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THE KNIGHTS OF ENGINEERING: YESTERDAY AND TODAY

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Abstract

Around the turn of the 20th century, when Canadians were still eligible to accept British honours, a number of distinguished Canadian engineers received the accolade of knighthood. At least two - Casimir Gzowski and Sandford Fleming - were well known and have remained so; others, like John Kennedy and Edouard Girouard, less so. Still others, who were not Canadians, but who had connections to Canadian engineering, also became knights.

Since the introduction of the Order of Canada in 1967, a number of today's distinguished engineers have been admitted to its highest grade, that of *Companion*. It could be argued that the Order and this grade have replaced knighthoods. This paper will discuss the knights, provide some biographical background, and explore this latter proposition. The main source materials were the records of the Canadian Society of Civil Engineers (1887-1918) and its successor (since 1918), the Engineering Institute of Canada.

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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.

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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 and has chaired Engineering Institute of Canada committees dealing with the history of the Institute itself and Canadian engineeering 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.

Andrew H. Wilson

Introduction

Let me assure you that the idea for this paper had nothing to do with the altercation that arose between Prime Minister Chrétien and Conrad Black over an offer of a British peerage to the latter. Nor had it any connection with the more recent award of British knighthoods to dual citizens Terry Matthews (who is an engineer as well as an entrepreneur) and George Bain (who is principal of Britain's Queen's University, in Belfast).

It does owe something to the research carried out by Richard White in connection with the Engineering Institute of Canada's nomination of Sir John Kennedy for designation by the Historic Sites and Monuments Board as a "person of national historic significance." Richard asked me how many Canadian engineers had, like Kennedy, received the accolade of knighthood and I looked into this using my records for the Canadian Society of Civil Engineers (CSCE), founded in 1887, which became the Engineering Institute of Canada (EIC) in 1918.

In 1919, the resolution sponsored by Bolger Nickle, MP, in the Canadian Parliament asked Britain not to give peerages and knighthoods to Canadians living in Canada. In theory at least, it has since prevented Canadian citizens permanently resident here from accepting British titles. So I asked the question: What form of national recognition could deserving people in this country receive nowadays? The answer appeared to be the Order of Canada and, in particular, its grade of Companion. The "C.C." also seemed to me to outrank the many medals, degrees and other awards given to engineers in recognition of individual merit and achievement by the provinces, national and provincial engineering societies, the universities and the engineering profession generally.

In my research I discovered that eight members of CSCE and EIC, and one non–member, had been knighted. So were two associates of the Society: that is, men not trained as engineers, who had been admitted to it on the strength of their services to the engineering profession. There was also a member who had earned the accolade before coming to work in Canada, and another who received it after coming here, but for work done in - or for - Great Britain. All but one were "pre-Nickle" - had been knighted by1919. None received a hereditary baronetcy. I also discovered that several British engineers had joined the CSCE or EIC as members while working principally in Britain. With the assistance of the Chancellery Branch at Rideau Hall, I was able to obtain a listing of those who, since 1967, had been admitted as Companions within the Order of Canada.

No Canadian engineer has been raised to the peerage, although the lists of honorary members of the CSCE, and later the EIC, contain quite a few British and Canadian peers of the realm. Included were: "Royals" such as the Duke of Windsor and - in more contemporary times - the Duke of Edinburgh; scientists such as Lord Kelvin; Governor Generals such as Lord Aberdeen and Lord Tweedsmuir; and Canadians such as Lord Strathcona and Lord Shaughnessy. There was Lord Congleton, who was born in Ireland and educated in England and at McGill University. He practised as an engineer briefly in this country, joined the EIC in 1922, but returned to live and work in the Britain. His title was hereditary. Baron Boris de Hueck also had a hereditary title. He was born in Russia and educated there and in Latvia, came to Canada in 1921 and, from then until his death in

1947, worked in Montréal, Cornwall and New York.

