Article

"The Very Model of a Modern Engineer: Status, Education, and the Engineering Institute of Canada, 1925-1932"

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The Very Model of a Modern Engineer: Status, Education, and the Engineering Institute of Canada, 1925-1932[1]

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Abstract : Between 1925 and 1932, the Engineering Institute of Canada (EIC)—one of the oldest professional organizations for engineers in Canada—advocated vigorously for the inclusion of cultural and communications courses in university engineering curricula. Motivated by the perceived inferiority of engineering in comparison to the medical and law professions, this effort led to an important reconsideration of the social status and professional identity of engineers. The EIC challenged the self-identification of engineers as technical experts and forced the engineering profession to re-evaluate its pedagogical and public priorities. This paper documents changes in engineering mentalities between 1925 and 1932 and argues that, in these years, Canadian engineers fostered a broader understanding of their role in society.

Résumé: Entre 1925 et 1932, l'Institut canadien des ingénieurs (ICE) – un des plus anciens organismes professionnels des ingénieurs au Canada – promut le renforcement de la formation culturelle et des capacités de communication des étudiants en génie aux universités canadiennes. Stimulée par la perception que les ingénieurs ne gagnaient pas le respect accordé aux médecins et aux avocats, cette initiative lançait une réévaluation du standing social et de l'identité professionnelle des ingénieurs. L'ICE s'interrogeait sur l'identification auto-appropriée des ingénieurs en tant qu'experts techniques et insistait que les ingénieurs reconsidèrent leurs priorités pédagogiques et publiques. Cet article décrit l'évolution de l'image de soi des ingénieurs entre 1925 et 1932 et conclut que les ingénieurs canadiens ont bâti une meilleure compréhension de leur rôle dans la société canadienne.

1. I thank Janis Langins and Trevor Levere (Institute for the History and Philosophy of Science and Technology, University of Toronto, Toronto, Canada), and two anonymous referees, for their advice.

In 1925, the Engineering Institute of Canada (EIC), an organization dedicated to advancing the professional capacities of Canadian engineers,[2] launched an effort to establish itself as a respected advisory body to Canadian universities. That effort lasted seven years, and forced engineers to re-evaluate their profession. In the early 1900s, Canadian engineers prided themselves on their technical proficiency. By the late 1920s, the EIC was convinced that cultural knowledge and communications skills were essential to the status of the engineering profession. In particular, the EIC advocated the inclusion of writing and public speaking courses in university engineering curricula. By forcing engineers to consider the benefits of the humanities, the EIC challenged the self-identification of engineers as technical experts.[3]

While the EIC saw its work at the university level between 1925 and 1932 as vital to the Institute and to the profession at large, the movement ended prematurely. Despite the failure of the project, it provides an important framework around which to investigate the evolution of the EIC and of engineering mentalities in the late 1920s and early 1930s. By documenting the history of the EIC's involvement with university engineering education from 1925 to 1932, this paper argues that the EIC's work on university-level engineering education fostered a new understanding of the public status and professional identity of engineers in Canada.

Engineering in Canada to 1925

Fed by the canal boom of the 1840s and the railway surge of the 1880s, the engineering profession emerged as a formative force in 19th century Canada. In 1887, Canadian engineers founded the EIC to further their profession and foster a professional identity. By 1919, the EIC boasted over 3,200 members from Halifax to Victoria.[4] As the EIC grew, so too

2. The EIC was founded in 1887 as the Canadian Society of Civil Engineers (CSCE), and was re-named the EIC in 1918. For simplicity, the term *EIC* will be used throughout this paper to refer to the organization in both periods of its history. For a detailed study of the early history of the CSCE/EIC (from 1887 to 1922), see J.R. Millard, *The Master Spirit of the Age: Canadian Engineers and the Politics of Professionalism, 1887-1922* (Toronto: University of Toronto Press, 1988). Further, it should be noted that the Canadian Institute (established in 1849) was intended for surveyors, architects and persons with affiliated interests as well as engineers, and that the Royal Society of Canada (1882) excluded engineers. For studies of the Canadian Institute and the Royal Society of Canada, see W.S. Wallace, ed., *The Royal Canadian Institute Centennial Volume, 1849-1949* (Toronto: The Royal Canadian Institute, 1949) and T.H. Levere, *Research and Influence: A Century of Science in the Royal Society of Canada* (Ottawa: Royal Society of Canada, 1998).

3. In this paper, the word *technical* is used to describe the knowledge and skills of the engineering profession. In particular, it does not refer to technicians, draftsmen or the trades, but only to engineers.

4. Practicing engineers and engineering students are admitted to the EIC on the basis of technical knowledge and professional experience. Full members of the EIC carry the

did the feeling that Canadian engineers needed a regulatory body to set salary standards and license the profession.[5] Pro-regulation engineers pointed to the protections afforded to other professions, including medicine and law, which were legally governed by provincial bodies.[6] However, the Dominion-chartered EIC was blocked from regulating the engineering profession by the British North America Act, which assigned control of professions to provincial jurisdiction. Accordingly, engineers formed licensing associations on a province-by-province basis. Between 1920 and 1922, seven of the nine provinces in the Dominion established licensing associations which legally controlled the title *Professional Engineer*.[7] The EIC's struggle to retain its relevance in face of the licensing associations would factor in the Institute's work at the university level between 1925 and 1932.[8]

Despite Canada's close political, economic and military ties to Britain in the 19th and early 20th centuries, the development of Canadian science and engineering in this period mirrored the American, not the British, model.[9] In particular, while British engineers were trained by apprenticeship into the 20th century, university education for Canadian engineers began in the 19th century, and by the years of interest in this paper—1925 to 1932—"practically the whole of engineering education in Canada [was] in the

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initials MEIC, while associate members carry the initials AMEIC. In the early 20th century, full members were required to be at least 35 years of age and to have a minimum of twelve years experience in engineering, including at least five years of responsible charge of engineering projects. Associate members were required to be at least 27 years of age and to have six years experience in engineering, including at least five years of responsible charge of engineering projects. Student membership was restricted to students enrolled in engineering programs at Canadian institutions. "Report of Council for the Year 1919," *Engineering Institute of Canada Journal* (hereafter, *EICJ*) 3 (Feb. 1920): 43; "Preliminary Notice of Applications for Admission and for Transfer," *EICJ* 8 (Nov. 1925): 473-4.

5. For a study of the emergence of engineering licensing associations in Canada, see Millard.

6. It should be noted that, unlike their counterparts in the United States who opposed regulatory measures, Canadian engineers saw regulation as a method of setting themselves apart from tradesmen. For a study of the attitudes of American engineers towards regulation and licensing, see P. Meiksins and C. Smith, "Why American Engineers Aren't Unionized: A Comparative Perspective," *Theory and Society* 22, 1 (1993): 57-97.

