

THE CEDARGROVE SERIES OF
DISCOURSES, MEMOIRS AND ESSAYS

#3/2006

**RECOGNIZING ENGINEERING MERIT:
THE AWARDS OF THE ENGINEERING INSTITUTE OF CANADA**

by Andrew H. Wilson

May 2006

Abstract

The text of this paper was the basis of a presentation by the author to the 2005 Biennial Conference of the Canadian Science and Technology Historical Association (CSTHA). The text that follows is a slightly expanded version of the presentation. It covers the origins of the medals, honorary memberships, fellowships and other awards of the Canadian Society of Civil Engineers and the Engineering Institute of Canada, from 1887 until 1997. Most of them are still being awarded annually, either by the Institute or by the Member Societies to which they were assigned sometime after these Societies came into existence in the 1970s. Only a few have been retired or discontinued.

The paper includes the names of some of the initial winners of these awards, but not the complete lists. These can be found, in whole or in part, in the Honours & Awards section of the EIC website (www.eic-ici.ca).

About this Series

Principally, the Cedargrove Series is intended to preserve some of the research, writings and oral presentations that the author of this present paper has completed over the past half century or so but has not yet published. It is, therefore, a modern day variant of the privately published books and pamphlets written by forebears, such as his paternal grandfather and grandmother, and his grandfather's brother John.

About the Author

He was born in Penicuik, Scotland, in 1928 but since 1945 has not lived there. For some years, his wanderings were limited to the British Isles in pursuit of a university education and various kinds of working, military and social experience. Then in 1957 he flew across the Atlantic to settle in Ontario, Canada, and - while visiting other parts of the world from time to time - has had his home and family base there ever since. The majority of his working life was spent in the service of various agencies of the Government of Canada, from which he retired in 1986 to become a consultant, writer and editor. He has also served in leadership positions in the engineering profession in Canada and, more recently, has written extensively on the history of engineering.

Introduction

The Canadian Society of Civil Engineers (CSCE, the Society) was founded in 1887 as the 'learned' society within the emerging engineering profession in Canada. In 1918, its name was changed to the Engineering Institute of Canada (EIC, the Institute) to reflect developments in the discipline orientation of its members and to encourage more non-civils to join. From its early days, CSCE - as a society devoted to the exchange of technical information - established a series of 'best paper' awards that recognized merit amongst those of its members who presented papers at technical meetings, and later published them in the Society's *Transactions*. CSCE also established an elective award known as Honorary Membership to provide some eminent people with a form of association with the Society, and later with the Institute. This process was continued by EIC, which established a number of awards that recognized meritorious contributions by members to the Institute, the profession and to the science, technology and management of engineering. In the early 1960s, the EIC Council also established the elective membership grade of Fellow to recognize excellence in engineering and service to the profession and to society.

For many years, the various awards were administered by the Society or Institute Councils or by small expert committees appointed by the Councils to consider the nominations, which were often invited from the membership. The first Institute-wide Honours and Awards Committee was not formed until 1959 and, in 1962, a separate one was formed to look after the Fellows. These two committees were amalgamated in 1985 and became known as the HAF Committee. However, the Institute Council still has the last word on all awards and may add to, or remove, names from the lists provided by the Committee.

Both CSCE and EIC have used the word 'medal' to mean just that: a medal is being given. The words 'and prize' could be added to 'medal' when a monetary reward is also being given. The word 'prize' by itself means there is a reward (either monetary or in kind) without a medal. The use of the word 'award' in a designated sense means that recipients receive certificates rather than medals although, for some time now, medal winners have also received appropriate certificates.

The principal sources of the information given in this present paper were the CSCE's *Transactions*, the EIC's *Engineering Journal*, the honours and membership lists of CSCE and EIC, and the *Book of Honours and Awards* compiled in the 1990s by the then chair of the HAF Committee, Remy Dussault.