The Ten Member Knights

The eight "fully Canadian" engineering knights were Casimir Gzowski, John Kennedy, Sandford Fleming, Collingwood Schreiber, Herbert Holt, Alexander Bertram, Percy Girouard and Godfrey Rhodes. To these should be added two others: Henry Japp, a Scotsman, whose work in, and for, Britain earned him his accolade; and Henry Thornton, an American, who became a British citizen but who received the accolade before coming to work in Canada.

What manner of men were they?

The most colorful was probably Casimir Gzowski. Of Polish origin, he was born in St. Petersburg, Russia, in 1813, where he attended military college and, in 1830, was commissioned as an engineering officer in the Imperial Russian Army. However, he took part in the Polish insurrection of 1830-31 and, after being imprisoned for this, was exiled to the United States and New York in 1833. To perfect his English, he articled as a student of law in Massachusetts. In 1838 he was admitted to the Pennsylvania bar and practised in that state until 1841. He then moved north, to Toronto, was hired by the Board of Public Works of the province of Canada, and appointed superintending engineer of roads and harbours in the Western Division. In 1846 he became a British subject. From 1850 to 1853 he was in Montréal, working on the development of the harbour and the ship channel to Québec. He was then appointed chief engineer of the main line of the Grand Trunk Railway (GTR) but soon resigned, moved back to Toronto, and joined a partnership for the construction of the GTR main line from Toronto to Sarnia. In the 1870s he designed and built the international bridge between Fort Erie and Buffalo and participated in a study of inland waters that anticipated what later became the St. Lawrence Seaway. He took a very active interest in military matters, served as a senior officer in the militia and was president of the Dominion Rifle Association. He was appointed an Honorary ADC to Queen Victoria, was the first chairman of the Niagara Parks Commission, and served briefly as Acting Lieutenant-Governor of Ontario. A founding member of the Canadian Society of Civil Engineers in 1887, he later served as its president. During his three years in this office, he established and funded the Gzowski Medal. Gzowski became a Knight Commander of the Order of St. Michael and St. George (KCMG) in 1890 in recognition of his engineering and military services. He died in 1898.

John Kennedy, Casimir Gzowski's successor as president of CSCE in 1892, was another founding member of the Society. Born in 1838 in Spencerville, Ontario, and educated at McGill, he first worked in engineering on the St. Lawrence Ship Channel below Montréal, under the legendary Thomas Coltrin Keefer. He moved to Ontario while still a young man to be a divisional chief engineer in the Great Western Railway system, but returned to Montréal in 1875 on being appointed chief engineer of the Harbour Commission. He played a significant part in the development and enlargement of the harbour facilities and in protecting that city from the adverse effects of springtime ice jams in the river. By 1907, however, he had become blind and resigned from this position. Nevertheless, the Commissioners appointed him as a consulting engineer and he continued

his engineering career and harbour work. He also served on several Royal Commissions and was instrumental in the founding of the Canadian Engineering Standards Association, now known simply as the "CSA." Kennedy became a Knight Bachelor in 1916 for his services to engineering. He died in 1921. The most senior EIC medal for career service to the Institute and to engineering was established in 1927 and named after Kennedy in recognition of his services to the profession.

Somewhat surprisingly, Sandford Fleming was not a founding member of the CSCE. In fact , he did not join it until 1896, and was never president. He had, however, been a founding member and leading light many years earlier in what was the first attempt to organize a technical society that involved engineers - and became, in time, the Royal Canadian Institute. He also supported the formation of the short-lived Dominion Institute of Amalgamated Engineering. Born in Scotland in 1827, Fleming came to Canada in 1845 and, after studying engineering on both sides of the Atlantic, was appointed to the staff of the Ontario, Simcoe and Huron Railway. He was later named chief engineer of the Northern and Intercolonial Railways. From 1871 to 1880 he was chief engineer of what became the Canadian Pacific Railway and was in charge of the surveys for it across the Prairies and through the Rocky Mountains. However, his recommendations for the CPR route were not followed in the 1880s, although his work facilitated the construction of the Canadian Northern Railway a quarter century later. After leaving the CPR, Fleming became a consultant and also broadened his engineering interests. He was involved, for example, in the laying of the telecommunications cable across the Pacific and, perhaps better known, the development and adoption of the world-wide system of standard time. Although not a university graduate, Fleming was appointed Chancellor of Queen's University (the Ontario one) and served for 35 years. He was also president of the Royal Society of Canada. He was created a Companion of the Order of St. Michael and St. George in 1877 and raised to KCMG in 1897. He died in 1915.

