



**THE ENGINEERING INSTITUTE OF CANADA**

*and its member societies*

**L'Institut canadien des ingénieurs**

*et ses sociétés membres*

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## **EIC's Historical Notes and Papers Collection**

(Compilation of Articles, Notes and Papers originally published as  
EIC Articles, Cedar Grove Series, and EIC Working Papers)

### **ENGINEERING HISTORY PAPER #28**

#### **“Some EIC Memorabilia: 1918-1945”**

**by Andrew H. Wilson**

(previously published as EIC Working Paper 16/2003 – Apr 2003)

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EIC HISTORY AND ARCHIVES

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Abstract

The Engineering Institute of Canada's *Engineering Journal*, published between 1918 and 1987, is an excellent source of information on the growth and development of engineering in Canada, and of the profession itself. It can be 'mined' in a number of ways, and already has. This present attempt is based principally on extracts from editorial comments and news items, as well as some biographical entries and articles, taken from the issues that appeared between the end of World War I and the end of World War II, from the change of name that brought the Institute into being to the beginning of the spectacular growth period in its history. The intent is to describe some of the activities and traditions of the Institute and its members in an anecdotal and episodic way without pretending to be definitive or to follow specific issues from beginning to end. Representative illustrations have been added on pages 10-13, 31-34 and 51-54.

The period from 1945 to 1987 will be covered in future Working Papers.

About the Working Paper Series

In June 1995 the Council of the Engineering Institute of Canada agreed that Working Papers on topics related to its history and development, to the history and development of other institutions serving the engineering profession in Canada, and to engineering generally should be published from time to time.

These Papers have limited initial distribution, but a supply is maintained by the EIC History & Archives Committee for distribution on request. They may also be published later, in whole or in part, in other vehicles, but this cannot be done without the expressed permission of the Institute. The available Papers are also listed and summarized in the History & Archives section of the EIC's website ([www.eic-ici.ca](http://www.eic-ici.ca)). The series is presently administered by the Publications Sub-Committee of the main Committee in co-operation with the Executive Director of the Institute.

Opinions expressed in the Working papers are those of the author(s) and are not necessarily shared by the Engineering Institute of Canada or its History & Archives Committee.

*The editor of this present Working Paper was Peter R. Hart*

About the Author

Since 1975, Mr. Wilson has been associated with work on the history of engineering in Canada. However, most of it has been done since his retirement from federal government service in 1986. Professionally, he is a mechanical engineer, but also has academic training in economics and history. He served for many years as chair of the History Committee of the Canadian Society for Mechanical Engineering. He has also chaired Engineering Institute of Canada committees dealing with the history of the Institute itself and Canadian engineering generally and is presently chair of its History & Archives Committee. In both CSME and EIC, he has served as president and in a variety of other positions. He is the author of over 200 published reports, papers and articles on a variety of subjects.



## Introduction

The Engineering Institute of Canada (EIC) was formed in April 1918 when the Parliamentary Charter granted in June 1887 to the Canadian Society of Civil Engineers (CSCE) was amended to permit the Society to change its name. Its objectives remained essentially the same, namely, "to facilitate the acquiring and interchange of professional knowledge among the members and to encourage investigation in connection with all branches and departments connected with the profession." The Institute and its member societies still effectively pursue these same objectives<sup>1</sup>.

From 1918 until the mid-1980s, this pursuit involved the Institute and its branches across the country in the organization of activities such as technical meetings, conferences, social gatherings, study and policy committees, and the publication of a magazine, the *Engineering Journal*, which appeared monthly from May 1918 until 1972, bimonthly until 1977, and periodically from then until 1983. It became a multi-page insert in another magazine, the commercially-published *Engineering Digest*, from 1984 to 1986. A single, centennial commemorative issue appeared in 1987.

Three EIC Working Papers series have presented material previously published in the *Journal*<sup>2</sup>. The purpose of this fourth one is to draw attention to a variety of Institute activities and traditions - and to some of its members - from years past, as chronicled in the *Journal* between 1918 (the end of World War I) and 1945 (the end of World War II). It uses extracts from published material, which possibly refreshes the memories of those old enough to have been members of the Institute during this period. It may also help to provide a better idea of what was going on in the 'old days' for those of younger generations. It has been chronologically structured, is anecdotal and episodic, and makes no pretense whatsoever of being definitive. The extracts and direct quotations used are in their language of origin but, for clarification, some information has been added *in parentheses and italics* to the quoted text. Illustrated material has been added from time to time, and the individual items have been separated by asterisks.

Readers will find few references in this paper to the Institute's presidents, medal and prize winners, senior executives and Annual Meetings, or to the activities of the committees, regions and branches. The technical side of engineering has also been sparsely treated; nor is there much about the 'great issues of the day' - for example, the relations between the Institute and the provincial associations, the two very serious attempts to 'confederate' the engineering profession, and by-law changes. Each of these subjects deserves at least one paper to itself. Little has been said about the present Member Societies of the Institute since they did not exist in 1945.

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<sup>1</sup> A recently published booklet *The Engineering Institute of Canada...a short history/L'Institut canadien des ingénieurs...Un survol historique* by Andrew H Wilson and his collaborator, André Rollin, briefly describes the development of the original Society, the Institute, and the present Member Societies since 1887.

<sup>2</sup> Working Paper 1/1995, *The Engineering Journal, 1918-1987: Some Notable Highlights*; Working Paper 6/1998, *The Engineering Journal as a Source for the History of Engineering*; and Working Paper 7/1998, *Historical Extracts from Papers Published in the Engineering Journal* - all written by Andrew H. Wilson.

One final point: the Canadian Society of Civil Engineers (1887-1918) has been referred to throughout this paper as 'CSCE' and the Engineering Institute of Canada as 'EIC.' Sometimes, in similar papers to this one, this particular CSCE is referred to as the 'old' CSCE to distinguish it from the 'new' CSCE - the Canadian Society for Civil Engineering - a Member Society of the Institute that was formed in 1972.

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### 1918-1919

The steps leading to the name change of the Canadian Society of Civil Engineers were outlined in the very first issue of the *Journal* in May 1918:

"The name, the Engineering Institute of Canada, was officially recommended by the Committee on Society Affairs (*otherwise known as the Haultain Committee*) at the time that this Committee submitted proposed the new By-Laws. That the change in name met the general approval of all was shown by the overwhelmingly large majority in favour, demonstrated by the return of the ballot opened at the Annual Meeting on January 23<sup>rd</sup>. Council appointed a Committee, consisting of the President and Messrs. R. A. Ross and Walter J. Francis, to take the necessary steps to secure the legal adoption by the Society of the name, the Engineering Institute of Canada. A Bill was presented to Parliament for this purpose...

"Sir Herbert Ames kindly sponsored this Bill in the Commons and in a letter received from him under date of April 17<sup>th</sup>, 1918, he advised that the Bill had passed the Private Bills Committee of the House of Commons and went through the Lower House without amendment on April 11<sup>th</sup>.

"In the Senate, Senator Casgrain, who was the only corporate member of the Institute in either the Commons or Senate in Ottawa, when the suggestion was made to him regarding seeing the Bill through the Senate, stated that he was glad to have the opportunity. The Bill passed the Senate on April 25<sup>th</sup>, but before its use was legal it was still necessary to receive the assent of the Governor General. This has just been given."

The last president of CSCE and the first president of the new Institute, Henry H. Vaughan, added a message to this first issue of the *Journal*. He wrote, in part:

"The change in name, with all that it involves, the holding of professional meetings in various provinces and the publication of a journal are the concrete results of the recommendations made by the Committee on Society Affairs which have led to such important alterations being incorporated in our new by-laws. The change in name implies the attempt to unite all engineers in Canada, to whatever branch of the profession they may belong, into one Society. The provincial and branch organization and the general

professional meetings will enable our members, in whatever province they reside, to meet together for the interchange of knowledge and become acquainted with each other and their problems. The *Journal* will afford us all a means of being better informed on the activities of the Society throughout the entire country, for keeping members more closely in touch with each other and with headquarters and for increasing the usefulness of the Society to its membership.”

This same issue of the *Journal* noted that new branches had recently been formed in Montréal, Saint John and Halifax, illustrating the expansion of activities within the Institute, and joining the existing branches in Québec, Ottawa, Toronto, Winnipeg, Regina, Calgary, Edmonton, Vancouver and Victoria.

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In 1918, the Institute took under its wing a new organization called the Canadian Engineering Standards Committee (CESC). The August 1918 *Journal* had this to say about it:

“Quietly and unostentatiously there was recently created in Montréal an organization presently known as the Canadian Engineering Standards Committee under the chairmanship of Sir John Kennedy, the influence of which in the years to come is bound to be felt in Canadian industrial life. In fact, the extent to which the work which this committee has set out to accomplish in standardizing engineering practice in its industrial application becomes effective and is adopted by Canadian manufacturers will largely determine the part Canada is to play in the future as an exporter of manufactured products.

“Engineering standardization is now generally recognized as of paramount importance to economic production...”

At this organizational meeting, Sir John Kennedy (CSCE president in 1892) was appointed chairman, H. H. Vaughan and Captain R. J. Durley (later the secretary of the Institute) were appointed vice-chairmen, and F. S. Keith (then EIC secretary) was appointed secretary. The CESC’s first headquarters were in the EIC Building at 176 Mansfield Street in downtown Montréal.

CESC was incorporated in 1919 as the Canadian Engineering Standards Association (CESA). In 1944, because of the, by then, apparent need to extend its activities beyond the engineering field, the name was changed to the Canadian Standards Association (CSA), the one by which it is known today<sup>3</sup>.

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<sup>3</sup> See Robert F. Legget *Standards in Canada*, Information Canada, Ottawa, 1971

A lengthy editorial on the end of the so-called 'Great War' that appeared in the November 1918 issue of the *Journal* said that the engineering profession had played a large part in accomplishing Germany's defeat. Infinitely superior engineering skill within the Allied armies, navies and air forces in the field and in the factories at home had been a large factor in this. In the future, it said, engineers would also need to play their part in the replacement of the material things that had been lost, as well as in the reconstruction of the areas devastated by the fighting and in the continuing evolution of the social system and its infrastructure. Engineering efforts would also be required to assist Canadians, collectively, and their governments to grow strong and wealthy, and to ease their financial burdens. Every member of the Institute, the editorial concluded, should be ready and able to participate in this work.

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The March 1919 issue of the *Journal* contained a report from the Honour Roll Committee for World War I. It included the information that around 1000, or 36 percent of the total membership eligible for service, had been on active service - as commissioned or non-commissioned officers, many serving with the Royal Canadian Engineers and the Canadian Railway Troops. Of these, nine had achieved the rank of Brigadier-General and nine were Colonels. There were 35 Lieutenant-Colonels, 114 Majors, 110 Captains, 329 Lieutenants, and 377 served as non-commissioned officers. Some 75 of the 1000 were killed or died of wounds. In regard to decorations, 29 received the Distinguished Service Order, and 55 the Military Cross. Captain C. N. Mitchell of Winnipeg received the Victoria Cross.

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One of the principal engineering contributions to World War I was the development of the aircraft that took part in aerial combat. Just after the end of the war a paper on this development was published in the March 1919 issue of the *Journal*. Its author, M. R. Riddell of the Canadian Aeroplane Company, commented on the special uses to which aeroplanes could be put in Canada in the future - uses which, today, we take very much for granted. He wrote:

"One field in which it would appear that useful service could be rendered is that of fire patrol of forests. Destructive bush fires are very small at the beginning, and if immediately detected could be easily dealt with. A fire ranger from an elevation of say 5,000 feet could command a view of a wide stretch of territory and could detect the first signs of a fire.

"For this service in Canada it is probable that the small flying boat or at any rate a hydro aeroplane (aeroplane fitted with pontoons instead of wheels) would be found best...

"A question which might reasonably arise in connection with the use of aeroplanes in all seasons in Canada is the question of rising from or alighting on a surface covered with snow, especially if the snow be soft, and of considerable depth. It is obvious in the case

of a machine equipped with the ordinary landing gear with wheels, a depth of soft snow might so impede its progress on the ground that it could never reach a flying speed, particularly in the case of a heavy machine. At the time when the Royal Air Force established training squadrons in Canada it was considered so difficult if not impossible to continue flying under the ordinary conditions of a Canadian winter, that for the winter of 1917-1918 the bulk of the training camps were transferred to the South, only a small number remaining, more as an experiment than anything else...

"Then it was suggested that snow shoes or 'skis' might be fitted instead of wheels. This was tried on several machines, and proved so satisfactory that a considerable number of machines were at once equipped with these 'skis' and during the latter part of the winter of 1917-1918 much flying was done with them. It was even reported that a machine equipped in this manner took off and landed on a snow surface more easily than a wheel equipped machine on ordinary ground...

"From the experience of the RAF therefore, it would appear that as far as snow conditions are concerned aeroplane service could be maintained throughout the winter."

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Among the pressing concerns of the new Institute was the development of a method for the registration and regulation of professional engineers and for increasing their status in the public eye. This was not a new issue, having been discussed extensively prior to the founding of the CSCE, in 1885 and 1886. But since the Institute, as a national body, could not take charge of a matter under provincial jurisdiction, the solution that appeared most feasible was linked to the development of a 'model' licencing law, the use of which would assist in the writing of appropriate legislation in the individual provinces. Two of the leading participants in the 'status' debates of 1918 and 1919 were F. H. Peters of Calgary and C. E. W. Dodwell of Halifax. The main initiatives behind the Model Act came from the branches of the Institute in Western Canada.

Peters presented a paper at the Second Professional Meeting of the Institute held at the University of Saskatchewan in August 1918, which was reported in the September issue of the *Journal*. His remarks were centred on the discussions that had already taken place in Alberta. But at the beginning of his paper, he said that - if the idea of legislation was a good one - it was the biggest thing that engineers could possibly have to think about and work at until it was either put into effect or abandoned. The main aims of his paper were to trace the progress of the idea of legislation in his home city of Calgary and to add some ideas that had originated elsewhere.

While opinions were still divided in 1918 regarding the need for such legislation, the arguments favouring it included the following facts: anyone could call himself an engineer and advertise his willingness to practice it; the public had no protection from the ineffective expenditure of public money on engineering works; and yardsticks for the proper status and compensation of engineers were lacking. However, on the other side of the coin, members of the mining profession objected to



legislation covering all branches of engineering. Also, the legislation enacted in two provinces a decade or more earlier had not 'worked.' Comparisons with the medical and legal professions were made, emphasising that the public should have the same kinds of concerns about the qualifications and competence of engineers as they apparently had in regard to the other two professions.

The Saskatchewan Branch of the Institute developed its own version of such legislation and wished, as a matter of priority, to have it tabled in its Legislature. It was published in the *Journal* in September 1918. However, when the matter was put to the EIC Council at its special meeting in October, the decision was made that such an Act should have the approval of members from coast to coast since its application was intended to be Dominion-wide. Accordingly, at the Annual Meeting of the Institute in February 1919, a resolution was passed establishing a special committee whose members represented all of the branches of the Institute to devise a suitable draft Model Act. C. E. W. Dodwell of Halifax was elected chairman. F. H. Peters was a member. This committee met in Montréal on 5 April and sat for three sessions daily over five days. In reporting this, the *Engineering Journal* quoted from the Committee's report:

"The Council will observe that the outstanding feature of the draft is the creation and incorporation in each Province of the Dominion, of an entirely new body, to be called 'The Association of Professional Engineers of the Province of...'

"After prolonged and earnest debate this provision appeared to the Committee to be not only imperative and unavoidable, but to offer the only practicable solution of the problem before us..."

The draft Model Act was sent to the corporate membership for balloting in mid-June 1919. The September issue of the *Journal* reported that, of the 616 ballots cast, 77 percent had voted in favour. An editorial comment in the October issue said that the proposed legislation recognized no existing engineering body and, therefore, all bodies of professional engineers, or bodies composed in part only of professional engineers (*a reference to the Canadian Institute of Mining*) were on an equal footing. Also, engineers in the various provinces would no doubt - in making their plans to secure enactment - invite the cooperation of all qualified engineers, whether members of recognized institutions or not.