The CSCE Awards

The earliest award established by CSCE was *Honorary Membership*. The qualifications for election to it were defined in the very first set of By-Laws of the Society in 1887, as follows:

"Honorary Members shall be distinguished men who, by virtue of their position, may be able to further the objectives of the Society, or who may be eminent in engineering or kindred sciences, but who are not engaged in then practice of engineering in Canada."

It should be noted at this point that, for some time now, distinguished women have also been elected to honorary membership in the Institute.

Clearly, from the beginning, honorary membership was the vehicle through which CSCE could attract the attention and support of eminent and influential people in Canada and, especially, in Great Britain. The first two men so elected were the Governor General, Lord Stanley of Preston, and Sir J. William Dawson, the distinguished Canadian natural scientist and founder of the Faculty of Engineering at McGill University. The election of Lord Kelvin followed shortly afterwards. By the time EIC was formed in 1918, some 25 honorary members had been elected, including several Governors General, the Lords Strathcona and Shaughnessy, Sir Sandford Fleming, Sir John Kennedy and the founding president of CSCE, Thomas Coltrin Keefer. The Prince of Wales, later King Edward VIII and the Duke of Windsor, was elected in 1919.

By 1937, those elected included federal Cabinet ministers and CSCE/EIC past presidents. Prince Philip became an honorary member in 1953 - the last Royal to be elected. The first woman elected was the American, Dr. Lillian Gilbreth. Between 1975 and 2000, the practice was to elect non-engineers who had been of special service to engineering and engineers in Canada. Only one posthumous award of honorary membership has so far been made - to the Hon. Robert Bourassa, the former Quebec premier whose most notable engineering association was with the James Bay hydro-electric project.

In comparison with the earlier years, one might argue that, over the 30 to 40 years, the eminence of elected Honorary Members has "slipped" somewhat - no Royalty, Governors General or federal Cabinet ministers, for example. But it is still the means available to EIC to recognize contributions by men and women who have distinguished themselves in the service of engineering in this country and to attract attention and support.

The first of the 'best paper' awards was the *Gzowski Medal*. It was established and funded by Sir Casimir Gzowski in 1890, when he was president of the Society. The initial rules for its award were set at the AGM in 1891. It could only be won by members for papers published the previous year that were of "sufficient merit as contributions to the profession of civil engineering." A small committee would judge the nominations and select the winner. If none was of sufficient merit, no award would be made for the year in question. The rules for the later CSCE/EIC 'best paper' awards mirror those for the *Gzowski*.

The first winner of the *Gzowski Medal* was H.E. Vautelet for his paper on "Bridge Calculations." The papers by subsequent winners covered mechanical, electrical and other subjects in addition to those in civil engineering.

With the addition after 1917 of the *Leonard* and *Plummer Medals* for mining and chemical/metallurgical engineering papers (which I will deal with in a moment), the purview of the *Gzowski* was narrowed. Later, in 1935, the *Duggan Medal* was established for papers on the use of metals for structural and mechanical purposes. In 1942, the *Keefer Medal* was added as a second

civil engineering paper award, leading to complications for the *Gzowski*. But that same year, the *Ross Medal* was established for electrical engineering papers, reducing the pressure on the *Gzowski*. With time and experience, the fields covered by the two civil medals were clarified. And finally, in 1957, when the *Angus Medal* was added to cover mechanical engineering papers, all of the principal disciplines had their own 'best paper' awards.

The Earlier EIC Awards

Over the years, CSCE and EIC presented awards to *engineering students*. Beginning in 1902, prizes of \$25 each were awarded for the best papers presented at technical meetings by student members in each of four categories: electrical; mechanical; mining and general (civil) engineering. In some years, there were multiple awards in some categories, and none in the others. In other years, there were fewer than four awards altogether, or none at all. During World War I, the categories were abandoned and a single award was made...or not made.

This program was terminated in 1927, to be replaced the following year by a new 'best paper' award - based this time on four zones across Canada. The student and junior memberships of the Institute were eligible for nomination. The five prizes were named after past presidents of CSCE: the H.N. Ruttan for the four Western provinces; the John Galbraith for Ontario; the Phelps Johnson for Quebec (English) and Ernest Marceau for Quebec (French); and the Martin Murphy for the Maritime provinces. Each zone had its own small selection committee. The value of the prizes was again \$25, in the form of books or instruments chosen by the winners. The pattern of awards was again irregular. The program was discontinued after World War II.