Collingwood Schreiber was born in England in 1831 and trained there as a surveyor and civil engineer. In 1852, he immigrated with his family to Toronto, where he joined the Hamilton and Toronto Railway. Four years later he entered private practice with Sandford Fleming, but left this in 1860 to work as a superintending engineer on the construction of the Northern Railway. In 1864 he was appointed a divisional engineer on the Intercolonial Railway in Nova Scotia. By 1868 this had become a federal project, with Fleming as chief engineer. Schreiber continued to work in Nova Scotia and Prince Edward Island in positions of increasing responsibility. In 1880 he replaced Fleming as chief engineer of the CPR. Later that same year he became general manager of all government railways in operation, working out of the new Department of Railways and Canals in Ottawa where, in 1892, he was appointed deputy minister and chief engineer. Schreiber was a large man, with an enormous capacity for work and known to be an able and effective administrator. But the downside was his tendency to be abrasive and authoritarian - things that did not endear him to his political masters, among others. In 1893 he was made a Companion of the Order of St. Michael and St. George for his work. Schreiber retired from the Department in 1905 but was retained by the federal government as a consulting engineer for the Western Division of the Grand Trunk Pacific and the National Transcontinental Railways. In 1916 he was created a KCMG. He died in Ottawa in 1918.

Herbert Samuel Holt was born in Ireland in 1856. In 1873, at the age of 17, he emigrated to Canada.. His two principal activities that involved engineering were his work as an engineer and contractor on the building of the mountain section of the CPR and his presidency of the Montréal Light, Heat and Power Company, the hydroelectric company he helped put together from the merger of several smaller utilities. But his business interests were much broader than engineering. He was, for example, president of the Royal Bank of Canada from 1908 until 1934. He was also active in mergers involving pulp and paper, textile, coal and steel companies. Holt was elected a member of the CSCE in 1889. He was created a Knight Bachelor in 1915. He died in 1941.

Alexander Bertram was born in Dundas, Ontario, in 1853 into a family that owned one of Canada's foremost machine tool manufacturing companies. At the age of 14 he went to work at the John Bertram plant in Dundas. Over the years he rose through the management ranks to occupy the presidency, which he still did at the time of his death in 1926 at the age of 73. Until 1912 he lived in Dundas but, as the firm had expanded its operations throughout the country, he moved that year to Montréal to direct its affairs from there. Like Gzowski, he was as an enthusiastic member of the militia. He joined the 13th Regiment in Hamilton at the age of 16 as a bugler, but was promoted through the ranks to command the 77th Wentworth Regiment of Hamilton and, in 1905, the 3rd Infantry Brigade, with the rank of Brigadier-General. He also took an active interest in rifle shooting and, in 1909, commanded the Canadian Rifle Team at the international competition at Bisley, England. He also served as president of the Dominion Rifle Association. When World War I broke out, he offered his services to the Minister of Militia and was assigned a leading role in the production of munitions in Canada. In this work, he combined his experience of manufacturing with military requirements, with the support of his fellow Canadian manufacturers. Bertram was, in effect, one of the "fathers" of large scale manufacturing in Canada. In 1915 he was appointed deputy chairman of the Imperial Munitions Board and a year later was created a Knight Bachelor. Bertram also served from 1919 until his death as treasurer of the Engineering Institute of Canada. He was never its president, as John Kennedy was, but, like him, was very active in the Canadian Engineering Standards Association, now the CSA.