7. The two provinces which did not form licensing associations in the early 1920s were Saskatchewan and Prince Edward Island. These provinces established licensing associations in 1930 and 1955, respectively.

8. The tensions between the EIC and the licensing associations are exemplified in "Institute's Relations with Provincial Associations," *EICJ* 6 (March 1923): 142-3.

9. See Suzanne Zeller's work on science in Victorian Canada for an analysis of the effects of Canada's geography, climate, and proximity to the United States on the development of Canadian science. *Inventing Canada: Early Victorian science and the idea of a transcontinental nation* (Toronto: University of Toronto Press, 1987).

hands of the universities."[10] The Canadian engineering education model followed that of the United States, where engineering had been taught at technical colleges and universities since the early 19th century. By the mid 1920s, eleven Canadian institutions offered engineering programs, with approximately three hundred graduates per year.[11]

At the turn of the century, Canadian university engineering courses were commonly taught by professors from the pure sciences, and curricula "took the form of a simple extension of the field of pure science to such applications as could be conveniently dealt with in the classroom or college laboratory."[12] As trained engineers gradually filled professorships, curricular emphasis shifted from the fundamental sciences (e.g., mathematics, physics and chemistry) to practical engineering applications. Industrial employers who valued graduates with practical skills encouraged the trend towards technical education. As universities focused increasingly on training students to enter the industrial workplace, "courses in languages, history, logic and economics were crowded out."[13] The de-emphasis of cultural and communications courses continued through the 1920s as universities struggled to keep their curricula up-to-date with a plethora of new technical subjects.[14] This precedence of practice over culture led R.W. Boyle (MEIC), Dean of Engineering at the

10. E.G. Cullwick, "Engineering Education in Canada," *EICJ* 15 (July 1932): 337-48.

11. These eleven Canadian institutions were the Nova Scotia Technical College (now part of Dalhousie University), the University of New Brunswick, École Polytechnique, McGill University, Queen's University, the University of Toronto, the University of Manitoba, the University of Saskatchewan, the University of Alberta, the University of British Columbia and the Royal Military College of Canada. A detailed breakdown of these engineering programs is presented in Cullwick's 1932 essay on the state of engineering education in Canada (Ibid.). It should be noted that Harris' work on higher education in Canada contains an historical overview of engineering education. See R.S. Harris, *A History of Higher Education in Canada, 1663-1960* (Toronto: University of Toronto Press, 1976). Also, histories of engineering education have been written for several Canadian institutions. These include R. Gagnon, *Histoire de l'École Polytechnique de Montréal, 1873-1990: La montée des ingénieurs francophones* (Montreal: Boréal, 1991); W.G. Richardson, *Queen's Engineers: A Century of Applied Science, 1893-1993* (Kingston: Queen's University, 1992); R. White, *The Skule Story: The University of Toronto Faculty of Applied Science and Engineering, 1873-2000* (Toronto: University of Toronto Press, 2000); C.R. Young, *Early Engineering Education at Toronto, 1851-1919* (Toronto: University of Toronto Press, 1958).

12. W.E. Duckering, "Problems of Engineering Education," *EICJ* 9 (Nov. 1926): 467-72. For accounts of the transformation of engineering education at Canadian universities between the 1870s and the 1920s, also see R.W. Boyle, "Discussion on Engineering Education," *EICJ* 8 (March 1925): 121-2; E.G. Cullwick, "Engineering Education in Canada," *EICJ* 15 (July 1932): 337-48; H.M. MacKay, "Some Thoughts Regarding Engineering Education," *EICJ* 8 (March 1925): 113-16.

13. W.E. Duckering, "Problems of Engineering Education," *EICJ* 9 (Nov. 1926): 467-72.

14. Cullwick notes that radio electronics and aeronautics were two of the many technical areas which had to be added to engineering curricula in the 1920s. E.G. Cullwick, "Engineering Education in Canada," *EICJ* 15 (July 1932): 337-48.

University of Alberta from 1921 to 1929, to describe young engineers in 1925 as "over-trained but under-educated."[15] The debate over the merits of non-technical courses in engineering curricula would be taken up by the EIC in the late 1920s. It should be emphasized that the EIC itself had no significant involvement with universities in the late 19th or early 20th centuries. As a learned society, the EIC played a role in the continued education of practicing engineers through the publication of technical papers and the sponsoring of conferences, but this educational work did not extend greatly into the university sphere.

In the early 20th century, Canadian engineers—and especially the EIC executive—were greatly concerned with the status of the engineering profession.[16] Firmly believing "theirs to be not merely the noblest, but, so far as utility and modern material development are concerned, the most important Profession," engineers were frustrated that the public considered engineering to be of lower status than the traditional professions (medicine, law and the clergy).[17] Canadian engineers felt they had been slighted by politicians and businessmen, who excluded them from the Royal Society of Canada; blocked them from holding public positions such as directorships at the Bank of Canada (which were open to "lawyers, newspaper editors, doctors, locomotive engineers, [and] printers," but not engineers); and failed to adequately appreciate their contributions during the First World War.[18] Fraser S. Keith (MEIC), an electrical engineer trained at McGill University, spoke for the profession when he stated in 1925 that "the engineering profession is not recognized as it should be, and does not occupy the high place that we would like to see it occupy."[19]

Many reasons were proposed to explain this low status, including that engineering lacked the long history that the traditional professions enjoyed; that the public conflated professional engineers with tradesmen; and that, unlike doctors and lawyers, engineers had little contact with society and hence few opportunities to make the public aware of the

15. R.W. Boyle, "Discussion on Engineering Education," *EICJ* 8 (March 1925): 121-2.
16. This concern can be seen in C.E.W. Dodwell, "Engineers and Engineering," *EICJ* 3 (March 1920): 143-5; H.E.T. Haultain, "Engineers and Geologists," *The Canadian Engineer* 24 (3 April 1913): 525-6; S.G. Porter, "Some Observations on the Engineering Profession," *EICJ* 14 (Dec. 1931): 622-3; Library and Archives Canada, EIC Fonds (hereafter LAC, MG-28-I277), vol. 214, Book IV, "EIC Minutes 1927," p. 112; "The Professional Status of the Engineer [editorial]," *EICJ* 14 (Feb.1931): 120-1.
17 C.E.W. Dodwell, "Engineers and Engineering," *EICJ* 3 (March 1920): 143-5; H.E.T. Haultain, "Engineers and Geologists," *The Canadian Engineer* 24 (3 April 1913): 525-6.
18. LAC, MG-28-I277, vol. 211, Annual Meeting Minutes Book No. 4, "49th Annual General and General Professional Meeting, 1935," 87.
19. F.S. Keith, "Engineering Education – An engineering society viewpoint," *EICJ* 8 (March 1925): 118-20.

significance of their work.[20] Further, the EIC pointed to the crowding of the profession in the early 20th century (including the influx of lower-middle class American engineers into Canada) as responsible for lowering the state of Canadian engineering in comparison to the mid-to-late 19th century, when great names such as Thomas Keefer and Casimir Gzowski led the profession.[21]

The status problem was far from unique to Canada: in early 1900s, American engineers—frustrated by their subordination to managers who had no engineering training—were also "obsessed with status."[22] In the United States, efforts to improve the status of engineers included Morris Cooke's uprising against the American Society of Mechanical Engineers and utility companies and Henry Gantt's work on industrial efficiency, inspired by Frederick Taylor's scientific management. These reform platforms reflected Progressive Era politics and the nascent Technocracy movement, and were highly politicized and ideological.