In 1930, the Institute's Council established cash prizes of \$25 each for competition among students at each of the 11 Canadian engineering schools in the year prior to their graduation. This program was administered by the schools, and students in all departments were eligible. They were judged for their papers and for their participation in the schools' engineering societies and the local learned societies. This program was terminated by EIC in the 1970s, when it - or an equivalent - became the responsibility of the Member Societies of the Institute.

I mentioned the *Leonard Medal* a moment ago. In 1917, Lt. Col. Rueben W. Leonard, president of CSCE two years earlier, established a fund to provide a gold medal to be awarded annually for the best original paper on a mining engineering subject presented at a technical meeting of EIC or of the Canadian Institute of Mining and Metallurgy. The competition was open to members of both Institutes. It was, however, an EIC award and was presented for many years at its annual meetings. The five judges, appointed by the EIC Council, had to belong to both institutes. The first award was made in 1919 to E.E. Campbell for his paper on "Hidden Creek and its Operations." *Leonard Medals* were awarded regularly for more than half a century.

I also mentioned the *Plummer Medal*. Funding for this second gold medal was also provided in 1917. It was named for Dr. J.H. Plummer, who had established the fund. It was awarded annually for the best original paper on a chemical or metallurgical subject by a member of EIC and presented at an Institute

meeting. A five-person committee administered the award. The first winner, in 1920, was Alfred Stansfield for his paper on "Recent Developments in Metallurgy in Canada." As with the *Leonard Medal*, the *Plummer* was awarded almost every year for many years, latterly in cooperation Mining and Metallurgy Institute.

Funding for the *Past Presidents' Prize* was established in the 1920s by then-living past presidents of the Society and the Institute. This prize was rather different from the usual 'best paper' award. It given for an original essay written by a member and submitted to the Council on a topic selected by the Council in consultation with the Institute's branches. The subject chosen had to be in keeping with the EIC's objectives. The judges were a committee of five full or honorary members appointed by the Council. The prize consisted of cash, or instruments or books up to the same value. The winning essays would normally appear later in the *Engineering Journal*.

The first *Past Presidents' Prize* was awarded in 1930 to Group Captain E.W. Stedman for his paper on "Rigid Airships." You will recall that the British airship, the R-100, visited Canada in September of that year. The 1931 prize was awarded to A.W.F. McQueen for his paper on "Engineering Education." A student member, Eric G. Adams, won in 1932 for his paper on "The Relation of Economics to Engineering." Eventually, however, enthusiasm for this program waned and some of the later submissions more or less ignored the chosen topics. The last award was made in 1939 and the program was terminated in 1941.

The *Sir John Kennedy Medal* was the first to recognize meritorious life-time contributions by members to the Institute, the profession and the science and technology of engineering, and was established in 1927. Originally a gold medal, it commemorated Sir John's own distinguished contributions during his lifetime. Its administration remained in the hands of the Council until the establishment of the first H&A Committee around 1960. Originally, also, the branches were asked for nominations and the final decision was reached by letter ballot. Unlike the other medals, this one has usually been awarded on a two-year rotation. It was, and still is, the most senior award of the Institute.

The first recipient, in 1928, was Lt.Col. Rueben W. Leonard, and the second was Professor George H. Duggan in 1930 - both of whom were past presidents of CSCE. Indeed, the majority of the recipients until the late 1970s held the presidential office. Since then, most have been senior industrialists, consulting engineers and academics. Throughout its history, there have seldom been multiple winners in the same year.

The *Duggan Medal and Prize* was established by EIC in 1935 to honour Professor George H. Duggan, CSCE's president in 1916. It was financed in part by a donation from Dr. Duggan and was awarded originally for the best paper by a member of the Institute dealing with the use of metals for structural or mechanical purposes. The first winner was Philip L. Pratley for his paper on "The Superstructure of the Reconstructed Second Narrows Bridge, Vancouver." Until quite recently, the majority of the recipients were from the civil discipline. In the 1960s, the 'prize' element was abandoned due to a lack of funds.

