THE

Canadian Society of Civil Engineers.

112 MANSFIELD STREET, MONTREAL.

(Established Feb. 24, 1887; Incorporated by Dominion Act, June 23rd, 1887)

(50 Vic. Cap. 124.)

LIST OF MEMBERS

AND

Report of Annual Meeting.

1894.

Montreal:
PRINTED FOR THE SOCIETY,
BY JOHN LOVELL & SON.

LIST OF MEMBERS

OF THE

Canadian Society of Civil Engineers.

MARCH 1st, 1894.

NOTICE.

It is particularly requested that changes of address be immediately communicated to

The Secretary,

Canadian Society of Civil Engineers,

112 *Mansfield St, Montreal.*

N.B.—Names of deceased members are in *italics.*

THE

Canadian Society of Civil Engineers.

Established February 24th, 1887—Incorporated by Dominion Act June 23rd, 1887, 50 Vict., Cap. 124.

Council :

PRESIDENT.

P. ALEX. PETERSON.

VICE-PRESIDENTS.

ALAN MACDOUGALL, PERCIVAL W. ST. GEORGE,
HERBERT WALLIS.

TREASURER.

KENNET W. BLACKWELL.

SECRETARY.

CLEMENT H. MCLEOD.

Honorary Councillors :

PAST-PRESIDENTS.

COL. SIR CASIMIR S. GZOWSKI, A.D.C., K.C.M.G., THOMAS C. KEEFER, C.M.G.
JOHN KENNEDY, EDMUND P. HANNAFORD.

MEMBERS.

HARRY ABBOTT,
PETER S. ARCHIBALD,
JOHN DAVIS BARNETT,
HENRY T. BOVEY,
OCTAVE CHANUTE,
GRANVILLE C. CUNINGHAM,
HIRAM DONKIN,
GEORGE H. DUGGAN,
JOHN GALBRAITH,
GEORGE H. GARDEN,
WILLIAM HASKINS,
HENRY A. F. MACLEOD,
HURD PETERS,
HENRY M. RUTTAN,
LOUIS A. VALLEE.

LIBRARIAN.

WILLIAM MCNAB.

STANDING COMMITTEES.

ON FINANCE.

PERCIVAL W. ST. GEORGE, Chairman,
JOHN D. BARNETT,
GEO. H. DUGGAN,
HENRY A. F. MACLEOD,
HERBERT WALLIS.

ON LIBRARY.

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GRANVILLE C. CUNINGHAM,
GEO. H. DUGGAN,
GEO. H. GARDEN,
CLEMENT H. McLEOD.

COMMITTEE ON PAPERS.

(Appointed by Council.)

ALAN MACDOUGALL, Chairman,
LOUIS COSTE,
GRANVILLE C. CUNINGHAM,
JOHN GALBRAITH,
EDWIN GILPIN, jun.,
HENRY IRWIN,
WM. T. JENNINGS,
WALTER H. LAURIE,
THOS. MONRO,
JOHN T. NICOLSON,
DONALD ALEX. STEWART,
WM. G. THOMPSON.

GZOWSKI MEDAL COMMITTEE.

(Appointed by Council.)

THOS. MONRO, Chairman,
WM. BELL DAWSON,
JOHN GALBRAITH,
WILLIAM T. JENNINGS,
FREDERICK THOMSON.

BUILDING FUND COMMITTEE.

(Appointed by Council.)

SIR DONALD A. SMITH, Chairman,
THOS. C. KEEFER, Past Pres.
COL. SIR C. S. GZOWSKI, Past Pres.
JOHN KENNEDY, Past Pres.
EDMUND P. HANNAFORD, Past Pres.
HENRY T. BOVEY,
THOMAS C. BRAINERD,
HON. GEO. A. DRUMMOND,
ROBERT G. REID,
JAMES ROSS.

STATEMENT OF MEMBERSHIP.

	Jan. 30, 1893.			Jan. 30, 1894.		
	Non-Res.	Res.	Total.	Non Res.	Res.	Total.
HONORARY MEMBERS.....	5	1	6	6	1	7
MEMBERS.....	222	58	280	225	58	283
ASSOCIATE MEMBERS.....	105	19	124	113	20	133
ASSOCIATES.....	43	26	69	35	24	59
STUDENTS.....	114	54	168	103	47	150
			647			632

CANADIAN SOCIETY OF CIVIL ENGINEERS.

LIST OF OFFICERS FOR THE YEARS 1887 TO 1894.

	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.
President....	T. C. KEEFER.	S. KEEFER.	C. S. GZOWSKI.	C. S. GZOWSKI.	SIR C. S. GZOWSKI.	JOHN KENNEDY.	E. P. HANNAFORD.	P. ALEX. PETERSON.
Vice-Presidents....	C. S. GZOWSKI. J. KENNEDY. W. SHANLY.	C. S. GZOWSKI. E. P. HANNAFORD. H. F. PERLEY.	E. P. HANNAFORD. H. F. PERLEY. P. A. PETERSON.	E. P. HANNAFORD. J. KENNEDY. H. F. PERLEY.	E. P. HANNAFORD. J. KENNEDY. F. J. LYNCH.	W. T. JENNINGS. THOS. MONRO. P. A. PETERSON.	W. T. JENNINGS. THOS. MONRO. P. A. PETERSON.	A. MACDOUGALL. P. W. ST. GEORGE. H. WALLIS.
Members of Council	F. N. GISBORNE. E. P. HANNAFORD W. T. JENNINGS. S. KEEFER. L. LESAGE. H. D. LUMSDEN. A. MACDOUGALL. H. F. PERLEY. H. PETERS. P. A. PETERSON. H. S. POOLE. H. N. RUTTAN. P. W. ST. GEORGE. C SCHERIBER. H. WALLIS.	H. ABBOTT. F. R. F. BROWN. F. N. GISBORNE. J. HOBSON. W. T. JENNINGS. J. KENNEDY. L. LESAGE. A. MACDOUGALL. H. A. F. MACLEOD. M. MURPHY. P. A. PETERSON. H. S. POOLE. H. N. RUTTAN. P. W. ST. GEORGE. C. SCHERIBER.	G. F. BAILLAIRGE. J. D. BARNETT. K. W. BLACKWELL. ST. G. J. BOSWELL. F. R. F. BROWN. G. C. CUNINGHAM. E. GILPIN. F. N. GISBORNE. W. T. JENNINGS. G. A. KEEFER. J. KENNEDY. M. MURPHY. B. D. MCCONNELL. E. WRAGGE. J. A. VANIER.	W. P. ANDERSON. J. D. BARNETT. F. R. F. BROWN. K. W. BLACKWELL. C. E. W. DODWELL. W. T. JENNINGS. G. A. KEEFER. H. G. C. KETCHUM. T. MONRO. G. H. MASSY. P. A. PETERSON. H. N. RUTTAN. P. W. ST. GEORGE. J. W. TRUTCH. E. WRAGGE.	W. P. ANDERSON. J. D. BARNETT. F. R. F. BROWN. K. W. BLACKWELL. C. E. W. DODWELL. H. DONKIN. F. N. GISBORNE. E. A. HOARE. J. HOBSON. W. T. JENNINGS. T. MONRO. P. A. PETERSON. H. N. RUTTAN. P. W. ST. GEORGE. SIR J. W. TRUTCH.	J. D. BARNETT. K. W. BLACKWELL. H. T. BOVEY. H. J. CAMBIE. C. E. W. DODWELL. F. C. GAMBLE F. N. GISBORNE. E. A. HOARE. JOS. HOBSON. C. H. KEEFER. H. G. C. KETCHUM. H. D. LUMSDEN. A. MACDOUGALL. H. N. RUTTAN. P. W. ST. GEORGE.	J. D. BARNETT. ST. GEO. BOSWELL. H. T. BOVEY. F. R. F. BROWN. G. C. CUNINGHAM. C. K. DOMVILLE. C. H. KEEFER. H. D. LUMSDEN. A. MACDOUGALL. E. MOHUN. G. A. MOUNTAIN. H. S. POOLE. FRANK R. REDPATH. THOMAS RIDOUT. P. W. ST. GEORGE.	H. ABBOTT. P. S. ARCHIBALD. J. D. BARNETT. H. T. BOVEY. O. CHANUTE. G. C. CUNINGHAM. H. DONKIN. G. H. DUGGAN. J. GALBRAITH. G. H. GARDEN. WM. HASKINS. H. A. F. MACLEOD. H. PETERS. H. N. RUTTAN. L. A. VALLEE.
Past Presidents and H. Councillors	.....	T. C. KEEFER.	T. C. KEEFER. S. KEEFER.	T. C. KEEFER.	T. C. KEEFER.	T. C. KEEFER. SIR C. S. GZOWSKI.	T. C. KEEFER. SIR C. S. GZOWSKI. JOHN KENNEDY.	T. C. KEEFER. SIR C. S. GZOWSKI. JOHN KENNEDY. E. P. HANNAFORD.
Secretary..	H. T. BOVEY.	H. T. BOVEY.	H. T. BOVEY.	H. T. BOVEY.	H. T. BOVEY.	C. H. MCLEOD.	C. H. MCLEOD.	C. H. MCLEOD.
Treasurer..		H. WALLIS.	H. WALLIS.	H. WALLIS.	C. H. MCLEOD. H. WALLIS.	H. WALLIS.	H. WALLIS.	K. W. BLACKWELL.
Librarian....	.....	F. CHADWICK.	F. CHADWICK.	F. CHADWICK.	F. CHADWICK. M. MCNAB.	WM. MCNAB.	WM. MCNAB.	WM. MCNAB.

HONORARY MEMBERS.

(Hon. M. Can. Soc. C.E.)

Date of Membership.	*Name.*	*Address.*
1893 Dec. 21.	ABERDEEN, The Right Hon., the Earl of, G.C.B., etc.	Government House, Ottawa.
1889 May 23.	BRAMWELL, *Sir* FREDERICK JOSEPH, D.C.L., F.R.S.	5 Great George St., London, England.
Jan. 3.	DAWSON, *Sir* JOHN WILLIAM, C.M.G., M.A., LL.D., F.R.S.	McGill University, Montreal.
Jan. 3.	DERBY, The Right Hon. the Earl of, G.C.B.	Knowsley, Liverpool, England.
Nov. 14.	FOWLER, *Sir* JOHN, Bart., K.C.M.G., LL.D.	2 Queen's Square Place, London, England.
Mar. 28.	HARTLEY, *Sir* CHARLES AUGUSTUS, K.C.M.G.	26 Pall Mall, S.W., London, England.
Nov. 14.	*Hawkshaw, Sir John.*	
May. 23.	KELVIN, the Right Hon. Lord, F.R.SS.L.&E., LL.D.	The University, Glasgow, Scotland.

MEMBERS.

(M. Can. Soc. C.E.)

Date of Membership.	*Name.*	*Address.*
1887 Feb. 3.	ABBOTT, HARRY	Port Moody, B.C.
	(Member of Council.)	
1890 Apr. 10.	Abbott, Ira	Room 31, 150 Broadway, New York.
1887 Jan. 20.	Abbott, Job	Room 31, 150 Broadway, New York.
1888 Mar. 22.	Alexander, Horace Clement	Room 908 Cham. of Com. Bdg., Chicago, Ill.
1887 Jan. 20.	Anderson, *Lieut. Col.* Wm. P	Dept. of Marine, Ottawa.
1887 Nov. 11.	ARCHIBALD, PETER S	Moncton, N.B.
	(Member of Council.)	
1887 Feb. 24.	Armour, John Fisher	Hamilton, Ont.
1887 Jan. 20.	Armour, R	Hamilton, Ont.
1887 Jan. 20.	Armstrong, Harry W. D	23 York St., Toronto.
1888 Oct. 11.	Armstrong, John Harvey	478 Huron St., Toronto.
1887 Jan. 20.	Armstrong, J. S	141 Union St., St. John, N.B.
1887 Apr. 28.	Atkinson, Roger	C. P. R., Montreal.
1887 Feb. 24.	Aylen, John	Morrisburg, Ont.
1887 Jan. 20.	Aylmer, John A	Care Manning & Macdonald, Toronto.
1887 Feb. 3.	Baillairgé, Chas. P., F.R.S.C	Quebec.
1887 Feb. 3.	Baillargé, George Fred	Dept. Public Works, Ottawa.
1888 Jan. 27.	Baker, *Sir* Benjamin	2 Queen Sq. Pl., London, Eng.
1887 Jan. 20.	Barber, James Henry	C. P. R., Toronto, Ont.
1889 Nov. 14.	Barclay, William Duncan	Lethbridge, N.W.T.
1887 Feb. 3.	Barlow, John Rigney	City Hall, Montreal.
1887 Jan. 20.	BARNETT, JOHN DAVIS	G. T. R., Stratford, Ont.
	(Member of Council.)	
1893 May 18.	Barrow, Ernest George	City Hall, Hamilton, Ont.
1892 Mar. 11.	Barry, Aug. Burges	252 Bathurst St., Toronto.
1887 Feb. 3.	Bartlett, James Herbert	Middlesborough, Kentucky.
1887 Mar. 12.	Bayne, George Arthur	144 Garry St., Winnipeg, Man.
1887 Jan. 20.	Beaudry, Jos. A. U	107 St. James St., Montreal.

1887 Feb. 3. BEEVOR, ABRAHAM FRED.....G. T. R., Montreal.
1887 Feb. 3. BELCHER, JOHN E .....Peterborough, Ont.
1887 Sept. 17. BELL, JAMES ANTHONY .....St. Thomas, Ont.
1887 Feb. 24. A.M. } BERLINGUET, F. X. THOS.....Three Rivers, P.Q.
1890 Nov. 20. M. }
1887 Feb. 3. BERRYMAN, EDGAR.... .....Q. C. Ry., Sherbrooke, Que.
1887 Feb. 3. BLACKWELL, KENNET WM....111 Metcalfe St., Montreal.
(Treasurer and Member of Council.)
1887 Feb. 3. BLAIKLOCK, MORRIS STANSFELD.....St. Clair Tunnel, Sarnia, Ont.
1887 Feb. 3. *Boag, Robert*.....
1887 Feb. 3. BOLLAND, PERCY JAMES LEES.....I. C. Ry., Moncton, N.B.
1887 May 23. BONZANO, ADOLPHUS .....331 South 18th St., Philadelphia, Pa.
1887 Jan. 20. BOSWELL, ST. GEO. J., B.A.SC. ...8 St. Denis St., Quebec.
1887 Jan. 20. BOVEY, HENRY TAYLOR, D.C.L., LL.D., F.R.S.C. McGill University, Montreal.
(Member of Council.)
1887 June 25. BREEN, THOMAS.....P. O. Box 1041, Quebec.
1887 Jan. 20. BRITTAIN, ALFRED.....City Hall, Montreal.
1887 Feb. 3. BROWN, FRANCIS ROBT. F.....Mech. Supt., I. C. Ry., Moncton, N.B.
1890 May 22. A.M. } BROUGH, WALTER C.....Pembroke, Ont.
1893 April 20. M. }
1887 Feb. 3. BRUSH, GEORGE ....Eagle Foundry, Montreal.
1887 June 9. BURCHELL, HERBERT CHAS.....St. John's, Nfld.
1890 Feb. 27. BURPEE, MOSES..... .....Chief Engineer, Bangor & Aroostook R.R., Houlton, Me.
1887 Feb. 3. BUSK, CHARLES WESTLEY.....Balfour, B. C.
1887 Jan. 20. BUTLER, MATTHEW JOSEPH.....K. N. & W Ry., Napanee, Ont.
1887 Jan. 20. BUTLER, WILLIAM ROBT., B.E.....King's Coll., Windsor, N.S.

1889 Jan. 3. CADDY, JOHN ST. VINCENT.....Dept. Rys. and Canals, Ottawa. Ont.
1887 Jan. 20. CADMAN, JAMES.....15 Belle Lane, Quebec.
1888 Feb. 9. CAMBIE, HENRY JOHN.....Vancouver, B.C.
1887 Feb. 24. CAME, FRANK ELDON.....P. O. Box 385, Montreal.
1887 Jan. 20. CARRE, HENRY .....Box 203, Belleville, Ont.
1888 June 27. CARRY, HENRY E. C.....C. P. Ry., Vancouver, B.C.
1887 Dec. 1. CARSON, WILLIAM.....Warrington, Eng.
1890 May 22. CHANUTE, OCTAVE.....413 Huron St., Chicago.
(Member of Council.)
1887 Feb. 24. CHAPMAN, CHAS. HERBERT.....Care of McLennan, Stuart & Chapman, Leader Lane, Toronto.

1887 June 9. CHIPMAN, WILLIS, B.A.Sc.....Bay St., Toronto, Ont.
1888 Feb. 9. CLARKE, RANDOLPH.....G. T. Ry., Stratford, Ont.
1887 June 9. CLEMENT, LEWIS METZLER.....1013 Central Av., Oakland, Cal.
1888 April 19. *Cooke, Richard Plunkett*.....
1890 Nov. 20. COLTHELL, ELMER LAWRENCE.....The Temple, Chicago, Ill.
1887 Jan. 20. COSTE, JEAN LOUIS NAPOLEON.....Dept. Public Works, Ottawa.
1887 Jan. 20. CRAWFORD, WILLIAM.....Box 40, Sault Ste. Marie, Ont.
1887 Feb. 3. CUNINGHAM, GRANVILLE C...1018 Sherbrooke St., Montreal.
(Member of Council.)
1888 Jan. 6. CUSHING, RICHMOND HERSEY.....Care of Andre Cushing & Co., St. John, N.B.