In Canada, the engineers' quest for status played itself out in a more subdued manner. During the First World War, Canadian engineers tried to increase their status by promoting their work to the public and taking a greater role in "the administration of public affairs wherever engineering principles or practices are involved."[23] The formation of the licensing associations in the early 1920s was also linked to status, as the regulation and legal protection of the profession were seen as ways of highlighting the importance of professional engineers in the public mind.[24] These efforts were, however, not effective, and in the mid 1920s Canadian engineers remained frustrated with both the low "position of the engineer in the estimation of the public" and the failure of politicians to appoint engineers to public service committees.[25] By 1925, some engineers were drawing connections between low status and the technical focus of university engineering curricula. R.S.L. Wilson (AMEIC), who would replace Boyle as Dean of Engineering at the University of Alberta in

20. H.E.T. Haultain, "Engineers and Geologists," *The Canadian Engineer* 24 (3 April 1913): 525-6; "Toronto Engineers Suggest Means of Increasing Prestige of the Profession," *Contract Record* 32 (24 April 1918): 326-7; "The Professional Status of the Engineer [editorial]," *EICJ* 14 (Feb. 1931): 120-1.

21. Millard; R. White, "Canadian Civil Engineers Pre-1850: Professionals before Professionalization," *Scientia Canadensis* 24, 52 (2000): 73-95.

22. For a detailed study of American engineers and status in the early 20th century, see E.T. Layton, *The Revolt of the Engineers: Social Responsibility and the American Engineering Profession,* 2nd Edition (Baltimore: Johns Hopkins University Press, 1986).

23. "Toronto Engineers Suggest Means of Increasing Prestige of the Profession," *Contract Record* 32 (24 April 1918): 326-7.

24. Arthur Surveyor, "Messages from Councilors and Branch Officers to the Membership," *EICJ* 1 (June 1918): 110; "Summary of Legislation Situation," *EICJ* 2 (Feb. 1919): 120-1; "Legislation for Professional Engineers," *EICJ* 2 (June 1919): 458-63.

25. R.W. Boyle, "Discussion on Engineering Education," *EICJ* 8 (March 1925): 121-2.

1929, argued that the key to increasing the status of the profession was to include "a generous allowance of humanistic studies" in university curricula.[26] In the late 1920s, this link between curricula and status would become the foundation of the EIC's platform at the university level. The EIC's response to the status problem involved the rejection of the prevailing American model and the elaboration of a built-in-Canada solution.

Status, Education, and the EIC, 1925-1932

The EIC's interest in university education between 1925 and 1932 was a marked change from earlier years, when the Institute's educational work had centered on the dissemination of technical information among its members. This change in direction was sparked by the work of the Society for the Promotion of Engineering Education (SPEE) in the United States, which in 1923 had launched a major study of American college engineering education.[27]

Founded in 1893, the SPEE was the brainchild of the World Engineering Congress held in conjunction with the Chicago World's Fair.[28] The SPEE was originally intended to provide a mechanism through which American engineering colleges could coordinate their objectives and discuss pedagogical methods.[29] The SPEE study which caught the attention of the EIC—the Wickenden Study, named for Director of Investigation William E. Wickenden—was a sweeping investigation into "the objects of engineering education and the fitness of the present day curriculum for preparing the student for this profession."[30] The Wickenden Study lasted from 1923 to 1929, and was funded by the Carnegie Corporation and backed by the United States Bureau of Education as well as American industries, colleges and engineering societies.

While the Wickenden Study centered on the United States, it also attracted the interest of the Canadian engineering community, as noted by the EIC's 1924 comment that "during the past months the question of engineering education has been foremost in the minds of the engineering societies, the universities and the profession at large" in both Canada and

26. R.S.L. Wilson, "Discussion on Engineering Education," *EICJ* 8 (March 1925): 122-3.
27. "Annual Meeting at Montreal," *EICJ* 7 (Dec. 1924): 726.
28. D.C. Jackson, *Present Status and Trends of Engineering Education in the United States* (New York: Engineers' Council for Professional Development, 1939), 2.
29. Ibid.
30. C.J. Mackenzie, "Engineering Education," *EICJ* 8 (March 1925): 110-13. For more detail about the Wickenden Study, see "A Statement of Objectives and Outline of Procedure of the Investigation of Engineering Education," cited in H.P. Hammond, "The Study of Engineering Education," *EICJ* 8 (March 1925): 106-10; W.E. Wickenden, *A Comparative Study of Engineering Education in the United States and Europe* (Lancaster: Lancaster Press, 1929); and the SPEE's *Journal of Engineering Education*.

America.[31] The concerns raised by the Wickenden Study gave a new acuity to the EIC's desire for a more literate and culturally-knowledgeable body of engineers. Wanting to capitalize on the interest generated by the SPEE, the EIC announced at the end of 1924 that university education would be the focus of its next annual general meeting (to be held in January 1925).[32] Invitees to the meeting included official delegates from the SPEE and representatives from Canadian engineering universities and industries, as well as the EIC membership.[33] This meeting launched what would become a seven-year effort to build the EIC into a key advisor on the Canadian university engineering scene.

Held in January 1925 at Montreal's Windsor Hotel, the EIC's Symposium on Engineering Education was a well-attended, day-long event which generated numerous papers and much discussion.[34] The star of the symposium was Harry P. Hammond, the Associate Director of Investigation at the SPEE, who delivered the opening address and set the stage for debate.[35] Speakers including C.J. Mackenzie (MEIC, Dean of Engineering, University of Saskatchewan), H.M. MacKay (MEIC, Dean of the Faculty of Applied Science, McGill University) and W.M. Carruthers (AMEIC, Canadian General Electric Company) followed Hammond's address.[36] The discussion from the floor considered the state of engineering curricula and pedagogy in Canada—a set of topics which extended beyond the traditional learned society interests of the EIC. [37]

The EIC itself was represented at the symposium by Fraser Keith.[38] Keith voiced the EIC Council's support for the Wickenden Study, declaring that such studies could engender concrete improvements at