To perpetuate the memory of Julian Cleveland Smith, the Institute's president in 1928, a fund was established in 1939 by a small group of senior members to be used by the Council for a memorial medal to be awarded annually "for achievement in the development of Canada." Dr. Smith had been one of Canada's most prominent developers of hydro-electric power.

Originally, the administration of the *Julian C. Smith Medal* was by a small committee appointed by the Council. Nominations were sought from past presidents and vice presidents of the Institute. The final decision was made by letter ballot of the current members of the Council. Again, this arrangement remained in place until the Institute-wide H&A Committee began its work around 1960. Effectively, this medal was, and still is, the second-ranking award within EIC. Over the years, the interpretation of 'achievement in the development of Canada' has been wide and generous. It was decided that there would be multiple inaugural awards, in 1940 and 1941. Subsequently, it became the practice to award two per year, although the Council could increase this number if there were special reasons. As with the *Kennedy Medal*, the *Smith Medal* has never been awarded posthumously.

The *T.C. Keefer Medal* was established by the Council in 1942 to perpetuate the memory of the founding president of CSCE, Thomas Coltrin Keefer. It was to be awarded for the best paper on a civil engineering subject, although the term 'civil' was limited to surveying, structural and construction work. As I have already noted, it 'co-occupied' the civil field with the *Gzowski Medal* and, to a lesser extent, the part of it covered by the *Duggan Medal*. This caused some difficulties, which were subsequently resolved. The first winner of the *Keefer Medal* was Max V. Sauer for his paper "St. Lawrence River Control and Remedial Dams - Soulanges Section."

Also established in 1942 by the EIC Council was the *Ross Medal*, to perpetuate the name of yet another past president. As I have noted already, it was given for the best paper presented to the Institute on an electrical engineering subject. The first winner of the medal was R.A.H. Hayes for his paper on "Electrical Equipment at Shipshaw." It was awarded regularly for the next 30 years.

The *Canadian Lumbermen's Association Prize* was established in 1944, following negotiations between the Association and the Institute. Its purpose was to encourage the study of the uses of wood and the presentation and discussion of papers on the subject in the EIC branches. It was a 'best paper' award, given annually, and the prize was \$100. It was open to Canadian residents, and not just to Institute members. A committee of five - all EIC members - judged the entries. The *Engineering Journal* issue of February 1945 announced the first winner as Carson F. Morrison for his paper on "Modern Timber Engineering." However, in succeeding years there were only sporadic announcements of winners. Sometime after 1961, this prize was no longer included in the EIC's annual list.

The *Angus Medal* was established by the EIC Council in 1957 to honour the late Robert W. Angus, the first professor of mechanical engineering at the University of Toronto, the first head of its ME Department, and an honorary member of the Institute. As I said earlier, it 'rounded out' the medal coverage for 'best papers' in the principal engineering disciplines. The *Angus* was awarded initially for a paper on a mechanical engineering subject, with particular reference to ME practice. The administration of the award was in the hands of a small committee. The first winner, in 1958, was

Russell J. Kennedy for his paper on "Forces Involved in Pulpwood Holding Grounds."

In the early 1960s, the Institute gave the *Sir George Nelson Award* for a 'best paper' on the science of electrical engineering. The one winner who can be identified from the *Engineering Journal* was in 1961: K.H. Williamson, for his paper on "Load Frequency Control System of the Manitoba Hydro-Electric Board."