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## 1920-1929

Collecting and publishing biographical material on the careers and achievements of Canadian engineers were regular activities of the editorial staff of the *Journal* throughout its lifetime. Their importance for the magazine and for the Institute were officially recognized as early as the March 1920 issue, in which Peter Gillespie wrote:

"Is it not possible for the Engineering Institute of Canada, now that its future and

prosperity are quite well assured, to do something to encourage the preparation and publication of memoirs of those engineers who have been prominently identified with Canada's major engineering undertakings? In Canadian biographical history so far as the writer has observed, the work of engineers whose vision and industry have had something to do with Canada's present day status, is for the most part only indirectly recorded."

Gillespie cited three reasons in support of this possibility: such biographies would be a distinct contribution to Canadian history; a biographical series of well-written memoirs would be a real inspiration for young Canadians; and the Institute, by making the material available in narrative form, would be supporting its declared policy of "enhancing the usefulness of the profession to the public." He went on to say that the work involved should preferably be undertaken by engineers, since he believed there to be members of the profession in Canada who possessed enough of a historian's patience and a biographer's interest to do it successfully.

In 1925, the EJC Council established a Committee on Biographies. The founding chairman was Peter Gillespie. For a variety of reasons, including Gillespie's ill-health, the output of this Committee over the next eight years was relatively sparse, after which it ceased to operate.

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For most of its life, the *Journal* published a page of consultants' professional cards in its issues. The names on those cards included in the September 1920 issue will be quite unfamiliar in 2003. They were:

Ewing, Lovelace and Tremblay; civil engineers and land surveyors, Montréal

The Research Bureau (Hanbury A. Budden); patents, trade marks etc., Montréal

J. M. Robertson Ltd.; mechanical and electrical engineers, Montréal

Montréal Blue Print Company; photo reproductions etc., Montréal

Dominion Engineering & Inspection Company; testing engineers and chemists, Montréal, Toronto and Winnipeg

Fetherstonhaugh & Company; patent solicitors, Toronto, Ottawa and other cities

A. B. See Electric Elevator Company of Canada Ltd.; Montréal and Toronto

Chipman & Power; municipal engineers, Toronto and Winnipeg

Bremner, Norris & Company Ltd.; construction engineers and contractors,  
Montréal

Parsons Engineering Company; municipal engineers, Regina

Smart & Burnett; consulting engineers, Montréal

F. A. Coombe; combustion and steam engineer, Montréal

Process Engineers Ltd.; chemical engineers, Montréal and New York

Gerald M. Ponton; mining and metallurgical engineer, Montréal

Walter J. Francis & Company; civil, mechanical and electrical engineers,  
Montréal

R. S. & W. S. Lea; municipal engineers, Montréal

deGaspé Beaubien; consulting engineer, Montréal

McDougall & Pease; electrical engineers, Montréal

The E. A. James Company Ltd.; municipal, structural and architectural  
engineers, Toronto

John S. Metcalf Company Ltd.; design and construction of grain elevators,  
wharves and power plants, Montréal, Chicago and Melbourne

Arthur Surveyer & Company; consulting engineers, Montréal

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The Report of the Council for the year 1921 (which appeared in the February 1922 issue of the *Journal*) included a section on the membership roll of the Institute. This report noted, for example, that during the year one honorary member, 71 members, 330 associate members, 115 junior members, 347 students and 10 associates had been elected. Meanwhile, the names of 16 members, 50 associate members, 71 juniors, 106 students and 10 associates had been removed from the roll through resignation or non-payment of dues, while a further 32 had died. At year end, the breakdown of the membership by class was:

|                   |        |
|-------------------|--------|
| Honorary members  | - 10   |
| Members           | - 1018 |
| Associate members | - 2285 |

|            |                   |
|------------|-------------------|
| Juniors    | - 438             |
| Students   | - 899             |
| Associates | - <u>38</u>       |
|            | 4688 <sup>4</sup> |

In addition, the acceptances of 191 electees were pending, and would bring the total to 4879.

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For most of its publication life, the *Journal* issues included a section called 'Personals' - some of which were quite short, others more elaborate. Over the years, it was possible to follow the careers of particular members through their entries in this section. For example, among the 'shorts' in the March 1922 issue were personals for two Canadian soldier-engineers who many years later distinguished themselves internationally. The entry for E. L. M Burns, a junior member of EIC at the time, said that he had recently returned to Canada from the School of Military Engineering at Chatham, England, and was now stationed at the RA Park, Halifax, Nova Scotia. The entry for Brigadier General A. G. L. McNaughton, then an associate member of the Institute, noted that he had also returned to Canada from abroad and had resumed his duties as director of military training at Militia Headquarters in Ottawa, having spent the previous year attending the Army Staff College in England.

In this same issue, there was a longer entry for A. Emile Doucet, a member, who had just resigned as head of the Montréal Water Board. He was one of quite a few contemporaries who combined their professional interests in engineering with military service. He also practised his profession in locations across the country and in a variety of civil engineering disciplines. He was a founding member of CSCE, served on its Council and chaired the Québec branch. Doucet was born in 1860 in Montréal and graduated from the Royal Military College, Kingston. Following experience as a rodman on the construction of the Algoma Branch of the Canadian Pacific Railway, he was appointed in 1883 to be resident engineer on the Lake Superior Jackfish Bay line. In 1886, he was appointed assistant engineer on the construction of the Lachine Bridge and, a year later, as division engineer of the CPR at St. Jean, Québec. Then, for three years from 1887, Doucet was chief engineer of construction for the contractors building the Algoma & Sault Ste. Marie Railway, the Cape Breton Railway and the Newfoundland Railway. For 17 years from 1898, he was chief engineer for the Arrowhead & Kootenay Railway in British Columbia and held senior appointments in two railway companies in Québec. He entered private practice in Montréal in 1915 but, in 1918, accepted appointment as head of the Montréal city engineering department, and was later appointed to head the Montréal Water Board.

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<sup>4</sup> Members and associate members were the 'corporate' members of the Institute and entitled to vote. The associate member grade was abolished in 1940. The first elections to the grade of 'fellow' did not take place until 1963.



H. H. VAUGHAN, M.E.I.C.  
PRESIDENT, ENGINEERING INSTITUTE OF CANADA,  
1918

TO THE MEMORY  
OF THE MEMBERS OF  
THE ENGINEERING INSTITUTE  
OF CANADA  
WHO GAVE THEIR LIVES  
IN THE GREAT WAR  
1914 - 1918

MAJ. A. WAGNEW  
LT. J. D. ALLAN  
LT. G. J. ANDERSON, M.C.  
LT. J. D. ARMSTRONG  
CAPT. H. C. BASTIN  
LT. C. H. BAYNE  
LT. D. P. BELL, IRVING  
SGT. MAJ. S. E. BIRCHALL  
CAPT. G. V. BIRNIE, M.C.  
CAPT. D. D. BORTH, D.S.O., M.C.  
LT. W. G. BROWN  
LT. B. H. A. BURNOWS  
CAPT. D. L. CAMERON  
CAPT. A. CAMPBELL  
LT. J. C. CAMPBELL  
LT. J. C. CAMPBELL  
LT. R. H. M. CHRISTIE  
LT. R. D. COWAN  
LT. COL. J. A. CROFTON (M.C.)  
LT. G. M. DANN  
CAPT. G. H. DAVIS  
LT. G. W. DAVIS  
LT. J. H. DAWSON, M.C.  
LT. J. H. DAWSON  
LT. C. S. DODD, M.C.  
MAJ. A. A. DOLAN  
LT. H. G. DOLAN  
LT. L. DUNN  
LT. U. S. DUNN  
CAPT. R. L. DUGGAN  
LT. J. J. J. ELLIS  
LT. A. E. EVANS  
CAPT. R. H. EWART, M.C.  
CAPT. J. H. FAIR  
SPR. L. L. FERGUSON  
LT. W. L. FRANK  
LT. F. F. FRANK  
SPR. J. S. GILWAY  
LT. J. H. G. GLAVY  
LT. F. W. GLOVER  
CAPT. H. L. GORDON  
LT. COL. H. S. GILLWOOD  
LT. H. J. A. HAFNER  
CAPT. H. R. HAMILTON  
LT. J. H. HANNING  
CAPT. J. C. HELLWELL  
LT. R. A. HENDERSON  
LT. H. C. HICK  
LT. COL. T. C. IRVING, D.S.O.  
SPR. R. JACOBSON  
MAJ. G. A. E. JANIN  
MAJ. J. J. KENT  
CAPT. A. C. KNIGHT, D.S.O., M.C.  
LT. A. J. LAPOINTE  
LT. F. N. LAWLOR  
SPR. E. J. LEWIS  
MAJ. E. T. LUCAS

LT. C. A. MACABLAY  
LT. D. D. MACLEAN  
FLY. LT. G. G. MACLENNAN (M)  
CAPT. J. F. MACLENNAN  
LT. H. S. MANLEY, M.C.  
LT. O. J. MARCHANK  
MAJ. J. MASON, D.S.O., M.C.  
LT. A. W. MCKINNEY  
LT. C. B. MCLAN  
CAPT. M. N. MCPHEE, M.C.  
MAJ. A. D. C. MEADY, M.C.  
LT. J. D. MIDDLETON  
MAJ. J. A. MITCHELL  
LT. J. H. MONTGOMERY-CASE  
LT. D. M. MORRIS  
SPR. J. MORRIS  
CAPT. T. L. MORRISON  
LT. J. H. L. C. MULLON  
LT. MAJ. A. MURRAY  
LT. C. S. NILES  
LT. R. H. O'REILLY  
LT. G. H. D. OTTY  
LT. J. J. PAGE  
MAJ. C. E. PARK  
LT. H. N. PIERCE  
MAJ. V. E. PERRY, M.C.  
MAJ. T. F. POWELL, D.S.O.  
GNS. A. L. POWELL  
LT. F. PROBST (M)  
SPR. F. S. RAILLY  
LT. P. H. RANLY  
LT. F. S. RANKIN  
SPR. G. T. REVELL  
LT. F. A. RICHARDSON  
FLY. SUB. LT. S. S. RICHARDSON  
LT. T. C. ROBINSON  
LT. J. H. ROSE  
LT. F. D. ROSS  
LT. D. W. ROSS  
MAJ. A. V. ROY  
LT. R. T. SAILMAN  
LT. SUB. LT. C. M. SCOTT  
CAPT. W. B. SCOTT  
MAJ. T. D. SNEATH, M.C.  
LT. J. H. STEWART  
LT. R. A. STUBBS  
CAPT. F. B. TINGLEY, M.C.  
CAPT. H. L. TUCKER  
CAPT. J. A. TUZO  
LT. W. P. UHWIN  
MAJ. O. E. VANSITTAR  
MAJ. S. H. WALDRON  
FLY. SUB. LT. D. H. WALLACE  
LT. S. F. WEEKS  
LT. J. L. WHITSIDE  
LT. J. J. WILSON  
LT. C. E. WILSON  
CAPT. W. J. WILSON  
MAJ. R. H. WINSLOW  
LT. F. A. WRIGHT

(1) FOREIGN ORDERS

(1) FOREIGN ORDERS

NOT VAIN YOUR SACRIFICE - NOR LOST YOUR WORK

World War I Memorial Tablet at EIC Headquarters, Montréal



Members attending the EIC's Third Professional Meeting  
Halifax, September 1918



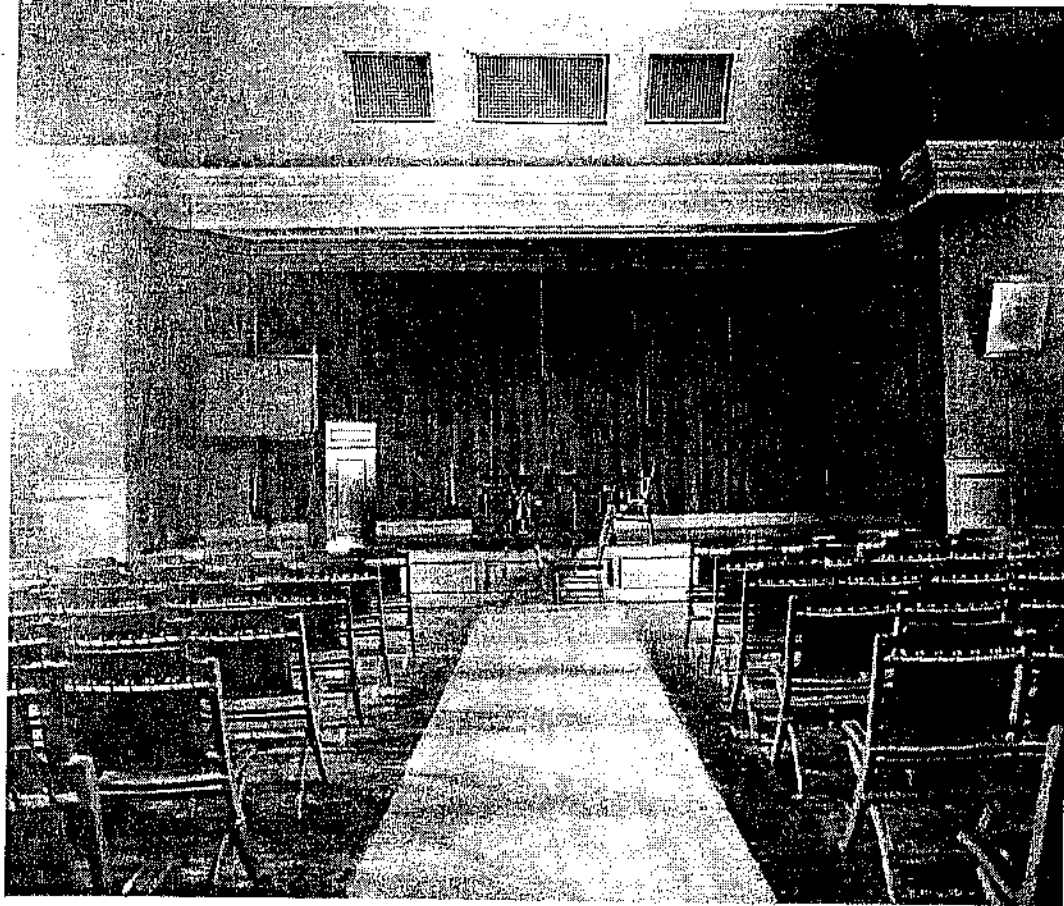
Fraser S. Keith  
Editor, *Engineering Journal*  
1918-1925



Arthur Surveyer  
President, EIC  
1924-25



Richard J. Durley  
Editor, *Engineering Journal*  
1925-1938



EIC Headquarters

2050 Mansfield Street

Montréal

in the 1930s

The Lecture Theatre

The Reading Room





The first seven presidents of CSCE were civil engineers, several of whom spent their careers in railways. The eighth president (1896), Herbert L. Wallis, was the first mechanical engineer to lead the Society although he, too, spent his career in railways. The July 1922 issue of the *Journal* printed an obituary - a duty the magazine carried out for most past presidents up until the 1960s - from which the following has been taken:

"The death of Herbert L. Wallis, MEIC, at his home in Montréal on May 24<sup>th</sup> last, has taken from the Institute one of its earliest and most eminent members, and from the engineering profession one of the outstanding figures in the early history of the engineering development of our Canadian railways. Mr. Wallis was intimately known to all the older members of the Institute and to a great many of the younger members. He was one of the signatories of the Charter of the Canadian Society of Civil Engineers, and as such, his name is known to the entire membership as one of the founders of the Institute, one of the few men who, in the early eighties, looking into the future, laid so lasting a foundation upon which to build a society to serve the profession.