31. "Annual Meeting at Montreal," *EICJ* 7 (Dec. 1924): 726.
32. Ibid.
33. "Symposium on Engineering Education," *EICJ* 8 (March 1925): 105.
34. Ibid.
35. H.P. Hammond, "The Study of Engineering Education," *EICJ* 8 (March 1925): 106-10.
36. "Symposium on Engineering Education," *EICJ* 8 (March 1925): 105-20.
37. "Discussion on Engineering Education," *EICJ* 8 (March 1925): 120-3.
38. Born in Smith's Falls (Ontario), Keith (1878-1958) graduated as an electrical engineer from McGill University in 1903. He then worked as an editor and manager for Canadian technical publications including *Canadian Machinery*, *Canadian Manufacturer*, and the journals of the MacLean Publishing Company. From 1925 to his retirement in 1944, he served as a manager at the Shawinigan Water and Power Company (Quebec). Keith joined the EIC as a student member in 1902 and progressed through its ranks, becoming a full member in 1921. He was actively involved with the EIC executive for decades, serving as General Secretary and as Editor and Manager of the *Engineering Journal* from 1918 to 1925, and was instrumental to the establishment of the *Engineering Journal* as a respected publication. "Fraser S. Keith – Obituary," *EICJ* 41 (Dec. 1958): 74; "Fraser Sanderson Keith – In Memoriam," *University of British Columbia Alumni Chronicle* 13 (Spring 1959): 36.

universities.[39] Announcing that the EIC had already "offered its cooperation" to the SPEE for any aspects of its study which were relevant to Canada, Keith made clear the EIC Council's desire to involve the EIC on the Canadian university scene.[40] In later years, Keith would become the main figure in the EIC's work at the university level.

Following the 1925 symposium, the EIC unanimously passed a resolution calling for the appointment of a committee to ensure "the cooperation of the Institute with the Society for the Promotion of Engineering Education" and to cultivate a relationship between the EIC and Canadian universities.[41] This resolution was quickly acted on – not always the fate of EIC motions—and a six-member Committee on Engineering Education, chaired by Frederick B. Brown (MEIC),[42] was named later in 1925.[43] The EIC executive stated that the new committee was to be "one of the most active committees of the Institute."[44]

While the SPEE's Wickenden Study directly stimulated the EIC's interest in universities, other factors were also at play. From 1918 to 1922, the EIC had enjoyed a steady growth in membership size (figure 1). After 1922, when licensing associations became active in seven provinces, the EIC's membership numbers stopped increasing. Faced with two organizations, each with their own fees, many engineers chose to join their licensing association but not the EIC.[45] This trend was particularly evident among engineering students: of the 299 students who graduated from Canadian engineering programs in 1926, only 65 were members of the EIC.[46] Upon return from a visit to EIC Regional Branches in 1927,

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39. The EIC Council is the executive body of the EIC, elected annually by the membership. F.S. Keith, "Engineering Education – An engineering society viewpoint," *EICJ* 8 (March 1925): 118-20.

40. Ibid.

41. "Resolution Following Engineering Education Discussion," *EICJ* 8 (Feb. 1925): 83-8.

42. The first chairman of the Committee on Engineering Education, Frederick B. Brown (1881-1932), received degrees in mechanical and electrical engineering from McGill University. He then worked as a consulting engineer on projects including the municipal water system in Moose Jaw (Saskatchewan), the Carillon hydro-electric project (Quebec) and the street lighting system in Westmount (Montreal). Brown joined the EIC as a student member in 1903 and became a full member in 1914. He was active in both the EIC and the Corporation of Professional Engineers of Quebec (the licensing association for the province of Quebec). "Frederick B. Brown – Obituary," *EICJ* 15 (Sept. 1932): 443-4.

43. LAC, MG-28-I277, vol. 214, Book II, "EIC Minutes 1925," 3.

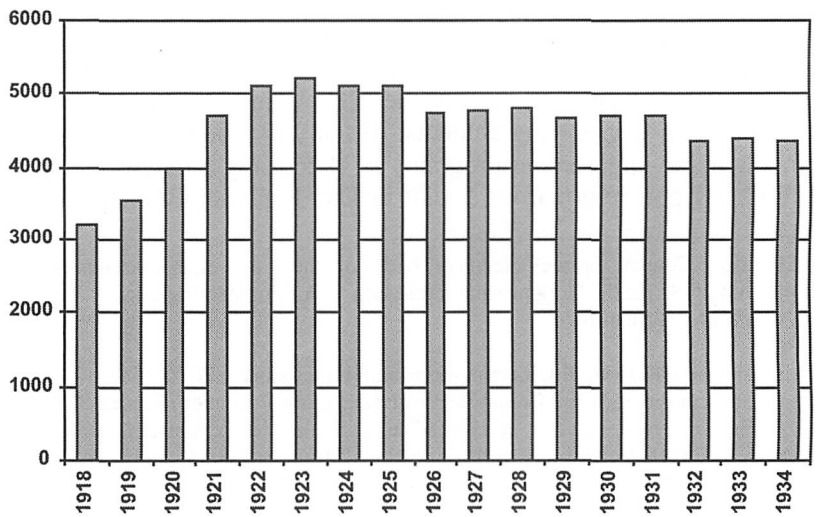
44. "Studying Engineering Education [editorial]," *EICJ* 8 (March 1925): 124.

45. LAC, MG-28-I277, vol. 211, Minutes Book No. 3 (1906-1930), "Minutes of 34th General Professional Meeting, 27-29 January 1926, Toronto," 395; LAC, MG-28-I277, vol. 241, folder 13, "Report of Council for the Year 1930."

46. These numbers take into account graduates of the Nova Scotia Technical College, the University of New Brunswick, École Polytechnique de Montréal, McGill University, Queen's University, the University of Toronto, the University of Saskatchewan, the University of Alberta, and the University of British Columbia. LAC, MG-28-I277, vol. 214, Book III, "EIC Minutes 1926," 106-7.

EIC Secretary R.J. Durley noted that engineers across Canada were finding membership in two organizations "too heavy a drain on their resources," and that "there is a very natural tendency to give up membership in any society to which they are not compelled to belong."[47] The EIC recognized that it was losing members, especially young members, to the licensing associations, and that "the Institute could never reach its full expansion unless membership were made more attractive to young men graduating from universities."[48] Until the formation of the Committee on Engineering Education in 1925, the EIC had had no dedicated mechanism for building relationships with universities—a task which was clearly important if the EIC was to recruit more student members. The EIC's involvement with universities from 1925 on was a response to falling membership numbers and to the loss of student members to the licensing associations, as well as to the SPEE.

Figure 1. EIC Membership, 1918-1934.



