance to boost its enrollment, UBC administrators joined an advisory committee charged with addressing this national issue. Participation in such efforts yielded positive results as UBC became one of a handful of Canadian universities to receive “Khaki funds” designated by the government to assist veterans in their educational pursuits(29-30). Damer places the university in historical context, but needs to develop his analysis more fully to explain the success of this national strategy.

Increased enrollment at UBC helped promote local community and regional growth and reassured politicians who feared high unemployment in the postwar era. The year 1920 marked passage of the first official engineering act and “registration with the Association of Professional Engineers of British Columbia (APEBC) became mandatory for all professional engineers in the province”(34) furthering the goal of respectability and professional affiliation. Furthermore, the level of compensation for work in the field increased and the association helped engineers cultivate a positive image by highlighting their role as mediator between the public and industry. In 1922, after enlisting the aid of Professor L.W. Gill, former faculty member at McGill and Queen’s University, UBC formed the Department of Mechanical and Electrical Engineering to expand their educational offerings (42-43).

Between 1913-1919, the faculty expressed concerns about the institution being a purely vocational college as funds for research were limited and the primary focus was placed on developing undergraduate education. Herbert Vickers, the first department head to hold a doctorate, worked to solidify these efforts and served as a liaison between UBC and the regional industrial sector. Although Vickers played a major role in this development, he remained an enthusiastic advocate of research and promoted this as the next stage of the university’s educational development. Interest in developing a strong research program required an institutional commitment, as well as considerable private and public resources that were not available due to the economic constraints of the 1920s.

World War II transformed industrial and scientific development throughout the world and offered the perfect opportunity for UBC and the Department of Mechanical Engineering to expand its scope of professional inquiry and develop a graduate program due to a major increase in funding by the national government. As Damer states, “patriotic excitement permeated the campus and cadet training became mandatory” as all Canadian universities embraced the call to serve their nation(63). Wartime demands continued and set the department on a course that clearly prioritized research and recruitment of top-flight students and faculty that ensured its rise to national prominence.

In 1957, the Soviet Union unveiled the fruits of her scientific labor by launching Sputnik, a historic event that fundamentally altered the global landscape and catapulted engineering research into a completely different realm. Cold War politics shaped the response of the United States as the Soviet Union pooled academic expertise and government resources and inaugurated the era of “Big Science,” a major shift intended to strike a balance of power in the international arena. As a result, engineering research in Canada received yet another boost, and the expansion of scholarly networks fostered educational exchanges and developments benefiting both nations such as the creation of a doctoral program in the Department of Mechanical Engineering at UBC in 1965 (78-84).

After receiving criticism for a too-narrow focus on theoretical concepts during the 1960s, the department modified the curriculum to reflect a more pragmatic approach to instruction and better prepare its graduates for the field. Direct application of scientific principles continued in the 1980s as the department implemented a comprehensive plan for training students that supplemented academic research with work experience, a strong liberal arts background, and management skills. Professional engineers were encouraged to broaden their conceptual framework and think of themselves as “designers” who developed finished products and played key roles in shaping the regional economy (131-132).

In 1985, the appointment of the first female department head, Martha Salcudean, represented a milestone for UBC and she demonstrated her leadership skills on multiple levels. An assertive personality, she strongly urged faculty members to apply for grants via the Natural Sciences and Engineering Research Council (NSERC) and funding innovative projects became the central focus of the department. While the university faculty pursued individual projects quite passionately, the demands of a growing field necessitated more collaborative research. However, Salcudean later expressed concern about the NSERC’s fixation on research production as the primary barometer for legitimate standing in the engineering community and about its negative impact on departmental relations (111,123).

Problems also surfaced in supervising the activities of the student population at UBC, particularly with the Engineering Undergraduate Society (EUS) and their publication of campus, local, and social issues in the *Red Rag*. Offensive articles with racial overtones received critiques from national publications and the society was reprimanded by university officials. While the author focuses on UBC, other Canadian institutions faced similar if not worse situations, such as the tragic account of the shootings of female students at L’Ecole Polytechnique in Montreal in 1990. Clearly, this represents an extreme case of resistance to women entering the profession and the challenge of overcoming outdated stereotypes. Unfortunately, racial and gender divisions manifested themselves in this field as the composition of the student body and faculty gradually began to change (138-139). References to these social dynamics are truly compelling and engage the reader; further exploration would have enhanced Damer’s work.

At its inception, UBC was conceived as an undergraduate teaching institution established to serve the local community and facilitate regional industrial development, a goal UBC met by the early part of the twentieth century. UBC evolved into a major research university training advanced students to contribute to groundbreaking technological innovations in the field of engineering. Damer captures this dramatic transformation by carefully documenting important relationships shaping the character and educational vision of the institution. Establishing strong local and regional ties proved to be a smart move and garnered financial support that provided a solid foundation upon which administrators, faculty, and students could draw. Subsequent political developments and scientific advancements played a crucial role in directing the course of UBC, enabling it to compete on the international stage. *Discovery by Design* will, and very well should, foster greater interest in a subject that has fundamentally shaped our physical environment and major historical developments in Canada.