Unlike the previous six knights, Edouard Percy Cranwill Girouard spent his professional career outside Canada - in Africa and in Britain. During this career he was a senior government administrator as well as an engineer. Born in Montréal in 1867, Girouard graduated from RMC in 1886 and was commissioned in Britain's Royal Engineers in 1888. He was in charge of the railways in the Sudan from 1896 to 1898, and his construction of a particular bypass line in that country is considered to have made Kitchener's victory at Omdurman possible. Girouard then moved to South Africa and ran railways there from 1899 to 1904, which included the Boer War. He was created a KCMG in 1900. From 1907 to 1909 he served as high commissioner and governor of Northern Nigeria and from 1909 to 1912 was governor of what later became Kenya. However, some of his policies there were in conflict with those of the British government and he resigned. Returning to England, he was a director of the armaments firm, Armstrong Whitworth, from 1913 to 1932 - the year he died - although he did serve the Crown again briefly during World War I as director-general of Munitions and Supply at the War Office. Girouard was elected an honorary member of the CSCE in 1903. He was, like Gzowski and Fleming, and more recently Kennedy, designated by the Historic

Sites and Monuments Board of Canada as a "person of national historic significance."

The career of Godfrey Dean Rhodes mirrors that of Percy Girouard in several respects. Both were RMC graduates and were commissioned in the British Royal Engineers, Rhodes in 1907, after graduation. Both spent their working years abroad and were knighted for their work outside Canada. Rhodes became a Knight Bachelor in 1934, and was the only "post-Nickle" knight in the group. He was also a much-decorated officer during World War I. He retired from the Army for the first time in 1926, but served again during World War II, achieving the rank of Brigadier-General. In peacetime, he worked in Europe, India and Africa, mainly in railways and other forms of transportation. Rhodes was also chief representative in the Africa Office of Sir Alexander Gibb and Partners, the consulting engineers. He became a member of the EIC in 1922. He lived for many years in Kenya and died there in 1971.

Henry Japp was born in Montrose, Scotland, in 1869 and educated there and at University College, Dundee. He was apprenticed to the Caledon Engine Works in that city, and was awarded a Whitworth Exhibition and Medal at its completion. He spent a year at Finsbury Technical Institute in London and two years as a draftsman with a Deptford company before joining S. Pearson and Son Ltd. as a mechanical and civil engineer. A year later, in 1896, he was promoted to chief engineer and, in 1898, became engineering contracts manager. In 1904 he was sent by Pearson to New York as managing engineer of its American subsidiary. In 1914, Japp was made president of S. Pearson and Son and Partners Canada Ltd., and moved to Montréal. However, he soon returned to New York to be with the British War Mission, and returned to England and London in 1920 on his appointment as chief engineer and works director of John Mowlem and Company, a position he retained until his death in 1939. The notable projects with which he was associated included the Surrey Commercial Docks, London, the Prince of Wales Dock, Workington, and the King George V Graving Dock, Southampton, as well as New York's Pennsylvania RR East River Tunnels. Japp joined the CSCE as a member in 1914 and was made a life member of the EIC the month before he died. He became a Knight of the Order of the British Empire (KBE) during World War I.

Henry Worth Thornton was born in Indiana in 1871 and began his career as a draftsman in the chief engineer's office of the Pennsylvania Railroad. He followed this with a variety of engineering positions on the Cleveland and Marietta Railroad. In 1911 he was made general superintendent of the Long Island Railroad. In 1914 he went to England to be general mamager of the Great Eastern Railway which, when World War I broke out, became an important line in military communications. In 1916 he was commissioned as a Colonel in the Army and from then until 1918 held increasingly important military positions, reaching the rank of Major-General. He became a British citizen in March 1919 and was created a KBE in May of that same year. Sir Henry came to Canada in 1922 and for the next 10 years was president of Canadian National Railways. He was elected a member of the EIC in 1924.

Interestingly, one of the best known Canadian engineers of the pre-Nickle period and a person designated to be of "historic significance" - Thomas Coltrin Keefer - was never knighted. He was twice the president of the Canadian Society of Civil Engineers, as well as president of the Royal

Society of Canada and the American Society of Civil Engineers. And his distinction did not go unnoticed within the profession in Britain, where he was awarded honorary membership of the Institution of Civil Engineers. He was appointed to the Order of St. Michael and St. George in the grade of Companion, as were Sandford Fleming and Collingwood Schreiber some years prior to their being raised to KCMG.