Source: EICJ *3 (Feb. 1920): 43; LAC, MG-28-I277, vol. 213, "EIC Minutes 1921," 3; LAC, MG-28-I277, vol. 213, "EIC Minutes 1922," 3;* EICJ *6 (Feb. 1923): 52;* EICJ *8 (Feb. 1925): 49;* EICJ *9 (March 1926): 127; LAC, MG-28-I277, vol. 241, folder 12, "Report of Council for the Year 1927";* EICJ *11 (March 1928): 195;* EICJ *12 (Feb. 1929): 53;* EICJ *14 (Feb. 1931): 94;* EICJ *15 (Feb. 1932): 88;* EICJ *16 (Feb. 1933): 69;* EICJ *18 (Feb. 1935): 83.*

47. LAC, MG-28-I277, vol. 214, Book IV, "EIC Minutes 1927," 126.
48. Ibid., 116.

The Committee on Engineering Education's original assignment was to collaborate with the SPEE and to establish the EIC as a knowledgeable player at the university level—a mandate interpreted by Frederick Brown and his committee as directing them to undertake a study of Canadian university engineering education parallel to the SPEE's Wickenden Study.[49] By early 1927, however, Brown's committee was overwhelmed by the task at hand.[50] While the SPEE was supported by an army of investigators and funded by the Carnegie Corporation, the EIC had neither the personnel nor the financing to replicate the SPEE's effort in Canada. Noting the impossibility of "undertaking a complete independent study of the whole matter," Brown's committee essentially ended its efforts in March 1927.[51]

Despite the failure of Brown's committee to make any progress, the EIC Council's interest in universities remained high. In the fall of 1927, discussion of university curricula again dominated an EIC meeting, even drawing reaction from EIC President A.R. Decary.[52] Stating that "a classical education should be considered as necessary for engineers as for doctors and lawyers," Decary criticized the lack of cultural and communications courses in engineering curricula.[53] Decary's views would, in the following years, become central to the EIC's platform.

In April 1928, at the second review of the Committee on Engineering Education, Fraser Keith replaced Brown as chairman.[54] With a wealth of administrative experience at the EIC and a deep familiarity with the Institute's ideology, Keith brought new life to the committee. With Keith in charge, there was no longer talk of mirroring the work of the SPEE, or even of cooperation with the SPEE: instead, the committee dedicated itself to finding a suitable role for the EIC in the Canadian university context.[55] Keith saw the need to fashion objectives and solutions which did not emulate those used in the United States, but which were feasible in the Canadian milieu. After two years of consultations, Keith's committee released six recommendations (listed below) designed to give the EIC

49. F.B. Brown, "Studying Engineering Education [editorial]," *EICJ* 8 (March 1925): 124.
50. F.B. Brown, "Committee on Engineering Education," *EICJ* 10 (March 1927): 145-6.
51. F.B. Brown, "Committee on Engineering Education," *EICJ* 11 (March 1928): 198.
52. Born in Montreal in 1875, Albert R. Decary received his engineering training at École Polytechnique. He spent most of his career working on hydrography for the Department of Public Works (Ottawa) and as District Engineer for Quebec. Decary joined the EIC in 1900 and became a full member in 1907. He was prominent in both the Quebec Branch of the EIC, where he served as chairman from 1919 to 1925, and in the Corporation of Professional Engineers of Quebec, where he served as inaugural president. LAC, MG-28-I277, vol. 214, Book IV, "EIC Minutes 1927," 114.
53. Ibid.
54. LAC, MG-28-I277, vol. 214, Book V, "EIC Minutes 1928," 38, 46.
55. F.S. Keith, "Committee on Engineering Education," *EICJ* 12 (Feb. 1929): 56.

"a more dominant and aggressive position in relation to the subject of engineering education."[56]

Recommendations of the Committee on Engineering Education, 1929-1930.

I - The formation of a more intimate bond between the Institute and engineering universities throughout Canada, in order that the Institute may be in a position to advise on engineering education through its older and most successful members.
II - That steps be taken whereby the Institute becomes the definite agency—the active connecting medium—between engineering universities and industries.
III - That a study should be made by a committee on technical education in its relation to industry and to the engineering profession.
IV - That immediate steps be taken by conference with university heads with a view to adopting a six year course for engineers, or a much high matriculation standard.
V - That the universities be urged to give consideration to giving additional time on the curriculum to public speaking and literature.
VI - That immediate steps be taken leading to the formation of student branches of the Institute or student affiliations in every engineering university in the Dominion.

Source: F.S. Keith, "Committee on Engineering Education," Engineering Journal *13 (March 1930): 183-4.*

While recommendation *V* (which related to the status of the profession) would come to be dominant, it is important to understand the purpose and direction of the recommendations as a set. The recommendations were intended not only to build the EIC as a player at the university level, but also to maintain the relevance of the EIC in face of the licensing associations. In particular, the two recommendations regarding industry (*II* and *III*) aimed to carve a place for the EIC in an area which the licensing associations took to be their territory. As the organizations which bridged young engineers into the workplace by licensing them to practice their profession, the licensing associations saw themselves as the key connection between universities and industry—a connection which Keith's committee aimed to challenge.[57]

Further, the final recommendation (*VI*) was a response to the loss of young EIC members to the licensing associations. Keith's committee criticized the EIC for failing to attract student members, stating that "large numbers of students [are] graduating from universities with practically no knowledge of the Institute" and noting that student recruitment was "of

56. F.S. Keith, "Committee on Engineering Education," *EICJ* 13 (March 1930): 183-4.
57. LAC, MG-28-I277, vol. 241, folder 12, "Report of Council for the Year 1927."

vital concern to [the EIC's] future welfare."[58] If the EIC did not reverse this trend, the committee warned, the Institute would be unable to renew itself.[59] By urging the formation of student branches of the Institute at Canadian universities, Keith's committee aimed to boost the EIC's visibility on university campuses and to increase the appeal of the EIC to engineering students. The work of the Committee on Engineering Education was influenced (as were all aspects of the EIC in the 1920s) by the fear of the EIC being rendered irrelevant by the licensing associations.

While Keith's committee was careful to praise the level of technical engineering instruction at Canadian universities, the committee criticized the low importance given to cultural and communications courses in engineering curricula.[60] Stating that "one great weakness of the engineering training is that the engineer is not taught to properly articulate, either in writing or orally," the committee argued that engineering graduates were technically proficient, but incapable of adequately expressing themselves and contributing to broader societal efforts.[61] By early 1930, Keith and his committee had arrived at one "definite conclusion—that the reason the engineer does not occupy the position as a professional man that is accorded to other professions lies largely in our present curricula and the fact that a cultural background is not provided."[62] If the engineering community was serious in its desire to be afforded higher status, they continued, the neglect of cultural and communications courses in university curricula needed to be rectified. Supporters of this view argued that the technical focus of university curricula resulted in the formation of engineers who lacked the communications skills necessary to attain prominent public positions, and thus perpetuated the public perception of engineering as being of lower status than the traditional professions.