"The late Mr. Wallis was born in Derby, England, in 1844 and was educated at the Moravian School, Ockbrook, near Sowerby Bridge. Upon the completion of his schooling, he was apprenticed to the late Matthew Kirtley, locomotive superintendent of the Midland Railway, under whose mentorship he remained for five years. In 1866 he was appointed foreman in charge of the locomotive department of the Midland Railway at Bradford, the district connected with the same being also under his control. He remained in the employ of the Midland Railway Company until May 4<sup>th</sup>, 1871, when he sailed for Canada to assume the position of assistant mechanical superintendent of the Grand Trunk Railway with headquarters in Montréal. About two years after, he was appointed chief mechanical superintendent, which position he held until he retired in 1896.

"To enumerate the many improvements brought about under Mr. Wallis' supervision, during his quarter of a century service with the Grand Trunk Railway Company, would not be possible in the present instance, but mention must be made of the fact that the first compound locomotive upon the Grand Trunk Railway was built by Mr. Wallis and that he was instrumental in improving the shops of the company to such an extent that they were able to construct practically all the new locomotives for service during the last twenty years of his tenure of office.

"In the commercial life of Canada, as well as in the engineering profession, Mr. Wallis was held in very high esteem. Among his many official positions were those of vice-president of the Ottawa River Navigation Company, and president of the Carillon and Grenville Railway Company. Mr. Wallis was a member of the Institutions of Mechanical and Civil Engineers of Great Britain."

Another of the Haultain Committee's recommendations to CSCE in 1917 was that a full-time secretary should be appointed to administer the Society's increasing level of activity. The secretary then was Professor C. H. McLeod, who divided his time between the Society and McGill University. The first appointee to the new position was Fraser Sanderson Keith, a native of Smiths Falls, Ontario, where he was born in 1878. He graduated in electrical engineering from McGill in 1903 and, unusually, entered the technical publications field, working as an editor and managing editor of several publications. Immediately after his appointment to CSCE in February 1917, he took charge of the administration of the changes brought about by the Haultain Report and the up-coming parliamentary legislation and, the following year, became the editor and manager of the new magazine, the *Engineering Journal*. He served the Institute during the years following World War I and laid the administrative basis for its growth at headquarters and in the branches during the 1920s. Keith resigned in February 1925 but, before leaving, wrote the Christmas editorial in the December 1924 issue of the *Journal*. It was remarkably upbeat:

"During the year nineteen twenty-four, there has been a notable advancement in the direction of securing greater recognition and appreciation, by the public at large, of the work of the engineering profession. Evidence of this is not lacking: the Institute, through its members, has been called upon to give counsel on many matters of national import; in the daily press constantly appears news of the achievements of our members, reports of their pronouncements on public matters, and detailed quotations from their technical discussions; in the technical press the activities of the Institute find conspicuous space; to the important gatherings of sister societies in the Republic to the south as well as abroad, representatives of our institute receive cordial invitations; and in the industries of our country recognition of the engineer's true value finds expression in the rapid adoption of policies whereby the technically trained man is being drafted into industry to fill positions of responsibility.

"The achievement of this recognition is in no small measure due to the whole-hearted co-operation of our members, and it is only through the continuation of our united efforts that the fullest appreciation of our services may be obtained.

"In thanking each and every member for his splendid support, it is the sincere wish of your Secretary that the Christmas season may be filled with gladness for all and that the coming year may be one of great prosperity."

Richard John Durley replaced Fraser Keith as secretary of the Institute in May 1925. The *Journal* noted just prior to his appointment that Durley was born in England and received a well-rounded technical training in mechanical engineering there before coming to Canada and McGill University in 1901 as a professor. From 1911 to 1915 he was in practice as a consulting engineer in Montréal. During World War I, he served in the Canadian inspection department of the Imperial Ministry of Munitions. In 1918 he was appointed a Member of the Order of the British Empire (MBE) in recognition of his valuable wartime service. As noted above, he was appointed a founding vice-chairman of CESC and, in 1919, took over from Keith as secretary of that organization and served

it until his appointment to the Institute.

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Many of the decorations earned during World War I were won by Institute members serving with the Canadian Railway Troops. A 'landmark' article on the organization and work of these Troops, written by Lt.-Col. A.C Garner, was published in the June 1925 issue of the *Journal*.

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One of the customs established in the days of CSCE was the delivery of a retiring president's address at the Annual Meeting of the Society. At first, presidents tried to present summaries of where the art and science of engineering as a whole then stood but, as engineering in Canada expanded into new fields, this became an impossible task. So their subjects followed two other directions. One was a description of the field of engineering in which their professional interests lay, and the other was a discussion of the current affairs of the Society. When EJC was formed, these two directions were still being followed, and the practice of having formal addresses by retiring presidents continued until it petered out in the years following World War II. Thereafter, shorter reports - or 'accountings' of their stewardship - were delivered by them at the Annual General Meetings.

The retiring address by President Arthur Surveyer was delivered on 26 January 1926 and published in the *Journal* in March. He spoke principally about the current economic situation in construction in the United States and Canada and, generally, about the education of the (then wholly male) profession of engineering. His views on the latter would have been considered familiar by many engineers in Canada up until the 1970s. These following paragraphs were included in this address:

"Judging by the fact that our railroad expansion is about completed, that our population has practically stopped increasing, and that necessity will compel us to curtail our public works, it would seem that it will be some years before our construction activities will again reach our actual pre-war figures.

"Luckily, the education received by engineers does not, in any way, limit their usefulness to the design or construction of engineering works. Engineers have recently discovered that they are also competent to operate mines and manufactures, to manage cities and public utilities, and, in other words, to fill numerous positions which have hitherto been filled by business men.

"Two years ago the National Industrial Conference Board of the United States reported the astonishing finding that there were 750,000 major technical and supervisory positions in the manufacturing and mechanical industries in the United states, and that in 1930 American industry might need 400,000 more, and this without taking into account the necessary replacements.

"These figures, of course, cannot be applied bodily to Canadian conditions, but there is no doubt that even in this country there is a rapidly growing need for administrative and technical ability in practically all lines of human activity, especially in the manufacturing industries and in the field of public utilities. It has been observed that engineering courses have, in the past, succeeded in developing, in a certain measure, these two talents in the best graduates. The training of the engineer, besides, gives him the ability to analyse causes and effects, as well as the faculty of working out in his own mind original solutions of the business or technical problems which he has to solve. Engineers could also be employed more frequently, not only by investment bankers, but even by the banks themselves on questions of industrial loans.

"In France, where the field of the banks is broader than in Canada, each important bank has its own technical staff, and for an engineer to be in charge of such a department is considered to be the crowning of his career.

"I remember seeing, some years ago, a report analysing the occupations of the engineering graduates of Rensselaer, Pennsylvania, Harvard, Lehigh and Stevens Institute. This report showed that 15 years after leaving college, from 35 to 60 per cent of the engineers had risen from purely engineering positions to executive work, and that 25 years after graduation, these percentages had increased to 45 and 72 per cent. It is needless to tell you that the larger salaries are certainly drawn by the engineers who have become administrators, and we are being forced to the somewhat paradoxical conclusion that the crowning of an engineer's career is out of the pure engineering into the executive field.

"And why should it not be so? These functions are all implied in our name 'engineer' which, according to some British authorities, does not come from the word 'engine' but from the Latin verb "ingenere" and from the corresponding French word 's'ingénieur'. The import of this word has nothing whatever to do with engines or machines, but is purely psychological and is defined by Littré as follows: "s'ingénieur: chercher dans son génie, dans son esprit, quelque moyen pour réussir"; in other words, an engineer is one who sets his mental power in action in order to discover or devise some means of succeeding in a difficult task he may have to perform.

"The engineer who wishes, however, to graduate from the designing and supervising field into an executive position must be well informed on all financial matters, and he must remember at all times that all engineering problems are dominated by the financial aspect of the question, and that to forget this truth is to condemn himself to remain for ever what an ex-president of this Institute, Mr. R. A. Ross, once called a "glorified slide rule" and with no great chance of advancement. This fact is beginning to be realized by the men in charge of engineering education, and that is why you will note in the various curricula a larger portion of the time being devoted to the teaching of financial subjects, such as economics, accounting, business administration, etc.

“Ten or twelve of the leading American engineering schools have gone so far as to create courses in business administration and engineering. It is now a recognized truth that all engineering activities are dominated by economical and financial requirements. It is therefore advisable for all engineers who, during their stay at college, did not have the benefit of modern engineering teaching, to devote as much time as possible to the study of financial questions. There is such a thing as obsolescence of knowledge, and the engineer who does not improve continually is very rapidly left behind by his colleagues.”

Here, perhaps, is an early articulation of the need for the ‘lifelong education’ of engineers - the principal clarion call of the EIC almost 80 years later, in the year 2003.

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The principal publications of CSCE were called *Transactions*. The birth of the *Journal* in 1918 provided a vehicle for the publication of papers of more general interest. The idea was that the Institute would have its own *Transactions*, to be published separately and irregularly, to include papers with more theoretical content for a narrower readership, as well as some that had already appeared in the *Journal*. This practice of separation was followed from the early 1920s until the 1960s when, for several more years, the EIC *Transactions* were published as a section of the *Journal*.

In the October 1926 issue of the *Journal*, a notice appeared indicating that the publication of a volume of *Transactions* was being considered and calling for members of the Institute to subscribe separately for copies.

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When it came into existence in 1918, the Engineering Institute of Canada’s headquarters building was located at 176 Mansfield Street in Montréal. However, as reported in the July 1927 issue of the *Journal*, this number became 2050 when a general renumbering of buildings downtown was put into effect. This well-known number remained the headquarters address until the move to Ottawa in 1991.

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At least once a year, and for many years, the *Journal* published a listing of the Institute’s committees and their membership. The list that appeared in the issue for September 1927 included the following:

|                         |   |
|-------------------------|---|
| Finance                 | Board of Examiners and Education  |
| Library and House       | Canadian National Committee for<br>the International Electrotechnical<br>Commission |
| Legislation and By-laws |   |
| Papers                  | International Co-operation  |

|                                    |   |
|------------------------------------|---|
| Publications                       | Canadian Engineering Standards            |
| Gzowski Medal and Students' Prizes | Honour Roll and War Trophies              |
| Leonard Medal                      | Concrete Deterioration in<br>Alkali Soils |
| Plummer Medal                      | Biographies                               |
| Engineering Education              | Past Presidents' Fund                     |

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Begun in 1890 under CSCE and continued under EIC, the headquarters in Montréal maintained a library of books, magazines and reports that could be used for research by members. Library and reading room services were provided for many years. Regular acquisition lists appeared in the *Journal*. Also appearing were announcements and advice in regard to use of the collection by the members, such as the following, from the August 1927 issue:

"Briefly, the library contains about fifteen hundred volumes of text books and files of many of the leading technical periodicals, transactions of other societies and governmental reports. At the present time, the Library and House Committee of the Institute has under consideration a set of regulations governing the operation of the library. As soon as these regulations are approved by Council they will be made available for the information of members.

"In the meantime, it may be pointed out that the library service is prepared to advise any member as to what text books are available in the library on any particular subject, and if any particular text book is not available, information as to where it may be secured will be supplied. The technical periodicals, transactions of other societies and government reports may be consulted at headquarters, and for those members residing outside of Montréal who desire to secure copies of any particular article, these will be secured in photostat form at actual cost.

"The Institute's library has been of service to a great many members, and it is hoped that when the regulations are published that even greater use will be made of the library in order that it may more effectively serve the interests of members."

The regulations appeared in the October 1927 issue. Of them, perhaps two are of particular interest.

The first one said, "The library will be open from 9 am to 5 pm daily, except Saturdays, Sundays and legal holidays. On Saturdays it will be open from 9 am to 12 noon. The reading rooms will be open from 9 am to 9 pm daily except Sundays and legal holidays. When an evening meeting is being held

in the Headquarters building, the reading rooms will remain open until the close of the meeting. On Saturdays during the months of June, July and August they will be closed at 6 pm."

The second one said, "Members have the privilege of borrowing books for a period not exceeding two weeks from the date the book is received, on deposit of \$5.00, upon personal application or by written order. Upon application, at the expiration of the original two weeks' period, books may be renewed for a further two weeks at the discretion of the librarian. Express charges on books sent to members are to be charged to the borrower and are to be deducted from the deposit before it is refunded."

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Over the years the Institute has seldom participated directly in the commemoration of an engineering achievement by means of the erection of a plaque or other form of memorial. This has been largely left to the government heritage/designation agencies and, in recent years, to EIC's Civil and Mechanical Engineering Societies. An exception was the unveiling of a cairn at Spuzzum on the Fraser River in British Columbia during the summer of 1928. The *Journal* recorded in its September issue that this had been done on Dominion Day and that it carried a bronze plaque recognizing the accomplishments of the (*British*) Royal Engineers who built the Cariboo Road between 1859 and 1862. The Institute had joined with the Association of Professional Engineers of British Columbia in the erection of this cairn, which is still visible from the new highway.

An article, 'The Cariboo Road: Its Origin, History and Reconstruction,' by Patrick Philip, was published in the July 1928 issue. Judge F.W. Howay, who had unveiled the plaque at the Spuzzum ceremony in 1928, published an article on 'The Royal Engineers in British Columbia: 1858-1862' in the January 1937 issue.

Shortly before his death in April 1928, EIC erected a tablet in the CPR Terminal in Vancouver in recognition of the work of Henry J. Cambie on the construction of the railway across British Columbia and, in particular, through the Fraser Valley canyons. During his life, Cambie had worked with Walter Shanly, Casimir Gzowski and Sandford Fleming. He joined CSCE in 1888. An obituary was published in the June 1928 issue of the *Journal*. This plaque can be seen in the remodelled terminal building, now the 'Sea Bus' terminal in Vancouver. One of the main streets in downtown Vancouver was also named after him.

In July 1929, the Peterborough Branch of the Institute undertook the erection of a commemorative plaque - which can still be seen - honouring Richard Birdsall Rogers, the superintending engineer of the Trent-Severn Waterway during the construction (1902-1904) of the Lift Lock in that city. Rogers, a charter member of the Branch, was born in Peterborough in 1857 and died in 1927.

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**1930-1939**

The 25<sup>th</sup> branch of the Institute - the St. Maurice Valley Branch, headquartered at Trois Rivières - was formed in 1926. By the decade's end, this number had not grown. The January 1930 issue of the *Journal* listed the branches as follows:

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Halifax                             | Niagara Peninsula (Niagara Falls) |
| Cape Breton (Sydney)                | London                            |
| Moncton                             | Border Cities (Windsor)           |
| Saint John                          | Sault Ste. Marie                  |
|                                     | Lakehead (Port Arthur)            |
| Saguenay (Chicoutimi)               |                                   |
| Québec                              | Winnipeg                          |
| St. Maurice Valley (Trois Rivières) | Saskatchewan (Regina)             |
| Montréal                            | Lethbridge                        |
|                                     | Edmonton                          |
| Ottawa                              | Calgary                           |
| Kingston                            | Vancouver                         |
| Peterborough                        | Victoria                          |
| Toronto                             |                                   |
| Hamilton                            |                                   |

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Two reasons for the development of semi-autonomous, discipline-oriented societies within the Institute in the 1970s were the proliferation of specialized branches and sub-branches of engineering and the recruiting efforts of foreign engineering societies in Canada. But this problem of specialization was not a new one for EIC. It had been recognized at least 40 years before. The *Journal* issue for July 1930 carried an editorial on this theme:

"It is commonplace to say that the increasing complexity of modern life leads to greater specialization in the industries and professions. This in turn gives rise to many problems connected with professional education, training, and practice, for in many cases it is no longer possible for a professional man to cover the whole field of even the one division which he has chosen. For example, though all lawyers and medical men must have had the prescribed general professional training, a great number are dealing in their daily work with only some one sub-division of law or medicine.