The Other Knights

The non-member of the CSCE/EIC was Georges Garneau, who graduated in civil engineering from École Polytechnique de Montréal in 1884. Born at Québec in 1864, his father was in the wholesale dry goods business. After only a few years of engineering practice, Garneau joined his father in this business, becoming president of the company in 1911. In 1908, he was appointed chairman of the National Battlefields Commission, the same year he was knighted for non-engineering services by the Prince of Wales (later King George V) at the time of the tercentenary of the founding of Québec. He died in 1944.

The two knighted associates of the CSCE were William Cornelius Van Horne and Robert Gillespie Reid.

Van Horne was born at Chelsea, Illinois, in 1843. He began his working career as a telegrapher in the United States in 1857. He worked for several railroads and, by 1880, was general superintendent of the Milwaukee Road. He was appointed general manager of the CPR in 1882, where he used his managerial skills to expedite the construction of the railway across the Prairies and through the mountains to Port Moody. Van Horne succeeded George Stephen as president of the CPR in 1888 and developed its business beyond railways. He was created a KCMG in 1894. He died in Montréal in 1915.

Reid was born in Scotland in 1842 and came to Canada in 1871, by way of Australia. He became a bridge and railway contractor and financier. He built the Lachine Bridge over the St. Lawrence at Montréal, the international bridge at Sault Ste. Marie and - with Casimir Gzowski - the one over the Niagara River. He became involved in the construction of the CPR, including the difficult sections along the north shore of Lake Superior. He spent his later years building railways in Newfoundland, as well as developing its natural resources and transportation systems. He was created a Knight Bachelor in 1907.

The British engineers who were elected members of the EIC while maintaining their principal engineering activities in Britain included Sir Alexander Gibb, Sir Hugh Beaver and Sir Maurice Fitzmaurice. Sir Alexander was later elected to honorary membership of the Institute. In this grade, he joined (or was later joined by) other distinguished British engineers, including Sir John Fowler, Sir Charles Hartley, Sir John Hawkshaw, Sir William C. Macdonald, Sir William H. White, Sir Frederick Bramley and Sir Frank Whittle.

Modern-Day Knights

There was no continuing post-Nickle *Canadian* alternative to the national recognition of individual merit and accomplishment until the establishment of the Order of Canada in 1967, although Canadian-born (but not Canadian-resident) people, such as Godfrey Rhodes, continued to receive British honours and former Prime Minister Bennett received a peerage. As a result, many distinguished engineers who were recognized by the profession and the universities did not receive the kind of national recognition that either knighthood or Companionship in the Order might have brought. Among them I would include the engineer/politician C.D. Howe and the engineer/soldier A.G.L. McNaughton. However, it could be argued that both of these men received *national* recognition without either of these honours.

The listing of both living and deceased Companions in the Order of Canada that I received from Rideau Hall contained 375 names and covered the period from 1967 to May, 2001. Those designated by field or discipline as engineers, and those shown in other fields and disciplines, but recognizable to me at least as engineers, numbered 15, including one woman - or around 4 percent of all the Companions. The list might also include a further 7 names of men who, like Van Horne and Reid, contributed through the management of engineering activities rather than as practicing engineers. This would bring the total to 22 and the combined percentage to just under 6 percent.

I cannot argue that the percentage representation of the engineering profession is undeservedly low. But I can draw attention to the fact that those Companions who represent the cultural disciplines and fields such as acting, writing, painting and sports number 72 out of the 375 - almost 20 percent of the total. On the other hand, some 26 Companions are from the health sciences and medicine - a number just above the combined engineering figure.

I don't propose to discuss all 22 engineers/industrialists. What I will do is to speculate on how many of them might have received knighthoods as their predecessors did prior to 1920.