In making the status of engineers a priority, Keith's committee was reacting to the feeling within the profession that engineers were struggling against a society biased towards the traditional professions. The committee did not push for cultural and communications training in response to societal pressure, but because it was seen as a method of equalizing the status of engineers with that of doctors and lawyers. The promotion of non-technical courses in university engineering curricula was a Canadian solution to a Canadian problem—a solution which aimed to solve the status problem without following the model of the well-endowed SPEE, and which, if successful, would help maintain the EIC as a relevant organization in face of the licensing associations.

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58. LAC, MG-28-I277, vol. 214, Book VI, "EIC Minutes 1929," 146-9.
59. Ibid.
60. F.S. Keith, "Committee on Engineering Education," *EICJ* 13 (March 1930): 183-4.
61. Ibid.
62. Ibid.

The weight given to writing and public speaking by the Committee on Engineering Education marks the beginning of a new conception of the engineering profession in Canada. Canadian engineers were traditionally proud of their technical knowledge, and saw this knowledge (such as the ability to harness water resources for hydro-electricity or to build ventilated railway tunnels in the Rocky Mountains) as a defining aspect of their profession.[63] This technical expertise differentiated engineering from the trades and provided a common link between the various fields of engineering (that is, fields such as civil, mechanical, electrical and chemical engineering). Stating that communications skills were "as essential to the engineer as... to the lawyer or minister," Keith's committee suggested that technical proficiency alone would not bring engineers the public respect they desired, but that the profession needed to expand its aptitude beyond the technical realm.[64] In the following years, the EIC would take hold of this view and endorse it as vital to raising the status of engineers.

In 1930 the EIC Council accepted all of the recommendations put forward by the Committee on Engineering Education with the exception of the six-year university course (recommendation *IV*).[65] For the next two years, university education occupied "a prominent place" at the EIC, and the Institute's executive fully supported the efforts of Keith's committee to "achieve for the Institute a more definite leadership role in the realm of engineering education."[66] In order to devote more manpower to these efforts, the Committee on Engineering Education was enlarged from six to thirteen members.[67]

In an editorial published in the *Engineering Journal* in late 1931, the EIC Council made clear its interest in the relationship between status and curricula expounded by Keith's committee.[68] Concurring with the committee's evaluation of existing university programs, the EIC Council declared its concern "with the efficiency of our education system as a means of raising the professional status of the engineer."[69] It was no longer sufficient for engineering institutions to cater to the demands of industry and train students only in technical areas, the Council continued: instead, universities needed to cultivate well-rounded engineering

63. S.G. Porter, "The Engineering Profession – Yesterday and Tomorrow," *EICJ* 15 (March 1932): 171-4; "Toronto engineers suggest means of increasing prestige of the profession," *Contract Record* 32 (24 April 1918): 326-7; "The Engineer in the Pulp and Paper Industry," *EICJ* 6 (Sept. 1923): 409; "The Professional Status of the Engineer [editorial]," *EICJ* 14 (Feb. 1931): 120-1.
64. F.S. Keith, "Committee on Engineering Education," *EICJ* 13 (March 1930): 183-4.
65. F.S. Keith, "Committee on Engineering Education," *EICJ* 14 (Feb. 1931): 97-8.
66. "The Institute and Engineering Education [editorial]," *EICJ* 14 (Dec. 1931): 618-9.
67. F.S. Keith, "Committee on Engineering Education," *EICJ* 14 (Feb. 1931): 97-8.
68. "The Institute and Engineering Education [editorial]," *EICJ* 14 (Dec. 1931): 618-9.
69. Ibid.

professionals who were "more than a walking pocket-book full of technical data."[70]

The view enunciated by the EIC executive had three components: that engineers lacked cultural knowledge and communication ability, that rectifying these inadequacies would raise the prestige of the profession in the public eye, and that the key solution was the introduction of "paper writing and critical discussions" into engineering curricula.[71] The connection with status was underlined in an essay written for the EIC by A.W. McQueen (AMEIC), an assistant engineer at H.G. Acres & Co., Ltd. (Niagara Falls, Ontario).[72] McQueen argued that engineers traditionally placed too much value on technical knowledge, and too little on the social and economic aspects of society. Addressing the frustration of engineers with the lack of representation of their profession "on bodies charged with the investigation of questions of public interest and welfare," McQueen stated that governments would be more likely to appoint engineers to public committees if engineers were to "raise their noses from their blue-prints and figures," display familiarity with general culture, and improve their "ability to use language effectively."[73] The desire for engineers to be seated side-by-side with doctors and lawyers on public bodies exemplifies the long-standing dissatisfaction with status in the engineering community. The Committee on Engineering Education's identification of a deficiency in university curricula gave the EIC a convincing strategy to solve the status problem.

The belief that engineers had a professional obligation to serve society in non-technical spheres was not entirely new. During the First World War, Canadian engineers had embarked on a commitment to public service with the aim of raising their status. This led to an increased contribution by engineers to the social, political and economic aspects of engineering projects (for example, engineers proposed political strategies to deal with the coal shortage in Ontario and Quebec, and pronounced on the economic benefits of the export of hydro-electricity to the United States).[74] However, the idea of addressing the status problem through curricular changes was new, as was the EIC's explicit declaration that engineers needed to expand their training beyond the technical. Stating that "technical knowledge, however profound, will be of little service to [the engineer] unless he is able to think clearly, to express his ideas

70. Ibid.
71. E.G. Cullwick, "Engineering Education in Canada," *EICJ* 15 (July 1932): 337-48.
72. A.W. McQueen, "Engineering Education in Canada," *EICJ* 15 (May 1932): 253-60.
73. Ibid.
74. "Discussion on Canada's Fuel Problem," *EICJ* 6 (Jan. 1923): 26; "Discussion of Export of Power (Presented at a Meeting of the Montreal Branch, The Engineering Institute of Canada, held on February 26th, 1925)," *EICJ* 8 (April 1925): 172-9; "Export of Hydro-Electric Power [Editorial]," *EICJ* 8 (Nov. 1925): 458-9.

correctly and to use his own language effectively, and unless he has that familiarity with literature and questions of the day which any well-educated man should possess," the EIC Council called attention to the need for engineers to look beyond technical proficiency to properly fulfill their professional role.[75] This conception of the profession forced engineers to re-evaluate their self-identification as technical specialists, and led to a greater respect for culture and communications among Canadian engineers.

The extent to which the work of the Committee on Engineering Education engendered a change in engineering mentalities can be seen in reports published in the *Engineering Journal*.[76] At the EIC's 1925 Symposium on Engineering Education, there was little consensus over the proper structure for engineering curricula, and some engineers argued against the inclusion of non-technical courses. By 1931-1932, however, the training of engineers in culture and communications—elements usually associated with the traditional professions—was widely seen to be urgently necessary for the good of the profession.