1888 Mar. 22. DANCER, CHAS. HENRY.....Portage la Prairie, Man.
1887 Feb. 24. A.M. } DAVIS, WILLIAM MAHON.....Woodstock, Ont.
1891 April 9. M. }
1887 Jan. 20. DAVY, RICHARD ADAMS.....Rivière du Loup Stn., P.Q.
1887 Feb. 24. DAWSON, WM. BELL, M.A.E., M.A....Dept. of Marine, Ottawa.
1887 Jan. 20. DENIEL, MARIE VICTOR EMILE.....Box 88, Cornwall, Ont.
1887 Jan. 6. DICKEY, JAMES ALEX.....Cornwall, Ont.
1887 April 12. S. } DOANE, FRANCIS WM. City Engineer, Halifax, N.S.
1889 Jan. 3. A.M. } WHITNEY.
1892 April 8. M. }
1887 Jan. 20. DODWELL, CHARLES EDWARDS 42 Queen St., Halifax, N.S.
WILLOUGHBY, B.A.
1887 Jan. 20. DOMVILLE, CHARLES K.....Hamilton, Ont.
1889 Feb. 14. DONALDSON, MORLEY.....Can. Atlantic Ry., Ottawa.
1887 June 9. DONKIN, HIRAM.....Mulgrave, N.S.
(Member of Council.)
1887 June 9. DOUCET, *Capt.* ARTHUR EMILE.....Care R. G. Reid, Contractor, Placentia Jct., Nfld.
1887 Jan. 20. DRUMMOND, *Hon.* GEORGE ALEX...874 Sherbrooke St., Montreal.
1887 Feb. 24. DRURY, EDMUND H.....B. & A. Rd. Co., Island Falls, Me.
1887 Feb. 24. A.M. } DUFFY, AMBROSE..... 519 King St., Ottawa.
1887 April 14. M. }
1888 Mar. 22. A.M. } DUGGAN, GEORGE HERRICK. Dom. Bridge Co., Montreal
1890 Feb. 27. M. }
(Member of Council.)
1887 April 14. DYER, JOHN.....363 St. Antoine St., Montreal.

1888 April 19. ELLERS, GEORGE HOWARD.....Box 327, Chicago, Ill.

1887 Feb. 24. EVANS, JOHN DUNLOP.....Trenton, Ont.
1887 Feb. 24. EVANS, EDWARD ARTHUR..... ....Q. & L. St. J. Ry., Quebec, P.Q.

1887 Jan. 20. FELLOWES, G. R..... ...121 Nepean Street, Ottawa.
1887 Feb. 3. FIRTH, C.... .....U. S. Engineer's Office, Wetumpka, Ala.
1888 Sept. 17. FLEMING, RICHARD PHILIP.....Standard Building, St. James Street, Montreal.
1889 Nov. 14. FORREST, HORATIO FRED.....Winnipeg, Man.
1888 Mar. 22. FORSE, EDWIN.... .....Temiscouata Ry., Edmundston, N.B.
1887 Jan. 20. FORSYTH, ROBERT.....130 Bleury Street, Montreal.
1888 Jan. 6. A.M.) FORTIER, SAMUEL.....Agricultural College, Logan,
1892 Dec. 23. M.) Utah.
1892 April 8. FOSS, CHAS. ORRIN.....Bridgewater, N.S.
1887 April 28. FOSTER, PHILIP LAWRENCE.....Bluebird Mining Co., Butte City, Montana.
1887 Jan. 20. FOWLER, ZACCHEUS JOHN.... .....Newcastle, N.B.
1887 Feb. 3. *Franks, Cecil Bushe*.....
1888 June 27. FRY, HENRY, JUN..... .....Quamichan, B.C.

1887 Jan. 20. GALBRAITH, JOHN, PROF., M.A.University College, Toronto. (*Member of Council.*)
1888 Mar. 22. GALT, JOHN.....Toronto.
1887 Jan. 20. GAMBLE, F. C.....Dept. Pub. Works, Victoria, B.C.
1887 Jan. 20. GARDEN, GEORGE HERBERT..51 St. Mark St., Montreal. (*Member of Council.*)
1887 Jan. 20. GIBSON, PETER SILAS.....Willowdale, Ont.
1887 Jan. 20. *Gilbert, E. E*.....
1887 Jan. 20. GILBERT, FRANK.... .....Can. Eng. Works, Montreal.
1887 Feb. 3. *Gilbert, Walter W*.....
1887 Nov. 11. GILPIN, EDWIN, JUN., F.R.S.C.....P. O. Box 160, Halifax, N.S.
1887 Jan. 20. *Gisborne, Frederick N., F.R.S.C.*
1887 June 9. A.M.) GISBORNE, HARTLEY.....Qu'Appelle Stn., Assa., N.W.T.
1892 Dec. 23. M.)
1888 Mar. 22. GOAD, CHARLES EDWARD.....Mercha its Bank Chambers, Wellington St., Toronto.
1887 May 12. GOWER, WILLIAM EDWARD.....204 St. James Street, Montreal.

1887 June 9. GRANT, PETER.....Grand Narrows, C.B., N.S.
1887 Jan. 20. GRAY, HENRY ALFRED.....151 Sherbourne Street, Toronto.
1887 Jan. 20. *Guerin, Thomas*.....
1887 Jan. 20. GZOWSKI, COL. SIR CASIMIR The Hall, Toronto.
STANISLAUS, A.D.C., K.C.M.G.
(*Past President and Honorary Councillor.*)

1887 Jan. 20. HANNAFORD, EDMUND P.....G. T. Ry., Montreal.
(*Past President and Honorary Councillor.*)
1887 Feb. 24. HARKOM, JOHN WILLIAM.....G. T. Ry., Toronto.
1887 Jan. 20. *Harrington, T. W*.....
1888 Feb. 9. HARRIS, WILLIAM DALE.....237 McLaren St., Ottawa.
1891 Jan. 29. HASKINS, WILLIAM.....Hamilton, Ont.
(*Member of Council.*)
1887 Feb. 24. HAY, THOS. ALEX. STEWART.....G. T. Ry., Peterborough, Ont.
1888 May 17. HEGAN, JAMES BLACK.....St. John, N.B.
1887 Jan. 20. HENDERSON, ERNEST G.....C. P. Ry., London, Ont.
1887 Jan. 20. *Henshaw, George H*.....
1889 May 23. HERING, RUDOLPH.....277 Pearl Street, New York.
1887 April 14. HERSEY, JOHN RANDOLPH.....Pillow & Hersey Co., Montreal.
1888 May 17. HERTZBERG, ANTON LUND.....C. P. Ry., Toronto.
1887 April 28. HIBBARD, F. A.....Ottawa & Parry Sound Ry., Ottawa, Ont.
1887 Feb. 3. HILL, ALBERT JAMES, M.A.....New Westminster, B.C.
1887 June 25. HILL, ARTHUR ED. BRETON, B.A.Sc..New Westminster, B.C.
1887 Jan. 20. HILLMAN, THOMAS EDWARD.....Box 512, Sarnia, Ont.
1887 Jan. 20. HOARE, EDWARD ARTHUR.....93 St. Peter Square, Quebec.
1887 Jan. 20. HOBSON, JOSEPH.....G. T. Ry., Hamilton, Ont.
1890 April 10. HOGG, ALEXANDER LAUDER.....Fort Steele, East Kootenay, B.C.
1887 Dec. 1. HOLGATE, HENRY.....G. T. Ry., Peterborough, Ont.
1887 Jan. 20. HOLLAND, GEORGE.....G. T. Ry., Montreal.
1889 Feb. 14. A. } HOLT, HERBERT SAMUEL.....Windsor Hotel, Montreal.
1889 Dec. 19. M. }
1887 Jan. 20. HOWARD, STUART.....P. O. Box 1177, Montreal.
1887 Jan. 20. HYNDMAN, PATRICK KENNEDY.....286 Stewart Street, Ottawa.

1887 Jan. 20. A.M. } IRWIN, HENRY.....103 Union Ave., Montreal.
1892 May 20. M. }

1887 Jan. 29. JENNINGS, WILLIAM T.....506 Bd. of Trade Building, Toronto.
1887 Feb. 24. JOHNSON, E. V .....Dept. of Railways, Ottawa.
1893 April 20. JOHNSON, PHELPS.....Dom. Bridge Co., Montreal.

1887 Jan. 20. KEEFER, CHARLES HENRY.....Manning Arcade, King St., Toronto.
1887 Feb. 3. KEEFER, GEORGE ALEXANDER.....Victoria, B.C.
1887 Feb. 3. *Keefer, Harold*.....
1887 Jan. 20. KEEFER, THOMAS C., C. M. G..Ottawa.
(Past President and Honorary Councillor.)
1887 Jan. 20. *Keefer, Samuel*.....
1893 April 20. KENNEDY, JAMES CRON.....Norman, Ont.
1887 Jan. 20. A.M. } KENNEDY, JAMES HENRY, Box 434, St. Thomas, Ont.
1893 May 18. M. }
1887 Jan. 20. KENNEDY, JOHN.....Harbour Office, Montreal.
(Past President and Honorary Councillor.)
1887 Feb. 24. KENNEDY, WILLIAM, JUN.....Room 3, Y.M.C.A. Building, Montreal.
1887 Oct. 16. KETCHUM, HENRY GEORGE CLOPPER, Amherst, N.S.
1887 Jan. 20. *Killaly, Hamilton H*.....
1893 Dec. 21. KING, ROBERT W.....141 Bayle St., Montreal.
1887 Jan. 20. KINGSFORD, WILLIAM, LL.D.....127 Stewart Street, Ottawa.
1890 Feb. 27. KONDRATOVITSH, ADAM BOLESLAUS IMSHENICK. Care of Administration of Russian State Rys., St. Petersburg, Russia.
1890 Feb. 27. KROUGLICOFF, NICHOLAS.....Care of Administration of Russian State Rys., St. Petersburg, Russia.

1887 Jan. 20. LAFLEUR, EUGENE D .....Dept. Pub. Works, Ottawa
1887 Feb. 24. A.M. } LANTIER, ELZEAR.....Coteau du Lac, Que.
1889 Nov. 14. M. }
1892 Dec. 23. LANGTON, JOHN.....Canada Life Building, Toronto.
1887 Jan. 20. LAURIE, WALTER H.....203½ St. Hubert St., Montreal.
1888 Jan. 6. LAWSON, ALLAN JOHN.....Grantown, Scotland.
1887 Jan. 20. LEDUC, DENIS.....206 St. Denis Street, Montreal.
1893 Oct. 12. LEE, WILLIAM W.....Box 1006, Belleville, Ont.
1889 Feb. 14. LEIGH, FREDERICK JAMES.....Kingston, Ont.

1887 Jan. 20. A.M. } LEONARD, REUBEN WELLS....35 George Street, Kingston,
1890 May 22. M. } Ont.
1887 Jan. 20. *Lesage, Louis*.....
1889 Feb. 14. LINDENTHAL, GUSTAV.....45 Cedar St., New York, N.Y.
1887 Jan. 20. LUMSDEN, HUGH DAVID.....63 Homewood Ave., Toronto.
1887 May 12. LYNCH, FRANCIS JOSEPH.....Dept. Rys. & Canals, Ottawa.

1888 Mar. 22. MCCARTHY, WILLIAM.....Res. Eng. St. Peter's Canal, St. Peter's, C.B.
1887 Jan. 20. MCCONNELL, BRIAN D.....No. 513 New York Life Bdg, Montreal.
1893 April 20. MCCREADY, GEORGE WELLESLEY ...Moncton, N.B.
1887 Jan. 20. MCLEOD, C H, F.R.S.C., PROF., McGill University, Montreal.
(*Secretary and Member of Council.*)
1887 June 25. MCMILLAN, DANIEL.....Charlo Station, Restigouche, N.B.
1887 Jan. 20. MCMINN, THOMAS JAMES.....277 Pearl St., New York.
1887 Feb. 3. MCNAB, WILLIAM.....G.T.R, Montreal.
(*Librarian.*)
1887 Feb. 3. MCWOOD, WILLIAM .....G.T.R., Montreal.
1889 Feb. 14. MACDONALD, CHARLES.....No. 1 Broadway, New York.
1887 Jan. 20. MACDOUGALL, ALAN.....32 Adelaide St. East, Toronto.
(*Vice-President.*)
1887 Nov. 11. MACKENZIE, WM. BROUARD.....Moncton, N.B.
1887 Feb. 24. MACKLIN, JOHN GEORGE.....86 Potomac Block, Los Angeles, Cal.
1887 Jan. 20. MACLEOD, HENRY A. F.....340 Cooper St., Ottawa.
(*Member of Council.*)
1887 June 9. MACLEOD, MALCOLM HUGH.....C.P.R., Mattawa, Ont.
1887 Jan. 20. MACPHERSON, DUNCAN.....C.P.R., Dalhousie Sq. Stn., Montreal.
1887 May 12. MARCEAU, ERNEST.....48 Sparks St., Ottawa.
1891 May 21. MASSON, GEORGE.....Detroit, Mich.
1887 Jan. 20. MASSY, GEORGE HUGH.....180 St. James St., Montreal.
1887 Feb. 3. MATHESON, WILLIAM GRANT. .....New Glasgow, N.S.
1887 Feb. 3. MEADOWS, JOSEPH, B.A .....Thornville, Ballycoyley, Wexford, Ireland.
1887 June 9. METCALFE, CHARLES PERCIVAL.....Care V. Morgan, Australian Club, Melbourne, Australia.
1887 Feb. 3. MIDDLETON, THOMAS.....Care S.S. & D. Co., Bucyrus, Ohio.

1887 Feb. 24. MILLER, FRED. FRASER, B.A.Sc.....Room 119 Temple Building, Montreal.

1888 May 17. A.M. } MILES, CHARLES LEBARON...P. O. Box 117,
1890 April 10. M. } Upper Andover, N.B.

1887 Nov. 11. MILLIDGE, EDWIN GILPIN.....Antigonish, N.S.

1887 Nov. 11. MITCHELL, WM. CALDWELL.....Care of A. J. Hill, Esq., New Westminster, B.C.

1887 Feb. 24. MOFFAT, JAMES W., B.A.Sc.....Chief Engr. Great West. Ry., Salt Lake City, Utah, U. S.

1888 Feb. 9. MOHUN, EDWARD.....City Hall, Victoria, B.C.

1887 June 25. MOLESWORTH, BALFOUR NEPEAN....Johnson City, Tenn., U.S.

1887 Jan. 20. MONRO, THOMAS.....Coteau Landing, P.Q.

1888 Mar. 22. MORKILL, JOHN THOMAS.....Engineer's Office Lotbinière & Megantic Ry., Lyster Station, P.Q.

1887 Jan. 20. MOUNTAIN, GEORGE ALPHONSO.....Can. At. Ry., Ottawa.

1887 Jan. 20. MURDOCH, WILLIAM.....30 Union St., Kingston, Ont.

1887 Feb. 3. MURPHY, MARTIN, D.Sc.....Halifax, N.S.

1888 Feb. 24. NASH, GEORGE RICHARD.....141 Mackay St., Montreal.

1888 May 17. NEILSON, MATTHEW.....44 Pearl St., St. Thomas, Ont.

1891 Nov. 19. NICOLSON, JOHN T., PROF.....McGill University, Montreal.

1891 Jan. 20. O'ROURKE, JOHN FRANCIS.....Care of Rapid Transit Com'n., 22 William St., New York.

1887 May 12. A.M. } OSTLER, CHAS. HODGSON....Chief Engr. N. & S. Ry.,
1892 Dec. 23. M. } Nakusp, B.C.

1887 May 12. *Page, John*.....

1887 Jan. 20. PARENT, ETIENNE H.....Canal Office, Montreal.

1888 Jan. 6. PATERSON, JAMES ALLISON.....9 Masonic Buildings, Toronto.

1887 Jan. 20. PERLEY, HENRY F.....147 McLaren St., Ottawa.

1888 Mar. 22. PERRY, JAMES RUDSTON.....Napanee, Ont.

1887 Jan. 20. PETERSON, P. ALEX.....C.P.Ry., Montreal.
(*President.*)

1887 Jan. 20. PETERS, HURD.....St. John, N.B.
(*Member of Council.*)

1887 Feb. 24. PIM, JOSEPH PHELPS, B.A.....Room 25 Abington Buildings, Portland, Oregon.
1891 Nov. 19. PINDER, WILLIAM GEORGE.....94 Superior St., Victoria, B.C.
1887 Jan. 20. PLUNKETT, EDMUND WALTER. .....91 O'Connor Street, Ottawa.
1887 Jan. 20. POOLE, HENRY SKEFFINGTON .....Stellarton, N.S.
1889 Mar. 14. POULIN, STANISLAS R.....Emsdale, Dis. of Parry Sound, Ont.
1887 June 25. PRATT, ROBERT MURP ".....36 Rennie's Mill Road, St. John's, Nfld.
1888 Oct. 11. PRICE, PETLEY LLOYD A.....Kentville, N.S.
1887 Feb. 24. PRINGLE, THOMAS.....2439 Notre Dame St., Montreal.
1892 May 20. POUSSIN, M. J. E. LUDOVIC DE LA VALLÉE. P.O. Box 1889, Montreal.