To put my speculations in context, I have taken account of the criteria of "individual merit and achievement in an important field of endeavour" which presently govern admission to the Order of Canada and would also appear to have been applied to the knighthoods awarded to Canadians prior to 1920. I have also considered the traditions that appear to have been applied to knighthoods awarded in times of peace in Britain. For example, few military people who achieve the rank of Lieutenant-General or equivalent are denied knighthoods, and the same may be said for those in the public service who occupy ranks equivalent to deputy minister, president of a Crown corporation, or head of a large scientific agency or a major technical institution. In the political field, senior cabinet ministers, when they step down, are usually rewarded with life peerages, the hereditary variety having disappeared, and former junior ministers receive knighthoods. In industry, the so-called "captains" often become become knights and, if they continue to contribute, become life peers. The presidents, principals, rectors, or whatever they are called, of the older - and some of the newer - universities usually become knights. The heads of the larger international consulting engineering firms also appear to receive knighthoods, especially after the completion of very successful and

visible technical enterprises. The same may be said for eminent research scientist and engineers, and especially Nobel prizewinners, as well as top-ranking cultural people such as Olivier, Richardson, Gielgud...and so on. It is quite usual for the presidents of the British engineering institutions to receive honours from Her Majesty, but only occasionally are these at the level of knighthoods. It should also be noted that what applies to the men also applies nowadays to women. But there is an understood escape clause. A number of those who are offered the accolade choose not to accept it. The clue to this particular situation is often the award to the person concerned of non-title recognition, such as membership of the Order of Merit (OM) or as a Companion of Honour (CH).

In my view, and this is very much a personal opinion, at least one-half of the 22 engineers/industrialists who were created Companions of the Order of Canada between 1967 and 2001 would have received pre-1920 British knighthoods, had they been were available to Canadians resident in this country. In other words, it was somewhat tougher for a Canadian engineer/industrialist to be knighted pre-1920 than it has been to become a Companion of the Order of Canada today, but some would have done so. Let me illustrate this using very brief references to several of the 15 engineers, who are now deceased:

Robert F. Shaw was the first federal deputy minister for the Department of the Environment, the deputy commissioner for Expo 67, vice-principal of McGill University, chairman of the Foundation Company of Canada and president of the Engineering Institute of Canada.

Chalmers Jack Mackenzie was president of the National Research Council, Atomic Energy Control Board and the Engineering Institute of Canada.

Norris R. Crump was president and later chairman of the CPR. The case for a knighthood for Crump is bolstered by the fact that several of his predecessors were knighted.

J. Lorne Gray was president of Atomic Energy of Canada Limited.

General E.L.M. Burns was a soldier who served in senior international capacities.

Among the 7 industrialist-knights might have been Donald Gordon, president and later chairman of Canadian National Railways and R.S. McLaughlin, president and later chairman of General Motors of Canada, as well as James Harrison and Wilfrid Bennett Lewis, who were internationally known and respected for their scientific contributions to geology and nuclear energy as well as their industrial contributions.

In my view once again, I prefer the system we now have to the earlier one. The Companion grade within the Order of Canada "captures" the spirit of individual merit and achievement sufficiently to render accolades redundant for Canadians. It is also sufficiently senior in relation to the other two grades that an individual can be promoted within the Order over time - just as a British knight can become a peer - and this has happened quite regularly. What we need is a wider spreading of information about the achievements of those who are being recognized - and more recognition by

the public generally of the value of these achievements to the country as a whole.

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Acknowledgements and Sources

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The general sources used for this paper were: the publications of the Canadian Society of Civil Engineers and the Engineering Institute of Canada, notably the lists of members, obituaries and *Transactions* of CSCE and the lists of members, obituaries and *Engineering Journal* of EIC; *The Canadian Encyclopaedia* published by Hurtig in 1988; the Dictionary of Canadian Biography (DCB); the Macmillan DCB of 1978; and, for the "Modern Knights," recent annual issues of the *Canadian Who's Who.*

Among the specific sources were the following:

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Sir John Kennedy: the Macmillan DCB, p 406; the *Engineering Journal*, Volume 4, p 581

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Sir Georges Garneau: the Macmillan DCB, p 290

Sir William Van Horne: DCB, Volume XIV, pp 1030-1036

Sir Robert Reid: DCB, Volume XIII, pp 859-863

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