While the EIC Council saw curricular changes as the key to solving the status problem, the Council also saw a role for the Institute itself in the training of well-rounded engineers. Through the organization of professional and social events for its members, the EIC furnished an environment which aimed to develop in engineers "the polish which results from a continual contact with his fellow men"—a polish which the EIC believed was possessed by the traditional professions, but lacked from the engineering profession.[77] Engaging young engineers in this environment, though, necessitated that these engineers join the EIC—but, in the late 1920s and early 1930s, many young engineers were choosing to join only their licensing association. In the minds of Keith's committee and the EIC Council, bolstering the involvement of young engineers in the EIC would both contribute to the formation of a cultural awareness in the profession and provide a much-needed boost to the Institute.

In 1930 and 1931, the EIC Council's desire for curricular change was at a peak. However, as an autonomous institute with no direct link to universities, the EIC had no established way of influencing curricula, but could only hope to bring its proposals to fruition by becoming a respected advisory body on the university stage. In order to build "intimate contact" with engineering institutions, Keith's committee planned to invite one delegate from each Canadian engineering university to the EIC's forthcoming annual meeting (to be held in February 1932).[78]

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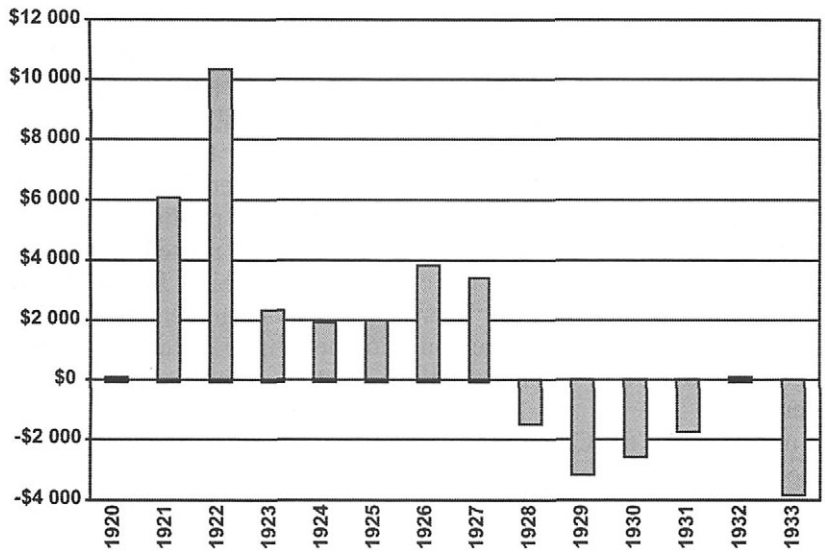
75. "The Institute and Engineering Education [editorial]," *EICJ* 14 (Dec. 1931): 618-9.
76. For example, E.G. Cullwick, "Engineering Education in Canada," *EICJ* 15 (July 1932): 337-48; "Discussion on Engineering Education," *EICJ* 8 (March 1925): 105-23.
77. "The Institute and Engineering Education [editorial]," *EICJ* 14 (Dec. 1931): 618-9.
78. LAC, MG-28-I277, vol. 215, Book I, "EIC Minutes 1931," 6.

In the same years, the EIC Council was growing increasingly anxious over internal troubles at the Institute.[79] Hit by the unemployment and uncertainty of the Depression, many EIC members could no longer afford their annual fees.[80] As arrears built up, the EIC's tolerance for outstanding membership dues fell, and between 1929 and 1931 hundreds of members were removed for failing to pay their fees.[81] Between the economic effects of the Depression and competition from the licensing associations, the EIC's revenue from membership fees plummeted. In 1928, the EIC recorded a deficit for the first time in many years—a trend which continued into the 1930s (figure 2).

Figure 2. EIC Annual Surplus/Deficit, 1920-1933.



Source: LAC, MG-28-I277, Vol. 211, Minutes Book No. 3 (1906-1930), "Minutes of 35th General Professional Meeting, 2-3 February 1921", 350; EICJ *5 (February 1922): 55;* EICJ *6 (February 1923): 52;* EICJ *8 (February 1925): 49;* EICJ *9 (March 1926): 127;* EICJ *10 (March 1927): 142;* EICJ *11 (March 1928): 195;* EICJ *12 (February 1929): 54;* EICJ *14 (February 1931): 95;* EICJ *16 (February 1933): 69.*

In the early 1930s, these financial problems began to impact on the work of the Institute. In its annual report for 1930, the EIC stated that "it has not been possible to develop the work of the Institute along certain desirable

79. LAC, MG-28-I277, vol. 214, Book VI, "EIC Minutes 1929," 146-9; LAC, MG-28-I277, vol. 214, Book VII, "EIC Minutes 1930," 26, 30-32, 140; LAC, MG-28-I277, vol. 215, Book I, "EIC Minutes 1931," 81-2.
80. LAC, MG-28-I277, vol. 215, Book I, "EIC Minutes 1931," 81-2.
81. LAC, MG-28-I277, vol. 214, Book VI, "EIC Minutes 1929," 102-4.

lines, for Headquarters' expenditure has been strictly limited, and in some instances has had to be curtailed."[82] In a striking decision, the EIC Council refused to host a reception for the SPEE, which was holding a meeting in Montreal (the location of the EIC headquarters) in June 1930, citing a lack of funds.[83] In these years, the EIC Council was overwhelmed by internal troubles and had little time to support endeavours which did not contribute tangibly and quickly to improving the financial situation of the Institute. These problems were grave enough that Council only agreed to Keith's request to invite university delegates to the EIC's 1932 annual meeting after Keith assured that it "would involve no financial responsibility on the part of the Institute."[84] By late 1931, the desire of the EIC Council to establish the Institute as a player on the university scene was clashing with the realities of the EIC's financial position.

The Committee on Engineering Education held its meeting with university delegates on 4 February 1932 at Toronto's Royal York Hotel. Keith himself was unable to attend and sent a letter expressing his regrets.[85] Despite his absence, the meeting was by all accounts a success: a resolution stating that "this conference desires that the universities impress upon their students the necessity of proper use of their native tongue, a knowledge of literature, and facility in public speaking as a supplement to their engineering education" was passed, marking the beginning of the EIC's push for curricular changes.[86] In the following months, dialogue between the Deans of Canadian university engineering faculties and the Committee on Engineering Education continued, suggesting that the implementation of the committee's plans was underway.[87]

In mid 1932, as the Committee on Engineering Education was furthering its contact with universities, the EIC's financial problems came to a head. The total arrears owed by members surpassed $9,000, and the Institute had to draw upon "liquid assets" and sell off long-term bonds in order to cover immediate expenses and overdrafts.[88] In response, two EIC staff positions were eliminated and the remaining staff members took a ten percent pay cut.[89] Further, programs and events—including the publication of the EIC News and the 1932 Plenary Meeting of Council—were cut altogether, and a "reduction in the Institute's committee work" was