1887 Oct. 6. *Ramsey, William Allen*.....
1887 Jan. 20. RANNEY, GEORGE WARNER.....372 Water St., Peterboro, Ont.
1887 Jan. 20. REDPATH, FRANCIS ROBERT.....Inglenook, Ont. Av., Montreal.
1887 Jan. 20. RHEAUME, LOUIS NAPOLEON.....Morrisburg, Ont.
1887 April 14. RHODES, ARMITAGE.....P.O. Box 625, Quebec.
1887 Jan. 20. RIDOUT, THOMAS.....Dept. Rys. & Canals, Ottawa.
1887 Jan. 20. ROBERTSON, GEO. EDWARD, B.A.Sc.Galops Canal, Cardinal, Ont.
1887 Feb. 24. ROBERTSON, W. F., B.A.Sc.....New Brighton, Staten Is., N.Y.
1887 May 12. ROGERS, RICHARD B., B.A.Sc.....Peterborough, Ont.
1887 Feb. 24. ROSAMOND, JAMES EDWARD.....Cornwall, Ont.
1888 Oct. 11. ROSS, JAMES.....360 Peel St., Montreal.
1887 Feb. 3. RUST, CHARLES HENRY.....City Hall, Toronto.
1887 Jan. 20. RUTTAN, HENRY NORLANDE...City Hall, Winnipeg.
(*Member of Council.*)

1890 Feb. 28. A.M. } SARGENT, CHAS. D.....Cornwall, Ont.
1893 Dec. 21. M. }
1887 Feb. 24. SCHREIBER, COLLINGWOOD.....Dept. of Railways, Ottawa.
1887 Jan. 20. SCOTT, WILLIAM LEMUEL.....Harbour Office, Montreal.
1890 Feb. 27. SECRETAN, JAMES HENRY EDWARD..N. W. C. Ry., Winnipeg, Man.
1887 Feb. 24. A.M. } SHANLY, JAMES MOORE.....Standard Building, Montreal.
1890 Feb. 27. M. }
1887 Feb. 24. SHANLY, WALTER, M.P.....St. Lawrence Hall, Montreal.
1887 Jan. 20. SHEWEN, EDWARD THORNBROUGH PARKER. Pub. Works of Canada, Antigonish, N.S.
1888 June 11. SIEMENS, ALEXANDER.....12 Queen Anne's Gate, London, Eng.

1887 Feb. 24. SIMPSON, FRANK.....1 Wellington St. East, Toronto.
1887 Jan. 20. SIMPSON, JOHN.....Mount Forest, Ont.
1887 Feb. 3. SMITH, A. H.....G. T. Ry., London, Ont.
1888 Feb. 9. SMITH, HENRY BADELEY.....Victoria, B.C.
1887 Jan. 20. SMITH, HENRY.....Dept. Crown Lands, Toronto.
1887 Sept. 17. *Smith, Thomas T. Vernon*.....
1887 May 12. SOMERVILLE, FRANK LINN.....G. T. Ry., Peterborough, Ont.
1887 Jan. 20. SPROATT, C.....City Hall, Toronto.
1887 Jan. 20. SPROULE, WILLIAM JOHNSTON, M.A.E. Harbour Office, Montreal.
1887 Feb. 24. A.M. } STECKEL, LOUIS JOSEPH Dept. Pub. Works, Ottawa.
1888 Feb. 9. M. } RÉNÉ.
1889 Nov. 14. STEWART, ALEXANDER.....Duluth & Winnipeg Rd. Co., Duluth, Minn.
1893 April 29. STEWART, DONALD ALEXANDER.....C. P. Ry., Winnipeg, Man.
1888 Feb. 9. STEWART, GEORGE ALEXANDER.....National Park, Alberta.
1887 Feb. 24. STEWART, ROBERT C.....Hamilton, Ont.
1887 Jan. 20. ST. GEORGE, PERCIVAL W...City Hall, Montreal.

(*Vice President.*)

1891 Nov. 19. A.M. } STOESS, CHAS. ANTHONY....New Westminster, B.C.
1892 April 8. M. }
1887 Jan. 20. *Stokes, J. T.*.....
1888 Feb. 9. SUMMERFIELD, PETER.....P.O. Box 338, Victoria, B.C.
1887 Jan. 20. SURTEES, ROBERT.....City Engineer, Ottawa.
1888 June 11. SUTCLIFFE, JOHN.....Mansion Sq., Poughkeepsie, N.Y.
1887 Feb. 24. SYKES, SAMUEL H.....Medford, P.O., Jackson Co., Oregon.
1887 Feb. 3. SYMMES, H. C.....Niagara Falls, Ont.

1887 April 28. TATE, ROBERT FREDERICK.....294 Crawford St., Toronto.
1888 Mar. 28. TAYLOR, JAMES HENRY.....K. & P. Ry., Kingston, Ont.
1889 May 23. TEMPLE, EDMUND BONNER.....25 Toronto St., Toronto.
1891 Jan. 29. THOMPSON, WM. GEORGE MACNEILL. Res. Engineer Welland Canal, St. Catharines, Ont.
1889 Dec. 19. THOMSON, FREDERICK.....Royal Electric Co., Montreal.
1888 Mar. 22. TORRANCE, JOHN FRASER, B.A.Sc...1761 Notre Dame St., Montreal.
1888 Oct. 11. TRACY, *Col.* THOMAS H.....City Hall, Vancouver, B.C.
1887 Sept. 17. TRUTCH, *Sir* JOSEPH W.....Victoria, B.C.
1891 Jan. 29. TURNER, FRANK EDWIN PRINCE.....Bracondale, Toronto, Ont.
1891 Oct. 8. TWINING, CHAS. RUFUS FAIRBANKS...Rua S. Pedro No. 56, Rio de Janiero, Brazil.

1887 Nov. 11. UNIACKE, ROBERT FITZGERALD.....Yarmouth, N.S.
1888 Jan. 6. UNSWORTH, JOSEPH LENNON.... ...P.O. Box 580, Charlottetown, P.E.I.

1892 Jan. 28. VALIQUET, ULRIC.....St. Joseph de Levis, Que.
1887 Nov. 11. VALLEE, LOUIS ANDRE.....Dept. Public Works, Que.
(*Member of Council.*)
1888 Jan. 9. VAUTELET, HENRI ETIENNE.....C. P. Railway, Windsor St., Montreal.

1887 Jan. 20. WALBANK, W. MCLEA, B.A.Sc.....214 St. James St., Montreal.
1887 Jan. 20. WALLIS, HERBERT.....G. T. Ry., Montreal.
(*Vice-President.*)
1887 Jan. 20. WANKLYN, FREDERICK LUMB.....G. T. Ry., Montreal.
1888 Oct. 11. *Wasell, Edward.... ....*
1887 Feb. 24. WEBSTER, GEO. HERBERT.....Chief Engineer, M. & N. W. Ry., Portage la Prairie, Man.
1891 Oct. 8. WELLINGTON, ARTHUR M.....Editor *Engineering News*, Tribune Building, New York, N.Y.
1893 May 18. WETMORE, GEORGE LUDLOW.....Schreiber, Ont.
1887 Jan. 20. WHITE, THOS. HY..... ....C. P. Ry., Winnipeg, Man.
1887 Jan. 20. WICKSTEED, HY. K., B.A.Sc. .....Box 156, Cobourg, Ont.
1890 May 22. WILLIAMS, JOHN.....1017 Bathurst St., Toronto.
1893 April 20. WILLIAMSON, FRANCIS STUART. ....22 Williams St., New York, U. S. A.
1888 Jan. 6. WILMOT, EDWARD ASHLEY.....Victoria, B.C.
1887 Feb. 24. WILSON, JAS.....Supt. Q. V. Niagara Falls Park, Niagara Falls, Ont.
1887 Jan. 20. WISE, FREDERICK A..... .....Dept. Railways and Canals, Ottawa.
1887 Jan. 20. WRAGGE, EDMUND..... .....G. T. Ry., Toronto.

1889 Dec. 19. YATES, HENRY... .....Brantford, Ont.

1890 Feb. 27. ZDZIARSKI, ANTOINE.....Petropavlovsk, Akmolinsk. District, Russia.
1889 Dec. 19. ZURCHER, MAX A.....1226 St. Denis St., Coteau St. Louis, Montreal.

ASSOCIATE MEMBERS.

(A. M. Can. Soc. C. E.)

Date of Membership.		*Name.*	*Address.*
1889 Mar. 14. 1890 April 10.	A. A.M.	ABREY, GEO. BROKITT.....	Toronto Junction, Ont.
1887 Oct. 16.		ALLISON, JOHN LOGIE.....	Coteau Landing, P.Q.
1887 Jan. 20.		*Archbald, Henry, B.A .Sc*.....	
1887 Feb. 24. 1892 Jan. 28.	S. A.M.	ASHBRIDGE, WELLINGTON THOS.	1444 Queen St. E., Toronto.
1892 April 8.		ASTLEY, JOHN WM.....	Winnipeg Hotel, Winnipeg, Man.
1887 June 25.		AYLMER, HARRY BROCK	Melbourne, P.Q.
1887 June 25.		BAKER, CHARLES STUART	Can. Govt. Office, Victoria St., London, Eng.
1892 Jan. 28.		BAKER, S. HANLAN	Union Stock Yards, Chicago, Ill.
1892 May 20.		BALL, EDWARD FREY.....	172 Bird Ave., Buffalo, N.Y.
1887 Jan. 20. 1891 April 9.	S. A.M.	BALL, JOHN PLAW.....	Lemont, Cook Co., Ill.
1887 June 9.		BANNISTER, HENRY	Portsmouth, Ont.
1888 Feb. 9.		BOOTH, CHAS. ED. STUART.....	196 Colborne St., Kingston, O.
1889 Feb. 24. 1892 May 20.	S. A.M.	BOULTON, ARTHUR .... HENRY.	22 Spadina Ave., Toronto.
1887 June 25. 1891 Nov. 17.	S. A.M.	BOWMAN, FRED. ALLISON....	New Glasgow Electric Co., New Glasgow, N.S.
1888 April 19.		BOWMAN, HERBERT JOSEPH	Berlin, Ont.
1892 April 8.		BOWMAN, LEANDER MEYER.	169 Cowan Ave., Toronto.
1891 Nov. 19.		BRIGHT, JOHN BENJ..	Macleod, Alberta.
1887 April 28. 1890 Nov. 20.	S. A.M.	BROOKS, NOEL EDGELL	M. St. Ry., Craig St., Montreal.
1887 Feb. 24.		BURNS, DAVID	168 Spadina Ave., Toronto.
1890 Feb. 27.		BURNS, WILLIAM	Renfrew, Ont.
1887 Feb. 24.		CAIRNIE, GORDON F.....	Melbourne, Que.
1888 Mar. 22.		CAMPBELL, ARCHIBALD WM.....	St. Thomas, Ont.
1893 Oct. 12.		CARROLL, WM. J	Box 994, Belleville, Ont.
1887 Feb. 24.		CHALONER, CHARLES.....	Dept. Public Works, Ottawa.
1889 Nov. 14.		CHAPMAN, WALTER PECK.....	G. T. R., Allandale, Ont.
1892 May 11.		CHEWETT, JAMES HENRY....	103 Bay St., Toronto.

1887 Nov. 11. COWIE, FREDERICK WM.....Dept. Public Works, Ottawa.
1887 Feb. 24. CREWE, HENRY.....Toronto, Ont.
1892 Mar. 11. CROSSLEY, FREDERICK.....10 Moreland Ave., Montreal.
1887 Feb. 24. CROWLEY, CHARLES JAS.....G.T.R., Cobourg, Ont.

1887 June 28. S. } DAWSON, GEORGE HERBERT, } Williams Bros. & Dawson,
1892 April 8. A.M. { B.A.Sc..... } Vancouver, B.C.
1887 June 25 DREWRY, WILLIAM STEWART.....Dept. of Land and Works, Victoria, B. C.
1889 March 14. DRUMMOND, THOMAS.....9 Crescent St., Montreal.
1887 June 25. DUNN, GUY CRAMP BELL.....O. & G. V. Railway, Central Chambers, Elgin St, Ottawa.

1892 Dec. 23. EATON, DANIEL ISAAC VERNON.....Geological Survey, Ottawa.
1891 May 21. ELLIS, HENRY DISNEY.....76 St. Patrick St., Toronto, Ont.
1890 April 10. EVANS, ARTHUR THOS. K.....25 Toronto St., Toronto.
1892 Nov. 11. EWING, JAMES.....Engineers' Department, C.P. R. Montreal

1893 Oct. 12. FITZGIBBON, ROBT.....64 Hutchison St., Montreal.
1887 Jan. 20. FLEMING, SANDFORD H.....Victoria Chambers, Ottawa, O.
1892 March 11. FRIPP, FRED. BOWLES.....325 Waverly St., Ottawa, Ont.

1892 May 20. GARDEN, CHARLES.....C. P. Ry., Winnipeg, Man.
1887 Feb. 3. GARDINER, EDWARD.....St. Catharines, Ont.
1887 Jan. 20. GAUVIN, CHAS. EDWARD.....Quebec.
1888 Dec. 6. GIROUARD, *Lieut.* PERCY C., R.E...Royal Arsenal, Woolwich, Eng.
1887 June 25. GIROUX, NAP. JULIEN.....Geological Survey, Ottawa.
1892 May 20. GOING, ALVAH SEYMOUR.....Box 345, Victoria, B.C.
1891 Oct. 8. GRANT, ALEX. JOS.....Cascades Point, Co. of Soulanges, P.Q.

1892	Jan.	28.	GRAYDON, AQUILLA ORMSBY.....City Hall, London, Ont.
1892	May	20.	GREEN, CHAS. DE BLOIS.....16 Labouchère St., Victoria, B.C.
1887	June	25.	HALL, CHAS. HALIFAX.....Engineer's Office, C.P.Ry., Winnipeg, Man.
1889	Dec.	19.	HANNAFORD, ROBT. MAITLAND.....G. T. Ry., Montreal.
1892	May	11.	HEBERT, EDMUND ANT.....250 St. John Street, Quebec.
1887	Feb.	24.	HECKMAN, JOS. WM., B.E.....803 Dorchester St., Montreal.
1892	May	20.	HENDRY, WM. A.....Halifax, N.S.
1892	May	20.	HENDERSON, THOS. ROBT.....28 McTavish St., Montreal.
1893	Oct.	12.	HESKETH, JAS. A.....1640 King St. W., Toronto, Ont.
1893	Oct.	12.	HIGMAN, ORMOND.....Ottawa, Ont.
1889	Feb.	14.	HISLOP, JOHN.....Box 59, Newhall, Los Angeles, Cal.
1887	Feb.	3.	HODGINS, ARTHUR EDWARD.....Nelson, B.C.
1887	Jan.	20.	S. HOPKINS, MARSHALL
1891	April	9.	A.M. WILLARD.....Stoney Creek, Ont.
1893	Oct.	12.	HUSBANDS, ARTHUR L.....Cookshire, Que.
1887	Jan.	20.	S. JONAH, F. GILBERT.....St. Louis Merchants' Bridge Ter.
1889	Dec.	19.	A.M. Ry., St. Louis, Mo.
1892	Dec.	23.	JONES, THOS. HENRY.....Brantford, Ont.
1887	June	25.	KEELEY, DAVID HERBERT.....Govt. Tel. Service, Ottawa.
1888	April	19.	KENRICK, ROBT. B.....Dom. Bridge Co., Montreal.
1893	April	20.	KER, NEWTON JAS.....City Engineer's Office, Toronto.
1893	April	20.	KERBY, FORBES M.....Vernon, B.C.
1888	Mar.	22.	S. KERRY, JOHN G. G.....149 Durocher St., Montreal.
1893	Dec.	21.	A.M.
1889	Dec.	19.	KIMBALL, WALTER R.....Wayne Hotel, Fort Wayne, Ind.
1888	Mar.	22.	KIRKPATRICK, ALEX. KING.....Can. Pac. Ry., Smith's Falls, Ont.
1888	June	27.	LANGEVIN, H. LAFORCE.....73 Lewis St., Quebec.
1887	Feb.	24.	LANGUEDOC, G. F. ERROL DEGUERRY.180 St. James St., Montreal.
1893	May	18.	LECKIE, ROBT. G. E.....Torbrook, N.S.
1889	Dec.	19.	LEPROHON, C. DE BELLEFEUILLE.....961 Dorchester St., Montreal.