"Engineering is affected in a similar manner, and an important problem to be solved in carrying on the work of a Dominion-wide organization like the Engineering Institute of Canada, is how best to aid those of our members who have specialized in this way. They naturally desire the latest and most authoritative data in their particular branches of work,



and wish to be in touch more particularly with their fellow-specialists for discussion of problems in which they are mutually interested.

“In the case of radio and aeronautical engineering, which hardly existed when the Institute took its present shape, the need is perhaps greatest. The Council has been considering this question for some time... Discussions are now pending, which, if brought to a successful conclusion, will mark a new feature of the Institute’s work and its relations with other national engineering societies. The object desired is the further development of professional sections of our branches and their co-operation with Canadian, British or American technical organizations dealing with specialized branches of engineering.”

The appearance of this editorial was actually preceded by the announcement in the May 1930 issue of the *Journal* that, on Tuesday, 8 April the inaugural meeting of the Aeronautical Section of the Montréal Branch had been held. Also, the issue of the *Journal* for June 1931 carried the announcement that aeronautical sections had been formed in connection with the EIC’s Montréal and Ottawa Branches, and that these would probably be followed by others. Their formation was in accordance with the agreement made with the (*British*) Royal Aeronautical Society and they would be recognized as local Canadian sections of that Society, with consequent benefits to the members.

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One of the most impressive addresses by a retiring president was delivered in February 1931 by Alexander J. Grant, who spoke on ‘Great Ship Canals of the World.’ His subject - in which he had a great deal of knowledge - was chosen to coincide with the opening of the (*fourth*) Welland Ship Canal the following year - an outstanding Canadian engineering achievement.

Scottish born, in 1863, Grant was educated at the University of Ottawa and St. Mary’s College in Montréal. Beginning his engineering career in the 1880s, he worked first in railway construction and later on the Soulages Canal and Trent-Severn Waterway as an employee of the federal government’s Department of Railways and Canals. In 1919 he was transferred to the Welland to take charge of the building of the reconstructed Ship Canal. He joined CSCE in 1891, and was elected to full membership ten years later.

Grant’s paper was published in the March 1931 issue of the *Journal*. He included brief histories of the Panama Canal, the Manchester Ship Canal, the North Sea Canal from Amsterdam to the North Sea, the Kaiser Wilhelm (Kiel) Canal across the Jutland Peninsula, and the Suez Canal, in addition to the Welland. He concluded with these paragraphs:

“The great rise of the (*Welland*) canal and the high lift of its locks is the outstanding feature of the canal. The high lift is a departure from previous canal practice, and has no equal today on any other canal in the world.

“One of the most important problems connected with the construction of the Welland was the maintaining of uninterrupted navigation in the third canal while the fourth was being built. The two canals crossed each other seven times and at two places...and the risks during construction of the fourth canal to the existing canal were very great, but throughout the entire period no delays and very little inconvenience to navigation occurred...

“The Welland is, and always will remain, one of the large canals of the world. The quantities of rock and earth excavation are not as large as those of the Panama and several of the other large canals, nor is its cost if compared on a pre-war basis nearly as large as that of the Panama and Suez, but compares favourably with that of the Manchester, North Sea and Kiel Canals. The Welland however stands pre-eminently above them all in its total rise and the lift of its locks.”

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Canadian engineers are familiar with the names of the half-brothers, Samuel and Thomas Coltrin Keefer. What they may not know is that, when CSCE was founded in 1887, *three* Keefers became members, the third being Charles Henry, son of Thomas Coltrin. An obituary for him appeared in the May 1932 issue of the *Journal*. It read as follows:

“Charles Henry Keefer, whose death occurred at Ottawa on April 12<sup>th</sup>, 1932, was one of the oldest and most prominent members of the Institute.

“Mr. Keefer was born in 1852. In his early days, he was employed on many important railway works, among them being the construction of the Canada Central Railway between Ottawa and Carleton Place, the Chaudière branch of the St. Lawrence and Ottawa Railway, the location of the proposed line of the Canadian Pacific Railway through the Yellowhead Pass of the Rocky Mountains, and the location of the Canada Atlantic Railway. During the years 1872-1875 he was assistant engineer on the construction of the Ottawa Water Works, and in 1878 was employed on the Montréal harbour works. In 1881-1885, Mr. Keefer was division engineer on the construction of the extensions of the New York, Lake Erie and Western Railway, having charge of the construction of the Kingan viaduct, and in 1884-1885 was in charge of the construction of a division of the Canadian Pacific Railway through the Kicking Horse Pass, Rocky Mountains. Later Mr. Keefer acted as engineer for the contractors in connection with the Tay Canal. Since his retirement, he has been a resident of Ottawa.

“Mr. Keefer was one of the original members of the Canadian Society of Civil Engineers, joining on January 20<sup>th</sup>, 1887... He was a member of Council in 1892, 1893 and 1903, and a vice-president in 1904-1905.”

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In years past, several members of the British peerage were elected to CSCE and EIC in the honorary member classification. As well as being peers, they had usually achieved eminence in public office - such as Governor General of the Dominion. Records show that there has been only one hereditary British peer who was elected to *corporate* membership of the Institute. He was John Brooke Molesworth Parnell, Lord Congleton.

Parnell born at Clonmel, Ireland, in May 1892 - the second son of the fourth Baron Congleton - and educated at the Royal Naval Colleges at Osborne and Dartmouth. From 1909 to 1919, he served as an officer in the Royal Navy, retiring with the rank of Lieutenant-Commander. He then entered the Faculty of Engineering at McGill University and graduated in 1921. Following graduation, he remained in Canada for several years before returning to London to the engineering firm of G. D. Peters & Company Ltd. He became a director of the Canadian subsidiary of this company. Lord Congleton, who became the sixth Baron, joined the Institute as a junior in December 1919 and transferred to associate member in January 1922. He died in London in December 1932.

His obituary appeared in the February 1933 issue of the *Journal*.

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The early 1930s were, of course, right in the middle of the Great Depression. The *Journal* began a regular 'Situations Wanted' section and the Institute's Employment Service Bureau was deeply involved. The Council also established a Committee on Unemployment in May 1932. Its work was largely advisory and directed towards the co-ordination of the efforts of the branches which, in turn, were encouraged to establish their own committees - and most did. These committees were also asked to advise the Council in regard to measures and general organization to assist in the solution of the unemployment problems of members. Funds were also collected for disbursement to those in most need.

The following findings and statistics were tabled by the Committee at the Council meeting held in October 1933 and published in the *Journal* the following December:

As of September 1933, 376 members were registered with the Employment Service Bureau, compared with 257 at the beginning of the previous January. Of the 376, some 60 had been temporarily employed.

During this period, 71 vacancies had been notified, but only 32 were filled, either because the positions were for (unattractive) commission sales personnel or engineers with particular experience.

During the spring and summer of the year, the Institute, through the branch committees and the Department of National Defence, had managed to place 133 engineers as supervisors in relief camps throughout Canada.

The membership of the Institute in all classes in 1933 was just over 4000, having fallen from 4700 two years earlier. Of these, 820 were students. The 376 unemployed represented around 9 percent of the corporate members and juniors.

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The majority of the medals and prizes awarded annually by the Institute during the 1930s were for meritorious papers delivered at annual, branch and other meetings and judged to be the best published during a particular year. Among them, the Past-Presidents' Prize was rather different. It was given in competition for a meritorious and unpublished essay - one whose subject was selected each year by the Council on a topic that need not be related directly to the practice of engineering. Members in any grade could enter. The prize was \$100 or the equivalent in books or instruments. A committee of five drawn from among the members and honorary members judged the entries.

In 1932 the entrants were asked to write on 'The Relation of Economics to Engineering.' The winner was Eric G. Adams, a student member. His essay was published in two parts in the February and April 1933 issues of the *Journal*. The first gave a brief historical review of the development of engineering and the development of economics and went on to discuss their inter-relationship as branches of knowledge. The second began with a discussion of the need for economic planning, the scope of this planning, and the "connected functions" in planning. It then discussed the disadvantages of economics ignoring engineering and vice-versa, how the overbalancing of one could effect the other, and how better relationships could be brought about.

The subject for the 1933 competition was 'The Engineering Features of City Management,' and for 1934 it was 'The Co-ordination of the Activities of the Various Engineering Organizations in Canada.'

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The May issue for 1934 reprinted a piece from the Brooklyn Engineers' Club Bulletin called 'Ways to Kill a Society.' In all, 31 ways were identified. The following were among the more cogent:

- Don't come to the meetings.
- If you do attend a meeting, find fault with the work of the officers and other members.
- Never accept an office, since it is easier to criticize than to do things.
- Hold back your dues as long as possible or don't pay them at all.
- Don't tell the society how it can help you; but if it doesn't help you, resign.

- At every opportunity, threaten to resign and then get your friends to resign.
- Agree to everything said at a meeting and disagree with it afterwards.
- When everything else fails, cuss the secretary!

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We have become used to ballots on anything from by-law amendments to slates of officers being successful, sometimes against considerable odds. However, the *Journal* noted in May 1934 that the recent ballot for by-law amendments had failed to show the two-thirds majority required to approve the Council's proposals. In view of the extended discussions held beforehand, the Council expressed its surprise and disappointment at the result.

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There have been many occasions on which the Institute Council and the members generally have turned their attention to the solution of national problems that called for engineering solutions. For example, the 1930s brought drought to the Prairie provinces. All of the technical papers published in the April 1935 issue of the *Journal* were devoted to Prairie water supply problems, the fruits of a special technical session at the Annual Meeting of the Institute in Toronto the previous February. An extensive editorial in this same issue was devoted to the technical aspects of the drought problem. It ended with some positive action within the Institute:

“Following a suggestion made during the discussion at Toronto, the Council of the Institute has appointed a representative committee who are asked to follow up the work of the Annual Meeting and collect relevant data on the various technical aspects of the subject in consultation with engineers who are in a position to give authoritative information. It is also thought that the committee should confer with agriculturists, foresters, geologists, meteorologists and other experts as may be found necessary, and then give consideration to the various methods of water conservation and utilization that have been suggested. In this way the Institute committee can be of assistance in advising as to those engineering features of the program for alleviating conditions in the affected area which would be the most promising of success... The carrying out of any programme based on such schemes would of course not be the work of the committee, but of the technical officers appointed by the various governments for that purpose. The assistance of the committee is being offered to the federal and provincial authorities, with the intimation that although the problem is primarily agricultural, engineers can help in collecting reliable information and expressing opinions on those remedial measures which involve engineering work or investigation.”

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In the 1930s the Institute published annually the *EIC Engineering Catalogue*. The third edition appeared in 1935 and was advertised in the April issue of the *Journal*. This catalogue was designed to serve the needs of those responsible for specifying and purchasing engineering equipment and materials in all branches of industry. Copies were supplied to Institute members who requested them. The balance of the printing was sent to a select list of companies that would make use of the information in it. By 1939, the *Catalogue* had been sold to a private publishing company.

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The July 1935 issue of the *Journal* was rather special in that it published a paper in both English and French. It was called 'The Modern Highway/La Route Moderne,' and had been presented to the Quebec City Branch of the Institute by Alphonse Paradis, chief engineer of the provincial Department of Highways.

The paper included some significant facts about the highway system in the province as a whole, of which the following is an extract from the French text:

"Nous avons actuellement 16,000 milles de chemins améliorés dont 5,585 milles classés comme grandes routes. Inutile de dire que ces grandes routes ne sont pas toutes des routes modernes. Tous ces chemins améliorés sont entretenus exclusivement par le département de la voirie au coût d'environ \$3½ millions par année.

"Nous avons dans la province de Québec, 174 milles de macadam bitumineux, 586 milles de pavage en béton bitumineux et 179 milles de pavage en béton de ciment. Le coût de ces pavages est de l'ordre de \$20,000 du mille, et, si on ajoute les fondations, les travaux préliminaires et les acquisitions de terrain, nous arrivons à environ \$40,000 du mille. L'introduction des pavages genre "low cost" nous permettra de réduire ce coût d'environ \$12,000 du mille, tout en conservant un revêtement de surface capable de porter un trafic moyen d'une façon satisfaisante. Cependant, à cause de la grande longueur de notre réseau, nous ne pouvons espérer de paver, même avec ce système de pavage économique, la plupart des routes dans quelques années, c'est pourquoi nous avons entrepris un programme de revêtements minces de l'ordre de \$2,000 du mille qui pourra s'exécuter à l'allure de 250 milles par année.

"Nous espérons ainsi, tout en continuant notre programme de pavage, donner à nos automobilistes et aux touristes étrangers, des routes propres et sans poussière dans un avenir rapproché."

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The largest issue - ever - of the *Journal* was the semicentennial number (Volume 20, Number 6) published in June 1937. Gold covered, it contained sections on the Institute's history, short biographies of the presidents from 1887 (T. C. Keefer) to 1937 (E. A. Cleveland), and separately

authored articles describing engineering achievements over the previous 50 years in 17 industry sectors.

The total membership of the Institute in all classes in 1937 was 4600. The regional breakdown was: British Columbia - 6%; the Prairies - 15%; Ontario - 34%; Québec - 31%; and the Maritimes - 8%. Members living abroad accounted for the remaining 6%. Canada-based members were distributed among the same 25 branches as they had been ten years earlier. The largest branches were: Montréal - 1228; Toronto - 451; and Ottawa - 409. The branches in Winnipeg and Vancouver had over 200 members; those in Calgary, Regina, Hamilton, Québec, Saint John, and Halifax each had over 100. E.A. Cleveland shared the presidential duties during the year with G. J. Desbarats. A Semicentennial Conference was held at the Windsor Hotel in Montréal in June and was attended by a number of distinguished visitors from other countries. There was a formal ball and the Governor General, Lord Tweedsmuir, spoke at the banquet, the proceedings of which were broadcast by the CBC. Congratulatory messages were received from sister institutions in many other countries. The Conference was continued in Ottawa.

The July issue of the *Journal* carried reports of the celebrations in Montréal and Ottawa, including the text of Lord Tweedsmuir's speech, which reflected his background as a classical scholar, lawyer, historian, fiction writer, politician and businessman. During this speech he said:

"Most professions, it seems to me, are empirical things and deal largely in speculations and generalities. The business of a lawyer, for example, is to give practical application to general principles, but he is not dealing with an exact science. No legal doctrine is really precise in its application. The work of the doctor, too, must be largely experimental. As for the politician, the terms he uses can never be accurately defined - that is part of the fun of politics. Therefore in nearly every profession you have faddists and theorists. But the engineer is wholly different. He has to deal with hard facts. He knows that if he is not exactly right in his calculations he will be wholly wrong. This gives his mind, I think, a clearness and precision which is not common in other walks of life. I have had the good fortune to know a fair number of eminent engineers, and I have always been struck by the firmness of their intelligence. There are no vague patches, no loose ends in their methods of thought.

"Your profession has always been the foundation of any civilized society. You provide the basis, the physical basis, which makes government possible. That was so in the ancient monarchies of the East and especially in ancient Egypt. There were not many greater engineers in history than the Egyptians. The Greeks, it is true, were no engineers. They were interested more in the human mind than in the physical conditions of life. But they had to borrow a physical basis from their predecessors, and without these predecessors there would have been no Greek civilization. When you come to the Romans, the real makers of the world as we know it, we find that they were above all things a race of engineers. The Roman roads, the Roman aqueducts, the Roman bridges still stand today in the Old World as a memorial of a people who based their society

firmlly on engineering science.

“Here, in Canada, the engineer is very much in the position of the ancient Romans... You have to conquer space and you have to adapt the landscape to human needs. Your profession must always be a matter of expansion and constant pioneering, and therefore a live profession. You have already had many great engineering achievements to your credit; your trans-continental railways, your harnessing of water powers are among the miracles of modern science.”

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The July 1937 issue of the *Journal* also published - appropriately in a sense - an obituary for Richard Adams Davy, one of the engineers who took part in the discussions prior to the founding of CSCE, and who joined the Society in January 1887.