82. "Report of Council for the Year 1930," *EICJ* 14 (Feb. 1931): 92-119.
83. LAC, MG-28-I277, vol. 214, Book VII, "EIC Minutes 1930," 34-5.
84. LAC, MG-28-I277, vol. 215, Book I, "EIC Minutes 1931," 56.
85. F.S. Keith, "Committee on Engineering Education," *EICJ* 16 (Feb. 1933): 75-6.
86. "The Forty-Sixth Annual General and General Professional Meeting," *EICJ* 15 (March 1932): 163-9.
87. LAC, MG-28-I277, vol. 215, Book II, "EIC Minutes 1932," 71.
88. Ibid., 32-33, 124; LAC, MG-28-I277, vol. 215, Book III, "EIC Minutes 1933," 2, 29.
89. "Report of Council for the Year 1932," *EICJ* 16 (Feb. 1933): 68-100; LAC, MG-28-I277, vol. 215, Book II, "EIC Minutes 1932," 32-3.

suggested to further decrease expenses.[90] Between 1932 and 1934, three EIC committees were discharged, including the Committee on Engineering Education, which was effectively terminated at the end of 1932.[91] With this, the efforts of the EIC at the university level came to an end.

Keith's committee had put forward a plan to raise the prestige of the engineering profession in society—a problem which had long been of concern to Canadian engineers—and the EIC Council had initially been strongly in favour of pursuing this plan. By mid 1932, however, the EIC executive was more concerned with maintaining the EIC as an organization than with the broader status of the profession. This shift in thinking underlines the severity of the internal problems faced by the EIC during the Depression. Even the efforts of Keith's committee to encourage students to join the Institute were not enough to sustain support from the EIC Council: cutting, not spending, was the order of the day, and the EIC executive calculated that potential student recruitment could not justify the expenses Keith's committee thought it would entail (for example, providing the *Engineering Journal* free-of-charge to student members for the first year after graduation).[92]

While the EIC's push for curricular changes was cut short in 1932, the questions about the role and identity of the engineering profession raised by the Committee on Engineering Education did not disappear altogether. The understanding of status developed between 1928 and 1932—that is, the importance of culture and communications to the public perception of engineers—again came to the forefront after the Second World War, when the Canadian engineering profession renewed its struggle to improve the prestige of engineers in society.[93] In the post-World War II years, as engineers began to move into consulting and administrative jobs, the purely technical training which had before been demanded by industrial

90. "Report of Council for the Year 1932," *EICJ* 16 (Feb. 1933): 68-100; LAC, MG-28-I277, vol. 215, Book II, "EIC Minutes 1932," 32-33, 46-47, 82-83.

91. While due to internal confusion the discharge of the Committee on Engineering Education was not officially recorded until 1934, it is clear from the 1934 statement and from published lists of Institute committees for 1932-1934 that the Committee on Engineering Education ceased to be an EIC activity after 1932. The other two committees discharged in these years were the Committee on Development and the Committee on Biographies. "Institute Committees for 1933," *EICJ* 16 (July 1933): 317; "Institute Committees for 1934," *EICJ* 17 (Oct. 1934): 453; LAC, MG-28-I277, vol. 215, Book III, "EIC Minutes 1933," 43; LAC, MG-28-I277, vol. 215, Book IV, "EIC Minutes 1934," 44, 107.

92. LAC, MG-28-I277, vol. 215, Book II, "EIC Minutes 1932," 38-9.

93. For an overview of the status situation in the years following the Second World War, see "Confederation, or a plan for unity," *Professional Engineer and Engineering Digest* 23 (Feb. 1962): 39-45; J. Martin-Nielsen, *In Principle but not in Practice: Professional engineering organizations in 20th century Canada*, Master's Thesis, University of Toronto, 2006.

employers was no longer sufficient. As the role of engineers expanded to include upper management and business leadership, universities responded by adding humanities, communications and business courses to engineering curricula.[94] Similarly in the United States, the SPEE began to win its battle for the inclusion of humanistic-social studies in engineering curricula in the early 1940s.[95] This change in professional focus mirrored what Keith's committee had noted in the late 1920s and early 1930s: that engineers needed to build cultural and communications skills as well as technical proficiency. The work of Keith's committee fostered in Canadian engineers an understanding of their profession which, although not put to use in the early 1930s, became significant later in the 20th century.

Conclusions

While the Committee on Engineering Education's failure to engender change in the 1930s was caused most directly by internal problems at the EIC, the relationship between the EIC and the universities needs to be further considered. Central to the aims of Keith's committee was to convince universities to change their curricula—but the EIC had little historical influence over universities and, in the late 1920s and early 1930s, the universities had more reason to listen to the licensing associations than to the EIC. With their monopoly over regulation, the licensing associations dictated the requirements for graduating engineers to earn the title *Professional Engineer*, and consequently held sway over engineering education. In this light, the work of the Committee on Engineering Education reflects the EIC's desire to prevent the licensing associations from dominating communication with universities.[96] Further, the committee's failure is attributable in part to the EIC's lack of influence over universities.

Finally, although cultural and communications courses were added to university engineering curricula in the post-World War II years, this did not bring about the increase in status anticipated by Keith's committee. Rather, Canadian engineers still listed their low status as a primary concern in the early 21st century.[97] Why, then, did the broadening of

94. For example, in 1945 the Faculty of Applied Science and Engineering at the University of Toronto (under the guidance of Dean C.R. Young) added humanities courses to engineering curricula and introduced an "Engineering and Business" program. White, *The Skule Story*, 155-6.

95. *Proceedings of the Society for the Promotion of Engineering Education, XLVIII* (1941): 189.

96. For detail about the relationship between the EIC and the licensing associations in the 20th century, see Martin-Nielsen.

97. A. Gill, "Giving the 'Quiet' Profession a Voice," *Engineering Dimensions* 23, 1 (2002): 34-6.

engineering education beyond the technical not have the effect predicted by Keith's committee? Firstly, Keith's committee believed that non-technical training would have an immediate effect on the desire and ability of young engineers to take prominent public positions and to promote their profession in social, political and business spheres. However, as the entry of engineers into consulting and management jobs in the post-WWII years shows, engineers were more interested in advancing their careers than in taking public positions to benefit their profession. Secondly, in the late 20th and early 21st centuries, the licensing associations and other engineering organizations used the status problem as a tool to push for stronger regulations, increased legal protection, and higher salaries for engineers.[98] The persistence of the status problem is due in part to its value as a bargaining tool for professional engineering organizations.

98. *Association of Consulting Engineers of Canada Annual Report, 2003-2004* (Ottawa: Association of Consulting Engineers of Canada, 2004); *The Voice (OSPE Member Communiqué), May 2000* (Toronto: Ontario Society of Professional Engineers, 2000).