1887 Jan. 20. LESAGE, THOS. W., B.A.Sc.....City Hall, Montreal.
1887 June 9. S. } LOCKE, ROBT. TODD..... .Care of F. W. W. Doane,
1891 Nov. 19. A.M. } City Engineer, Halifax, N.S.
1887 Dec. 1. S. } LOVELACE, EDGAR S. M., } 54 St. Matthew St., Montreal.
1893 April 19. A.M. } B.A.Sc .... }

1887 Jan. 20. S. } MCCARTHY, JAS. MARMADUKE.Standard Building, Montreal.
1890 Feb. 27. A.M }
1888 Feb. 9. S. } MCCOLL, RODERICK.....New Glasgow, N.S.
1890 April 10. A.M. }
1891 April 9. MCCULLOCH, AND. LAKE.....Galt, Ont.
1887 Feb. 24. S. } MCDOWALL, ROBT.....Owen Sound, Ont.
1892 Jan. 28. A.M. }
1888 May 28. MCGREEVY, CHAS.....Harbour Works, Quebec.
1887 Jan. 24. MCLEAN, ALEX. J., B.A.Sc .....G. T. Ry., Napanee, Ont.

1888 May 28. MACKENZIE, JAS. W.....Whycocomagh, C.B.
1888 Jan. 6. MACKENZIE, JAS. HUGH.....Queen's Hotel, St. John, N.B.
1891 Jan 29. MILLICAN, CHAS. ARTHUR.....Box 476, Winnipeg, Man.
1887 Feb. 24. MORRIS, JAS. LEWIS.....Pembroke, Ont.
1888 Mar. 22. S. } MORROW, HAROLD A.....Sault Ste. Marie, Ont.
1893 Dec. 21. A.M. }

1888 Jan. 6. ODELL, CHAS. MONTSARRAT.....The Boston & Nova Scotia Coal Co., Mabou, C.B.
1887 June 25. O'DWYER, J. SEABURY, B.A.Sc.....Granby, Que.
1887 Feb. 3. O'HANLY, JOHN MITCHELL.....352 Dale Street, Ottawa.
1887 Oct. 16. OLIVER, STUART STIRLING.....Quebec.
1887 Feb. 3. ORD, LEWIS R.....Sharpe's P. O., Indian River, Florida, U.S.

1887 Jan 20. S. } PALMER, ROBT. ED., B.A.Sc..P. O. Box 292, Vancouver, B.C.
1891 Nov. 19. A.M. }
1891 April 9. PANI, CAMILO ENRIQUE.....Resident Eng. Tampico Terminal Mex. Cent. R.R., La Barra, Tampico, Mex.
1887 Feb. 24. PAPINEAU, LOUIS G.....369 St. Denis St., Montreal.
1887 Feb. 24. PARISEAU, LOUIS S.....St. Johns, P.Q.
1887 Jan. 20. PERREAULT, EDWARD EUGENE .... .City Hall, Ottawa.

1893 Dec. 21. PHILLIPS, ARTHUR T.....Box 355, Ottawa, Ont.
1888 May 19. PILSWORTH, WM. ROBERT.....City Hall, Toronto.
1887 Feb. 24. S. } PINHEY, CHAS. H.....Coteau Landing, P.Q.
1893 Dec. 21. A.M. }
1893 April 20. POTTER, ALEXANDER.....137 Broadway, New York.

1887 Jan. 20. S. } RINFRET, RAOUL.....517 New York Life Bldg.,
1893 Dec. 21. A.M. } Montreal.

1889 Dec. 19. ROBERTS, EDMUND A. RHYS.....Hamilton Bridge Co.,
Hamilton, Ont.
1889 Feb. 14. ROSS, ALEX. BELL.....Room 213, Sheeley Block,
Omaha, Neb.
1887 Feb. 24. ROY, JOSEPH R.....631 Sherbrooke St., Montreal.
1888 Feb. 9. S. } RUSSELL, THOS. SIMPSON.....20 Sussex Ave., Toronto.
1891 Jan. 29. A.M. }
1893 Dec. 21. RUTHERFORD, WALTER .....65 Front St. W., Toronto, Ont.

1891 April 9. SAUNDERS, B. JOHNSTON .....Brockville, Ont.
1892 April 8. SHEARWOOD, FRED. PERRY.....Dom. Bridge Co., Montreal.
1887 May 12. S. } SKAIFE, WILFRED T., B.A.Sc. 630 Sherbrooke St., Montreal.
1888 Feb. 9. A.M. }
1887 Dec. 1. SMITH, C. BRUNSWICK, B.A.Sc.....491 Upper St. Urbain St.,
Montreal.
1887 June 25. *Smith, Wm. Henry Chatterton*....
1889 May 23. STARR, DAVID A .....Royal Electric Co., Montreal.
1891 Nov. 19. STEELE, EDWARD. CHAS .....453 Church St., Toronto.
1890 April 10 SYMMES, CHAS. THOS.....Ferrocarril de Parral a Conquénes, Conquénes, Provincia de Maule, Chili.

1891 Jan. 29. TESSIER, JOS. HOLLAND.....Acton Vale, P.Q.
1888 Mar. 22. THOMAS, ALFRED .....Room 792, Arcade Building,
Cleveland, Ohio.
1887 Jan. 20. THOMPSON, ROSS.....Port Arthur, Ont.
1893 Dec. 21. THOMPSON, WILLIAM T.....Qu'Appelle Sta., Assa., N.W.T.
1887 Feb. 9. S. } THOMSON, WILLIAM C .....Care of King Bridge Co.,
1893 Dec. 21. A.M. } Cleveland, Ohio.

1889 Nov. 14. TOMS, LEWIS WM .....Care J. P. Roberts, Esq., Box 888, Vancouver, B.C.
1891 April 9. TOUT, WM. HILL.....City Engineer's Office, Guelph, Ont.
1888 May 17. TRUE, ABBOT.....Waterville, Que.
1888 Feb. 9. S. } TYRRELL, HY. GRATTAN.....97 Bassett St.,
1889 Dec. 19. A.M. } New Britain, Conn

1891 April 9. VAN BUSKIRK, WM. FRASER.....Stratford, Ont.
1887 Jan. 20. VANIER, J. EMILE .....Imperial Building, St. James St., Montreal.

1888 April 19. WALKER, ALF. PAVERLEY..... ...Engineer's Dept., C. P. Ry., Toronto, Ont.
1891 April 9. WEBB, PERCY.....Care of Cooke Loco. Works, Patterson, N.Y.
1888 May 17. WHITED, WILLIS.....24 Grand St., New Britain, Conn.
1887 Feb. 24. WILDE, JOHN A.....Sault Ste. Marie, Ont.
1893 Dec. 21. WILFORD, FRED. R.....Renfrew, Ont.
1887 June 22. WOODS, JOS. EDWARD .. ..Aylmer, P.Q.

ASSOCIATES.

(A. Can. Soc. C. E.)

Date of Membership.	*Name.*	*Address.*
1887 Feb. 24.	ABBOTT, WILLIAM	55 St. Sulpice St., Montreal.
1890 April 10.	BAKER, WALTER REGINALD	Portage la Prairie, Man.
1889 Feb. 14.	BARR, MARSHALL D	Toronto.
1891 April 9.	BELL, JOHN, Q.C	Belleville, Ont.
1887 Jan. 20.	BELL, ROBT., B.A.Sc., M.D., LL.D.	Geological Survey, Ottawa.
1889 Nov. 14.	BRAINERD, THOMAS C., M.D	171 Drummond St., Montreal.
1887 April 14.	BROWN, THOMAS BRIGGS	14 Custom House Sq., Montreal.
1888 April 19.	BROWNE, WILLIAM ELLIS	Digby, N.S.
1889 Jan. 3.	COOPER, JAMES	860 Sherbrooke St., Montreal.
1889 Jan. 3.	COWANS, JOHN R	Cumberland Mines, N.S.
1889 Feb. 14.	COWANS, ROBERT	Montreal.
1889 Feb. 14.	DAVIS, MICHAEL P	Ottawa.
1888 Mar. 22.	DAVIS, WILLIAM HENRY	Theodore St., Ottawa.
1890 Nov. 20.	DION, ALFRED ADOLPHE	Moncton, N.B.
1887 Feb. 3.	EADIE, GEORGE W	155 Drummond St., Montreal.
1889 Dec. 19.	FAIRMAN, FREDERICK	287 Peel St., Montreal.
1890 Nov. 20.	FARLEY, RICHARD WILLIAM	Hull, P.Q.
1888 Mar. 22.	FERGUSON, JOHN, M.P	Niagara Falls, Ont.
1889 Dec. 19.	GARTSHORE, ALEXANDER	Box 125, Hamilton, Ont.

1891 Nov. 19. GIBSON, WILLIAM, M.P..... . ...Beamsville, Ont.
1889 Feb. 14. GREENSHIELDS, EDWARD B.....Victoria Square, Montreal.
1887 May 17. GRIFFIN, CHARLES GEORGE.....Ship Canal, Sault Ste. Marie, Ont.

1889 Dec. 19. HENDRIE, WILLIAM..... .....Hamilton, Ont.
1889 Feb. 14. HICKSON, *Sir* JOSEPH.....G.T.R., Montreal.
1887 Feb. 3. A.M. } HOOPER, GEORGE R.....W. Dow & Co., Montreal.
1890 Feb. 27. A. }
1891 May 21. HOWLAND, OLIVER AITKEN.....103 Bay St., Toronto.

1888 Mar. 22. ISBESTER, JAMES..... .....73 Daly Ave., Ottawa, Ont.
1888 Mar. 22. IVES, HUBERT R..... .....200 University St., Montreal.

1893 April 20. KAMMERER, JACOB A.....38 York St., Toronto.

1887 Jan. 20. LECKIE, R. G..... .....The Londonderry Iron Co., Londonderry, N.S.

1891 Nov. 19. MCFARLAND, JOS. WALTER..... ....P.O. Box 206, Vancouver, B.C.
1888 April 19. MCKENZIE, JOHN.....New Westminster, B.C.
1893 April 20. MCLAREN, HARRY, B.A.....67 Mansfield St., Montreal.
1888 Feb. 9. MCLENNAN, JOHN S., B.A.....95 Milk St., Boston, Mass.
1890 Feb. 27. MACLEAN, ALEXANDER.....Ottawa.
1889 Jan. 3. MOLSON, JOHN HENRY R.....Piedmont, Montreal.
1889 Nov. 14. MOUNT-STEPHEN, *Lord*.....140 Drummond St., Montreal.

1888 May 17. OSLER, BRITTEN BATH, Q.C.....23 Toronto St., Toronto.

1888 Oct. 11. POLSON, FRANKLIN BATES.....Polson Iron Works, Toronto.
1888 May 17. PRICE, BRUCE.....150 Fifth Avenue, New York.

1890 Nov. 20. RATHBUN, EDWARD WILKES.....Deseronto, Ont.
1887 Jan. 20. *Reaves, George R*.....
1887 June 9. REID, ROBERT GILLESPIE.... .....Temple Building, St. James St., Montreal.
1891 Jan. 29. REID, WILLIAM GILLESPIE.... .....30 St. John St., Montreal.
1887 Jan. 20. REYNOLDS, F. H.....Temple Building, St. James St., Montreal.
1887 Jan. 20. RIELLE, JOSEPH.....New York Life Bdg, Place d'Armes Sq., Montreal.
1890 Feb. 27. ROBERTSON, J. C.....St. John, N.B.
1888 May 17. RYAN, HUGH.....Toronto.

1890 April 10. SCOTT, J. PHILIP.....W. Dow & Co., Montreal.
1888 May 17. SHAUGHNESSY, THOMAS G..... ....C.P.Ry., Montreal.
1890 Feb. 27. SHEARER, JAMES TRAILL..... . Montreal.
1889 May 23. SMITH, *Sir* DONALD A., K.C.M.G...1157 Dorchester St., Montreal.
1888 Dec. 6. STARR, JOHN..... .....Halifax, N.S.
1888 Mar. 22. SUTHERLAND, KENNETH.....Kentville, N.S.
1889 Feb. 14. SWINYARD, THOMAS M..... .....The Hall, Gilbertsville, N.Y.

1890 Feb. 27. TAIT, THOMAS..... .....C.P.Ry., Toronto.
1889 Jan. 3. TOWNSEND, WALTER..... .....Standard Building, St. James St., Montreal.
1887 May 12. TROTTER, WALLACE CUTHBERT.....St. Johns, P.Q.

1888 May 17. VAN HORNE, W. C..... .....C.P.R., Montreal.

1892 Jan. 28. WEDDELL, ROBERT. .....Trenton, Ont.

STUDENTS.

(Stud. Can. Soc. C. E.)

Date of Membership.	*Name.*	*Address.*
1887 Jan. 20.	Addie, G. K., B.A.Sc.	Sherbrooke, P.Q.
1893 April 20.	Alison, Thomas H.	52 Murray St., Toronto.
1893 April 20.	Amos, Edouard C	31 Drummond St., Montreal.
1893 April 20.	Amos, Louis A	31 Drummond St., Montreal.
1887 May 12.	Antliff, John Holden, M.A.Sc., D.T.S.	458 Guy St., Montreal.
1887 Feb. 24.	Apsey, John F.	313 E. North Ave., Baltimore, Md.
1890 May 22.	Arcand, O.	Care of Pottsville Iron & Steel Co., Pottsville, Penn.
1888 May 17.	Archibald, Cyrus W.	I. C. Ry., Truro, N.S.
1891 Oct. 8.	Beatty, Herbert John.	Pembroke, Ont.
1887 Jan. 20.	Bertrand, J. T.	280 Theodore St., Ottawa.
1893 Dec. 21.	Boucherville, Jos. B. de.	61 Temple Building, Montreal.
1890 April 10.	Bowman, F. M.	Care of Riter & Conley, Alleghany, Penn.
1888 Dec. 6.	Bickerdike, R., Jun., B.A.Sc.	P. O. Box 94, Montreal.
1892 Mar. 11.	Bolton, Ellsworth, B.A.Sc.	Listowel, Ont.
1887 Feb. 24.	Brown, D. B.	Cornwall, Ont.
1887 Feb. 24.	Bucke, M.A.	Asylum, London, Ont.
1891 Nov. 19.	Campbell, Wm. Francis.	Dorchester, N.B.
1887 Jan. 20.	Childs, Arthur E., B.A.Sc.	632 Girard Ave., Philadelphia, Penn.
1887 Feb. 24.	Clement, W. A.	City Engineer's Office, Toronto, O.
1887 Feb. 24.	*Colquhoun, W. E.*	
1889 Mar. 14.	Copeland, L.B., B.A.Sc.	1272 Dorchester St., Montreal.
1889 Dec. 19.	Costigan, J. S.	McGill University, Montreal.
1892 Mar. 11.	Courtney, Reginald Mortimer.	J. M. Courtney, Dept. Minister of Finance, Ottawa.
1888 Mar. 22.	Coutlée, C. R. F.	Cascades, Vaudreuil Stn., P.Q.
1888 Mar. 22.	Covert, J. S.	King Bridge Co., Cleveland, Ohio.
1892 Jan. 28.	Creighton, Frank Albro.	Dartmouth, N.S.

1889 Nov. 14. DAWSON, A. S.....McGill University, Montreal.
1890 May 22. DEACON, T. R.....School of Prac. Science, Toronto.
1888 Jan. 6. DENISON, W. S., B.A.Sc.....Denison's Mills, P.Q.
1887 June 25. DIMOCK, A. H.....N. E. Cor. Sutter & Weller Sts., Seattle, Wash.
1891 April 9. DOMVILLE, JAS. WM.....11 Belmont St., Montreal.
1890 May 22. DOUGLAS, JAS. ATKINSON.....Montreal Electric Co., 302 St. James St., Montreal.
1893 May 18. DRAPER, WILLIAM N.....New Westminster, B.C.
1887 Jan. 20. DRUMMOND, A. L., B.A.Sc.....874 Sherbrooke St., Montreal.
1890 April 10. DUFF, JOHN A.....School of Prac. Science, Toronto.
1891 May 21. DUFF, WM. ARCHIBALD.....345 Prince Arthur St., Montreal.

1888 Dec. 6. ELLACOTT, C. H., B.A.Sc.....P.O. Box 479, Victoria, B.C.

1889 Dec. 19. FAIRMAN, F. W.....Temple Building, St. James St., Montreal.
1887 Nov. 4. FELLOWES, F. L.....Cor. Keele and Dundas Sts., Toronto Junction, Ont.
1887 Jan. 27. FORNERET, V. F. W., B.A.Sc.....Berthier, P.Q.
1892 May 20. FORTESCUE, MATTHEW.....C.P.Ry., Montreal.

1887 Feb. 24. GIBBONS, JAMES.....49 Augusta St., Ottawa.
1888 May 23. GOODWIN, E. P.....Baie Verte, N.B.
1891 April 9. GRANTHAM, ARTHUR MYLES.....634 Church St., Toronto.
1892 April 8. GREENBERG, LOUIS, B.A.Sc.....7 Chaboillez Sq., Montreal.

1893. Dec. 21. HARE, GEORGE G.....108 Durocher St., Montreal.
1888 Mar. 22. HATT, W. K., B.A.....Perdu University, La Fayette, Ind.
1887 Feb. 24. HAULTAIN, H. E. T.....Anglo-American Club, Frieburg in Sachsen, Germany.
1888 Dec. 6. HAWKINS, A. H., B.A.Sc.....Box 404, or care Garden, Hermom & Burwell, Vancouver, B.C.

1888 Mar. 22. HEATHCOTE, W. C. P..... .....Care of Royal Electric Co., Montreal.
1892 Mar. 11. HOLDEN, ARTHUR RAMSAY ....49 Belmont Park, Montreal.
1887 April 14. HUNTER, R. E.....Sorel, P.Q.
1891 Oct. 8. HUTCHEON, JAMES.....Nassagaweya, Halton Co., Ont.