Mr. Davy was born and educated in England. He began the study of civil engineering in 1870 and came to Canada three years later. His early employment was in mine, canal and railway work, principally in Northern Ontario, Québec and New Brunswick. In 1892, he was engaged in Exchequer Court cases and was sent by the Department of Railways and Canals to supervise the boring for the projected PEI tunnel. In 1894 and 1895 he assisted in irrigation work in Southern Alberta. In 1896 he collaborated with Charles H. Keefer (*who has been mentioned above*) in a report on drainage for the city of Ottawa. His later career was again a mixture of work on railways, canals, dams and bridges. He retired to Ottawa in 1925. He was a fifty-year member of CSCE-EIC at the time of his death at the beginning of May 1937.

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Back in the days of the Model Law, there seemed to be no legal support for the Institute providing the ‘umbrella’ for the new provincially regulated professional associations. But, with time, this view changed. In the early 1930s, some members of the Institute felt strongly enough that engineering as a profession in Canada would benefit from some form of ‘consolidation’ involving the Institute and the provincial associations. So at the Annual Meeting of the Institute on 7 February 1935, a committee was appointed to develop possibilities for such a consolidation. The Committee met for the first time the following day. Gordon M. Pitts was appointed chairman, and Robert F. Legget secretary.

Over the next two years this Committee developed proposals and distributed them for discussion by the Council and the membership, as well as at the Annual Meeting in January 1937. The final proposals were balloted, using amendments to the existing EIC by-laws, in three separate votes, in April 1937. All three votes were lost, however, but the idea was not abandoned completely. An editorial in the May 1937 *Journal* said that, as a result of the recent ballot, the situation involving the Institute and the provincial associations had been clarified and the way opened for further talks and for the development of regional, rather than national, co-operation agreements. But perhaps



because of World War II and the period of reconstruction that followed, it was not until the mid-1950s that the national 'consolidation' discussions became serious again.

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The April 1938 issue of the *Journal* noted the appointment of Leslie Austin Wright to succeed the incumbent Richard Durley as general secretary of the Institute and editor of the magazine. Resigning for reasons of health, Durley had served the Institute for 13 years.

Austin Wright was a 1910 mechanical engineering graduate of the University of Toronto. His varied experience prior to joining the Institute staff included spells in journalism, bridge, structural and railway engineering, construction and technical sales. He was also the author of a number of published articles.

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There appeared in the June 1938 issue an editorial with the title 'Innovation.' It read:

"Something absolutely new in the affairs of the Institute occurred at the May meeting of Council. For the first time in the history of that body a woman was elected to corporate membership. The new member is Elsie Muriel Gregory MacGill, assistant engineer of one of Montréal's aircraft factories. Miss MacGill is a Bachelor of Applied Science of the University of Toronto, and a Master of Science in engineering of the University of Michigan, and has done two years graduate study at the Massachusetts Institute of Technology towards her doctorate. She is also an Associate Fellow of the Royal Aeronautical Society...

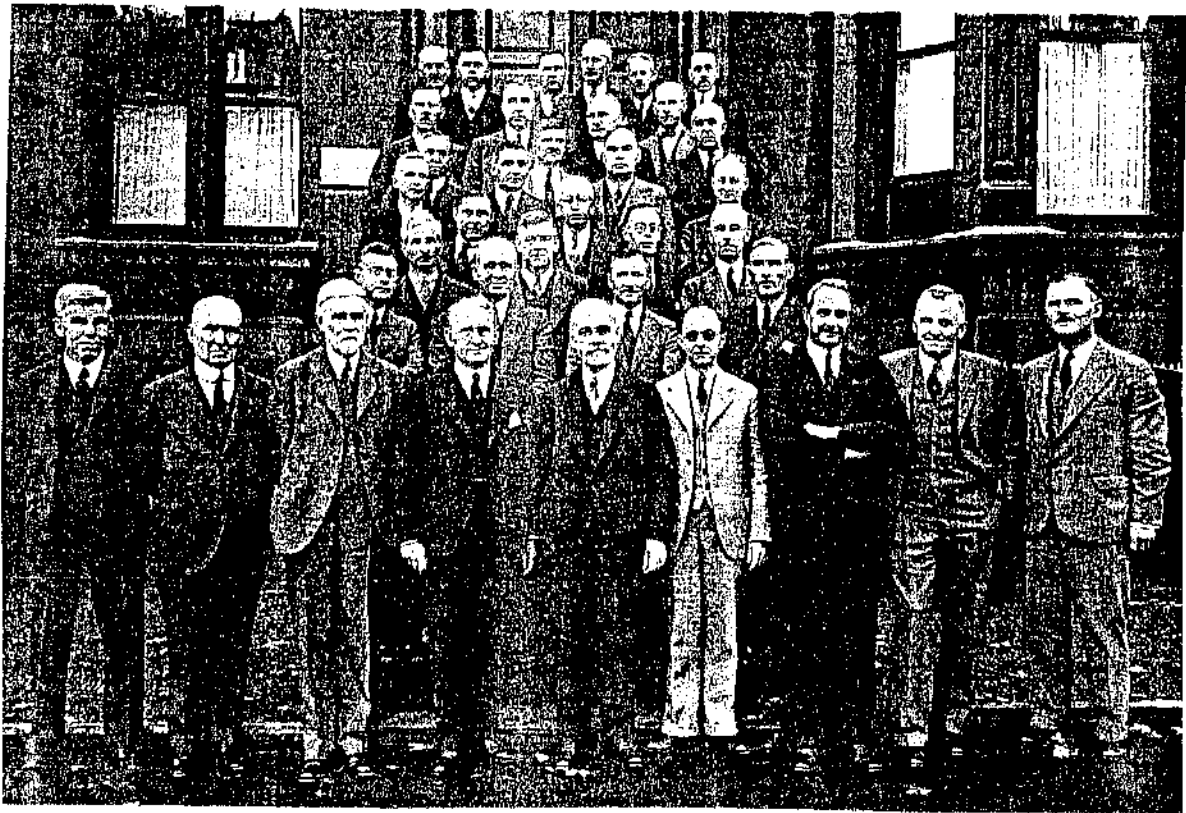
"Recently, Miss MacGill read a paper before the Ottawa Branch on 'Simplified Performance Calculations for Aeroplanes' in which she showed by the use of logarithmic curves how to determine in a simple manner the ceilings and high speed, climbing speed and the maximum rate of climb at any altitude for any aeroplane. We are informed that the paper reflected great credit on the author and made a definite contribution to the art of flying.

"The *Journal* is pleased to make acknowledgement of Miss MacGill's election to Associate Membership, and to congratulate her on her high academic standing and her practical knowledge in this complicated field. We wish her great success in her future endeavours."

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EIC Semicentennial Banquet - Windsor Hotel, Montréal - June 1937



Plenary Meeting of EIC Council, October 1936

President E. A. Cleveland is fourth from the left in the front row

To his right are: Past Presidents F. R. Shearwood, O. O. Lefebvre and A. J. Grant.

To his left are: 1937 President G. J. Desbarats, 1939 President H. W. McKeil, P. L. Pratley,  
1953 President R. L. Dobbin and H. J. McLean



E. V. Buchanan

Elsie M. G. MacGill





# THE ENGINEERING INSTITUTE OF CANADA

expresses to

## Richard John Durley

General Secretary from 1925 to 1938 its appreciation  
of his devotion to the interests and the welfare of  
the Institute, and his contribution to the progress  
and betterment of the engineering profession

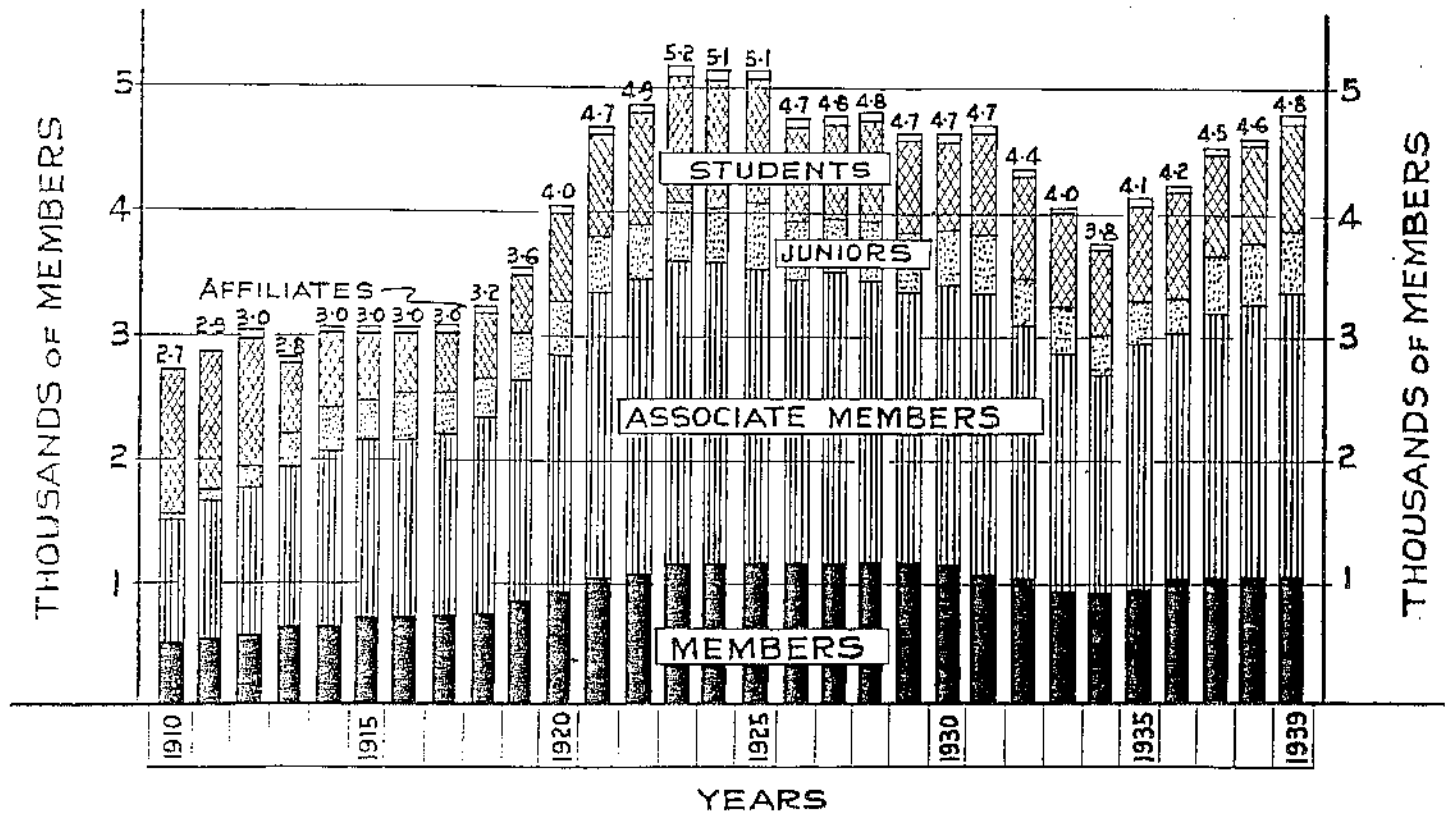
February 14<sup>th</sup>, 1939

*J. R. Allie* President  
*Flustey Wright* General Secretary  
*de Lasp. Beaubien* Treasurer

Endorsed by:

|                         |                           |                        |
|-------------------------|---------------------------|------------------------|
| <i>J. H. Duggan</i>     | <i>Julian C. Smith</i>    | <i>Sepline</i>         |
| <i>W. H. Smith</i>      | <i>Amiechew</i>           | <i>H. Shearwood</i>    |
| <i>J. M. Baird</i>      | <i>Alex. J. Leggat</i>    | <i>J. H. Haky</i>      |
| <i>Guthrie Surveyor</i> | <i>A. J. Hunter</i>       | <i>E. H. Cleveland</i> |
| <i>W. W. Allen</i>      | <i>Charles A. Russell</i> | <i>J. J. Dabbarato</i> |
| <i>A. R. Secary</i>     | Past Presidents           |                        |





Membership of CSCE/EIC: 1910-1939

Alexander J. Grant  
President  
Engineering Institute of Canada  
1930



Since the 1950s, Canadian scientists and engineers have become sensitive to arguments favouring research and development as the 'engines' of technical progress, innovation, market share, profitability and other parameters of the industrial marketplace. It is significant, therefore, that back in 1938 an article on this theme should appear in the November issue of the *Journal*. The author, predictably, was from the United States - M. W. Smith, a manager of engineering with the Westinghouse Company in Pittsburgh - and the paper had been delivered at an international management conference in Washington, D.C.. It was a long paper, covering types of research, new product development, pilot plants, patents and several related topics and was naturally geared to the roles of control and supervision in industry. The summary paragraphs at the end of this paper were remarkably similar to those presented in papers of much more recent origin by Canadian industrial R&D managers pleading for more funding. They said:

"It is almost axiomatic that technical progress is dependent entirely on progress or accomplishments in research and development work in the various branches of science, and unlimited illustrations could be applied to substantiate this claim. It therefore appears that the greatest responsibility - or probably we should say opportunity - of management in maintaining technical progress is to accelerate research and development work through better administration and control of organizations engaged in this kind of work. In addition to a more rigid application of the usual principles of efficiency and economy of operation, a sympathetic and encouraging attitude on the part of the top management of a company is considered essential. This promotes co-operation and teamwork among the personnel of research groups and is conducive to good performance, which, after all, is a large factor in the determination of the rate of our future progress.

"No invention or development is an unmixed good even though it may be based on sound economic principles. As inventions enlarge our activities and broaden our lives in one direction, they cause shrinkage and distress in another. It is the gradual but positive net progress over a long period of time which counts and we must not become disturbed and thrown from our long-range course by temporary upsets in our social and economic progress. Any basically new idea is really beyond our comprehension and vision. If we could visualize it, it would be immediately developed. However, we may be sure that engineers and scientists will continue to make new discoveries - new ways to heal and save, new ways to kill and destroy; and out of it all we will have new joys and new sorrows along the road of progress to better standards of living."

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The Institute was represented at the international engineering congress organized in association with the Empire Exhibition held in Glasgow, Scotland, during the summer of 1938. The EIC's delegates were James McGregor and E. V. Buchanan. Both wrote letters to the Institute describing their experiences, and these were published in the October issue of the *Journal*.

McGregor was brief, mentioning the social engagements and trips, as well as the technical sessions

and plant visits. He commented favourably on the Exhibition itself and the Canadian Pavilion within it - and on the popularity of the RCMP representatives on duty there. After Glasgow, Buchanan attended the International Electrotechnical Commission meeting in England and, consequently, his report was longer. He attended four of the technical sessions at the Glasgow congress, at one of which a paper on the gas industry in Canada, by a Canadian, was read. He visited the John Brown & Company shipyard at Clydebank and saw the *Queen Elizabeth* being built. Among Buchanan's more general comments were these:

"It is natural, in an exhibition held in Glasgow, that the Engineering Pavilion should be the most extensive. One of the delegates remarked that an Empire Exhibition should feature engineering since the real builders of the Empire were engineers...

"Things of interest to engineers are not confined to the Engineering Pavilion. In the United Kingdom Pavilion, for instance, there are a working model of a coal mine, a blast furnace, the fully equipped bridge of a battleship and a mechanical man.

"The predominating feature of the Exhibition for miles around is the modernistic observation tower (*also called Tait's Tower, after its designer*) rising 300 feet above the crest of the hill in the centre of the grounds. For the structural engineer, this tower is undoubtedly of much interest. I was told that the maximum downward pressure on any one leg is 700 tons, while the overturning pull due to wind pressure and the unbalanced balconies that could develop in any one leg is 400 tons.