Since 1963 the Council of the Institute has elected annually to the grade of Fellow a number of its members - and since the early 1970s, members of its Constituent/Member Societies - in recognition of their excellence in engineering and their services to the profession and to society. It was intended originally that the value of an EIC fellowship would be enhanced if the number awarded each year was small. This policy was maintained until 1969, when it was felt that many more members deserved the kind of recognition a fellowship conveyed. Subsequently, the numbers elected annually varied from a few to as many as fifty. The years with the largest numbers, however, attracted negative comments from some members, with the result that - since the mid-1980s - the numbers have been smaller, stabilizing at 15 per year when there were only five member societies, but slightly larger now as the number of Societies has increased. When the fellowship program began, and for some years afterwards, corporate members of the Institute could be nominated by their peers or could apply to upgrade their status. But this latter possibility was seldom used and was discontinued.

The Latest EIC Awards

Three new medals have been established by the Institute in recent years.

One was the *John B. Stirling Medal*, approved by the Council during the Centennial of Engineering in 1987, and awarded annually in recognition of leadership and distinguished service over many years within the Institute and its Member Societies at the national level. It was funded through the generosity of E.G.M. Cape & Company Limited to honour Dr. Stirling, who had been president of both the company and the Institute and who, incidentally, had served for many years as chair of the H&A Committee. The first awards were made in 1988. An average of two recipients were named for the first five years, and thereafter one per year.

The second was the *Canadian Pacific Railway Medal*, also approved in 1987, and awarded in recognition of leadership and distinguished service at the regional and local levels within the Institute and its Member Societies. The first awards were again made the following year. It was funded initially through the generosity of CP Rail to honour its past achievements in engineering and in the development of Canada. The terms of reference for this medal allow up to two recipients per year. In most years, however, there has only been one.

The third, and latest, medal - the *K.Y. Lo* - was established in 1997 by a group of former students to honour Professor Lo of the University of Western Ontario. It is awarded annually - for the first time in 1998 and recognizes significant contributions to engineering at the international level.

Transfers and Retirements

When they were first formed in the early 1970s, the EIC's societies were known as 'Constituent' Societies, the idea being that they would be semi-autonomous and would remain under the general administrative 'umbrella' of the Institute. However, as time passed and the individual societies developed their own activities, programs etc., it became clear that a further change was needed. This happened in the mid-1980s when the individual societies incorporated and became autonomous. They still remained under the 'umbrella' but the connection was more loosely maintained. Through a change in the Institute's By-Laws, the Societies - rather than individuals - became the *members* of the Institute. Hence the use of the term 'Member' Societies. Their number has also increased from five to nine.

One result of the progress of the Societies towards autonomy was that they took over responsibility for the administration of the 'best paper' awards, beginning around 1980. The Civils got the *Gzowski* and *Keefer Medals*; the Mechanicals got the *Angus*; and the Electricals got the *Ross*. The *Duggan Medal* was more of a problem. At first, it was administered jointly by the Civils and the Mechanicals but, effectively in 1985, and with the consent of both societies, it was placed in the hands of the Mechanicals.

Around the time of these transfers, the status of the *Leonard* and *Plummer Medals* was also discussed. The Institute's interest in mining and chemical/metallurgical engineering had been waning since the 1960s and the annual nominations for these two medals had become fewer. But having had the Canadian Institute of Mining and Metallurgy as a partner in the later years, it seemed logical to offer them for the exclusive use of this Institute. The offer was, however, declined, and these two medals were officially retired by EIC.

To Conclude...

The awards established by CSCE and EIC have recognized two main types of professional contribution: the dissemination of significant technical knowledge; and excellence, leadership and service, usually over the length of careers, to engineering and to the Institute itself. While the terms of reference of the individual awards may have been changed over the years, these changes have not been to the objectives of the awards. The advent of the Constituent/Member Societies has also strengthened the recognition factor throughout the Institute as a whole since each Society, in addition to assuming the administration of former EIC awards, has established awards of its own. Details of the latter are beyond the scope of this present paper.

The extent to which past presidents of CSCE and EIC have participated in the establishment of the awards, as well as in receiving them, has been significant. Also, the lists of the winners of the *Kennedy* and *Smith Medals*, in particular, provide a veritable 'Who's Who' of the profession over the years. The 'best paper' medals have provided academics, in particular, with Canadian recognition for their contributions to engineering science and technology. At one time, industry people also made good use of them.