1887 Feb. 24. IRVINE, JOHN.....Harriston, Ont.

1891 Nov. 19. JONES, HENRY AUGUSTUS.....King's Coll., Windsor, N.S.

1893 Dec. 21. KILLALY, HAMILTON M.....McGill University, Montreal.
1890 Nov. 20. KINGSTON, CHAS. B., B.A., B.A.Sc..1050 Dorchester St., Montreal.
1891 Nov. 19. KINNEAR, GUY STANHOPE ....Sussex Vale, N.B.
1890 Nov. 20. KIPPEN, HORACE BRUCE.....Lennoxville, Que.

1889 Feb. 14. LAFONTAINE, EMERY..... . .....Dept. Public Works, Quebec.
1893 May 18. LAIDLAW, JAMES T..... ....78 St. Albans St., Toronto.
1889 Dec. 19. LAMBERT, F.... ....McGill University, Montreal.
1890 May 22. LANE, ANDREW.....Box 230, Toronto Junc., Ont.
1887 Jan. 20. LEA, R. S., MA.E.....2446 St. Catherine St., Montreal.
1887 Feb. 24. LEASK, JOHN L..... ....71 Crawford St., Toronto.
1890 April 10. LEFEBVRE, J. H..... ....30 St. Elizabeth St., Montreal.
1887 Sept. 17. LEWIN, H. O. S..... .....237 McLaren St., Ottawa.
1892 Mar. 11. LOEB, ALFRED A..... ... .122 Crescent St., Montreal.
1887 Feb. 24. LOIGNON, A..... .....24 St. Augustin St., Montreal.
1887 Feb. 24. LOIGNON, E..... .....24 St. Augustin St., Montreal.
1892 Mar. 11. LONGWORTH, CHAS. H. B.....McGill University, Montreal.
1890 April 10. LORDLY, H. R..... ....93 Germain St., St. John, N.B.
1887 Feb. 24. LOTT, A. E.....Yuma, A.T., U.S.A.
1887 June 25. *Lough, William H*..... .....

1892 Mar. 11. MCBEAN, A. STEWART.....44 Bishop St., Montreal.

1888 Feb. 9. McDonald, John K ....Asst. Engineer, Winding Ledges, Madawaska Co.,
1887 Jan. 20. McFarlane, M.C., B.A.Sc.... ....Almonte, Ont.
1887 Feb. 24. McFarlen, G. W..... .....10 St. Vincent St., Toronto.
1887 April 28. McGregor, J. H.....Care of T. S. Gore, 14 Bastien St., Victoria, B.C.
1890 Nov. 20. McGregor, J. Murray, B.A.Sc.....59 McClure St., Victoria, B.C.
1887 Jan. 20. McKenzie, C. P..... .....Snohomish, Wash.
1887 Jan. 20. McLennan, M. J., B.A.Sc .....Williamstown, Ont.
1890 May 22. McLeod, T. M., B.A.Sc.... .....McGill University, Montreal.
1892 April 8. MacPhail, Jas. Alex., B.A.Sc....2430 St. Catherine St., Montreal.
1889 Mar. 14. McTaggart, N. B.....76 Redpath St., Montreal.

1887 Feb. 24. Marani, C. J .....School of Practical Science, Toronto.
1887 Feb. 24. Mather, C. D..... Care of J. A. Mather, Kincardine, Co. of Bruce, Ont.
1887 Dec. 1. Mattice, E. S., B.A.Sc.....Cornwall, Ont.
1887 Feb. 24. Mickle, G.....Queen's Par k, Toronto.
1888 Jan. 6. Middleton, P. H., B.A.Sc.....223 N. Cayuga St., Ithaca, N.Y.
1887 Feb. 24. Mill, F. X..... ....Glenburnie, Maria, P.Q.
1889 Mar. 14. *Mitchell, Geo* .....
1889 Jan. 3. Moberly, Harford K.....Care of Consolidated Coal Co., Frostburg, Md.
1887 Jan. 20. Mooney, G. W., B.A.Sc .....269 University St., Montreal.
1891 Jan. 29. Moore, Jas. Edwin Alex .....Duluth & Winnipeg Rd. Co., Duluth, Minn.
1889 Feb. 14. Murphy, Cornelius Jos.....Halifax.
1889 Dec. 19. Murphy, D. A., B.A.Sc .....418 Guy St., Montreal.
1887 Feb. 24. Murray, R. W.....Rossmore, Ont.

1887 April 14. Naismith, P. L., B.A.Sc .....The International Coal Co., Sydney, C.B.
1891 Oct. 8. Newman, Wm .....Box 442, Windsor, Ont.

1887 April 14. Ogilvy, R. F., B.A.Sc..... .....1144 Dorchester St., Montreal.

1893 April 20. PANET, HENRI A.....C. P. Ry., Smith's Falls, Ont.
1888 Feb. 9. PEARSE, T. E. E.....Martin's Ferry, Ohio.
1890 April 10. PEDDER, J. R.....Doon, Ont.
1892 Dec. 23. PLESSIS, JOS. E. L. DU.....Sorel, Que.
1887 June 25. PRAT, R.....Kentville, N.S.

1887 April 28. RAMSAY, H. M., B.A.Sc.....M. E.Office, P.R.R., Altoona, Pa.
1890 May 22. RANKIN, J., Jr.....838 Dorchester St., Montreal.
1887 Jan. 20. REDPATH, P. W., B.A.Sc.....1065 Sherbrooke St., Montreal.
1887 Jan. 20. REED, C B., B.A.Sc.....4130 Lake Ave., Chicago, Ill.
1887 Jan. 25. REID, W. M., B.A.Sc.....478 Guy St., Montreal.
1887 Feb. 24. RICHARDSON, G. H.....36 St. Joseph St., Toronto.
1892 Mar. 11. ROBERT, ALPH. M.A., B.A.Sc.....163 St. Patrick St., Ottawa.
1891 Nov. 19. ROSE, GEO. GILDERSLEEVE.....Morrisburgh, Ont.
1887 Feb. 24. ROSE, K.....Cuicatlan, Estado de Oaxaco, Mexico.
1888 April 19. ROSS, D. A.....Mount Forest, Ont.
1888 Jan. 6. RUSSEL, H. Y., B.A.Sc.....Geo. Survey Dept., Ottawa, O.
1893 May 18. RUSSEL, ROBERT K.....Pembroke, Ont.
1888 Feb. 9. RUSSELL, W.....Pembroke, Ont.
1889 Mar. 14. RUTHERFORD, F.....McGill University, Montreal.
1890 May 20. RYAN, A. J., B.A.Sc.....Rouses Point, N Y.

1888 Mar. 22. SCHWITZER, J. E., B.A.Sc.....486 Rideau St., Ottawa
1891 Jan. 29. SHERATON, ROBT. LEONARD.....Halifax, N.S.
1887 Feb. 24. SHILLINGLAW, W. H.....Box 182, Brandon, Man.
1891 Oct. 8. SILVESTER, GEO. ERNEST.....Box G., Sudbury, Ont.
1890 Nov. 20. SMART, JOHN ALDER, B.A.Sc.....Care of Judge Smart, Hamilton, Ont.
1888 Feb. 9. SMITH, G. S., B.A.Sc.....McGill University, Montreal.
1893 April 20. SPÉNARD, JOS. L.....Mastar, Que.
1888 June 27. SPENCE, A. W.....Sault Ste. Marie, Ont.
1893 May 18. SQUIRE, RICHARD H.....School of Science, Toronto, O.
1890 Nov. 20. STEVENSON, JAS. ALBERT, B.A.Sc... McGill University, Montreal.
1890 Feb. 27. STEVENS, A. J.....I. C. Ry., Moncton, N.B.
1892 Mar. 11. STIFF, HENRY CHAS.....Johnson Co., Johnstown, Penn.
1888 Mar. 22. STONE, E. A., B.A.Sc.....C. P. Ry., Montreal.
1892 Jan. 28. STREET, L. LEE, B.A.Sc.....Care of A. F. Street, Esq., Fredericton, N.B.
1887 Dec. 1. STRONG, A. W., B.A.Sc.....High School, Montreal.
1888 Mar. 22. STUART, H. B., B.A.Sc.....10 Hutchison St., Montreal.

1887 Jan. 20. Taylor, D., B.A.Sc .....712 Lumber Exchange, Minneapolis, Minn.
1891 Oct. 8. Thomson, Robt. Walker.....42 Gloucester St., Toronto, Ont
1893 Dec. 21. Thornton, Kenneth B .....42 Mackay St., Montreal.
1890 Nov. 20. Tighe, James, B.A.Sc.....City Hall, Holyoke, Mass.
1889 Jan. 3. Tremblay, Thomas .....Continental Hotel, Sherbrooke, P.Q.
1887 Jan. 20. Tuplin, J. P., B.A.Sc .....74 Cortland St., New York.

1890 Nov. 20. Wainwright, Jas. Geo. R., B.A.Sc. Engineer's Dept., G.T R., Sarnia, Ont.
1891 Nov. 19. Wallace, John Wm. Martin.....214 St. James St., Montreal.
1889 Mar. 14. Warren, W. H., B.A.Sc.....McGill University, Montreal.
1890 April 10. Wiggins, T. H.....Napanee, Ont.
1887 Feb. 24. Williams, M. L., B.A.Sc .....150 Mansfield St., Montreal.
1893 April 20. Wilkie, Octavius B. N.....Langley, B.C.
1888 April 19. Wingham, T. H., B. .Sc.....13 Mount St. Mary Ave., Montreal.
1893 May 18. Wonfold, Cuthbert C.....P.O. Box 337, Victoria, B.C.

REPORT OF PROCEEDINGS.

ANNUAL GENERAL MEETING.

January 9th and 10th, 1894.

E. P. HANNAFORD, President, in the Chair.

The Secretary read the notice convening the meeting.

The minutes of the Annual General Meeting held on the 23rd February, 1893, were read and approved.

The following gentlemen were appointed scrutineers of the ballot for the election of Officers and Members of Council :—

Messrs. H. Irwin, R. M. Hannaford and J. W. Heckman.

The following were appointed scrutineers for the ballot of the Nominating Committee :—

Messrs. A. Rhodes, W. McNab and T. W. Lesage.

Mr. Irwin said he would like to know before beginning to count the ballots, if the scrutineers were to follow the instructions given last year, viz.: that the fact of there being more than fifteen names on the ballot for councillors does not invalidate the ballot for the officers. The President stated that such ballots would be valid for officers.

The President stated that the Directors of the Montreal Street Railway had asked the members to visit the Power House on William street, and that the contractors, Messrs. Ross and McKenzie, had kindly offered to serve luncheon at one o'clock. The members could afterwards, if they so wished, visit the Royal Electric Co.'s Works and the Engineering Buildings of McGill University.

The meeting was then adjourned to Wednesday, the 10th instant, at 10 o'clock a.m.

ADJOURNED ANNUAL MEETING.

Convened at 10 a.m., January 10th.

E. P. HANNAFORD, President, in the Chair.

The Secretary read the following report on the work of the Society during the past year :—

REPORT OF COUNCIL.

The Council begs to present the following report on the work of the Society during the past year :

ROLL OF THE SOCIETY.

The elections comprised *one* honorary member, *ten* members, *thirteen* associate members, *two* associates and *sixteen* students. *Three* associate members have been transferred to the class of members, and *six* students to the class of associate members. *One* member has been replaced on the roll on application.

During the year resignations have been received from *four* members, *one* associate member, *four* associates and *one* student, while *five* members, *six* associate members, *eight* associates and *twenty-seven* students, or *forty-six* in all, have been struck off the roll for non-payment of dues.

The deaths have been :

Member.—W. A. Ramsay.

Associate Member.—W. H. C. Smith.

At the present date the membership stands as follows :

	Non-Res.	Res.	Total.
Honorary Members.....	6	1	7
Members	225	58	283
Associate Members..... .	113	20	133
Associates.....	35	24	59
Students.....	103	47	150
			632

At the same date last year the membership was as follows :

	Non-Res.	Res.	Total.
Honorary Members.....	5	1	6
Members..... .	222	58	280
Associate Members.....	105	19	124
Associates..	43	26	69
Students..... .	114	54	168
			647

Showing a decrease of 15 during the past year in members of all classes.

From the analysis it will be seen that the falling off is in the classes of associates and students, there being an increase of twelve in the corporate membership of the Society.

At the time of the last Annual General Meeting, there were thirteen applications pending, and at the present time there are three under the consideration of the Council.

ANNUAL MEETING.

The Seventh Annual General Meeting was held on Thursday, the 23rd February, 1893, at 10 a.m., and on adjournment reassembled at 2.30 p.m. The President, Mr. John Kennedy, occupied the Chair.

In the evening an ordinary meeting of the Society was held, at which His Excellency the Governor-General, Lord Stanley of Preston, was present. A paper on the "Transmission and Distribution of Power by Means of Compressed Air," by Prof. J. T. Nicolson, M. Can. Soc. C.E., was read to a very large meeting of both resident and non-resident members.

Through the kindness of the Governors of McGill University, the members attending the Annual Meeting were invited to the ceremonies connected with the opening of the Engineering and Physics Buildings of the University, on the afternoon and evening of the 23rd of February.

ORDINARY MEETINGS.

Fifteen ordinary meetings of the Society have been held during the year, at which the following papers were read :

On "Discharge of Sewers," by C. H. Rust, M. Can. Soc. C.E. ; on the "Stirling Boiler," by R. F. Ogilvy, Stud. Can. Soc. C.E.; on "Notes on Gold and Silver in the Province of Quebec," by J. F. Torrance, M. Can. Soc. C.E. ; on "The Transmission and Distribution of Power by Means of Compressed Air," by Prof. J. T. Nicolson, M. Can. Soc. C.E. ; on "Transition Curves for Railways and Electric Tramways," by J. S. Armstrong, M. Can. Soc. C.E. ; on "Common Roads," by C. R. F. Coutlee, Stud. Can. Soc. C.E. ; on "The Results of Tests of White Pine of Large Scantling," by Prof. H. T. Bovey, M. Can. Soc. C.E. ; on "The Quebec Land Slide of 1889," by Chas Baillairgé, M. Can. Soc. C.E.; on "The Temiscouata Railway," by R. A. Davy, M. Can. So C.E ; on "Domestic Sanitation," by A.

Macdougall, M. Can. Soc. C.E.; on "Port Crescent and her Breakwater," by A. S. Going, A. M. Can. Soc. C.E.; on "A Cubic Yard of Concrete," by H. F. Perley, M. Can. Soc. C.E.; on "The Professional Status, an Epitome of opinions gathered from the answers of correspondents to the draft circular of the Special Committee," by A. MacDougall, M. Can. Soc. C.E., Chairman of the Committee.

It is pleasing to note that the improved attendance referred to in the last Annual Report, as having taken place at the close of the year 1892, has been maintained throughout the year. The practice of serving light refreshments has been continued with gratifying results, and has aided materially in developing the social side of the meetings.

STUDENTS' MEETINGS.

There has been one students' meeting during the year, at which a paper on the "Disposal of Sewage at Marlboro, Mass.," by J. A. MacPhail, Stud. Can. Soc. C.E., was read.

ROOMS.

The lease of the rooms now occupied by the Society will expire on the 1st May, 1895. It is necessary that some arrangement be made as soon as possible to provide for the future home of the Society. These rooms, although excellent in many respects, are too small for present wants, and it is not possible to obtain additional accommodation in the building.

INTERNATIONAL ENGINEERING CONGRESS, COLUMBIAN EXPOSITION.

At the outcome of the canvass in aid of the International Engineering Congress at Chicago, the Society has been enabled to forward $800, or approximately $2.00 for each corporate member of the Society. In the early summer, tickets of admission to the privileges in connection with the Headquarters were received and distributed to the subscribers, and to other members of the Society applying for them. In response to a request from the General Committee, the Society has furnished to the Engineering Headquarters a more or less complete list of the engineering works and industries of interest in Canada for the information of visiting Engineers. The Society is indebted for aid in compiling this list to the Engineers of the various towns and public works of the Dominion.

AWARD OF THE GZOWSKI MEDAL.

For the reason assigned by the Chairman, the Committee on the award of the Gzowski medal was unable to report at the last Annual meeting. The Committee appointed by the Council for the present year was instructed that their duties would include the award of the medal for the past year. In accordance therewith the Chairman reported, under date May 8th last, recommending that the medal be awarded to Mr. H. G. C. Ketchum, M. Can. Soc. C. E., for his paper on the "Chignecto Ship Railway," published in Vol. V., Part II., of the Transactions, and the Council has accordingly presented the medal to Mr. Ketchum.

The Committee has unanimously recommended that the medal for this year be awarded to Prof. John T. Nicolson, M. Can. Soc. C. E., for his paper on "The Transmission and Distribution of Power by Compressed Air," published in Volume VII., Part I., of the Transactions.

FINANCES.

The income for the year has been $5081.38 and the expenditure $4240.07, leaving a balance of $841.31 and a total balance to carry forward in the general fund of $5925.90.