"The fountains and water displays are of great magnitude, novelty and variety. The use of special nozzles to aerate the water, giving it a sparkling white appearance, is an entirely novel device. The grading of the height of the jets, the carefully planned parabolas, and the skilful use of floodlighting all contribute to marvellous effects.

"The Canadian Pavilion is the largest in Dominion Avenue and is a strikingly designed building. The engineering feats for which successive generations of Canadian engineers have been responsible are presented in pictures and dioramas from the Welland Canal to the construction of bridges like that of Québec..."

A second international engineering congress, a British-American one to which EIC members would have gone in greater numbers than to Glasgow, was scheduled to take place in the late summer of 1939 in connection with the World's Fair in New York. But with the gathering of war clouds in Europe at that time, and with many of the intended participants coming from there, it was cancelled.

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Nowadays, with trans-oceanic aircraft flights commonplace, taken-for-granted events, it is easy to forget that, even in the late 1930s, crossing the Atlantic by air was rarely done. One such crossing was noted in an editorial comment in the September 1939 issue of the *Journal*:

"Developments in flying occur so rapidly these days that before one has grasped the significance of a new achievement, something else is reported that renders the previous record almost obsolete. Nevertheless the arrival in Montréal of the Imperial Airways flying boat *Caribou* on August 7<sup>th</sup> with 1050 pounds of mail has a significance that will not be lost no matter how many improvements may follow on its heels. The permanent establishment of a system of overnight transportation with the Old Country opens up entirely new fields. No small part of the importance of this system is the link it makes with the United States. An extension of the service to Australia, which is already planned, will indeed bring the Empire closer together and provide facilities which seem, even in these modern times, almost fantastic.

"In two details at least the flight made aerial history. It was the first time that a sea landing has been made by a transatlantic air boat by night. This occurred at the end of the run in New York. It was also the first time that a transatlantic plane had been refuelled in the air and on her route. The *Caribou* left Southampton for Foynes where she stopped for an hour and twenty minutes. From there she took the air with enough fuel to last 16 hours, the planned duration of the flight. However, when she was in the air she contacted a 'flying tanker' made out of a converted Harrow bomber, and in 16 minutes took on another 800 gallons, sufficient to last another seven hours.

"All this is very interesting even to the general public, but it is particularly so to the engineer. Surely this attainment is an engineering triumph. There is no phase of it that has escaped the hand of the engineer. From the design of the engine and plane, to the landing basin which terminated the journey, it is a product of engineering skill and ingenuity, and is something of which to be proud. It is a perfect example of the theme established for the British-American Engineering Congress..."

- which, as noted above, was cancelled because of the imminence of war in Europe.

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Perhaps the summer of 1939 is best remembered for the visit to Canada by Their Majesties, King George VI and Queen Elizabeth. Not long thereafter, on 10 September, things changed significantly for the country. The *Journal* for October 1939 carried a brief editorial simply titled 'War':

"The dread event which we have feared so long, and against which we have hoped and prayed so earnestly, is at last upon us. No man can tell where it will lead us or what it will demand of us as individuals or as civilization. No one could wish for such a development and yet no one will deny the necessity of it in view of the circumstances. The justice of right over might must still be fought for even though the price at times may seem unnecessarily exorbitant.

"Doubtless, the activities of the Institute will be affected but it is likely they will be



changed in character rather than in volume. Such an organization, established so firmly in twenty-five cities of Canada, should be able to make a real contribution to the national contribution. Time will disclose the nature of this effort, but in the meantime the support of the Institute has been offered to the Government by the President and Council, and indications have been given that it will be accepted."

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### 1940-1945

World War I and World War II had different effects on CSCE and EIC, reflecting two quite different times. In both cases, a large portion of the membership served at home or abroad in the Armed Forces, and there were also significant gains in terms of the diversification of engineering in order to contribute to the Allied war effort and to replace goods and services that had previously been imported. But it appears that while CSCE 'coasted' through the former, with membership and activities remaining about the same throughout, during the latter, the membership and activities increased and the Institute became actively involved in more national and local issues. On the negative side, towards the end of this War, paper for the *Journal* was in short supply.

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An editorial comment in the January 1940 issue of the *Journal* concerned Miss Elsie MacGill, the Institute's first woman corporate member. She was mentioned for her leading role in the design and manufacture of the Maple Leaf II trainer aircraft - a two-seater, open cockpit, single engine, fully aerobatic biplane, used as a primary trainer and built by the Canadian Car & Foundry Company's plant at Fort William.

Miss MacGill, the chief aeronautical engineer at Fort William, delivered a paper on 'Practicable Forms for Flight Test Reporting' at the Institute's 1940 Professional Meeting in Toronto. It was published in the February issue of the *Journal*. She also presented a paper on 'Factors Affecting the Mass Production of Aeroplanes' to the Lakehead Branch of the Institute, which appeared in the July issue of the magazine. This second paper earned her the Gzowski Medal in 1941.

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As we know, the beaver has always been the Institute's emblem. This was no accident since the animal in question was a Canadian symbol and was often credited with being our first engineer.

The *Engineering Journal* for March 1940 carried a short article reporting on a meeting at which EIC President H. W. McKiel signed a co-operative agreement in Halifax with the Association of Professional Engineers of Nova Scotia. Several other EIC members were also present. The printed programme for the occasion carried a special dissertation on the Institute's emblem (author unknown), which read as follows:

“The First Engineer was the beaver. He was also the first lumberman, hydro-electrical engineer, civil engineer, tunneller, and trench digger. He cut down the forest, made dams, storage ponds, bridges, and houses with compartments where he could conserve and preserve his food. He co-operated with his fellows and established the first telegraphic communication system in the world. This he did by wagging his tail, thereby instituting for the first time the Wig Wag System. He also established the first co-operative with regard to the storage and supplying of food materials. For his defence he became the builder of the first Maginot Line, and he has preserved his identity down through the ages. What advances the present day engineers have made on the system established by this industrial animal you will probably hear sometime during the day...”

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In early 1940, the Alaska Highway was still in the planning stages. A paper discussing the origins of the project and proposals for its routing and construction was published in the June 1940 issue of the *Journal*. The author was Arthur Dixon, the chief engineer of the Department of Public Works of British Columbia. Dixon said towards the end of his paper:

“The construction of the highway, besides giving direct access to Alaska, would open up vast areas in the Yukon and northern British Columbia known to be heavily mineralized, chiefly gold, silver and copper, also deposits of mica and marble. These districts contain vast timber resources and considerable areas suitable for agriculture. The road would provide a lifeline for air transportation over these uninhabited regions. It would open up a sportsman’s paradise, containing every kind of wildlife found on the North American continent, together with the finest fishing. The highway would provide unexcelled scenic attractions throughout its length.”

Not all of these benefits were realized when the highway became a reality. But that is another story...

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The June 1940 issue of the *Journal* announced that, as a result of a large favourable ballot result, the Institute’s by-laws had been changed to abolish the grade of associate member, which had been in place since 1887. The announcement said that this change was significant, that it indicated an almost unanimous desire on the part of the corporate membership to simplify the professional nomenclature, to do away with meaningless divisions within the Institute, and to establish a practice more comparable to that in use in other professions. However, it speculated that, had the change been submitted to a ballot only a few years previously, it would have been lost. The practical effect of the change was that around 2300 former associate members became full members.

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The *Journal* played a significant part throughout the six years of the War in keeping the members

aware of the roles the Institute could and did play in bringing it to a successful conclusion. Part of an early editorial in the September 1940 issue serves to illustrate this:

“Members...are anxious not only to offer their own services to help win the war, but to see that the Institute gives assistance also...

“In the first place, a very substantial piece of work was done in 1938 and 1939, in co-operation with several other engineering bodies, in gathering together the academic and professional records of approximately ten thousand Canadian engineers and technically trained men. This work was done at the request of the Department of National Defence, and after almost a full year’s effort, a complete card filing system was established and turned over to the government. It was expected, and in spite of disappointing experiences is still expected, that this record will be of considerable assistance in locating technical help of the types that are so badly needed for war work.

“The (*Institute's*) employment department has been working almost exclusively on enquiries from departments of government and from firms carrying out special contracts for war work. Problems involving the entire technical staff of new industries have been brought to Headquarters, and individuals with highly specialized experience have been found to fill positions of unusual responsibility. From students to ‘dollar-a-year’ men represents the range (*of positions filled*), and it is believed the Institute has assisted business and government materially by its knowledge of the market for technically trained men...

“One of the most important activities is represented by a series of confidential investigations that were carried out at the request of certain officials, and which placed helpful information in their hands quickly and safely. The national character of the Institute’s organization gave it special qualifications for this work...”

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The Council of the Institute decided in July 1940 that it would be in the interests of the profession and the public generally to present a series of radio broadcasts by prominent members. The series would be called ‘The Engineer in Wartime.’ It would discuss engineering education and the standards of practice, the contributions of the profession to the War, and the confidence that should be placed in the engineer’s contribution to the protection and defence of servicemen at home and abroad. Details of the series, arranged by the Institute’s Radio Broadcasting Committee, were given in the October 1940 issue of the *Journal*:

- October 16: Dr. T. H. Hogg, President of the Institute, on ‘Engineers in the War.’
- October 23: Dean C. J. Mackenzie, Chairman of the National Research Council, on ‘War Research - An Engineering Problem.’

- October 30: Miss Elsie M. G. MacGill, Chief Aeronautical Engineer, Canadian Car and Foundry Company Ltd., on 'Aircraft Engineering.'
- November 6: Dr. Augustin Frigon, Assistant General Manager, CBC, on 'Radio in Canada.'
- November 13: William D. Black, President, Otis-Fensom Elevator Company Ltd., on 'Industrial Development in Canada to Meet the War Emergency.'
- November 20: Armand Circé, Dean, École Polytechnique de Montréal, on 'The Training of Engineers at the École Polytechnique.'

The broadcasts were made as planned. The texts of the first three broadcasts were published in the November issue of the *Journal*, and the remaining three in the December one.

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The principal activity of the Engineering Institute of Canada in 2003 is the continuing education of engineers and their professional development. EIC has, however, been active in this field for many years. In particular, the announcement appeared in the December 1940 issue of the *Journal* that, on October 24<sup>th</sup>, the Institute had been admitted to membership of the Engineers' Council for Professional Development (ECPD) in the United States - the only Canadian body to be so elected.

ECPD had been formed in 1932, with seven U.S. engineering societies or councils as members. The thrust of its mandate was to enhance the status of the engineer. Its work was done principally by, and through, four standing committees: Student Selection and Guidance; Professional Training; and Professional Recognition, on all of which EIC was represented; and Engineering Schools, on which it was not. An article on ECPD also appeared in the December issue of the *Journal*, as did an account of the meeting of this Council on the 24<sup>th</sup> of October.

This new connection was described in the announcement as one of the most significant developments that had taken place in the Institute. It marked a widening of its interest and activities, the assumption of new responsibilities and obligations to the profession, and new opportunities for service. The interests of several EIC committees paralleled those of the ECPD committees.

For the next 25 years, the Institute would be a member of ECPD and frequent reports of its activities and deliberations would appear in the *Journal*.

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During the War, more of the Branch Reports and News of the Branches from Québec began to appear in French in the *Journal*. One of these, describing a recent branch golf tournament in a more light-hearted vein, appeared in the October 1941 issue:

“Le premier tournoi annuel de golf de la section de Québec, disputé sur les terrains du Royal Quebec Golf Club à Boischatel, le 15 septembre 1941, a été couronné d’un remarquable succès, en dépit de la mauvaise température. Le brillant soleil du début de l’après-midi fit place, vers les quatre heures, à une pluie torrentielle qui cependant ne réussit pas à décourager les joueurs. Les dames en particulier, qui avaient été invitées à prendre part au tournoi, firent preuve d’un excellent esprit sportif, et continuèrent la partie jusqu’à la fin.

“La coupe, donné par la maison Geo. T. Davie & Sons, fut gagné par P. A. Dupuis du Ministère des Travaux Publics qui enregistra le meilleur score brut. Le vainqueur devra défendre avec succès son titre pendant deux autres années consécutives, pour que la coupe emblématique du championnat reste en sa possession définitivement. Le “runner up” fut Lionel Bizier, du Port de Québec, qui enregistra deux coups de plus que le champion.

“Pour le meilleur score net, la palme revient à Gustave St-Jacques, de la Régie des Services Publics. Huet Massue de Montréal, le suivit de près.

“Chez les dames, Mademoiselle Charlotte Dupuis, fille du président de la section de Québec de l’Institut, enregistra le meilleur score brut, tandis que le crédit pour le meilleur score net revient à Madame Léo Roy.

“De nombreux prix de valeur, gracieusement offerts par différentes maisons de commerce de Québec, furent distribués aux vainqueurs à l’issue des matches.

“Au dîner qui suivit, dans le chalet du club, le président L. C. Dupuis avait avec lui à la table d’honneur, Hector Cimon, vice-président de l’Institut choisi pour l’an prochain, et Huet Massue, de Montréal, conseiller de l’Institut.

“Le dîner fut suivi d’une danse dans les salons du club.

“Tous ceux qui ont pris part à cette fête, s’accordent pour reconnaître son succès, et se promettent d’y revenir l’an prochain.”

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One of the interesting things about the *Journal* during World War II was the relatively large number of major articles it published with regard to the coming post-war period. They began as early as 1941. ‘The Young Engineer in Tomorrow’s Democracy,’ by Harry F. Bennett, was in the June issue, and the article by E. R. Jacobsen on ‘The Engineer and the Post-War Period’ appeared in December. ‘A Peace Worth Fighting For,’ by W. E. Wickenden, appeared in July 1942, and ‘Reconstruction and Re-establishment,’ by F. Cyril James, in August. There were at least four more papers published in the *Journal* in 1943, and five the following year. In 1942, the Institute Council established a

## Committee on Post-War Problems.

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The year 1941 also saw an unusual Institute event. In March it was announced that Lt.-General A. G. L. McNaughton had been awarded the Sir John Kennedy Medal. But since the General was then on active service in Britain as GOC of the Canadian Forces, the presentation could not be made in Canada at an appropriate time. So he received the medal from the hands of President J. R. Beard on 8 May at an Ordinary Meeting of the Institution of Electrical Engineers in London, of which he was also a member. A luncheon, with a very distinguished guest list, was hosted by the Institution at the Waldorf Hotel prior to the meeting.

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General McNaughton was back in Canada during February 1942 and delivered an address at the banquet of the EIC Annual Meeting in Montréal. He spoke informally, without a text, which was prepared after the event. This was published in the *Journal* in March, and was titled, 'A Message to Canadian Engineers.' Towards the end of it he said:

"One of the primary reasons for my return to Canada at this time was to carry a message to Canadian industry and to Canadian engineers that we want to win this war, not by the blood of our sons - and our daughters, because our daughters stand in the line as well - but by our intelligence. We must take our wits and put them to work, and the engineers must not only think out newer weapons, and better types of weapons, but must forge them and design them so they can be mass-produced; industry must make these newer and better weapons in the vast quantities which we shall need in order to bring this chaos to a satisfactory conclusion without the expenditure of more than is necessary of the precious lives that have been entrusted to our care.

"We have to win this war by our wits..."

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Also at the 1942 Annual Meeting, the Minister of Munitions and Supply - the Hon. C. D. Howe, by then an honorary member of the Institute - presented a long luncheon address titled, 'Canadian Industry in the War.' The Minister also spoke informally and without a text, which was prepared later and appeared in the March issue of the *Journal*. The following extracts illustrate the differences wartime can make to getting things done. At the beginning of his speech, the Minister said:

"The early problems in the Department were not the ones we have today. You remember that the Department started from absolute zero. We first had to find an office, a typewriter and desk, and a stenographer, and then build up a competent organization.

"Frankly, we were quite ruthless. We looked over the whole field of industry and

business in Canada, and we picked out men that we thought were most able to do a job in the new Department. Having practised engineering in Canada for a number of years, I had a very wide acquaintanceship among my own profession and throughout Canadian industry, which I used to help me in selecting people who would work with me in the job at hand. I am very proud of the organization that we have built up in Ottawa to handle munitions and supply problems. Its personnel now comprises over three thousand men and women..."