It will be noticed, however, that after deducting the receipts and expenditure on account of the Columbian Exposition, the actual receipts have exceeded the expenditure by more than $1,000.

BUILDING FUND.

The amount to the credit of the Building Fund in the hands of the Treasurer is $3390.56, being an increase, due to bank interest, of $127.75 during the year.

No additional subscriptions have been received, but the amount is drawing interest at the rate of 4 per cent. per annum.

PROFESSIONAL STATUS.

The report of the Committee appointed at the last Annual Meeting is presented herewith, and contains the recommendations of the Committee for further action.

E. P. HANNAFORD, *President.*
C. H. McLEOD, *Secretary.*

REPORT OF THE LIBRARY COMMITTEE.

The Library Committee begs to report that the rooms of the Society have been open during the year as follows:

From January 1st to November 23rd, from 9 a.m. to 12.30 p.m. and from 2 to 6 p.m. every week day except Tuesdays and Thursdays. On Tuesdays the hours were from 2 to 6 p.m. and from 8 to 10 p.m., and on Thursdays from 9 a.m. to 12.30 p.m. After November 23rd, the rooms were open from 2 to 5.30 every afternoon and from 8 to 10 every evening except Saturdays.

The change in the hours after November 23rd was in accordance with a resolution passed at an ordinary meeting of the Society held on the 12th October, and it was expected that the opening of the reading room during the evening hours would result in a largely increased attendance of members. The desired effect, however, does not appear to have been produced, and the average attendance throughout the year cannot be placed at more than 2 to 3 members per day.

The Committee cannot too strongly recommend to the members an increased use of the rooms, with view not only to a greater interest being taken in the Society at large, but also because it feels assured that frequent meetings of the members will be for their personal benefit in many ways. Located as the rooms are in one of the best parts of the city, convenient of access, comfortable and well lighted, and supplied with the principal engineering and scientific journals and transactions of kindred societies, they afford a most attractive rallying point to the resident members, and should be highly appreciated by them.

Donations to the Library have been received from the following:

H. Irwin, M. Can. Soc. C.E.
R. McDowall, A. M. Can. Soc. C.E.
E. S. M. Lovelace, A. M. Can. Soc. C.E.
W. H. Wiley, A. M. Am. Soc. C.E.
W. B. Dawson, M. Can. Soc. C.E.
W. McNab, M. Can. Soc. C.E.
J. W. Heckman, A. M. Can. Soc. C.E.

Four volumes have been purchased and exchanges have been effected with the following:

New York State Library, Western Railway Club of Chicago, Engineers Society of Western Pennsylvania, Association of Engineers of Virginia, Public Library of Boston.

In conclusion, the Committee would urge on the members greater liberality towards the Library, and would express the hope that it may be strengthened during the coming year by substantial donations. There are many members who could easily make contributions of suitable books from their private libraries, thus doing a great service to the

Society without depriving themselves, as the books can always be obtained from the Library when required. The Library has made a fair start, but it should grow more rapidly and in a manner commensurate with the importance of the Society.

The inconvenience in regard to more storage capacity for journals, etc., referred to in last year's report, is still felt, but in a much greater degree. Nothing further has been accomplished towards obtaining more space.

Respectfully submitted,

P. ALEX. PETERSON,
Chairman.

W. McNAB,
Librarian.

MONTREAL, Dec. 30th, 1893.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

ABSTRACT OF RECEIPTS AND EXPENDITURES FOR THE YEAR ENDING DECEMBER 31st, 1893.

Balance from 31st Dec., 1892		$5,084 59
GENERAL RECEIPTS.		
Subscriptions:—		
Arrears	$ 985 00	
Current	2,468 00	
Advance	449 00	
Extra on local cheques	1 55	
		$3,903 55
Donation by Sir Casimir S. Gzowski, A.D.C., K.C.M.G.		300 00
Transactions and papers sold.		43 50
Donation to Library		5 00
Subscription towards expenses of General Committee to Columbian Exposition		624 00
Interest to 31st Dec., 1893		205 33
		5,081 38
BUILDING FUND.		
Balance from 31st Dec., 1892	$3,262 81	
Interest to 31st Dec., 1893	127 75	
		3,390 56
		$13,556 53

HERBERT WALLIS,
Treasurer.

GENERAL EXPENDITURE.		
Transactions and President's address	$ 812 74	
Advance proofs and extra papers	154 55	
Printing, stationery and books, etc	358 98	
Postage, messengers, telegrams, cabs	339 87	
Secretary	300 00	
Assistant Secretary	480 00	
Janitor	125 00	
Office furniture	10 05	
Rent of rooms one year	550 00	
Telephone service	30 00	
Bank commission on collection	13 68	
Diplomas	6 90	
Gas	25 67	
Water	25 22	
Insurance	13 50	
Books, magazines and binding for Library	182 70	
Express charges	7 80	
Engraving medal	1 50	
Subscription towards expenses of General Committee to Columbian Exposition	802 51	
		$4,240 07
BALANCES.		
General Fund—Treasurer	$5,925 90	
Building Fund—Treasurer	3,390 56	
		9,316 46
		$13,556 53

Examined with books and vouchers, and found correct.
PERCIVAL W. ST. GEORGE,
F. R. REDPATH,
Auditors.

Mr. Anderson said he would like some information as to what was done and what benefit had been received from the $800 sent to the Engineering Congress ?

Prof. Bovey asked whether any of the visiting Engineers to the Congress had availed themselves of the privileges afforded to visit the Engineering Works in Canada, a list of which had been compiled for their benefit.

The President stated that the $800 which had been given was the voluntary subscription of members. With regard to what was done, we all of us received tickets to visit the Rooms, but he had not seen any of our members who had attended any of the meetings of the Congress.

Mr. Gray said the only member of the Society whom he had met who had received a notice to attend these meetings was Mr. Murphy of Halifax. The speaker stated that he should have liked to attend the meetings but he had not received any notice.

Mr. Goad said he was present throughout the convention. It was an ordinary convention of the American Society of Civil Engineers. Mr. Murphy was to have read a paper, but he came too late, and the paper was read by title in his absence. They had very comfortable rooms and every convenience for visiting engineers.

Mr. Peterson said he thought that notifications to the Congress were sent to all the Canadian Engineers, as also notifications of the meetings. He knew that Mr. Keefer was there, and that he considered it very successful. As to the grant of the money, the question is not whether we received any advantage from it. We were under bond to give it, we had given our word, and he thought that now the members of Canadian Society of Civil Engineers could hold their heads up any where.

Mr. Gray said he was not referring to the money but as to whether any notices of the meetings had been sent to the members of the Society.

Mr. Anderson said he wished to put on record his opinion that the grant of $800 to the Engineering Congress was an utter waste of $800. They had been told that the Society was bound to pay this sum through the action of a previous Council, but what he wished to emphasize was his opinion that this Society is not in a position to undertake the expenditure of $800 for any outside purpose. He thought it would be much better if the subscriptions were put into the building fund or library fund. He did not think that the question

as to whether it was an advantage or not need be discussed now, but he hoped that incoming Councils would not undertake the grant of such large sums without first giving the matter full consideration

Mr. Sproule said it was probably not much use taking up the time of the meeting discussing this question at this late date, but the matter had been hushed down by those who wanted to hush it down. This Society did not contribute this sum as a Society. It was contributed by individual members, but we cannot be blind to the fact that we were told that we were in honour bound to subscribe to that fund. He was not arguing on one side or the other. He only wished that the matter should be known to every member of the Society and how it was started.

The Secretary took exception to the statement that circulars had been sent out stating that members were in honour bound to subscribe.

Mr. Peterson said he thought that at the last annual meeting the matter had been fully explained. We had sent three representatives to Chicago who agreed to the terms that the other Societies made. These representatives reported to Council. The Council approved of the report, and we were asked to pay at the rate of $2.00 per member. As to the circular referred to, Mr. Peterson said he had sent that out himself. He felt that we were in honour bound to pay the $800 as we agreed to pay it, and he stated so in his circular.

Prof. Bovey said he would like to say that the Council knew nothing about this circular. It did not come from the Council, and he did not think it should be considered as coming from the Society, because he did not think the Council would commit themselves to that extent.

Mr. Peterson said the Council had nothing whatever to do with the sending out of the circular. The members of Council were not then in favor of paying the $800. They afterwards, however, changed their minds, and passed a resolution to the effect that they considered the Society was bound to pay the $800.

The Secretary read a circular under date of 20th December, 1892, in which the word "honour" was used, but not in the sense implied.

The President said he would draw the attention of the meeting to page 3 of last year's report of Council. He said the members were well aware of what had been done. There was no attempt whatever to hush the matter up. There were some strong opinions on both sides. He assured them that the Council was not at all united on the question. The $800 had been subscribed. It did not come from the

Society as a whole. The most of it was given in large sums by individual members. He thought that the matter might now be allowed to repose.

Prof. Bovey said he would like to ask one question as to the clause in the Report, "it is necessary that some arrangement should be made as soon as possible to provide for the future home of the Society." He would like to know if the Library Committee had ascertained from the Directors of the Bank of Montreal whether it was impossible for them to get additional accommodation in this building.

Mr. Peterson in reply said they had endeavoured to get additional accommodation in the building, but they had not been able to do so. Of course if the Bank would undertake to build an addition to the building we would then be in a position to remain in these rooms. Otherwise they are too small.

Mr. Macdougall asked what was done with the amount to the credit of the building fund?

The Treasurer replied that it was invested in the bank at 4 per cent. Probably the new Treasurer will think it necessary to invest it differently.

Mr. Hannaford said that the present rooms were certainly too small The Directors of the Bank of Montreal may think it necessary to build an addition. That was a matter for the incoming Library Committee to find out.

Mr. Wragge said he would like to make a suggestion. The Society had now a large balance of $5,900. He thought it would be a great assistance to the Society in getting papers presented for reading if there were premiums given for papers.

Mr. Peterson said he did not think it was advisable to take from our funds to give premiums. In the American Society the premiums were given by members or associates. He thought that it would be a very excellent idea if some of our members or some of the past Presidents would give a sum whereby we could give premiums.

It was moved by Mr. Walter Shanly, seconded by Mr. Peterson, and resolved:

"That the Annual Report be received and adopted."

A statement of attendance of members at Council meetings during the year was then read and laid on the table.

Mr. Macdougall then read the report of the Committee on Professional Status.

It was moved by Mr. Macdougall, seconded by Mr. Gray, and resolved:

"That the report be received."

Mr. Macdougall said he had prepared for the information of the Society a short epitome of the opinions he had gathered from correspondents on this question of professional status. He said that he had received replies from every province from the Atlantic to the Pacific, and the result of sending out the draft report had really been of much advantage to them in discussing the question to-day. It has brought out an unanimity of opinion as to the desirability of taking some steps to promote our position and to put us on a higher plane than we occupy. The number of answers show that there is a very strong feeling that something needs to be done. He felt that there were very many difficulties to be overcome, and he had thought that it would be better at the present moment to simply bring in a report such as they had just presented. As the profession stands at present, we have the privilege of practising in every province. An engineer is not governed by any special charter or rights. The medical profession recognize a great difficulty in this question. A medical practitioner in Ontario or any other province must pass specified examinations before he can be admitted to practise in any of the sister provinces. The question has now attracted the attention of the medical profession, and they are endeavouring to see whether they cannot bring about a reciprocity of practise, so that by the permission of certain medical councils in each of the provinces the standard would be raised, and a practitioner in one province could, by simply showing his diploma, be admitted to practice in another province. The speaker said the personal discussion which he had had with friends in the legal profession point out that there is no reason why a Dominion charter should not be granted to the Society, but they all say it would be a doubtful question how far we could practise under it. He did not wish to say a word against the right of any man to earn a living, but he wished to point out that the name of the profession suffers very much from the acts of men who are really not engineers, and who are not qualified to call themselves engineers. The expenditure of public money is at times put in the hands of a man who has a certain amount of influence and assurance, and who undertakes to construct a work in which he probably fails. The result is of course that he is called the engineer of the work. A case was brought under the speaker's notice last year, in which a man who was a bridge carpenter applied for the position of County engineer, and wished to design a bridge of very large magnitude. As far as the speaker can see to-day, or can form an opinion of what we should do, he

would say that we ought to be satisfied with the hold the Society has got. We have a good standing ground, and if we will only gradually improve our position, not allowing ourselves to slip back but keep moving ahead, we will do a great deal more than we would do by any hasty action in pushing ourselves forward by legislation. The question is to be looked at in this way. The speaker said he presumed that he was perfectly at liberty to give them the information which he had received from all over the country. He did not think that they could get the present provincial government in Ontario to pass an act whereby recogniti on would be given to the members of the Society. Therefore, so far as that province is concerned, we shall have to let matters stand. Mr. Webster is very anxious for and believes that it would be possible to carry an act in the province of Manitoba recognizing the members of the Society. If that were done, and the beginning made in that province only, the members would have the right to practise there. He thought, however, it would be far better for them to be satisfied with the report and the position which they had to-day, and to endeavour to find out from the members of our Society who are resident in the different provinces what the feeling is in relation to the matter. To interview members of the Government, Ministers of Crown Lands, of Public Works and the Attorneys General of the Provinces, to ascertain what our position is, and then we can form an opinion. The movement must come from ourselves. There are other professions before us who have worked themselves up. Our position is enormously improved in the last eight years, and in the course of the discussion which he had had the speaker was very much pleased to hear a learned counsel say that our strongest move would be to keep amongst ourselves a high standard, so that when the standing of an engineer is being discussed it will be sufficient to say whether or not he belongs to a society like ours, in order to determine his character. He also added that if at present we are suffering from the actions of men who are not civil engineers, they will in the future disappear and the truly professional man will come to the surface.

Mr. Shanly said he was sorry to say that he had not been able to work very hard on this question. He did not think it would be wise to attempt to obtain legislation at present, so they had decided to do no more than report as they had done. He would not recommend seeking Dominion legislation at all until we find that we can get it in the provinces.

Prof. Bovey said the report favored the formation of a close cor-

poration. Personally he was opposed to it, although he thought the Society should take some steps to prevent encroachments such as had already been made. We have a Dominion charter giving us the right to practise as engineers. He wished to know if we are a close corporation can the provincial governments interfere with our rights in any way, and if provincial laws can be passed curtailing the rights given us by the Dominion government?

Mr. Cuningham said he understood that the Society would be committed to nothing by receiving the report and by naming a committee to make further enquiries. At the same time, he thought that while we are all here we should think over and discuss the various aspects of this question and the various complications that would arise from the formation of a close corporation. The point that Mr. Macdougall brings up is very well taken, that a man should be a member of this Society before he is entitled to practise as a Civil Engineer, and that where the letters C. E. appear after a man's name it should be held to mean a member of the Society. But if this is to be the case, our Society must designate much more clearly what is meant by a Civil Engineer. As the Society is at present constituted, the term Civil Engineer comprises men who are mechanical, sanitary, hydraulic, mining, electrical and naval engineers. Now, if a man who is a Civil Engineer is allowed to do any mechanical or other branch of work without being specially fitted for that work, then it seems that this would be no guarantee for special branches. It seemed to him that if we were to form a Society that would give a standard of fitness for the carrying on of various works, we must invest the Society with power to say who shall be fit for this or that branch of the profession.

Prof. Bovey: Can you give us any answer as to whether the Provincial governments can curtail our rights?

Mr. Walbank said the Provincial governments cannot actually curtail our rights, but they can practically do so by giving the land surveyors and others the same rights as Civil Engineers have.

Prof. Bovey said he was one of the deputation that had waited upon the late Provincial government to ask that the engineers might be allowed to practise as land surveyors. Mr. Mercier said he would favour the movement.

Mr. Walbank said he agreed with Mr. Macdougall, that if we could get a close corporation it would be a very good thing. He was afraid however, that it would be an impossible and useless task to attempt it.

He would like to know from Mr. Macdougall if the committee had studied out the question from this point of view as well as from that of the land surveyors. He did not know that the Dominion land surveyors or provincial land surveyors might not be better qualified to practise as engineers than a lot of other men, such as architects, builders, inspectors, etc. Now, supposing we get this, what better off shall we be? A great many men who are practising, as engineers will have to be admitted into the Society,—in fact, we shall have to admit all men who are practising.

Mr. Sproule said he would like to ask that the portion referring to the land surveyors be expunged from the report. The land surveyors in this country are men who have got out of employment. The occupation of land surveyors is entirely gone, and they have drifted into the profession of civil engineering. These men are better qualified to act as engineers than a great many others, and they have to pass examinations that 50 per cent. of our men would not be able to pass. He would be very sorry to have this report go into print with this reference to land surveyors. Mr. Sproule also advocated the changing of the name of the Society from the Canadian Society of Civil Engineers to that of the Canadian Society of Engineers, in order that it may embrace all classes of engineering. The term Civil Engineer cannot be now made to include what the definition of our Society is endeavouring to make it. It does not include mechanical engineering. A mechanical man does not feel that he is a civil engineer, although probably having just as important work to do as the civil engineer. He thought that the standing of the members should be defined, and that a member should be admitted as mechanical electrical or whatever branch he was qualified to follow, whereas now a man is admitted under the general title of Civil Engineer.

After some further discussion on the question, it was finally moved by Prof. Bovey, seconded by Mr. Wallis, and carried :—

"That the report on Professional Status be not included in the Transactions, but be referred back to the Committee; that the Committee be continued, and report not later than November 1st, and the report to be printed and distributed amongst the corporate members not later than December 1st, 1894."

Mr. Peterson, Chairman of the Committee on Cement Testing, then read the report of the Committee, as follows :—

APPENDIX TO REPORT OF COUNCIL.

To the President and Members of the Canadian Society of Civil Engineers.

GENTLEMEN,

The Committee on cement testing begs to submit an interim report, and asks to be continued.

It is felt that the subject is one of great importance; and the Committee finds it will take a great deal of experimenting, and therefore a considerable amount of time in order that results worthy of acceptance may be reached. The subject of standard tests for cement has received most thorough treatment in France, Germany, Austria, Switzerland, Norway and Sweden, and Russia; in England, no standard system is yet in vogue, although its importance is recognized, as shown by the number of papers read before the Institution of Civil Engineers.

In the United States action has been taken, and the suggestions of the Committee appointed by the American Society of Civil Engineers are pretty well in force all over the United States and Canada.

The recommendations embodied herewith will, it is believed, determine fairly the value of a cement, and until further information the Committee asks that they be included in specifications made under the direction of the Members of the Society.

Your Committee, having in mind the difficulty of determining authoritatively the value of cements, and the fact that the small consumer has neither the opportunity nor means of testing for himself, suggests that a memorial to the Dominion Government be prepared, setting forth the conditions and advantages of the establishment of Testing Bureaus in McGill University, Montreal, the School of Science, Toronto, and at the Capital, or principal city, where the requisite skill and facilities may be had, in each of the Provinces. The scope of the Bureau would be to determine in case of dispute of guarantee the value of the cement under the terms of the standard system for testing, which should be uniform and on the lines herein suggested, or to examine and give certificates to dealers and manufacturers, under proper restrictions to provide against improper use of the certificate granted by the Testing Bureau to be provided for, etc.

Respectfully submitted,

P. ALEX. PETERSON,
Chairman.

M. J. BUTLER,
Secretary.

MONTREAL, January 8th, 1894.

INTERIM REPORT.—STANDARD METHOD FOR TESTING CEMENTS.

All experiments should be carried on at a uniform temperature of 65° F., as nearly as practicable, except when being made for the purpose of ascertaining the comparative strength of cements required for winter use. In this case cements should be mixed at a temperature below freezing with cold water, cold sand, and kept exposed to ordinary winter weather, such as it would be exposed to in actual construction of masonry—a description of what was done in this connection should be kept to compare with the work of other experimenters.

1st. Fineness of Cement.

The finer a cement is, other things being equal, the better it is. It is advised that cements shall not leave more than 5 p. c. residue on the 2500 mesh sieve.

A mechanical sifter that will work automatically by a jig motion is recommended, thus eliminating the personal error. Sieves of (50 x 50), 2500 meshes, (74 x 74), 5476 meshes, and (100 x 100), 10,000 meshes to the square inch to be used.

The gauge of the wire to be for the 2500 mesh sieves, No. 35 Stubbs wire gauge ; for the 5476 mesh sieve, No. 37 Stubbs wire gauge ; for the 10,000 mesh sieve, No. 40 Stubbs wire gauge.

The Globe Wire Works Co., 85 Fulton St., New York, undertakes to furnish sieves of the above gauge and size, as correct as can be made ; cost, $4.80 for set of three.

Sand sieve.—Use sieve of (20 x 20) 400 meshes and (30 x 30) 900 meshes to the square inch. The sand to be crushed quartz, and only use what will pass the 20 sieve and what will be retained on the 30 sieve. The gauge of the wire in the 20 sieve to be No. 28 Stubbs wire gauge, and in the 30 sieve No. 31 Stubbs wire gauge, cost $4.00 for set of two.

2nd. Specific gravity.

"The specific gravity affords the only means of determining the calcination of a cement with certainty, and is hence of high value." It varies according to the brand and the quantity of lime between 3.12 and 3.25 (for fresh samples).

For instructions as to best means of determining the specific gravity, the following references are attached : the gravimetric system is advised in every instance.

Transactions American Society of Civil Engineers, October, 1893, page 37, "Gary."

Minutes of Proceedings of the Institution of Civil Engineers, Vol. LXII, appendix IV, page 129.

3rd. Test cement for blowing (presence of free lime). The Committee does not feel like committing itself to any positive statements. It is certainly advisable to use Faija's apparatus, and in order to settle points in dispute it is suggested that *boiling* first class well known cements be tried for comparison. Samples are prepared in the way of thin pats on sheet glass. After hardening in air they are placed in warm water, say 115° F., and allowed to remain for 24 to 48 hours; if they do not leave the glass or crack, it is considered certain that no free lime in a form to cause injury to the mortar is present. Cements when very finely ground, even if slightly over-limed, are not so liable to blow.

4th. Determine all proportions by weight.

5th. Determine time of setting by noting the time it takes sample under test to bear needle of $\frac{1}{12}$ an inch diameter loaded with one fourth of a pound and $\frac{1}{24}$ of an inch diameter loaded with 1 pound, the mortar under test to be of the consistency of rather stiff plaster or mortar.

6th. Do all gauging or mixing by a mechanical mixer; Faija's gauger has been found quite satisfactory.

It is claimed by several experts that hand work can be made to agree closely with the mechanical methods; and it is quite possible that experts may agree; it is not questioned that the mechanical method is on the whole the more uniform, inasmuch as no skill or dexterity is required to produce the same results.

7th. Fill briquette moulds mechanically, and until further experiments are made it is advised that the moderate pressure of 10 lbs. to the square inch of area of the briquette be tried. The filling may be by an hydraulic press or by simply loading a slab to bring the requisite pressure, sufficient mortar to fill the mould being placed with the trowel at once.

The quantity of water to be used varies with the kind of cement, fineness, etc., hence no arbitrary quantity can be specified; the only correct way is to bring all mortars to the same degree of plasticity. It is therefore recommended that an apparatus similar to "Vicats" be used; it consists of a needle having an area of 0.4 sq. inch weighted with about 11 oz.

"The tests are made as follows : a ring 1½ inches in height and 3 inches in diameter, made of non absorbing material, is placed on a glass plate and filled with the mortar to be tested, the consistency to be such that the needle does not entirely pierce it." (See Transactions of the American Society of Civil Engineers, page 11, October, 1893.)

8th. Testing machines.

Should be of the positive lever automatic type, so arranged as to apply the loads quietly and uniformly at the rate of 200 lbs. per minute.

9th. The style of clip.

The style of clip to be such as to break the briquette at the line of least section. The clips on the Riehle machine with adjustable rubber have been found to work satisfactory.

10th. Chemical tests are strongly recommended.

Full quantitive analysis and preference will be given to cements the manufacturers of which furnish an analysis.

The following analysis shows the constituents of a cement which has been found to give good results :

Lime, Ca.O.....	60.05
Silica, $Si.O_2$	24.31
Alumina and Iron oxide $Al_2O_3FiC_2$.	10.84
Magnesia, Mg. O, not more than.....	3.00
Alkalies.....	1.60

10th. It will be found, however, that the strongest cements made carry considerably more lime. There are, however, certain deleterious substances which should not be accepted. If there is found to be more than 2 per cent. of sulphuric acid, the cement should be rejected ; or if more than 5 per cent. of magnesia, the cement should be rejected ; it must be understood that the above applies only to Portland cements, inasmuch as all the so-called natural cements contain magnesia to the extent of 6 to 12 per cent.

The analysis of an average good quality of American natural-cement is as follows :—

Silica.....	28.11
Alumina.....	27.62
Lime.....	37.18
Magnesia.....	7.09
	100.00

11th. It is recommended that tension tests be the basis for comparison, although tests in compression and for transverse loading are strongly advised.

12th. Inasmuch as neat cement is rarely used in practice, it is advised that sand tests be always made as a final basis for comparison. The standard sand to be crushed quartz, an article of commerce readily obtainable from the manufacturers of sand paper. The size to be as specified under Clause 1.

P. ALEX. PETERSON,
Chairman.

M. J. BUTLER,
Secretary.

MONTREAL, 8th January, 1894.

Mr. Peterson said he thought the Committee would like the members to make tests and send the results to the Committee.

Prof. Bovey said if the Grand Trunk Railway and the Canadian Pacific Railway would send them barrels of cement, the Committee would have them tested and give them the results for nothing.

It was moved by Mr. Kennedy, seconded by Mr. Cuningham, and resolved :—

"That the report of the Committee on Cement Testing be received, and that the Committee be continued, and also that it be given power to add to its number."

Mr. Sproule then read the report of the Committee on Professional Ethics. Before doing so, he explained that early in the season he had endeavoured to get meetings of this Committee and had failed. They had not wished, however, to come before the annual meeting with nothing done. So that a few weeks ago they had held a meeting, and a rough draft was made out and distributed. He had received a draft report from Col. Sir C. S. Gzowski, together with some letters which he was requested to read to this meeting.

Mr. Sproule then read the report of the Committee and the report of Sir Casimir Gzowski, as also the letters referred to.

It was moved by Prof. Bovey, seconded by Mr. Walter Shanly, and carried : "That the Committee on Professional Ethics be authorized to add to its number, and be requested to report to the Council on or before the 1st of October."

On motion, the above resolution was reconsidered, and it was moved by Prof. Bovey, seconded by Col. Anderson, and resolved :—

"That the report on Professional Ethics be accepted and referred back to the Committee for further consideration. The Committee is hereby empowered to add to its number and to communicate with the corporate members of the Society, in order to obtain their opinions before making a final report to the Council, which report is to be made on or before the 1st October, 1894."

Mr. Irwin said he would suggest that the Committee should consider how this code of ethics is to be enforced or carried out. We would require to have some means of disciplining members.

The meeting was then adjourned to 2.30 p.m.

ADJOURNED ANNUAL MEETING.

Convened at 2.30 p.m.

E. P. HANNAFORD, President, in the Chair.

The Secretary read the following report of the scrutineers on the election of officers for the year 1894 :—

To the Secretary
Canadian Society of Civil Engineers :—

We, the undersigned Scrutineers, appointed to examine the ballots for the election of Officers for the ensuing year, beg to report that the result of the voting is as follows, viz. :—

			Votes
For President	P. Alex. Peterson,	Montreal	109
	E. P. Hannaford,	"	5
For Vice-Presidents	Herbert Wallis,	Montreal	112
	Alan Macdougall,	Toronto	110
	P. W. St. George,	Montreal	103
	Octave Chanute,	Chicago	6
For Treasurer	K. W. Blackwell,	Montreal	115
	Herbert Wallis,	"	5
For Secretary	C. H. McLeod,	Montreal	120
For Librarian	William McNab,	Montreal	120
For Members of Council	H. T. Bovey,	Montreal	97
	John Galbraith,	Toronto	96
	H. N. Ruttan,	Winnipeg	93

		Votes.
P. S. Archibald,	Moncton.....	88
G. C. Cuningham,	Montreal.....	88
G. H. Duggan,	"	82
William Haskins,	Hamilton	82
H. A. F. MacLeod,	Ottawa.....	82
J. D. Barnett,	Stratford	81
L. A. Vallée,	Quebec	81
Hiram Donkin,	Mulgrave, N. S..	80
Hurd Peters,	St. John, N.B....	80
Harry Abbott,	Vancouver, B. C.	78
G. H. Garden,	Montreal.....	77
Octave Chanute,	Chicago.....	73
A. L. Hertzberg,	Toronto	72
Stuart Howard,	Montreal.....	72
G. A. Mountain,	Ottawa	71
E. G. Millidge,	Antigonish.....	56
Louis Costé,	Ottawa	6
H. Irwin,	Montreal.....	5
D. A. Stewart,	Winnipeg.....	5

124 ballots in all were sent in. Of these 107 were found to be valid throughout; 4 were found to be entirely void, 2 through non-payment of dues and 2 on account of no name being on the outer envelope; while 13 were void as regards Members of Council through comprising more than 15 names.

R. M. HANNAFORD,
H. IRWIN,
JOSEPH W. HECKMAN, } *Scrutineers.*

MONTREAL, 9th January, 1894.

The President then declared the Council for the following year to be as follows :—

President :

P. ALEX PETERSON.

Vice-Presidents :

A. MACDOUGALL, P. W. ST. GEORGE, H. WALLIS.

Treasurer :

KENNET W. BLACKWELL.

Secretary :

CLEMENT H. MCLEOD.

Librarian :

WILLIAM MCNAB.

Council:

H. ABBOTT.
P. S. ARCHIBALD.
J. D. BARNETT.
H. T. BOVEY.
O. CHANUTE.
G. C. CUNINGHAM.
H. DONKIN.
G. H. DUGGAN.
J. GALBRAITH.
G. H. GARDEN.
WM. HASKINS.
H. A. F. MACLEOD.
H. PETERS.
H. N. RUTTAN.
L. A. VALLEE.

The report of the scrutineers on the election of the Nominating Committee was then read as follows:

To the Secretary

Canadian Society of Civil Engineers.

The scrutineers appointed to examine the ballot for the election of the Nominating Committee for 1894 beg to report as follows:

82 ballot papers were received, of which one was invalid by reason of more names being on it than called for.

MARITIME PROVINCES AND NEWFOUNDLAND.

Seven names received nomination by residents in the Maritime Provinces, of which H. S. Poole received the highest number of votes, viz., 3 votes.

Messrs. C. E. W. Dodwell and P. S. Archibald received 2 votes each, and the others 1 vote each.

PROVINCE OF QUEBEC.

For the Province of Quebec, thirty names received nomination, of which Messrs. H. Irwin and G. H. Duggan received the highest number of votes,—8 and 7 respectively.

Five votes were cast for Thomas Monro; 4 each for John Kennedy, Stuart Howard, J. M. Shanly; 3 votes were cast for D. MacPherson, and the balance received less than 3 votes each.

PROVINCE OF ONTARIO.

By members in the Province of Ontario thirty-six names received nomination, of which Alan Macdougall received 12 votes, J. Galbraith, 8 votes; W. T. Jennings, 4 votes; and W. P. Anderson, 3 votes, the balance receiving less than 3 votes each.

NORTH-WEST PROVINCES.

From the North-West Provinces four names received nomination, of which H. N. Ruttan received 4 votes, and H. J. Cambie 2 votes. Messrs. H. D. Lumsden and G. H. Webster, 1 vote each.

OUTSIDE OF CANADA.

From members outside of Canada, six names received nomination : H. T. Bovey, G. C. Cuningham, C. H. Keefer, John Kennedy, J. M. Shanly, P. W. St. George received 1 vote each.

We, the undersigned scrutineers, therefore declare the following elected as the Nominating Committee for the year 1894 :—

H. S. POOLE,	Maritime Provinces.
H. IRWIN, G. H. DUGGAN.	Province of Quebec.
ALAN MACDOUGALL, J. GALBRAITH, W. T. JENNINGS.	Province of Ontario.
H. N. RUTTAN,	North-West Territories.

In consequence of a tie between the names selected by members outside of Canada, we refer the selection to the meeting as per clause 40 of the By-laws governing the election of officers, which we presume will apply also in this case.

Respectfully submitted.

W. MCNAB,
ARMITAGE RHODES,
T. W. LESAGE,
Scrutineers.

Jan. 9th, 1894.

A ballot having been taken from amongst the five members voted for (Mr. Kennedy being already a member of the Committee as past president of the Society), Mr. J. M. Shanly was elected the representative of the provinces outside of Canada.

The Chairman then declared the Nominating Committee for the ensuing year to be as follows:

Province of Quebec—G. H. Duggan, H. Irwin.
Province of Ontario—J. Galbraith, W. T. Jennings, A. Macdougall.
Maritime Provinces and Newfoundland—H. S. Poole.
Northwest Provinces—H. N. Ruttan.
Outside of Canada—J. M. Shanly.

PRESIDENT'S ADDRESS.

The President then read the following address :

In addressing you on the occasion of my retiring from the presidency of this Society, permit me to return you my sincere thanks for the support you have given me during my term of office ; and on this occasion I may perhaps be permitted to refer to some facts as at this time, and in comparison with the past.

We are living not only in an age of progress but in one of great energy. The "piping times of peace" have given to our land a liberal population, full of vigour and advancement. Our institutions in Canada are guarded by liberty of thought and action, and we should be, and I think we are, a contented people.

But although this is, or may be, applicable to us as a country, yet to the "Canadian Society of Civil Engineers" the term may not be so comforting in its disposition ; as we are by nature a restive and, to some extent, an uneasy body of men, whose education and surroundings have tended to lead us onward through works of magnitude, and positions of marked difficulty in endeavouring to reconcile Capital with Labor, and thus to satisfy that phase of human nature, the "investor for gain," because we know that in the end we must account to the Financier, without whom our profession would be inactive. We are simply the stepping-stones across the angry waters, to lead the great mass over to the shore of gain—or it may be of loss—but to us as a profession is not so much the financial success as the carrying out of the construction.

I purpose to occupy your time by giving you my experience of some of the principal features in the construction of railways in Canada, affecting their cost and subsequent management.

The object of our profession in a country like Canada is economy, if not cheapness, of construction, and to this end the efforts of manufacturers have been directed.