The Minister went on to describe some of the ways industry was brought into the supply picture:

"In the last war we had developed the technique of making shells and components of finished rounds of ammunition, and we were able to tackle that problem fairly rapidly, so that our first progress was made in the field of ammunition..."

"We also had a very efficient Canadian motor industry with a strong designing staff. Thus we were able to start very quickly in the making of mechanized equipment for our army, which is required in such vast quantities for the type of warfare that we now have to provide for. We have continued to expand that industry and I think today we have delivered over 216,000 motor vehicles...either to our own forces or overseas to the many theatres of warfare.

"However, we had no experience in manufacturing guns in this country, except the old Ross rifle, which did not turn out so well. So we had to call on the Old Country for technicians and for designers to enable us to set up a technique for producing guns of all types...Today, we are building almost every type of gun used in the war, except the very large coast defence guns. We are building naval guns of every calibre..."

"The year before the war I think we turned out 200 aircraft. We had only a small industry working mostly on small planes for transport work, and one or two types of army planes. Today we are turning out planes at a rate of about 70 a week, or 300 a month. We are independent now of outside help in finishing planes for our Air Training Plan, and we are also building several of the most modern types of planes that are used by the fighting forces. From a small nucleus we have built up a strong aircraft industry.

"In the field of shipbuilding, we formerly built ships to some extent in Canada, but during the Depression Years that industry reached a low ebb, and its activities were confined largely to repair work...However, we commenced immediately to build several types of ships...From some fourteen vessels at the outbreak of the war, our naval strength has now risen to about 330 ships of all types, and we expect the year 1942 will see another large increase."

"At the outset we knew very little about the many secret devices that have played such a great part in winning the Battle of Britain and fending off the attack of aircraft on that

island. Dean Mackenzie (*and the National Research Council*) undertook the work of developing that equipment and today I believe that Canada is not only abreast of Britain in the quality of its secret equipment, but possibly at the moment a step or two ahead.. We established a government-owned plant, Research Enterprises Ltd., to manufacture this apparatus...”

At the end of his speech, the Minister said that his Department's program was limited by shortages of skilled management, although human resources, in general, were not yet seriously lacking. The Department was also looking for more firms that could take on the increased wartime workload since the firms that were already involved had all the production they could handle.

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A third presentation at the 1942 Annual Meeting, and from the March issue of the *Journal*, had a great deal to do with the availability of human resources in wartime Canada, and with technical personnel in particular. Elliott M. Little, the Director of the Wartime Bureau of Technical Personnel in Ottawa (*WBTP* - not to be confused with the *Wartime Prices and Trade Board, WPTB*), spoke on 'National Service - A Challenge to the Engineer.'

Based in part on the success of the 'substantial piece of work' done in 1938 and 1938, and referred to above, the WBTP was established in 1941 by the Department of Labour in Ottawa in cooperation with EIC, the Canadian Institute of Mining and Metallurgy and the Canadian Institute of Chemistry, with Elliott Little - an engineer - as the director. Its job was to find technically trained people who could fill the wartime needs of industry, government and the active service forces. It amounted to the first large scale attempt at national technical manpower planning in Canada. EIC's Austin Wright was closely associated with the Board from the beginning and, from April 1942 until January 1943, was seconded to it as a full-time member of staff.

Towards the end of his February paper, and after describing the planning process and the fact that it involved post-war as well as wartime considerations, Little said:

“Now what has all this to do with the engineer? At some stage in this planning, all these broad outlines, all the projects and undertakings, any new industries, or plant rehabilitation, any conservation or reafforestation, must be worked out and translated into pounds or other quantities of materials; into man-hours of work for the production, preparation and transportation of that material; and into the man-hours of work for fabricating the material into finished products. And then those man-hours must be broken down into work for the miner, the carpenter, the mechanic, the mason, the forester, the engineer, the architect and so on up and down the whole list. The engineer is so important to this part of the planning that I can safely say it cannot be done without him.

“But there is another function the engineer can perform which is important at an earlier stage in the planning. Many of you know from experience that some well conceived



plans fail in their execution because some detail has been overlooked, that undertakings supposedly well organized missed something, that people who are eminently capable of planning in broad outline may neither have the time for, nor appreciation of, the details necessary to carry those plans to complete fulfilment. The engineer must do his part to see that in this planning no detail is omitted, that in the organization of this vast job no step is missed. Those who are, or may be, charged with the planning of the broad outlines, should enlist the engineers' assistance as early as is desirable, or permissible."

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A piece in the May 1942 issue of the *Journal* asked - and answered - the question: Are engineers inarticulate?

Evidence in favour included the statement that, when they spoke in public or wrote for journals, engineers preferred to discuss subjects that could be based on ascertained facts, not on sentiment, emotion or prejudice - the stock-in-trade of the political speaker. They preferred to use fifty words instead of five hundred. Evidence against pointed to the Institute and its function of providing opportunities for oral communication, to the many high quality papers that appeared every year in the *Journal*, to the fact the individuals such as General McNaughton (*as mentioned above*) could deliver long addresses without texts or even notes, and the fact that EIC presidents seemed to be able to make brief but cogent public statements when called upon to do so without warning. Down the middle, so to speak, was the statement that too many engineers remained silent because they did not realize that their individual work and experience covered much that was of interest to other people.

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The January 1943 issue of the *Journal* published an obituary for the last president of CSCE and the first of EIC, Henry Hague Vaughan. He was only the third mechanical engineer (after H. L. Wallis and K. W. Blackwell) to have lead the two organizations since 1887. As noted at the beginning of this paper, Vaughan was deeply involved in the transition from the "old" CSCE to the "new" Institute.

A mechanical engineer, born in England, he was one of those who began his career as a shop and drawing office apprentice and worked his way up to the professional ranks and to senior positions in both the profession and industry. His North American career began in 1891 when he joined the St. Paul, Minneapolis and Manitoba Railroad, working successively as a machinist, draftsman and assistant engineer. After periods with several other railroads in the United States, he joined the Canadian Pacific Railway in Montréal in 1904 as superintendent of motive power. A year later he was appointed to take charge of the design and construction of locomotives and car equipment, the maintenance of equipment east of Fort William, and the operation of the CPR's Angus shops - all at the beginning of a period of rapid growth for the CPR. The obituary then goes on to say:

"His first task was the standardization of the many types of locomotive then in service

on the Canadian Pacific Railway, which resulted in greatly simplified maintenance. He undertook a great deal of experimental work on new types of equipment. Considerable saving followed his adoption of thermostatically controlled feed water heaters. Later he was a pioneer in the successful application of superheated steam to locomotives, a course which he first advocated in 1905. This required extensive investigation of problems regarding valve design, new types of piston packing, and cylinder lubrication. The CPR adopted superheating steam some years before the United States roads recognized the advantages of the practice. The many other developments in which Mr. Vaughan was interested included improvements in the balancing of locomotives to avoid rail breakages, and the design of what were at the time the most powerful rotary snowploughs in North America...Mr Vaughan was in fact an inventor, and always had experiments and tests under way. Many of these resulted in notable economies in operation."

Vaughan retired from the CPR in 1915 and became a consulting engineer. He was among the pioneers of the mass production of munitions in Canada, and spoke on this subject in his address as retiring president of the Institute, which was published in 1919 as 'The Manufacture of Munitions in Canada,' in Volume XXXIII, Part I, of the *Transactions* of EIC. As noted much earlier in this paper, he also took a leading part in the establishment of the Canadian Engineering Standards Association. After the war, his consulting work was more administrative and financial than technical. He also held directorships in a number of companies. He joined ASME in 1899, and served that society twice as a vice-president. He was elected to honorary membership in 1940.

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From 30 September to 2 October 1943, the Engineering Institute of Canada and the American Society of Mechanical Engineers held a joint technical meeting in Toronto. Earlier, in August of the same year, representatives of the two organizations had sat down to consider how thirty years of cordial relations between them could be turned into a program of active cooperation. Their report was discussed at the Toronto meeting and adopted formally by the Council of ASME on 2 October and by the Institute Council on 23 October. This cooperation agreement remained in force until the formation by the Institute of the Canadian Society for Mechanical Engineering in 1970.

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A quick aside: in today's non-smoking world, it is interesting to notice in the many photographs of conferences, meetings, and banquets that appeared in the *Journal* during the war years and immediately after, just how many Canadian engineers were pipe smokers!

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de Gaspé Beaubien was elected president of the Institute for 1944, and his biography appeared in the February issue of the *Journal*. Born in Montréal in 1881, he received his engineering degree in 1906 from McGill University. He remained at the University for a time as an administrator before joining

the Westinghouse Company in Pittsburgh, having gained relevant experience in 1903 with the Montreal Light, Heat and Power Company. Beginning in 1908, he practised on his own account as a consulting engineer in the hydro-electric and power development fields before going into partnership with other engineering consultants, and was still in these fields of consulting at the time of his presidency.

Beaubien undertook other duties, both related and unrelated to engineering. For example, he was a member of the committee set up to write the French version of the National Building Code, served as a vice-president of the Royal Automobile Club of Canada, and was a joint chairman of the National War Savings Committee, as well as holding directorships in a number of companies. He joined CSCE in 1903 as a student, becoming a member of EIC in 1921.

As president, Beaubien contributed an editorial to the *Journal's* March 1944 issue. Titled, 'Your Institute,' it looked to the the future and the post-war years. In the second half he wrote:

"The Institute itself will have definite post-war problems. One of these will be the successful transfer of its members from active service and from war industry to peacetime occupations. While the Wartime Bureau of Technical Personnel (*about which, see above*) may be continued after the war, it seems evident that the Institute itself can also do much to help its members through that period of change.

"During the past decade, steady development in the organization of the engineering profession in Canada has shown the necessity of closer association between our various technical societies. With this in view, certain proposals have now been made to change the by-laws of the Institute, so as to enlarge its field of usefulness and enable it to align itself more closely with bodies having kindred aims. Council has approved these proposals, and it is my earnest hope that all our members will vote for their adoption.

"I am confident that in the future, as in the past, the Council will regard as of prime importance all matters of national significance which touch on the profession of engineering in Canada. In dealing with these questions, and in the discussion of important technical problems, the Institute's policy will continue to aim at the development of a national, rather than a local, point of view.

"These and many other endeavours of Council to promote the well-being of the engineers of Canada, deserve - and I am sure that they will receive - the fullest support of all our members."

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A report in the April 1944 issue of the *Journal* announced the formation of a new army corps, the Canadian Electrical and Mechanical Engineers (CEME) - soon to be 'the Royal' - to take over the engineering repair and maintenance services work formerly done by the Royal Canadian Ordnance

Corps. The Institute had become publicly involved in the preceeding debate, sparked by the formation in the British Army two years earlier of the Corps of Royal Electrical and Mechanical Engineers (REME). However, the April report kept the debate going with the following paragraphs:

“This news will be welcomed by Canadian engineers everywhere. There is nothing to be gained by further criticism now, but one cannot withhold the comment that it is difficult to understand why it took so long to bring about a reform which every engineer in the service saw as essential at least a year ago, and which had proved itself so clearly in the North Africa and Sicily campaigns.

“It is too bad that in drawing up the order C.A.R.O. 4230 nothing was included to indicate that the officers of the new engineering corps were to be professional engineers (*as was the case with REME*). If the commissions, particularly the senior appointments, are to be given to non-technical persons, the situation may well be no better than it was when the work was carried out in Ordnance. Surely this mistake is not going to be repeated... In Order No. 4230 it is stated simply that CEME officers will consist of electrical and mechanical engineers of appropriate ranks and of upgraded engineering officers.”

The Institute had in fact established in February 1943 a committee to study reported grievances of engineers on active service. It subsequently wrote a report making three particular points, which was sent to the Hon. J. L. Ralston, the Minister of National Defence. Its first point was the need to form what became CEME, and this had now been gained. The second, the appointment of technical people to technical positions in the services had not. Nor had the third, the apparent pay discrimination against engineers that favoured certain other professions.

And so the debate and the correspondence continued. One result of this was the publication in the December 1944 issue of the *Journal* of a long paper on ‘The Corps of Royal Canadian Electrical and Mechanical Engineers’ by Lt.-Col. A. O. Monk and Major R. T. Bogle of National Defence Headquarters in Ottawa. Another was the publication of an exchange of correspondence between the Office of the Minister in Ottawa and the Institute in Montréal in the September 1945 issue of the *Journal*.

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Engineers who have delved into the history of engineering education know that Sir John William Dawson had a significant influence on its formal beginnings in Canada during the late 19<sup>th</sup> century, first in New Brunswick and later at McGill University in Montréal<sup>5</sup>. They may also know that Sir William’s son - geologist, surveyor and botanist George Mercer Dawson - served with distinction for many years with the Geological Survey of Canada, and was its director from 1895 to 1901. They

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<sup>5</sup> See, for example: R.D. Findlay, ‘The Origins of Mechanical Engineering Education in Canada,’ in *From Steam to Space*, Canadian Society for Mechanical Engineering, Ottawa, 1996.

may not know that his younger son, William Bell Dawson, had a distinguished career as an engineer, surveyor and civil servant. He was also a founding member of CSCE in 1887 and, at the time of his death in 1944, was one of the oldest living members of the Institute. An obituary appeared in the June 1944 issue of the *Journal*.

Born in Nova Scotia in 1854, William Dawson grew up in Montréal and attended high school there. He then went to McGill, from which he graduated in geology and natural science as well as in engineering. Unusually for a Canadian, he then entered France's École des Ponts et Chaussées in Paris, to which foreign students were admitted by examination. There, he took a three-year course in civil engineering, graduating with a diploma of special merit. Returning to Canada, Dawson worked initially as an engineer in private practice before joining the Dominion Bridge Company and, later, the Canadian Pacific Railway, where he designed bridges. The main activity of his career began in 1894 when he carried out surveys of tides and currents on both the Atlantic and Pacific coasts, including the Gulf of St. Lawrence, the Strait of Belle Isle and the Bay of Fundy, and continued for 30 years. He served as superintendent of the Dominion Tidal and Current Survey of Canada and retired from government service in 1924. His work drew both national and international recognition, including fellowship of the Royal Society of Canada, the Watt Gold Medal of the Institution of Civil Engineers in London, and the Becquerel Award of the Academy of Sciences in Paris.

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The *Journal* of September 1944 published some current information, based on a survey, about the disciplines to which the corporate membership of the Institute belonged. It was made up of the following::

|                 |     |
|-----------------|-----|
| Civil.....      | 46% |
| Mechanical..... | 23% |
| Electrical..... | 21% |
| Chemical.....   | 5%  |
| Mining.....     | 3%  |
| Other.....      | 2%  |

The total corporate membership of the Institute in 1944 was 4000, and the total for all classes was 6700<sup>6</sup>.

Considering the three largest groups, these figures were very close to those established by the Wartime Bureau for Technical Personnel, for which 42 percent were civil, 29 percent were mechanical, and 29 percent were electrical.

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<sup>6</sup> In the years just after World War II, Huet Massue - a member of the Institute - undertook extensive analyses of the membership of CSCE and EIC. Some of his results appeared in the *Journal* from time to time. They were all consolidated into a report prepared by Massue and issued in 1948. The statistics for Newfoundland and Labrador were not included with those for Canada since that province did not join Confederation until 1949.