The history of steel rails since their use in Canada, now 23 years ago, is an instance of this, and forms an interesting and instructive subject.

In the year 1870 when steel rails were introduced into Canada for general use, the price was £10 to £12, and even up to £16 16s sterling, per ton. The price to-day is £4 sterling per ton.

The question may be asked if the rails of to-day are as good as those of earlier years. The reply is definite : "No, they are not as good ;" and to those who are interested in the wear of rails it will

afford information if we look into the reasons affecting the decay of manufacture,—if I may use such a term.

In 1870, the Bessemer process consisted of rolling steel rails from ingots, by passing through a series of roll shapes, one rail length at a time. To-day, less passing through rolls and longer lengths is the method, as tending towards economy per ton in manufacture. In the earlier years the process ensured ample working of the material,—the rails were well rolled; but latterly the opposite is the effect. Several rails are now turned out in one length, and are cut up, at yellow heat, and allowed to cool at pleasure.

In former years the chemical parts were different to those at present used; and as it is possible to employ the same constituents now as then, it follows that, if observed, the difference must be in the process of the manufacture.

The following shews the principal chemical elements of steel rails in 1870 and in 1893, English manufacture:

	Carbon.	Silicon.	Manganese.	Phosphorus.
1870	.30	.22	.60	.10
1893	.45	.08	1.10	.07

The increase in carbon and decrease in silicon, of late years, is the result of endeavouring to overcome the effects of rapid rolling, by maintaining the hardness, as a remedy to meet the mechanical effects of slow rolling in earlier years, which admitted lower carbon and increased silicon. The increase of manganese in later years is to absorb impurities. Carbon .45 to .50 can be used with success, in rails of 65 lbs. per yard, and increased, if found to be necessary, as the rails are made heavier in section.

The result in wear of the earlier steel rails, from 1870 to 1875, of English manufacture, is much greater than any subsequent dates, the life decreasing in proportion as years have passed.

Thus I find that 65 lb. steel rails laid in 1870 to 1873 have served from 18 to 20 years, and carried a tonnage, gross and nett, of eighty millions (80,000,000), a record that will not be equalled, or nearly so, since that date.

Competition has effected lower prices and given less wear.

It is no use complaining of the decrease in wearing value; makers say "but look at the low price." Quite true. Still, the railways, having to replace the steel rails oftener, means increased cost in laying, and additional ties, because ties that may last one year

longer, if left in their beds, will in laying new rails often yield in re-spiking and re-setting.

This decrease in the wearing value of steel rails is fairly met by the makers, but the demand is such, and the inclination to give low prices so as to obtain and encourage orders, that there seems to be no recourse but to take the best offered for the money, and a combination of railmakers' prices does not leave any difference at the "mills' mouth."

Although the cost of rails and fittings forms the largest item in the permanent way, first construction, yet in subsequent maintenance the replacement of ties becomes the greater of the two.

For instance, a mile of 65 lb. steel rails and fittings cost in

1870	$5,500
A mile of ties then cost	800
In 1893, the renewal cost :—	
Rails and fittings	$2,500
Less realized on old material	1,350
	$1,150

But as the life of rails has been two and a half times the average life of ties, it follows that cost of renewals of rails is in this comparison as $460 per mile to $800 per mile. To carry this further, I find that on a territory of 1800 miles of railway in Canada the cost of rail renewals last year was (after giving credit for the old material released ton for ton) $110,000, and on the same territory for ties it cost $250,000, in both cases the cost of handling and putting into track, not included; hence, it follows that as the perishable nature of ties is greater than rails, the cost is also greater; and if to this is added that of carriage, handling, and putting ties into the track, it would add 40 per cent. to the latter, whilst for the former it would not increase it more than 20 per cent.

I find the average life of ties to be 7½ to 8 years, including hardwood and softwood, and on main lines, branches and sidings. It becomes a question of great importance in the maintenance of railways, the lasting quality of rails and ties. The former, we must follow the makers, schooling them with our experience, and endeavouring to get them to maintain the quality, even although the price per ton decreases. We realize, of course, it is a "forlorn hope;" we have to drift in prices, as the rail combination may by circumstances decide. But as regards ties, it is manifest that if by a method of treating or preserving the

timber, years of additional life can be added, it presents a feature for consideration. My experience is that but one process has proved satisfactory, viz., creosoting. The cost is considerable in this country, and more than the first cost of the ordinary tie made from the poorer class of timber (hemlock), which forms the bulk of the supply. But even so, it is open for favourable comparison, all things considered, because if a hemlock tie, costing, say, 25 cents, can by creosoting be made to last two lives (of which there is no doubt), and that the cost of doing so is 30 to 35 cents,—in England from 15 to 18 cents—making the creosoted hemlock tie cost say 55 to 60 cents, it is not more than the price of white oak; and railway experience admits that a white oak tie is cheaper at 60 cents than a hemlock tie at 25 cents.

Leaving ballasting—which will vary in cost with the local circumstances of handling, etc.—the large item of bridge and culvert construction is next in importance.

In Canada we are too often driven into accepting wooden structures, which within ten years require renewal; and as a plea for temporary work it is said that "necessity knows no law," and that it is cheaper to erect a permanent work after than before the railway is opened. Of course much can be said on both sides, but certainly it is a struggle to charge the railway maintenance with such large outlays, if no capital is left, and after construction it generally is exhausted.

My experience in constructing railway bridge masonry after the railway is opened is that the cost of such work in Ontario for ashlar may be taken as follows:—

At Belleville quarry (Trenton limestone), per cubic yard:—

Quarrying and loading	$2 00	
Cutting for "rock-faced," including dressing, cut-waters, copings, and all work general to average piers and abutments	2 70	
Cost f. o. b. at quarry		$4 70
Add for laying:—		
Labour and tools	$2 20	
Portland cement	80	
		$3 00
		$7 70
Add 10 per cent.—say		80
		$8 50

To which must be added freight.

"Backing" costs less than exposed work, and abutments generally less than piers, so that measured solid, at the prices quoted, it ensures covering the work. I can point to pier work in Ontario, constructed in 1892-93 of ashlar laid in Portland cement, which cost under $6.00 per cubic yard. Culvert masonry is proportionate in cost; but the best open and arch culvert work in ashlar will be about the same as for bridges. Ordinary box culverts, in Portland cement, from $4.00 to $5.00 per cubic yard.

A quarry at Chaudière, P.Q., where the stone is extremely hard (Cambrian formation), the cost f.o.b. cars is $7.00 (as against $5.00), making the piers of Chaudière Bridge (40 feet high, with cut-waters) cost $12.00 per cubic yard, including teaming the stone two miles from the quarry.

At Allenford, Ont., calciferous formation, the cost, dressed f.o.b. cars, is reduced to $3.50 per cubic yard. This is where the masonry, in situ, costs $6.00 per cubic yard (actual $5.38), including excavating, pumping, shoring, freight, Portland cement, lumber and filling around piers.

I desire to point to such work as the Grand Trunk Railway, Port Hope Viaduct (Trenton limestone), all built by the company's men, not a yard of it by contract, the courses up to 30 inches in thickness consisting of thirty piers and two abutments, aggregating 9,000 cubic yards, the cost of which did not exceed $8.50 per yard—and this, including the digging and filling, as well as any pumping for foundations, and freight charges equal to ruling "through rates."

On the line of the Grand Trunk Railway between Stratford and Port Dover, at Otter and Big Creek Vaileys, the pier work did not cost over $6.00 per cub. yard, everything included, and I can point to other work along the line of the railway, which, being done by its own day labour, and with stone from its own quarries, the cost has been covered by the prices I have named; so that my experience of the best ashlar pier work, including quarrying and setting in Portland cement, is from $6.00 to $8.50 per cubic yard in Ontario, and $12.00 per cubic yard at Chaudière, P.Q., and that this will cover ordinary digging for foundations and damming where steam is not required. If I am asked whether I consider these prices should be current as contractors' rates, I reply "certainly not." If any work of this nature is done by contract, then invite bids on specifications and plans, and award to the lowest and best man; but it is a source of strength for

the engineer to be aware of the cost of the work, and when a contractor puts on a "poor" face, to be able to say to him: "Not so, my friend; you are doing well, and I am glad to see you are getting ample to warrant my exacting the most liberal interpretation of my specifications."

This information is the result of carefully tabulated experience, and I know it is correct, but I do not wish to be understood as saying that a railway company should contract for work for others at those figures, neither should contractors be asked (otherwise than in open competition) to do work at such prices if they are considered low, as perhaps some men of experience may say if this reaches them; and in no work more than in masonry will circumstances affect prices. First, the nature of the stone, its adaptability for quarrying and dressing, cost of carriage, foundations, detentions by trains or otherwise during the building, and such like features, must regulate and affect the price per cubic yard, and the less masonry in quantity—such as smallness of piers—the greater will be the cost per cubic yard.

The steel superstructure of bridges now costs under three cents per pound for plate girder bridges, riveted together, on cars at bridge works ready for dropping into place, and three and a half cents per pound for lattice bridge work, f.o.b. cars, to which must be added cost of erection. These prices are less than at any time in our history—comparing favourably with prices for similar work in the United States.

The ordinary labour of the country, which enters so materially into construction, is plentiful; and in the settled portions of Canada can be obtained at the following rates:—

Labourers, $1.25 per day.
Carpenters, $1.50 to $1.75 per day.
Stone-cutters, $2.00 to $2.50 per day.
Masons, $2.00 per day.
Riveters, $1.50 per day.

So that in the construction of railways or works of like nature the rates are not high, commanding as they do experienced and able-bodied men. It has occurred to me that it would be beneficial if sets of specifications and working plans were made out for governing the construction of railways in Canada so as to form a basis for a proper understanding as between the "promoter" and the "investor."

Such a basis would be a guide for the engineer, and certainly form a protection for the investor. I would suggest two classes of construction:—

1st. The colonization railway to be built cheaply, having due regard to the salient features of gradients, earthwork and water-way so as to permit of being improved hereafter.

2nd. The railway to be built through a settled country should be of a better description, and with permanent structures.

Misunderstandings have, in the past, arisen, and may occur again for the want of a well-understood set of specifications; and although what I propose would not be popular in some quarters, yet it would have the effect of establishing a definite class of work that could not be assailed. It would certainly determine the class of the work to be done, and be of value to those at a distance where money has to be raised to carry out the undertaking. Cheap construction means dear maintenance, and hence we have seen in Canada and elsewhere how disappointing results have proved in this respect, which could have been materially lessened by a clear understanding set forth by standard specifications.

The economic working and maintenance of railways is more of a necessity in this country than in England, where all that is necessary to be done is done, and the revenue covers the charges; but hereafter the capital account is closed upon maintenance, and when a railway has to take care of itself, stern necessity has to reduce often to below the point of economic working. Freight rates have been less and less year by year, until the average all rail rate per ton per mile is but two-thirds of a cent, the grain rate Chicago to New York, one-half of a cent, and "cutting" attributes one-third of a cent or less.

Water competition in this country (happily for railways), although closed five months in the year, is a giant carrier for the other seven months; and "storages" at terminals make it possible to compete for ordinary demand all the year round.

The Manchester Ship Canal between Liverpool and Manchester is an instance of the revival of water communication, and at this time adds concern to the Port of Liverpool as to what extent its trade may be affected by carrying in bulk past its doors.

But the demand of to-day is lower rates of carriage for passengers and merchandise, and those systems of railways that cannot handle at current prices must stand aside. We have no reason to infer, judging from the past, that prices for carriage will go up, hence we must be ready to take our place in the ranks with the common carriers of the day, and overcome the difficult problem—that it is a diffi-

cult one must be admitted—and the increasing demand of higher rates of wages (already greater than the educated, professional and mercantile staff) of those who work the traffic is an element to be met with tact and knowledge; but met it must be, or the earnings will become absorbed by the dictation of men who already wield the destiny of capital, and who do not stop at the living margin of their requirements, but add exactions and conditions that the management stand aghast at, and which are unknown in countries like England; but here on this Continent, the whole has to be met, and settled, and not until those who trade upon the working men, and who make their living and profit by Labour Unions, are put aside, and the men themselves rely on their superior officers, will there be "peace and goodwill."

I will not detain you longer in regard to the smaller works, because I have not yet covered all the larger ones,—time will not permit my doing so. The question of "foundations" is of itself enough for one paper; and the "maintenance of railways" is so important, —I mean the economic honest maintenance, that a comparison of experience would be most valuable to our Profession. But here the accountant comes in and discriminates between "capital" and "revenue" charges, until we see the most irreconcilable comparisons per mile per annum, and which only end when "capital" has been exhausted and one purse has to provide for all wants.

I wish to say a word about the speculative railway builder, who poses as a philanthropist. He sees in Canada attractions of government bonuses, held out for construction, in addition to which he canvasses for bonuses from municipalities, together making about enough to construct a cheap and perishable roadbed, bridges and culverts Then the project is put into the market and "floated", and the whole bonded; the rails are laid, a sprinkling of ballast applied, and the contractor bids adieu, pocketing a balance; leaving the new line in the hands of the Railway Company, often to be worked at a loss, and with an ill-shaped, badly built, perishable undertaking, that becomes burdensome to maintain.

It is such enterprises as these that are disappointing to investors, and often reflect on our profession, when we have no power to prevent it; because the specifications for construction (it is rarely there are any worthy the name) are made to suit the circumstances. It is *that* or nothing, and often the engineer is left alone at the close of the work, blameable for results he has no control over; and the subsequent finishing of the work has to be done by maintenance, under a series of apologies.

If the railway has a large working mileage, the loss is charged off to the revenue account, acting like a "millstone around its neck."

I will close with the hope it may be my privilege in the near future to again address you, if I may be allowed, with further information acquired in a life-time devoted to the construction and maintenance of railways.

It was moved by Mr. Peterson, seconded by Mr. Blackwell, and unanimously resolved, that a vote of thanks be given to the retiring President, Mr. Hannaford, for his address, and that it be printed in the Transactions.

The President then presented the Gzowski Medal for the year ending June, 1893, to Prof. J. T. Nicolson, for his paper on the "Transmission and Distribution of Power by Means of Compressed Air."

The President said it became his pleasing duty, as his last act in the capacity of president, to present the Gzowski Medal to Prof. Nicolson. He congratulated Prof. Nicolson on having merited the medal, and said that there was no doubt that it had been fairly earned. The paper was one which we all took great delight in hearing read a year ago. He had much pleasure therefore in presenting the medal on behalf of Sir Casimir Gzowski.

The President then gave the Chair to Mr. Peterson.

Mr. Peterson said he had to thank the members most sincerely for placing him in the honourable position of President. He assured them that his best endeavours would be exercised to advance the interests of the Society, and he trusted that, with the aid of the Council and the Society, at the end of his term of office he would be able to show that he had merited the honour they had conferred upon him.

Mr. M. J. Butler said he would suggest that in future the Secretary be instructed to place a register at the door, and that by some means the members should be introduced to each other, so as to render the meeting more agreeable.

It was moved by Mr. Macdougall, seconded by Mr. Lumsden, and resolved:

"That the most cordial thanks of the Society be tendered to Mr. E. P. Hannaford for his untiring attention to the interests of the Society during his term in the Presidential chair."

It was moved by Col. Anderson, seconded by Mr. Kennedy, an resolved:

"That the thanks of the Society are due and are hereby tendered to Mr. Wallis for his valuable services as Treasurer of the Society."

It was moved by Mr. Walbank, seconded by Mr. McConnell, and resolved:

"That the thanks of the Society be tendered to Prof. C. H. McLeod for the efficient manner in which he has discharged the duties of Secretary during the past year."

It was moved by Mr. Gray, seconded by Mr. Macdougall, and resolved:

"That the thanks of the Society be given to Mr. McNab for his valuable services as Librarian during the year 1893."

It was moved by Mr. Lumsden, seconded by Mr. Macdougall, and resolved:

"That the thanks of this Society be tendered to Messrs. Ross and McKenzie, the contractors for the Montreal Street Railway, for their kindness in throwing open the Power House, now in course of construction, for inspection by the members of this Society, and for the very handsome manner in which they furnished lunch to the large number of members who availed themselves of that opportunity; also, that the thanks of this Society be tendered to the management of the Royal Electric Co., for throwing open their very interesting works for inspection by the members of this Society; also to the Governors and Faculty of McGill College for throwing open the various buildings in connection with that institution for inspection by the members."

Mr. Sproule moved, seconded by Mr. Torrance, that a vote of thanks be given to the Committee on Professional Status, and especially to Mr. Alan Macdougall, Chairman, for the services rendered by them.

This motion was carried unanimously.

It was resolved that a vote of thanks be given to the scrutineers of the ballot, and that the papers be destroyed.

It was moved by Mr. Butler, seconded by Mr. Macdougall, and resolved:

"That the Interim Report of the Cement Testing Committee be printed in the Transactions."

Some discussion took place as to the clause in the report of the Cement Committee, recommending that a memorial be prepared to be submitted to the Government, and after some remarks from Messrs. Kennedy, Butler and Walbank, it was moved by Mr. Walbank, seconded by Mr. Blackwell, and resolved:

"That the Council be requested to take some steps to petition the

Government to grant a sum of money to aid in the establishment of a testing bureau for investigating the strength and value of materials."

There being no other business to transact, the meeting was then adjourned.