Three Presidents of the  
Engineering Institute of Canada:

Chalmers J. Mackenzie  
1941

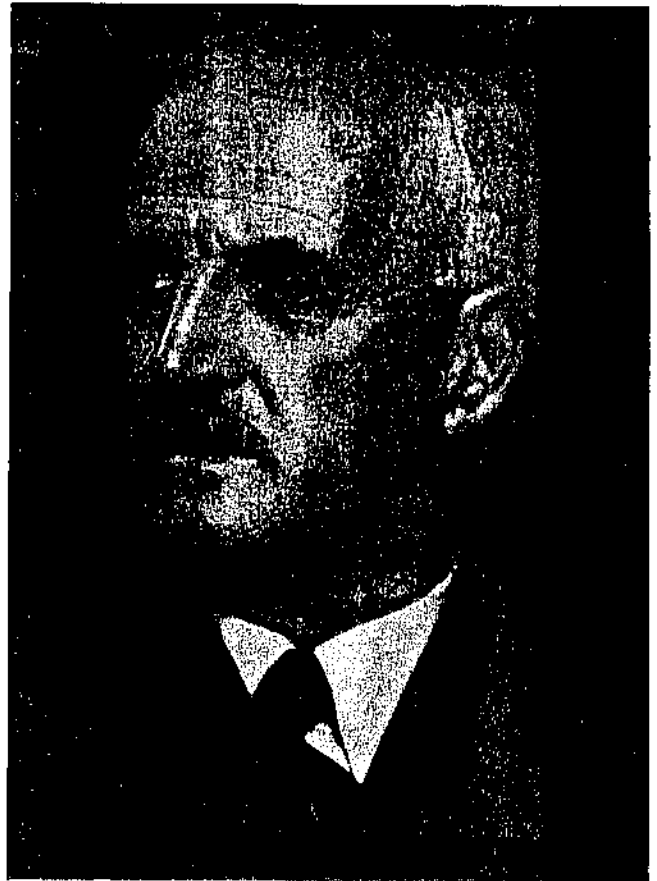
(Right)

de Gaspé Beaubien  
1944

(below)

Edward P. Fetherstonhaugh  
1945

(below right)

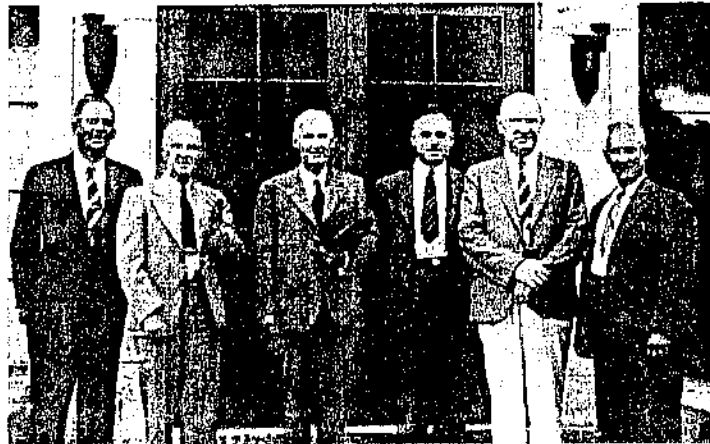




**LETHBRIDGE, ALTA.**  
Wm. Meldrum, chairman of the branch



**VICTORIA, B.C.**  
R. C. Farrow of the executive; E. W. Izard, chairman; K. Reid, secretary-treasurer



**REGINA, SASK.**

P. C. Perry, chairman; C. J. McGavin; H. S. Carpenter; J. J. White, secretary-treasurer; D. A. R. McCannel, president of Dominion Council of Professional Engineers; G. L. Mackenzie



L. Austin Wright

General Secretary Wright visits the West  
July 1940

# The President, Council and members of The Institution of Electrical Engineers,

on the occasion of the Ordinary Meeting of The Institution held on Thursday,  
8th May, 1941, wish to place on record their appreciation of the invitation  
received from

## The Engineering Institute of Canada

that The Institution should, on their behalf, present to

**Lieut.-General A. G. L. McNaughton, C.B.E., D.S.O.,**

the

## Sir John Kennedy Medal

awarded to him for "his noteworthy contribution to the science of engineering".

Since some years before the outbreak of the present war this Institution has advocated and fostered closer co-operation between Engineering Institutions in Great Britain and their sister Institutions in the overseas countries of our Commonwealth of Nations; the opportunity to carry out this ceremony on behalf of The Engineering Institute of Canada has therefore been especially welcome at a time when activities towards that co-operation have necessarily had to be curtailed. It adds to the Council's pleasure in arranging this ceremony that General McNaughton has long been an Associate Member of The Institution of Electrical Engineers.

The members present at this meeting extend a hearty welcome to General McNaughton and offer him their warm congratulations, not only on the signal honour in the engineering field conferred on him by the award of the Medal, but on the great distinction which he has achieved in a wider sphere by his appointment as head of the Canadian Forces in Great Britain during the present momentous conflict.

The contribution which is being made by Canadian Engineers to the war effort is recognised to be one of inestimable value in the vital place that is being taken by Canada in the cause of freedom at the side of the Mother Country.

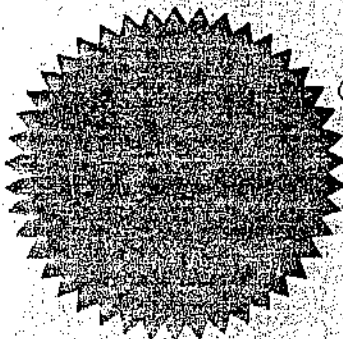
A facsimile copy of this Address is being handed to-day to General McNaughton in commemoration of the occasion of the presentation to him of the Medal.

**Witness** our hand and seal at Westminster this 8th day of May, 1941.

*James R. Beard* President.

*Johnston Wright* Past President.

*John Ashke* Secretary.



Reproduction  
of the Address  
by the Institution  
of Electrical  
Engineers, London  
at the presentation  
of the Sir John  
Kennedy Medal to  
Lt. Gen. A.G.L.  
McNaughton,  
May 1941



Lt. Gen. A.G.L.  
McNaughton





President and Madame Beaubien visit the Saguenay Branch  
August 1944

In comparison with the breakdown of the membership by discipline when CSCE was founded in 1887 and almost all of the membership were civil engineers, the 1944 figures show that fewer than half were civils. This also shows the extent to which diversified industrial development had taken place in Canada.

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The Council's Annual Report for 1944 - published in the February 1945 issue of the *Journal* - included reports from the various committees. Of the comparable list for 1927 (*see above*), nine were still in place: Finance; Library and House; Legislation; Papers; Publications; and the Board of Examiners; plus those for the Gzowski, Leonard and Plummer Medals. The remaining eight had been disbanded: Engineering Education; the Canadian National Committee for the International Electrotechnical Commission; International Co-operation; Canadian Engineering Standards; Honour Roll and War Trophies; Concrete Deterioration in Alkali Soils; Biographies; and the Past Presidents' Fund.

The mandates of the 17 new committees reflected the concerns of the Council for employment, the professional welfare of engineers, and new technical problems, plus those for the more recently established medals and prizes. They were:

|   |                                       |
|---|---------------------------------------|
| Employment Service                      | Industrial Relations                  |
| Employment Conditions                   | Prairie Water Problems                |
| The Engineer and the Civil Service      | Deterioration of Concrete Structures  |
| Training and Welfare of Young Engineers | Engineering Features of Civil Defence |
| Professional Interests                  | Nominations                           |
| The Engineer in the Active Services     | Keefer Medal                          |
| Julian C. Smith Medal                   | Ross Medal                            |
| Duggan Medal                            | Students and Junior Prizes            |
| Canadian Lumbermen's Association Prize  |                                       |

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This Annual Report also published the financial statements for 1944, as well as the reports from the branches.

Financially, revenues and expenditures balanced at just under \$80,000, including a surplus of \$3000. The statement of assets and liabilities put these at \$98,000.

Most branch reports offered lists of technical and other meetings, and some offered additional comments on certain of their activities. The two largest branches had the two longest reports! Here are some examples:

#### Cape Breton Branch

On April 26<sup>th</sup> President de Gaspé Beaubien visited the Branch. He was accompanied by General Secretary L. A. Wright and Councillor R. E. Heartz. The presidential party had luncheon with the officers of the branch and other prominent engineers at The Cove. In the afternoon a trip was made through the rolling mills and that evening there was a dinner meeting which combined the annual meeting of the branch and the reception to the president. The dinner started under the chairmanship of J. A. MacLeod, the retiring chairman, who handed over during the course of the programme to M. F. Cossitt, the new chairman of the branch.

The following morning the party was taken to visit some of the power plants of the Dominion Steel & Coal Company, returning at noon to have luncheon with the officers of the branch. In the afternoon, the party divided, some visiting the naval base and others taking in points of interest having to do with National Defence.

#### Ottawa Branch

The following meetings were held during the year, the attendance being shown in brackets:

Jan. 13 - Annual evening meeting, auditorium, National Research Council. Showing of two films: 'The Banff-Jasper Highway,' and 'The Story of Canadian Pine.' (80)

Feb. 3 - Luncheon Meeting, Chateau Laurier. 'Reconstruction and Re-Establishment' by Hon. Gray Turgeon, MP. (133)

Feb. 24 - Evening meeting, auditorium, National Research Council. 'Electricity in Modern Warfare' by G. E. Bourne, General Electric Company. (75)

Mar. 9 - Luncheon meeting, Chateau Laurier. Sound colour film, 'Oil for War,' courtesy of The Barrett Company, Montréal. (132)

Apr. 17 - Joint evening meeting with the Illuminating Engineering Society, auditorium, National Museum. 'The Engineer Looks Ahead' by M. J. McHenry. (80)

May 4 - Evening meeting, auditorium, National Research Council. Sound colour film, 'The Manufacture of Laminated Plastics' courtesy of Arnold Banfield & Company, Toronto. (90)

Oct. 12 - Luncheon meeting, Chateau Laurier. Assistant Commissioner V. A. M. Kemp, RCMP, spoke on 'The Application of Science to Criminal Investigation.' (110)

Nov. 9 - Luncheon meeting, Chateau Laurier. Sound colour films, 'Construction of the Trans-Canada Highway' courtesy of the Ontario Department of Highways, with commentary supplied by the chairman. (110)

#### Calgary Branch

During the year, the branch executive met seven times.

The following were the branch activities for the year 1944, with attendance in brackets:

Jan. 13 - 'History of Exploration in the Canadian Rockies' by Dr. H. H. Beach. (52)

Jan. 27 - 'The Electronic Microscope' by C. K. Chisholm. (65)

Feb. 10 - 'Waterworks Systems of Alberta and Some of Their Attendant Problems' by D. B. Menzies. (52)

Feb. 24 - 'The Alaska Highway' by Major General W. W. Foster. (124)

Mar. 11 - Annual Meeting, followed by Dinner. (42)

Mar. 23 - 'The Operation of the Alberta Nitrogen Products Company' by D. D. Morris. (68)

Oct. 24 - Dinner Meeting, followed by the President's Address. (148)

Nov. 2 - 'Coal and Coal Mining' by H. Wilton Clarke. (61)

Nov. 16 - 'Air Transportation' by J. Moar. (34)

#### Victoria Branch

During the year there were four meetings of the executive committee and five general meetings of the branch. The branch meetings may be summarized as follows:

Jan. 15 - Lecture meeting. 'Flying Control and Air-Sea Rescue Work' by Squadron

Leader R. M. Donaldson and Flight Lieutenant G. H. Lee. This meeting was held under the joint auspices of the Oak Bay ARP organization and the Victoria Branch, EIC. In addition, the air cadets of the Greater Victoria High School were in attendance. There was a total of about 500 people present. The talk was accompanied by a film entitled 'Prepare for Ditching.'

Feb. 1 - Lecture meeting. 'Into Unseen Worlds' by K. G. Chisholm, sales engineer of RCA Victor of Winnipeg. The talk was illustrated by a film, also entitled 'Into Unseen Worlds,' and by slides. Attendance was 60.

Aug. 2 - General discussion meeting. This meeting was held in the Oak Bay municipal hall to discuss the subject of collective bargaining. Attendance was 12.

Nov. 5 - General meeting. This meeting was called to hear President de Gaspé Beaubien, General Secretary L. A. Wright and Mr. Heartz, chairman of the Institute Committee on Employment Conditions.

Nov. 6 - President's visit. A dinner meeting was held at the Empress Hotel in honour of the visit of the presidential party. About 55 members and their ladies were present. Mr. Beaubien gave a very inspiring address concerning the place of the engineer in the Canadian scene.

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The same 25 branches of the Institute across the country were in place from the 1920s until mid-1940s, when the 26<sup>th</sup> branch - at Sarnia, Ontario - was established by the Council, and announced in the July and August 1945 issues of the *Journal*. One of the principal reasons for its establishment within the jurisdiction of the Border Cities Branch was that wartime restrictions had made it almost impossible for members in Sarnia to attend meetings in Windsor, and vice versa.

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Two landmark papers of interest to more than the engineering profession in Canada appeared in the September issue of the *Journal*.

The title of the first, 'The Atomic Bomb and Canada's Contribution To It,' is somewhat misleading as it described the fission process and the plans in place for the building of a new plant (*the Petawawa Works*) at Chalk River, on the Ottawa River, a hundred or so miles north-west of Ottawa. It noted that this plant would produce bomb-grade plutonium - not surprisingly, only a month after the Japanese surrender - as well as large quantities of radio-active materials for use in medicine and research. It did suggest, however, that since the war had ended, the plant might now be devoted to peaceful rather than warlike applications of its products, such as nuclear power.

The second paper, 'Engineering Investigation of the Water Resources of the Columbia River Basin'

by Victor Meek of the Department of Mines and Resources in Ottawa was really a short progress report, rather than a final one with conclusions, and was written in accordance with the agreement of March 1944 between the Canadian and United States governments to determine whether the further development of the water resources of this river basin would be practicable and in the public interest. The work was being done for the International Joint Commission by a four-person engineering board and a four-person engineering committee appointed by the Commission. In the paper, the author commented:

“In Canada, inauguration of the various phases of field investigations involved in the overall study had to be completely organized but considerable progress has been achieved already and is being forwarded in such fields as aerial photography, reconnaissance surveying, stream gauging, precise levelling, triangulation surveying, topographic mapping and groundwater studies. Much of this preliminary work has been initiated in the tributary Kootenay River basin where the urgency of consideration of storage, flood control, water power and reclamation problems dictated a priority of treatment.

“In the United States, the investigations in most instances represented a continuation and co-ordination of field surveys already well under way and progress is further advanced and covers a wider field of study.”

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In contrast with the beginning of World War II, when the *Journal* printed editorial comments on it, there was no similar editorializing at the end of this conflict. It was as if the magazine had been anticipating the event for a long time and found no comment necessary. Among the papers published about the profession around this time, most dealt with the future, the transition from wartime to peacetime, and the welfare of the engineer. An exception was the paper, ‘Canadian Engineers’ Contribution to Victory,’ delivered by General A. G. L. McNaughton to a joint meeting of the EIC Border Cities Branch and the ASME Detroit Section on 5 October 1945. It was published in the *Journal* in November.

This address was principally concerned with the application of science and engineering to weaponry and with subjects such as: Canada’s part in the inception, development and production of newer and better weapons; Canada’s position in the British Commonwealth and in America; the supply situation in Canada at the outbreak of the war; the periods of improvisation for defence in Britain and for the renewed offensive on the continent of Europe; and lend-lease and mutual aid. The General ended his address with these words:

“We have entered, and are far along, into the period of the application of science to war and the rate of acceleration makes the arms of today of lessened value for tomorrow. Already we have the atomic bomb, a decisive weapon in this year and day of grace, but it as well represents nothing more than a transient advantage unless we maintain our

lead; for the means to counter are already clearly in sight.

“If we are to retain our place as the wardens of peace, the most important thing we have to do is to maintain our research and development, to continue to produce the newer and better weapons, at least in prototype, and to ceaselessly experiment to master the technique of their employment.

“In this great task, I earnestly hope that Canada and the United States will long continue the satisfactory and fruitful collaboration which they have achieved in these matters.”

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### **In Conclusion**

Very, very briefly, as the writer and selector, I would hazard the guess that almost all of the above would be *NEWS* to today's readers. This was the intention of the exercise in the first place!

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